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Gulfstream GVI GVI (G650), GVI (G650ER)

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HIGHLIGHTS OF CHANGE

Revision 5: Documented FSB evaluation of, and training/checking/currency requirements for the PlaneView II Avionics Software version “Block 2” upgrade. This new information can be found in Appendix 7. Revised Aerodynamics description in para 5.5.2. Revised Slow Engine Response in para 5.5.1. Added Nosewheel Steering to Seat Dependent Tasks in para. 5.2.4.

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1. PURPOSE AND APPLICABILITY

- 1.1 This report specifies master training, checking, and currency requirements applicable to crews operating GVI aircraft under 14 CFR parts 91, 125, and 135. Provisions of this report:
 - a) Identify the pilot “type rating” assigned to the GVI,
 - b) Describe any unique requirement applicable to initial, differences, or recurrent training,
 - c) Describe “Master Difference Requirements” for flight crews requiring differences qualification for mixed-fleet-flying or differences, if applicable,
 - d) Provide examples of Operator Difference Requirements (ODR) tables, if applicable,
 - e) Describe acceptable training program and training device characteristics when necessary to establish compliance with applicable MDRs,
 - f) Identify checking and currency standards to be applied by the FAA or operators, and
 - g) Provide a listing of regulatory compliance status (compliance checklist) for 14 CFR parts 91, 125, and 135, Advisory Circulars, and other operationally related criteria.
- 1.2 This report addresses GVI aircraft as specified in FAA Type Certificate Data Sheet (TCDS) # T00015AT.
- 1.3 The provisions of this Flight Standardization Board (FSB) report are effective until amended, superseded, or withdrawn by subsequent revisions to this report.
- 1.4 Determinations made in this report are based on the evaluations of a GVI aircraft equipped in a given configuration and in accordance with current regulations and guidance. Modifications and differences made to the model described herein, or introduction of new related aircraft, may require amendment of the findings in this report. The FSB reserves responsibility/authority to re-evaluate and modify sections of this report based on new or revised Advisory Circular material or revisions to 14 CFR part 91, 125, and 135, aircraft operating experience, or the testing of new or modified aircraft under the provisions of Advisory Circular (AC) 120-53, “Guidance for Conducting and Use of Flight Standardization Board Evaluations”, as revised.
- 1.5 Terminology. The term “must” is used in this FSB report and certain MDR footnotes even though it is recognized that this report provides one acceptable means, but not necessarily the only means of compliance with 14 CFR part 91, 125, and 135 requirements. This terminology acknowledges the need for operators to fully comply with this FSB report and MDR and ODR provisions, if applicable, if AC 120-53 is to be used by the operator as the means of complying with 14 CFR parts 91, 125 and 135 requirements.

1.6 This report includes:

- a) minimum training, checking, and currency requirements for FAA field offices to use for approving operator programs (e.g., MDRs, Type Rating designations),
- b) general advisory information which may be approved for that operator (e.g., MDR footnotes, ODR tables), and
- c) information which is used to facilitate FAA review of an aircraft type or related aircraft that is proposed for use by an operator (e.g., compliance checklist).

1.7 Relevant acronyms are defined as follows:

AC	Advisory Circular
ACO	Aircraft Certification Office
ADS	Air Data System
AEG	Aircraft Evaluation Group
AFM	Airplane Flight Manual
AP	Autopilot
ASC	Aircraft Service Change
AT	Autothrottle
BAAV	Bleed Air Augmentation Valve
CCD	Cursor Control Device
CFR	Code of Federal Regulations
CPCS	Cabin Pressure Control System
CHDO	Certificate Holding District Office
DA	Decision Altitude
EASA	European Aviation Safety Authority
EBHA	Electric Backup Hydraulic Actuator
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indicating and Crew Alerting System
EVAS	Emergency Vision Assurance System
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FADEC	Full Authority Digital Engine Control
FGS	Flight Guidance System
FMA	Flight Mode Annunciator
FMS	Flight Management System
FSB	Flight Standardization Board
FTD	Flight Training Device
HUD	Head Up Guidance Display
IRS	Inertial Reference System
LPV	Localizer Performance with Vertical guidance
MCDU	Multi-Function Control Display Units
MDA	Minimum Descent Altitude
MDR	Master Differences Requirements
MMEL	Master Minimum Equipment List
MMO	Maximum Operating Mach Number

ND	Navigation Display
ODR	Operator Differences Requirements
PFD	Primary Flight Display
POI	Principal Operations Inspector
QRH	Quick Reference Handbook
RAT	Ram Air Turbine
RAAS	Runway Awareness Advisory System
SFD	Standby Flight Display
SMC	Standby Multi-function Controller
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
TCDS	Type Certificate Data Sheet
TCE	Training Center Evaluator
TCPM	Training Center Program Manager
UPS	Uninterruptible Power Supply
V2	Takeoff Safety Speed
VMO	Maximum Operating Speed
VNAV	Vertical Navigation
WOW	Weight on Wheels

2. PILOT TYPE RATING REQUIREMENTS

- 2.1 In accordance with the provisions of the 14 CFR part 61, FAA Order 8900.1 “Flight Standards Information Management Systems”, and AC 120-53, a new pilot type rating is assigned to the GVI aircraft and is designated “GVI”.
- 2.2 Gulfstream Aerospace recognized that the GVI (G650) has many similar or identical systems to related Gulfstream aircraft; the GV-SP (G550/G500) and the GIV-X (G450/G350). Because of this they asked the FSB to evaluate a “full” GVI (G650) initial training course which is designed for a pilot with no previous Gulfstream experience and a “shortened” GVI (G650) initial training course.
- 2.3 Enrollment in the GVI “shortened” initial training course is contingent upon the pilot meeting specific prerequisite experience requirements. The FSB evaluated both the full and the shortened courses and found that pilots may be enrolled in the shortened GVI initial course who are type rated in the GV-SP (G550/G500) or the GIV-X (G450/G350) and have at least 150 hours in the GV-SP (G550/G500) or the GIV-X (G450/G350) aircraft within the last 24 months.
- 2.4 The FSB also found that pilots may be enrolled in the shortened GV-SP (G550/G500) or the shortened GIV-X (G450/G350) initial courses who are type rated in the GVI and have at least 150 hours in the GVI aircraft within the last 24 months.
- 2.5 The minimum level of devices used to train pilots in a shortened GVI (G650), GV-SP (G550/G500) or GIV-X (G450/G350) initial course are listed in Section 4, “ODR”, of this report.
- 2.6 It is important to note that the FSB did not evaluate, and does not allow for, any checking credits, currency credits, landing currency credits, or proving test credits between the

GVI (G650) and the GV-SP (G550/G500) or between the GVI (G650) and the GIV-X (G450/G350) aircraft.

3. MASTER DIFFERENCE REQUIREMENTS (MDR)

- 3.1 Master Difference Requirements (MDRs) for aircraft related to the GVI [the GV-SP (G550/G500) and the GIV-X (G450/G350)] are shown in Appendix 1. They are a summary of the ODR tables which show the highest level of devices required to train pilots in a shortened GVI (G650), GV-SP (G550/G500) or GIV-X (G450/G350) initial course.

4. OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLES

- 4.1 ODR Tables list the differences between related aircraft; the GVI, the GV-SP (G550/G500), and the GIV-X (G450/G350). The sample ODR tables provided in Appendix 2 were developed by the Gulfstream and evaluated/modified by the FSB. They indicate the minimum level of training devices that may be used to instruct a pilot in a shortened GVI (G650), GV-SP (G550/G500) or GIV-X (G450/G350) initial course.

5. FSB SPECIFICATIONS FOR TRAINING

5.1 General.

- 5.1.1 The provisions of this Section apply to programs for airmen who have experience in multi-engine transport turbojet aircraft, Electronic Flight Instrument System (EFIS), and Flight Management System (FMS). Additional requirements may be appropriate for airmen not having this experience.

5.2 Pilots Initial Training.

- 5.2.1 GVI ground training is accomplished as specified by 14 CFR §§ 91.1065, 125.287, 125.296, and 135.345
- 5.2.2 GVI flight training is accomplished as specified by 14 CFR §§ 91.1103, 125.287, 125.296, and 135.347.
- 5.2.3 Emergency training is accomplished as specified by 14 CFR §§ 91.1083 and 135.331.
- 5.2.4 Seat Dependent Tasks training.

The FSB has found the following seat dependent tasks for the GVI.

- a) Head-Up Guidance Display (left seat)
- b) Enhanced Vision System (left seat)
- c) Passenger Oxygen System activation (right seat)
- d) Nose Wheel Steering Tiller (left seat)

5.3 Differences Training (14 CFR §§ 91.1065, 125.287, 125.296, and 135.347).

Reserved.

5.4 Recurrent Training:

5.4.1 Recurrent Ground Training must include appropriate training in accordance with 14 CFR §§ 91.1065, 125.287, 125.296, and 135.351 and Areas of Emphasis identified in paragraph 5.5.

5.4.2 Recurrent Flight Training must include appropriate training in accordance with 14 CFR §§ 91.1065, 125.287, 125.296, and 135.351 and Areas of Emphasis identified in paragraph 5.5.

5.5 Areas of Emphasis.

5.5.1 A pilot trainee must receive special emphasis on the following events during ground training:

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 training.

Fan blade out – This aircraft is unique in that the vibrations caused by the loss of an N1 fan blade increase as the aircraft slows. It is not intuitive, but the pilot will need to speed up to Maximum Operating Mach Number (MMO) or Maximum Operating Speed (VMO) as applicable when the aircraft is vibrating severely due to a fan blade out. This item must be included in initial and recurrent training.

Zero flap landing including the effects of wing anti-ice and de-rotation – When the anti-ice switches are selected ON the angle of attack schedule changes and a lower approach speed is achievable. After main gear touchdown the nose pitches up significantly and must be positively lowered. This item must be included in initial 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 training.

Slow engine response – Engine response to full power requests is slow at high altitudes and during any maneuvers with flaps less than 22 degrees. This item must be included in initial training.

Aerodynamics – This item must be included in initial training.

- a. Yaw induced roll – The importance of not exceeding the commanded 9 degree fixed pitch attitude during rotation until required to capture Takeoff Safety Speed (V₂), especially when single engine.

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

Triple FMS Failure – It is possible for all 3 FMSs to fail temporarily while in the Synchronous mode if an internal calculation error occurs. This item must be included in initial training.

Head-Up Display (HUD) Systems – See APPENDIX 4.

Enhanced Vision System (EVS) – See APPENDIX 5.

Nose Wheel Steering (NWS) failure on landing – NWS may fail upon touchdown as indicated by the amber “Steer by Wire Fail” Engine Indicating and Crew Alerting System (EICAS) 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. This item must be included in initial and recurrent training.

- 5.5.2 A pilot trainee must receive special emphasis on, and perform, the following events during flight training:

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 training.

Fan blade out – This aircraft is unique in that the vibrations caused by the loss of an N1 fan blade increase as the aircraft slows. It is not intuitive to speed up to MMO or VMO (as applicable) when the aircraft is vibrating severely. This item must be included in initial and recurrent training.

Zero flap landing including the effects of wing anti-ice and de-rotation – When the anti-ice switches are selected ON the angle of attack schedule changes and a lower approach speed is achievable. After main gear touchdown the nose pitches up significantly and must be positively lowered. This item must be included in initial and recurrent 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 training.

Slow engine response – Engine response to full power requests is slow at high altitudes, during touch and go landings, and during any maneuvers with flaps less than 22 degrees. This item must be included in initial training.

Aerodynamics – The importance of not exceeding the commanded 9 degree fixed pitch attitude during rotation until required to capture Takeoff Safety Speed (V_2), especially when single engine. This item must be included in initial training.

Head-Up Display (HUD) Systems – See APPENDIX 4.

Enhanced Vision System (EVS) – See APPENDIX 5.

Nose Wheel Steering (NWS) failure on landing – Flight training in a simulator should include: 1) prior completion of the Airplane Flight Manual (AFM) Before Landing checklist to inhibit the associated aural warning, and 2) the fault being induced 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, while taxiing with a free-castering nose wheel, could cause damage if the nose wheel 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 in initial and recurrent training.

5.6 Specific Flight Characteristics for training. (See Section 6.2 for checking requirements).

- All items listed in paragraph 5.5.2.
- 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 ‘AOA Limiting’ CAS message may appear first.

6. FSB SPECIFICATIONS FOR CHECKING

6.1 General

6.1.1 Checking must be conducted in accordance with 14 CFR part 61, Practical Test Standards and 14 CFR parts 91K, 125, and 135, as applicable and Specific Flight Characteristics in paragraph 6.2.

6.2 Specific Flight Characteristics (Ref. FAA Practical Test Standards (FAA-S-8081-5F) available at <http://www.faa.gov>).

- Landing from a No Flap or Non Standard Flap Approach – The FSB has determined that the probability of flap extension failure on the GVI is not extremely remote due to system design. Therefore, demonstration of a no flap approach and landing during pilot certification or a 14 CFR part 135.293(b) competency check is required. In accordance with Order 8900.1, when the practical test is conducted in an airplane, verses a simulator, touchdown from a no flap approach is not required and must not be attempted. The approach should be flown to the point where the inspector or examiner can determine whether a touchdown at an acceptable point on the runway and a safe landing to a full-stop could be made.

The FSB has found the following additional 14 CFR part 135.297 instrument proficiency check requirements:

- a. Precision approach using HUD and EVS.

- b. Localizer Performance with Vertical guidance (LPV) approach.

7. FSB SPECIFICATIONS FOR CURRENCY

The FSB has found no additional currency requirements for the GVI, other than those already specified in 14 CFR parts 61, 125, and 135.

8. FSB SPECIFICATIONS FOR RECENT EXPERIENCE

The FSB has found no additional “Recent Experience” requirements for the GVI, other than those already specified in 14 CFR parts 61, 125 and 135.

9. AIRCRAFT REGULATORY COMPLIANCE CHECKLIST

- 9.1 Regulatory Compliance Checklist (see Appendix 3).

This list was provided to the FSB by Gulfstream Aerospace to show operational regulatory compliance of the production version GVI (G650). It has not been evaluated by the FSB.

10. FSB SPECIFICATIONS FOR DEVICES AND SIMULATORS

This section is intended to identify specific training or checking devices or simulators that must be used to train or check specific GVI systems, procedures, or maneuvers. The FSB has found no specific systems, procedures, or maneuvers that are unique to the GVI that require a specific device or simulator for training or checking.

11. APPLICATION OF FSB REPORT

- 11.1 All GVI operators are subject to the provisions of this report. This report becomes effective when given final approval by the FAA.

All training, checking and currency for the GVI aircraft must be conducted in accordance with all provisions of this report. All training programs must incorporate the latest FAA Approved AFM Procedures, AFM checklists, manufacturer’s recommendations for training maneuvers and all provisions of this report.

12. ALTERNATE MEANS OF COMPLIANCE

- 12.1 Alternate means of compliance to the requirements of this report must be approved by the FSB. If alternate compliance is sought, operators must show that the proposed alternate means provides an equivalent level of safety to the provisions of AC 120-53 (as amended) and this FSB report. Analysis, demonstrations, proof of concept testing, differences documentation or other evidence may be required.

- 12.2 Equivalent Safety – Significant restrictions may apply in the event alternate compliance is sought, and the reporting requirements may be increased to ensure equivalent safety. FAA will generally not consider relief through alternate compliance unless sufficient lead-time has been planned by an operator to allow for any necessary testing and evaluation.
- 12.3 Interim Programs – In the event of clearly unforeseen circumstances in which it is not possible for an operator to comply with provisions of this report, the operator may seek an interim program approval rather than a permanent alternate compliance method. Financial arrangements, scheduling adjustments and other such reasons are not considered “unforeseen circumstances” for the purposes of this provision. Interim program approvals must be approved by the FSB Chairman.

13. MISCELLANEOUS

- 13.1 Landing Minima Categories, ref 14 CFR part 97.3. The GVI is considered Category C aircraft for the purposes of determining “straight-in landing weather minima”.
- 13.2 Forward Observer Seat – The GVI forward observer seat is part of the type certificated design. The FSB evaluated it using the criteria in AC 120-83 “Flight Deck Observer Seat and Associated Equipment” and found that it is operationally suitable for 14 CFR §§ 125.317(b) and 135.75(b).
- 13.3 Abnormal and Emergency Procedures – Gulfstream ‘s philosophy is to not identify any steps in the GVI abnormal or emergency procedures as “Memory Items”, yet Gulfstream expects pilots to perform some of the initial and critical steps without reference to any documentation. Gulfstream has advised that the initial, critical pilot responses for the following emergency procedures should be performed promptly without reference to a checklist: Rejected Takeoff, Engine Failure/Fire after V1, Emergency Descent, Rapid Decompression, Autopilot (AP) or Authrottle (AT) Uncommanded Disconnect, Engine Exceedance, Overspeed, Stall Protection / Stall Warning Activation, Flight Control Jams, Total Loss of Braking, Enhanced Ground Proximity Warning System (EGPWS) Alert, Windshear Alert, and Traffic Alert and Collision Avoidance System (TCAS) Alert. In addition, pilots are expected to don oxygen masks promptly when appropriate – for example when smoke is detected. Operators and training providers should ensure pilots are trained accordingly.
- 13.4 The PlaneView Charts function is FAA certified as part of the aircraft’s type design. It is functionally equivalent to a Class 3 Electronic Flight Bag (EFB) with Type C software applications. The PlaneView Enroute Charts Function does not contain all of the pertinent information for enroute operations (e.g., Minimum Enroute Altitudes) so either paper charts or a Class 1 or Class 2 EFB that is accepted by the FAA and contains Enroute Charts must be readily available to the flight crew.
- 13.5 G650ER – The Gulfstream model GVI with the optional Aircraft Service Change (ASC) 014 installed, which increases the airplane maximum fuel weight capability and thereby increases airplane range, is designated “G650ER”. ASC 014 installation increases the maximum ramp weight to 104,000 lb., the maximum takeoff weight to 103,600 lb., and the maximum fuel weight to 48,200 lb. The increased maximum takeoff weight results in

- revised noise standards data. The G650ER has an independent Airplane Flight Manual, Quick Reference Handbook, and Performance Handbook. The G650 and G650ER are assigned the same pilot type rating – “GVI”. Pilots transitioning between the G650 and G650ER should accomplish Level A difference training, which can be accomplished through self-instruction by becoming familiar with the aircraft weight and fuel capacity limitations, and the aircraft Effective Perceived Noise Level data. There are no checking or currency requirements for transitioning between the G650 and G650ER.
- 13.6 Flight Control Computer (FCC) version 6.2 software is installed with ASC 037, or as part of the production configuration. There are minor procedural changes associated with the version 6.2 software. Pilots transitioning to the FCC version 6.2 software should be trained on the differences using Level “A” training, which can be accomplished through self-instruction by reviewing the changes incorporated in G650 AFM Revision 10 or G650ER AFM Revision 1, and the Gulfstream Operating Manual Supplement describing the operationally significant changes. There are no checking or currency requirements for this transition.
- 13.7 An automatic braking system (“Autobrakes”) can be installed with an optional ASC 055, or as part of the production configuration. The autobrakes installation includes a rotary-style, mode selector switch mounted on the IRS selector panel in the flight deck center pedestal; modified brake control unit software; and a second outboard brakes hydraulic pressure accumulator. The autobrakes mode selector switch provides a Rejected Takeoff (RTO) position for takeoff, and LOW, MED, and HIGH settings for landing. The switch is spring-loaded to the OFF position. The LOW and MED landing modes use wheel speed and provide a defined deceleration after nose wheel touchdown. The HIGH landing mode provides maximum anti-skid braking after nose wheel touchdown. The RTO takeoff mode provides maximum anti-skid braking at wheel speeds greater than 80 knots, and reduced brake pressure at wheel speeds between 60 and 80 knots. Crew Alerting System (CAS) messages are provided to inform the crew of the autobrakes operational status and failure conditions. Landing performance data when using autobrakes are provided in the associated Airplane Flight Manual Supplement and in the FMS Takeoff and Landing Data (TOLD) with the PlaneView II avionics software version ‘Block 2’ upgrade (ASC 902) installed. Rejected takeoff accelerate-stop distances using the Autobrake system RTO setting are equivalent to or less than those distances with maximum manual braking, therefore the original Takeoff Performance data in the Airplane Flight Manual are applicable. Pilots transitioning to a GVI (G650, G650ER) with autobrakes installed should accomplish Level E difference training, which can only be satisfied by the use of either a full flight simulator (FFS) qualified at level C or D, or an aircraft. There are no checking or currency requirements for transitioning to an airplane with autobrakes installed.

TRAINING DIFFERENCE LEVELS

Difference Level	Type	Examples	Conditions
A	Self-Instruction	<ul style="list-style-type: none"> • Operating manual page revision (HO) • Flight crew operating bulletin (HO) 	<ul style="list-style-type: none"> • Crew has already demonstrated understanding on base aircraft (i.e. updated version of engine). • Minor or no procedural changes required. • No safety impact if information is not reviewed or is forgotten (i.e. Different engine vibration damping mount). • Once called to attention of crew, the difference is self-evident.
B	Aided Instruction	<ul style="list-style-type: none"> • Slide/tape presentations (ST) • <u>Tutorial</u> computer based instruction (TCBI) • Stand-up Instructors (SU) • Video tapes (VT) 	<ul style="list-style-type: none"> • Systems are functionally similar • Crew understanding required. • Issues need emphasis. • Standard methods of presentation required.
C	Systems Devices	<ul style="list-style-type: none"> • <u>Interactive</u> (full-task) computer based instruction (ICBI) • Cockpit system simulators (CSS) • Cockpit procedures trainers (CPT) • Part task trainers (PTT) • Flight training devices (level 2-5) (FTD 2-5) 	<ul style="list-style-type: none"> • Training can only be established through systems training devices. • Training objectives focus on mastering individual systems, procedures, or tasks VS. highly integrated flight operations or “real-time” operations. • Training devices are required to assure attainment or retention of crew skills to accomplish more complex tasks usually related to aircraft systems.
D	Maneuver Devices	<ul style="list-style-type: none"> • Flight training devices (level 6-7) (FTD 6-7) • Simulators (level A or B) (SIM A-B) 	<ul style="list-style-type: none"> • Training can only be established in “flight maneuver” devices in a “real-time” environment. • Training requires mastery of interrelated skills vs. individual skills. • Motion or visual cues are NOT required.
E	Level C/D Sim. or Aircraft	<ul style="list-style-type: none"> • Simulators (level C or D) (SIM C-D) • Aircraft (ACFT) 	<ul style="list-style-type: none"> • Motion, visual, and audio cues required. • Major system differences could lead to this. • Usually correlates with significant differences in handling qualities

APPENDIX 1

MASTER DIFFERENCE REQUIREMENTS (MDR) TABLE

HIGHEST LEVELS OF TRAINING DEVICES REQUIRED
--

Type Rating: GVI		FROM AIRPLANE		
		GVI (G650)	GV-SP (G550/G500)	GIV-X (G450/G350)
T O A I R P L A N E	GVI (G650)	N/A	E *	E *
	GV-SP (G550/G500)	D	N/A	N/A
	GIV-X (G450/G350)	D	N/A	N/A

- Level E differences is based on only one item: autobrakes. This is in accordance with AC 120-53B, dated 11/5/13, Appendix 2, paragraph 4.b.(9)c.(4)(c).

APPENDIX 2

SAMPLE OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLES

Definitions	ODR Training Level
“HO” = Handout	A
“ST” = Slide/tape presentations “TCBI” = Tutorial computer based instruction “SU” = Stand-up Instructors “VT” = Video tapes	B
“ICBI” = Interactive computer-based instruction “CSS” = Cockpit system simulators “CPT” = Cockpit procedures trainers “PTT” = Part task trainers “FTD 2-5” = Flight training devices (level 2-5)	C
“FTD 6-7” = Flight training devices (level 6-7) “SIM A-B” = Simulators (level A or B)	D
“SIM C-D” = Simulators (level C or D) “ACFT” = Aircraft	E
<u>NOTES</u> An “X” in an ODR table column indicates that any of the training methods listed for that level are acceptable. If a specific instruction method is specified in an ODR table column, it must be used.	

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GIV-X								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Weights	Max T.O. Weight Increased 25,000 lb	No	No	X				
Airplane Configuration	Body Extension increased 126"	No	No	X				
Airplane Configuration	Wing Tip increased 273"	No	No	X				
Overhead Panel Layout	RAT Test Switch installed	No	Minor		X			
Overhead Panel Layout	EBHA Battery Switch installed	No	Minor		X			
Overhead Panel Layout	UPS Battery Switch installed	No	Minor		X			
Overhead Panel Layout	Continuous Ignition switches combined into single switch and relocated to Overhead Panel	No	Minor	X				
Overhead Panel Layout	Four ADS Probe Heat Switches installed	No	Minor		X			
Overhead Panel Layout	Two Landing Gear Dump Switches installed	No	Minor		X			
Instrument Panel Layout	Standby Flight Instruments located in each SMC	No	Minor			X		
Pedestal Panel Layout	RAT Handle installed	No	Minor		X			
Pedestal Panel Layout	Different Parking Brake Handle	No	Minor	X				
Pedestal Panel Layout	RAAS Inhibit Switch installed	No	Minor			X		
Pedestal Panel Layout	FLT CTRL RESET Switch installed	No	Minor			X		
Pedestal Panel Layout	Electric FCS Trim Panel installed	No	Minor			X		
Pedestal Panel Layout	No Emergency STAB switch	No	Minor		X			
Pedestal Panel Layout	No Alternate Flap switch	No	Minor		X			
Pedestal Panel Layout	No Lateral Control switch	No	Minor		X			
Pedestal Panel Layout	No CPCS Panel	No	Minor		X			
Pedestal Panel Layout	No Weather Radar Panel	No	Minor		X			
Pedestal Panel Layout	Autobrake switch installed	No	Minor		X			
Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
Cockpit Side Panel	Pilot and copilot 60 Hz Outlet installed	No	Minor	X				
Cockpit Side Panel	EVAS installed	No	Minor			X		
Cockpit Side Panel	Security System installed	No	Minor	X				

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GIV-X								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Limitations	Max Takeoff Weight increased from 74,600 lb to 99,600 lb.	No	No	X				
Limitations	Max Landing Weight increased from 66,000 lb to 83,500 lb.	No	No	X				
Limitations	Fuel quantity increased from 29,500 lb to 44,200 lb	No	No	X				
Limitations	Maximum Operating Altitude 51,000 vs. 45,000 ft	No	No	X				
Limitations	Mmo 0.925 vs. 0.880	No	No	X				
Limitations	Different fuel imbalance values	No	No	X				
Limitations	APU and Engine limitations differences.	No	No	X				

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GIV-X								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
21. Air Conditioning	CPCS Semi Mode on SMC	No	Minor			X		
22. Autopilot	Different interface with flight controls	No	Minor			X		
23. Communications	Minor differences in radio functions	No	Minor		X			
25. Equipment and Furnishing	Different Crew O2 Masks	No	Minor		X			
25. Equipment and Furnishing	EVAS installed	No	Minor		X			
25. Equipment and Furnishing	Security System installed	No	Minor		X			
26. Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
28. Fuel	Heated Fuel Return System installed	No	Minor		X			
28. Fuel	Pressurized Fuel Servicing requires DC Electric Power	No	Minor			X		
28. Fuel	Refueling Panel located on right body fairing and function incorporated into SMC	No	Minor			X		
29. Hydraulic Power	Excessive Hydraulic Fluid Temperature does activate the Engine Hot Warning EICAS	No	Minor		X			
30. Ice and Rain Protection	Ice Detector system classified primary vs. advisory	No	Minor		X			
30. Ice and Rain Protection	Anti-Ice not automatically inhibited below 1500 ft	No	Minor		X			
30. Ice and Rain Protection	Closing Manifold Pressure Shutoff Valve does not block Cowl Anti-Ice	No	Minor		X			
31 Instruments	Different Locations	No	Minor		X			
32. Landing Gear and Braking Systems	Autobrakes installed.	No	Minor			X		
33. Lights	Different locations	No	Minor		X			
34. Navigation	SMC installed	No	Major				X	
34. Navigation	No Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EBDI) combined into Standby Flight Instrument located in each SMC	No	Minor				X	

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GIV-X								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
34. Navigation	Weather Radar Control Panel located in SMC	No	Minor		X			
34. Navigation	Predictive Windshear available	No	Signif.				X	
34. Navigation	Head-Up (HUD) Display Systems	No	No		X			
35. Oxygen	Different style mask and goggles	No	Minor			X		
36. Pneumatic	Different bleed pressure values	No	Minor	X				
49. APU	Different APUs installed both supplied by Honeywell.	No	Minor		X			
Limitations	Max Takeoff Weight increased from 74,600 lb to 99,600 lb.	No	No	X				
Limitations	Max Landing Weight increased from 66,000 lb to 83,500 lb.	No	No	X				
Limitations	Fuel quantity increased from 29,500 lb vs. 44,200 lb	No	No	X				
Limitations	Maximum Operating Altitude is 51,000 vs. 45,000 feet.	No	No	X				
Limitations	Mmo 0.925 vs. 0.880	No	No	X				
Limitations	Fuel Imbalance different values	No	No	X				
Limitations	APU and Engine limitations differences.	No	No		X			

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GIV-X								
APPROVED BY								
(POI) _____								
				TRAINING				
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Takeoff and Landing	Autobrake installed.	No	Minor					X

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GV-SP								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Weights	Max T.O. Weight 91,000lb increased 8,600 lb	No	No	X				
Airplane Configuration	Body Extension increased 39"	No	No	X				
Airplane Configuration	Wing Tip increased 73"	No	No	X				
Overhead Panel Layout	RAT Test Switch installed	No	Minor		X			
Overhead Panel Layout	EBHA Battery Switch installed	No	Minor		X			
Overhead Panel Layout	UPS Battery Switch installed	No	Minor		X			
Overhead Panel Layout	Continuous Ignition Switches combined into single switch and relocated to Overhead Panel	No	Minor		X			
Overhead Panel Layout	Four ADS Probe Heat Switches installed	No	Minor		X			
Overhead Panel Layout	Two Landing Gear Dump Switches installed	No	Minor		X			
Instrument Panel Layout	Standby Flight Instruments located in each SMC	No	Minor			X		
Pedestal Panel Layout	RAT Handle installed	No	Minor		X			
Pedestal Panel Layout	Different Parking Brake Handle	No	Minor	X				
Pedestal Panel Layout	RAAS Inhibit Switch installed	No	Minor	X				
Pedestal Panel Layout	FLT CTRL RESET Switch installed	No	Minor			X		
Pedestal Panel Layout	Electric FCS Trim Panel installed	No	Minor			X		
Pedestal Panel Layout	No Emergency Stab Switch	No	Minor		X			
Pedestal Panel Layout	No Spoiler Control Switch	No	Minor		X			
Pedestal Panel Layout	No CPCS Panel	No	Minor		X			
Pedestal Panel Layout	No Weather Radar Panel	No	Minor		X			
Pedestal Panel Layout	Autobrake switch installed.	No	Minor		X			
Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
Cockpit Side Panel	Pilot and copilot 60 Hz Outlets installed	No	Minor	X				
Cockpit Side Panel	EVAS installed	No	Minor			X		
Cockpit Side Panel	Security System installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GV-SP								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Limitations	Max Takeoff Weight increased from 91,000 lb to 99,600 lb.	No	No	X				
Limitations	Max Landing Weight increased from 75,300 lb to 83,500 lb.	No	No	X				
Limitations	Fuel quantity increased from 41,300 lb to 44,200 lb	No	No	X				
Limitations	Mmo 0.925 vs. 0.885	No	No	X				
Limitations	APU and Engine limitations differences.	No	No	X				

DIFFERENCE AIRCRAFT: GVI								
BASE AIRCRAFT: GV-SP								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
21. Air Conditioning	CPCS Semi mode on SMC	No	Minor			X		
22. Autopilot	Different interface with flight controls	No	Minor		X			
23. Communications	Minor differences in radio functions	No	Minor			X		
25. Equipment and Furnishing	Different Crew O2 Masks	No	Minor		X			
25. Equipment and Furnishing	EVAS installed	No	Minor		X			
25. Equipment and Furnishing	Security System installed	No	Minor		X			
26. Fire Protection	Minor differenced in Fire Protection plumbing	No	Minor		X			
28. Fuel	Pressurized Fuel Servicing requires DC Electric Power	No	Minor			X		
28. Fuel	Refueling Panel located on right body fairing and function incorporated into SMC	No	Minor			X		
30. Ice and Rain Protection	Ice Detector system classified primary vs. advisory	No	Minor		X			
30. Ice and Rain Protection	Anti-ice not automatically inhibited below 1500 ft	No	Minor		X			
31. Instruments	Different locations	No	Minor		X			
32. Landing Gear and Braking Systems	Autobrakes installed.	No	Minor			X		
33. Lights	Different locations	No	Minor		X			
34. Navigation	SMC installed	No	Major				X	
34. Navigation	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EDBI) combined into Standby Flight Instrument located in each SMC	No	Minor				X	
34. Navigation	Weather Radar Control Panel located in SMC	No	Minor		X			
34. Navigation	Predictive Windshear available	No	Signif.				X	
34. Navigation	Head-Up (HUD) Display Systems	No	No		X			
35. Oxygen	Different style mask and goggles	No	Minor			X		

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI) _____								
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRAINING				
				LVL A	LVL B	LVL C	LVL D	LVL E
36. Pneumatic	Different bleed pressure values	No	Minor	X				
49. APU	No BAAV installed	No	Minor		X			
Limitations	Max Takeoff Weight increased from 91,000 lb to 99,600 lb.	No	No	X				
Limitations	Max Landing Weight increased from 75,300 lb to 83,500 lb.	No	No	X				
Limitations	Fuel quantity increased from 41,300 lb vs. 44,200 lb	No	No	X				
Limitations	APU and Engine limitations differences.	No	No	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI) _____								
				TRAINING				
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Takeoff and Landing	Autobrake installed.	No	Minor					X

DIFFERENCE AIRCRAFT: GIV-X								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Weights	Max T.O. Weight decrease of 25,000 lb	No	No	X				
Airplane Configuration	Body Extension decreased 126"	No	No	X				
Airplane Configuration	Wing Tip decreased 273"	No	No	X				
Overhead Panel Layout	No RAT Test Switch	No	Minor		X			
Overhead Panel Layout	No EBHA Battery Switch	No	Minor		X			
Overhead Panel Layout	No UPS Battery Switch	No	Minor		X			
Overhead Panel Layout	Continuous Ignition switches located in Throttle Quadrant	No	Minor	X				
Overhead Panel Layout	ADS Probe Heat Switches only two installed	No	Minor		X			
Overhead Panel Layout	Single Landing Gear Dump Switch installed	No	Minor		X			
Instrument Panel Layout	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EDBI) located on Lower Instrument Panel	No	Minor				X	
Pedestal Panel Layout	No RAT Handle	No	Minor		X			
Pedestal Panel Layout	Different Parking Brake Handle	No	Minor	X				
Pedestal Panel Layout	No RAAS Inhibit Switch	No	Minor	X				
Pedestal Panel Layout	No FLT CTRL RESET Switch	No	Minor			X		
Pedestal Panel Layout	No Electric FCS Trim Panel	No	Minor			X		
Pedestal Panel Layout	Emergency STAB switch installed	No	Minor		X			
Pedestal Panel Layout	Alternate Flap switch installed	No	Minor		X			
Pedestal Panel Layout	Lateral Control switch installed	No	Minor		X			
Pedestal Panel Layout	CPCS Panel installed	No	Minor		X			
Pedestal Panel Layout	Weather Radar Panel installed	No	Minor		X			
Pedestal Panel Layout	Autobrake switch not installed	No	Minor	X				
Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
Cockpit Side Panel	Pilot and copilot 60 Hz Outlet not installed	No	Minor	X				

DIFFERENCE AIRCRAFT: GIV-X								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Cockpit Side Panel	EVAS not installed	No	Minor	X				
Cockpit Side Panel	Security System not installed	No	Minor	X				
Limitations	Max Takeoff Weight decreased from 99,600 lb to 74,600 lb.	No	No	X				
Limitations	Max Landing Weight decreased from 83,500 lb to 66,000 lb.	No	No	X				
Limitations	Fuel quantity decreased from 44,200 lb to 29,500 lb	No	No	X				
Limitations	Maximum Operating Altitude 45,000 vs. 51,000 feet	No	No	X				
Limitations	Mmo 0.880 vs. 0.925	No	No	X				
Limitations	Different fuel imbalance values	No	No	X				
Limitations	APU and Engine limitations differences.	No	No	X				

DIFFERENCE AIRCRAFT: GIV-X								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
21. Air Conditioning	CPCS Semi Mode on Pressurization Control Panel	No	Minor			X		
22. Autopilot	Different interface with flight controls	No	Minor			X		
23. Communications	Minor differences in radio functions	No	Minor			X		
25. Equipment and Furnishing	Different Crew O2 Masks	No	Minor		X			
25. Equipment and Furnishing	No EVAS installed	No	Minor	X				
25. Equipment and Furnishing	No Security System installed	No	Minor	X				
26. Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
28. Fuel	Heated Fuel Return System not installed	No	Minor			X		
28. Fuel	Fuel Servicing does not require DC Electric Power	No	Minor			X		
28. Fuel	Refueling Panel located on left cockpit bulkhead	No	Minor			X		
29. Hydraulic Power	Excessive Hydraulic Fluid Temperature does not activate the Engine Hot Warning EICAS	No	Minor		X			
30. Ice and Rain Protection	Ice Detector system classified advisory vs. primary	No	Minor		X			
30. Ice and Rain Protection	Anti-Ice Automatically inhibited below 1500ft	No	Minor		X			
30. Ice and Rain Protection	Closing Manifold Pressure Shutoff Valve blocks Cowl Anti-Ice	No	Minor		X			
31 Instruments	Different Locations	No	Minor		X			
32. Landing Gear and Braking Systems	Autobrake switch not installed.	No	Minor	X				
33. Lights	Different locations	No	Minor		X			
34. Navigation	No SMC	No	Major				X	
34. Navigation	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EBDI) on lower Instrument Panel	No	Minor				X	

DIFFERENCE AIRCRAFT: GIV-X								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
34. Navigation	Weather Radar Control Panel located on Pedestal	No	Minor		X			
34. Navigation	No Predictive Windshear	No	Minor		X			
34. Navigation	Head-Up (HUD) Display Systems	No	No		X			
35. Oxygen	New style mask with attached goggles	No	Minor			X		
36. Pneumatic	Different bleed pressure values	No	Minor	X				
49. APU	Different APU installed, both supplied by Honeywell.	No	Minor		X			
Limitations	Max Takeoff Weight decreased from 99,600 lb to 74,600 lb.	No	No	X				
Limitations	Max Landing Weight decreased from 83,500 lb to 66,000 lb.	No	No	X				
Limitations	Fuel quantity decreased from 44,200 lb to 29,500 lb	No	No	X				
Limitations	Maximum Operating Altitude is 45,000 vs. 51,000 feet.	No	No	X				
Limitations	Maximum Operating Altitude 45,000 vs. 51,000	No	No	X				
Limitations	Mmo 0.880 vs. 0.925	No	No	X				
Limitations	Fuel Imbalance different values	No	No	X				
Limitations	APU and Engine limitations differences.	No	No	X				

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI) _____								
				TRAINING				
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Takeoff and Landing	Autobrake not installed.	No	Minor	X				

DIFFERENCE AIRCRAFT: GV-SP								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Weights	Max T.O. Weight decreased 8,600 lb	No	No	X				
Airplane Configuration	Body Extension decreased 39"	No	No	X				
Airplane Configuration	Wing Tip decreased 73"	No	No	X				
Overhead Panel Layout	No RAT Test Switch	No	Minor	X				
Overhead Panel Layout	No EBHA Battery Switch	No	Minor	X				
Overhead Panel Layout	No UPS Battery Switch	No	Minor	X				
Overhead Panel Layout	Continuous Ignition Switches located in Throttle Quadrant	No	Minor	X				
Overhead Panel Layout	ADS Probe Heat Switches only two installed	No	Minor		X			
Overhead Panel Layout	Single Landing Gear Dump Switch installed	No	Minor		X			
Instrument Panel Layout	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EBDI) located on lower instrument panel	No	Minor				X	
Pedestal Panel Layout	No RAT Handle	No	Minor	X				
Pedestal Panel Layout	Parking Brake Handle modified	No	Minor	X				
Pedestal Panel Layout	No RAAS Inhibit Switch	No	Minor	X				
Pedestal Panel Layout	No FLT CTRL RESET Switch	No	Minor			X		
Pedestal Panel Layout	No Electric FCS Trim Panel	No	Minor			X		
Pedestal Panel Layout	Emergency Stab Switch installed	No	Minor		X			
Pedestal Panel Layout	Spoiler Control Switch installed	No	Minor		X			
Pedestal Panel Layout	CPCS Panel added	No	Minor		X			
Pedestal Panel Layout	Weather Radar Panel installed	No	Minor		X			
Pedestal Panel Layout	Autobrake switch not installed	No	Minor	X				
Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
Cockpit Side Panel	Pilot and copilot 60 Hz Outlets not installed	No	Minor	X				
Cockpit Side Panel	No EVAS installed	No	Minor	X				

DIFFERENCE AIRCRAFT: GV-SP								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
DESIGN	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Cockpit Side Panel	No Security System installed	No	Minor	X				
Limitations	Max Takeoff Weight decreased from 99,600 lb to 91,000 lb.	No	No	X				
Limitations	Max Landing Weight decreased from 83,500 lb to 75,300 lb.	No	No	X				
Limitations	Fuel quantity decreased from 44,200 lb to 41,300 lb	No	No	X				
Limitations	Mmo 0.885 vs. 0.925	No	No	X				
Limitations	APU and Engine limitations differences.	No	No	X				

DIFFERENCE AIRCRAFT: GV-SP								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
21. Air Conditioning	CPCS Semi mode on Pressurization Control Panel	No	Minor			X		
22. Autopilot	Different interface with flight controls	No	Minor			X		
23. Communications	Minor differences in radio functions	No	Minor			X		
25. Equipment and Furnishing	Crew O2 Masks different model	No	Minor		X			
25. Equipment and Furnishing	No EVAS	No	Minor	X				
25. Equipment and Furnishing	No Security System	No	Minor	X				
26. Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
28. Fuel	Fuel Servicing does not require DC Electric Power	No	Minor			X		
28. Fuel	Refueling Panel located on Left Cockpit Bulkhead	No	Minor			X		
30. Ice and Rain Protection	Ice detector system classified advisory vs. Primary	No	Minor		X			
30. Ice and Rain Protection	Automatic Anti-Ice automatically inhibited below 1500ft	No	Minor		X			
31. Instruments	Different locations	No	Minor		X			
32. Landing Gear and Braking Systems	Autobrake switch not installed.	No	Minor	X				
33. Lights	Locations slightly different	No	Minor		X			
34. Navigation	No SMC	No	Major				X	
34. Navigation	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EDBI) located on lower Instrument Panel	No	Minor				X	
34. Navigation	Weather Radar Control Panel located on Pedestal	No	Minor		X			
34. Navigation	No Predictive Windshear	No	Minor	X				
34. Navigation	Head-Up (HUD) Display Systems	No	No		X			
35. Oxygen	New style mask with attached goggles	No	Minor			X		

DIFFERENCE AIRCRAFT: GV-SP								
BASE AIRCRAFT: GVI								
APPROVED BY								
(POI) _____								
				TRAINING				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
36. Pneumatic	Different bleed pressure values	No	Minor	X				
49. APU	BAAV installed	No	Minor		X			
Limitations	Max Takeoff Weight decreased from 99,600 lb to 91,000 lb.	No	No	X				
Limitations	Max Landing Weight decreased from 83,500 lb to 75,300 lb.	No	No	X				
Limitations	Fuel quantity decreased from 44,200 lb vs. 41,300 lb	No	No	X				
Limitations	APU and Engine limitations differences.	No	No		X			

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI) _____								
				TRAINING				
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E
Takeoff and Landing	Autobrake not installed.	No	Minor	X				

APPENDIX 3

AIRCRAFT REGULATORY COMPLIANCE CHECKLIST

This list was provided to the FSB by Gulfstream Aerospace Corporation to show operational regulatory compliance of the production version Gulfstream GVI. It has not been evaluated by the FSB.

14 CFR §	Title	Compliance	Remark(s)
91.9(a)	Compliance with Flight Manual, Markings, and Placard Markings	Operator Responsibility	
91.9(b)(1)	Availability of Current Airplane Flight Manual in Aircraft	Operator Responsibility	Gulfstream provides a paper version of the Airplane Flight Manual (AFM) and three iPad™ electronic tablets, with the PlaneBook™ application software installed, with each airplane. The PlaneBook™ application software includes the AFM.
91.9(c)	Identification of Aircraft in Accordance with 14 CFR part 45	Operator Responsibility	Airplane is provided with identification in accordance with 14 CFR part 45.
91.103(a)	IFR Flight Planning and Fuel Requirements	Operator Responsibility	Performance planning information for fuel requirements are provided in the Airplane Flight Manual.
91.103(b)(1)	Preflight Planning Runway Performance Data	Operator Responsibility	Performance planning information for takeoff and landing runway distance data are provided in the Airplane Flight Manual.

14 CFR §	Title	Compliance	Remark(s)
91.126(c)	On or In The Vicinity of an Airport in Class G Airspace Minimum Certificated Landing Flap Setting	Operator Responsibility	The normal flap setting for takeoff is 20°, with an alternate takeoff flap setting of 10°. Takeoff performance data for both flaps settings are provided in the Airplane Flight Manual and the Flight Management System.
91.191	Category II and Category III Manual	Not Applicable	The GVI will not have Category II or Category III capability at Type Certification (TC). Gulfstream will pursue Category II authorization during a post-TC certification effort.
91.203(a) and (b)	Valid Airworthiness Certificate, Flight Permit, Registration Certificate.	Operator Responsibility	The airplane will be delivered with a valid airworthiness certificate.
91.203(c)	Fuel Tanks in the Passenger/Baggage Compartment	Not Applicable	The Model GVI does not incorporate fuel tanks within the passenger or baggage compartment.
91.203(d)	Fuel Venting and Exhaust Emissions Requirements	Complies	The Model GVI incorporates two RRD BR700-725A1-12 engines. These have been shown to comply with 14 CFR part 34, reference FAA TCDS E00057EN.
91.205(a)	Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates: Instrument and Equipment Requirements: General	Complies	

14 CFR §	Title	Compliance	Remark(s)
91.205(b)	Day VFR Equipment	Complies	Complies with the following exceptions: 14 CFR § 91.205(b)(6). The GVI does not incorporate liquid cooled engines. 14 CFR § 91.205(b)(12). The GVI is certificated as adequate for ditching when outfitted in accordance with GVI-GER-1709, entitled “Design Requirements Document for Ditching Equipment”
91.205(c)	Night VFR Equipment	Complies	Exception: 14 CFR § 91.205(c)(6) – The GVI uses circuit breakers and solid state power controllers for circuit protection for all standard aircraft wiring and avionics equipment. Fuses are not utilized.
91.205(d)	IFR Equipment	Complies	
91.205(e)	Flight at and Above FL240	Complies	
91.205(f)	Category II Operations	Not Applicable	The GVI will not have Category II capability at Type Certification (TC). Gulfstream will pursue Category II authorization during a post-TC certification effort.
91.205(g)	Category III Operations	Not Applicable	The GVI will not have Category III capability at Type Certification (TC).

14 CFR §	Title	Compliance	Remark(s)
91.207(a) and (b)	Emergency Locator Transmitter (ELT)	Complies	
91.207(c)	Emergency Locator Transmitter (ELT) Batteries	Operator Responsibility	
91.207(d)	Emergency Locator Transmitter (ELT) Maintenance	Operator Responsibility	
91.209(b)	Operate an aircraft equipped with an anti-collision light system.	Operator Responsibility	
91.211	Supplemental Oxygen: General	Operator Responsibility	The GVI is equipped with an Oxygen system that provides oxygen to each occupant when a loss of cabin pressurization has occurred.
91.213	Inoperative Instruments and Equipment	Operator Responsibility	The FAA provides a Master Minimum Equipment List (MMEL) document. Gulfstream provides a Maintenance / Operational / Placarding / Procedures (MOPP) Manual.
91.215	ATC Transponder and Altitude Reporting Equipment and Use	Operator Responsibility	Airplane complies with 14 CFR § 91.215(a).

14 CFR §	Title	Compliance	Remark(s)
91.217	Data Correspondence Between Automatically Reported Pressure Altitude Data and the Pilot's Altitude Reference: ATC Directed Deviation	Operator Responsibility	Airplane complies with 14 CFR § 91.217(a)(3).
91.219	Altitude Alerting System	Operator Responsibility	Airplane complies with 14 CFR § 91.219(b).
91.221	Traffic Alert and Collision Avoidance System (TCAS) Equipment and Use	Operator Responsibility	Airplane complies with 14 CFR § 91.221(a).
91.223(a)	Terrain Awareness and Warning System (TAWS)	Operator Responsibility	Airplane is equipped with an approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in Technical Standard Order (TSO)-C151.
91.223(b)	Terrain Awareness and Warning System (TAWS)	Not Applicable	
91.223(c)	AFM Procedures for TAWS	Complies	
91.223(d)	Exceptions to TAWS	Not applicable	

14 CFR §	Title	Compliance	Remark(s)
91.409(a), (b), (c), and (d)	Inspections	Operator Responsibility	
91.409(e)	Inspection	Operator Responsibility	
91.409(f), (g), and (h)	Inspection	Operator Responsibility	The aircraft is delivered with a set of maintenance manuals that provide inspections and inspection intervals.
91.411	Altimeter System and Altitude Reporting Equipment Tests and Inspections	Operator Responsibility	
91.413	ATC Transponder Tests and Inspections	Operator Responsibility	
91.503	Flying Equipment and Operating Information.	Operator Responsibility	The GVI is delivered with three flashlights, two of which are installed in the cockpit, as required by 14 CFR § 91.503(a)(1). An Airplane Flight Manual is provided that supplies a cockpit checklist as required by 14 CFR § 91.503(a)(2). Airplane Flight Manual provides information required by 14 CFR § 91.503(b)(c).
91.505	Familiarity with Operating Limitations and Emergency Equipment	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
91.507	Equipment Requirement: Over the Top, or Night VFR Operations	Operator Responsibility	Airplane design complies with equipment requirements.
91.509	Survival Equipment for Overwater Operations	Operator Responsibility	Airplane design complies with 14 CFR § 91.509(b)(5).
91.511	Radio Equipment for Overwater Operations	Operator Responsibility	Airplane design complies with equipment requirements.
91.513(a), (b), (c), and (d)	Emergency Equipment	Operator Responsibility	The airplane is equipped with emergency equipment and has inspection intervals listed in the Aircraft Maintenance Manual as required by 14 CFR § 91.513(a)(b). The airplane is equipped with fire extinguishers and meets the requirements of CFR § 91.513(c). The airplane is equipped with first aid kits as required by 14 CFR § 91.513(d).
91.513(e) and (f)	Emergency Equipment	Not Applicable	
91.517(a)	Passenger information	Complies	The aircraft is delivered with compliant signage.
91.517(b)	Passenger information	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
91.517(c), (d), and (e)	Passenger Information	Operator Responsibility	
91.519	Passenger Briefing	Operator Responsibility	
91.521(a)	Shoulder Harness	Complies	Reference TSO C127(a)
91.521(b)	Shoulder Harness	Complies	Reference TSO C127(a)
91.525	Carriage of Cargo	Operator Responsibility	Airplane is equipped with a baggage compartment located at the aft portion of the pressurized cabin and is accessible with the airplane in flight.
91.527	Operating in Icing Conditions	Operator Responsibility	Airplane certification will include flight into known icing.
91.531	Second in Command Requirements	Operator Responsibility	Airplane certification includes limitation requiring minimum flight crew of pilot and copilot.

14 CFR §	Title	Compliance	Remark(s)
91.603	Aural Speed Warning Device	Complies	
91.605(a)	Transport Category Civil Airplane Weight Limitations	Operator Responsibility	Airplane performance data are provided in the Airplane Flight Manual.
91.605(b) and (c)	Transport Category Civil Airplane Weight Limitations	Operator Responsibility	Airplane performance data are provided in the Airplane Flight Manual.
91.609(a) and (b)	Operation with Inactive Flight Data Recorder or Cockpit Voice Recorder	Operator Responsibility	
91.609(c) and (d)	Requirements for Flight Data Recorder – 10+ passengers	Complies	
91.609(e) and (f)	Requirement for Cockpit Voice Recorder	Complies	
91.609(g)	Accident Reporting	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
91.609(i)	Requirement for Cockpit Voice Recorder	Complies	
91.609(j)	Requirement for Recording Datalink Messages	Complies	
91.613(a)	Materials for Compartment Interiors	Not Applicable	
91.613(b)	Materials for Compartment Interiors	Complies	
91.853	Operating Noise Limits for Civil Subsonic Airplanes	Complies	GVI is Stage 4 Noise Compliant.
91.1033 (a)(1), (a)(2), (b), and (c)	Cockpit Checklist	Operator Responsibility	Gulfstream provides a paper version of the Airplane Flight Manual (AFM) and three iPad™ electronic tablets, with the PlaneBook™ application software installed, with each airplane. The PlaneBook™ application software includes the AFM and the Quick Reference Handbook (QRH).
91.1033 (a)(3) and (a)(4)	Aeronautical Charts	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
91.1035(e)	Automated Briefing Recording	Operator Responsibility	The GVI airplane is equipped with the capability to provide recorded briefings.
91.1035(f)	Passenger Briefing Cards	Operator Responsibility	
91.1045(b) (1)	Cockpit Voice Recorder	Complies	Reference TSO C-123b and TSO C-155
91.1045(b) (2)	Flight Recorder	Complies	Reference TSO C-124b and TSO C-157
91.1045(b) (3)	TAWS System	Complies	Reference TSO C-151b
91.1045(b) (4)	TCAS System	Complies	Reference TSO C-119b
91.1045(b) (5)	Airborne Weather Radar Equip.	Complies	Reference TSO C-67

14 CFR §	Title	Compliance	Remark(s)
91.1115(a)	Minimum Equipment List	Operator Responsibility	The FAA provides a Master Minimum Equipment List (MMEL) document. Gulfstream provides a Maintenance / Operational / Placarding / Procedures (MOPP) Manual.
91.1411	Continuous Airworthiness Maintenance Program	Operator Responsibility	
91.App A	Category II Operations	Not Applicable	The GVI will not have Category II capability at Type Certification (TC). Gulfstream will pursue Category II authorization during a post-TC certification effort.
91.App C	Operations in the North Atlantic (NAT) Minimum Navigation Performance Specifications (MNPS) Airspace	Operator Responsibility	The GVI airplane navigation performance capability complies with the requirements of Section C91.2.
91.App G	Operations in Reduced Vertical Separation (RVSM) Airspace	Operator Responsibility	The GVI airplane equipment complies with the requirements to operate within RVSM airspace.
125.75	Airplane Flight Manual	Operator Responsibility	Gulfstream provides a paper version of the Airplane Flight Manual (AFM) and three iPad™ electronic tablets, with the PlaneBook™ application software installed, with each airplane. The PlaneBook™ application software includes the AFM.
125.91	Airplane Requirements: General	Operator Responsibility	The airplane will be delivered with a valid airworthiness certificate.

14 CFR §	Title	Compliance	Remark(s)
125.93	Airplane Limitations	Complies	The GVI is certificated as adequate for ditching when outfitted in accordance with GVI-GER-1709, entitled “Design Requirements Document for Ditching Equipment”
125.113(b) (c)(2)	Cabin Interiors	Complies	
125.117	Ventilation	Complies	
125.119(c)	Fire Precautions for Aft Baggage Compartment	Complies	
125.183	Carriage of Cargo in Passenger Compartments	Operator Responsibility	
125.185	Carriage of Cargo in Cargo Compartments	Operator Responsibility	Airplane is equipped with a baggage compartment located at the aft portion of the pressurized cabin and is accessible with the airplane in flight.

14 CFR §	Title	Compliance	Remark(s)
125.187	Landing Gear: Aural Warning Device	Complies	
125.189(c)	Demonstration of Emergency Evacuation Procedures: Extended Overwater Operations	Operator Responsibility	
125.201	Inoperable Instruments and Equipment	Operator Responsibility	The FAA provides a Master Minimum Equipment List (MMEL) document. Gulfstream provides a Maintenance / Operational / Placarding / Procedures (MOPP) Manual.
125.203	Communication and Navigation Equipment	Complies	
125.205	Equipment Requirements: Airplanes Under IFR	Complies	Exception: 14 CFR § 125.205(e) – The GVI is equipped with four (4) independent air data systems, each primarily using pitot and static air data from its dedicated multi-function probe. Three of the air data systems are manually selectable by the pilots for display on their respective Primary Flight Display. The fourth air data system is used exclusively by the Standby Flight Displays.
125.206	Pitot Heat Indication systems	Complies	

14 CFR §	Title	Compliance	Remark(s)
125.207	Emergency Equipment Requirements	Not Applicable	The GVI airplane type certification limits the maximum number of passengers to 19.
125.209	Emergency Equipment: Extended Overwater Operations	Operator Responsibility	
125.211	Seat and Safety Belts	Operator Responsibility	Airplane design complies with equipment requirements.
125.213	Miscellaneous Equipment	Complies	<p>14 CFR § 125.213(a) – The GVI uses circuit breakers and solid state power controllers for circuit protection for all standard aircraft wiring and avionics equipment. Fuses are not utilized.</p> <p>14 CFR § 125.213(b) – The airplane is certified with the windshields having a hydrophobic, surface seal coating that obviates the need for windshield wipers.</p>
125.215	Operating Information Required	Operator Responsibility	Gulfstream provides a paper version of the Airplane Flight Manual (AFM) and three iPad™ electronic tablets, with the PlaneBook™ application software installed, with each airplane. The PlaneBook™ application software includes the AFM and the Quick Reference Handbook (QRH).
125.217	Passenger Information	Operator Responsibility	Airplane design complies with equipment requirements.

14 CFR §	Title	Compliance	Remark(s)
125.219	Oxygen for Medical Use by Passengers	Operator Responsibility	
125.221	Icing Conditions: Operating Limitations	Operator Responsibility	Airplane design complies with equipment requirements. Limitations for operating in icing conditions are provided in the Airplane Flight Manual.
125.223	Airborne Weather Radar Equipment Requirements	Operator Responsibility	Airplane design complies with equipment requirements (reference TSO C-67)
125.224	Collision Avoidance System	Complies	Reference TSO C-119b
125.226	Digital Flight Data Recorders	Complies	Reference TSO C-124b and TSO C-157
125.227(h) (i)	Cockpit Voice Recorders	Complies	Reference TSO C-123b and TSO C-155
125.247	Inspection Programs and Maintenance	Operator Responsibility	The aircraft is delivered with a set of maintenance manuals that provide inspections and inspection intervals.

14 CFR §	Title	Compliance	Remark(s)
125.249	Maintenance Manual Requirements	Operator Responsibility	
125.263(a)	Composition of Flightcrew	Operator Responsibility	Airplane certification includes limitation requiring minimum flight crew of pilot and copilot.
125.269	Flight Attendants	Not Applicable	The GVI airplane type certification limits the maximum number of passengers to 19.
125.317(b)	Inspector's Credentials: Admission to Pilots' Compartment: Forward Observer's Seat.	Complies	
125.327	Briefing of Passengers Before Flight	Operator Responsibility	The GVI airplane is equipped with the capability to provide recorded briefings.
125.329	Minimum Altitudes for Use of Autopilot	Operator Responsibility	The GVI AFM specifies the maximum altitude loss for a malfunction of the autopilot.
125.355	Airplane Equipment	Operator Responsibility	The FAA provides a Master Minimum Equipment List (MMEL) document. Gulfstream provides a Maintenance / Operational / Placarding / Procedures (MOPP) Manual.

14 CFR §	Title	Compliance	Remark(s)
125.377	Fuel Supply: Turbine-engine-powered Airplanes Other Than Turbopropeller	Operator Responsibility	Performance planning information for fuel requirements are provided in the Airplane Flight Manual.
135. 21	Manual Requirements	Operator Responsibility	
135.75(b)	Inspector’s Credential: Admission to Pilot’s Compartment: Forward Observer’s Seat.	Complies	
135.76(b)	DOD Commercial Air Carrier Evaluator’s Credentials: Admission to Pilots Compartment: Forward Observer’s Seat	Complies	
135.83(a)(1), (a)(2), (b), and (c)	Cockpit Checklist	Operator Responsibility	Gulfstream provides a paper version of the Airplane Flight Manual (AFM) and three iPad™ electronic tablets, with the PlaneBook™ application software installed, with each airplane. The PlaneBook™ application software includes the AFM and the Quick Reference Handbook (QRH).
135.83(a)(3) and (a)(4)	Aeronautical Charts	Operator Responsibility	
135.83(a)(5)	Multiengine Aircraft One-Engine Climb Data	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
135.93	Autopilot: Minimum Altitudes for Use	Operator Responsibility	The GVI AFM specifies the maximum altitude loss for a malfunction of the autopilot.
135.99	Composition of Flight Crew	Operator Responsibility	Airplane certification includes limitation requiring minimum flight crew of pilot and copilot.
135.113	Passenger Occupancy of Pilot Seat	Operator Responsibility.	
135.117 (e)	Passenger Briefing Cards	Operator Responsibility	
135.117 (f)	Automated Briefing Recording	Operator Responsibility	The GVI airplane is equipped with the capability to provide recorded briefings.
135.127	Passenger Information	Operator Responsibility	
135.129(d) and (e)	Exit Seating Passenger Information Cards	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
135.143(a) (b)	Approved/Operable Instruments and Equipment	Operator Responsibility	
135.143(c)	ATC Transponder	Complies	
135.147	Dual Controls Required	Complies	
135.149(a)	Altimeter Adjustable for Barometric Pressure	Complies	
135.149(c)	Additional Equipment	Complies	
135.151(a)	Requirement and Installation of CVR	Complies	
135.151(c)	CVR – Recorded Data	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
135.151(d)	Boom and Mask Microphone	Operator Responsibility	
135.151(e)	CVR – Recorded Data	Complies	
135.152	Flight Recorder	Complies	
135.154	Terrain Awareness and Warning System	Complies	
135.155	Fire Extinguishers: Type and Suitability of Agent	Complies	
135.157(b)	Oxygen Equipment Requirements Pressurized aircraft.	Operator Responsibility	Airplane design complies with equipment requirements.
135.157(c)	Oxygen Equipment Requirements Pressurized aircraft.	Complies	

14 CFR §	Title	Compliance	Remark(s)
135.158(a)	Pitot Heat Indicating Systems Requirement and Operation	Complies	
135.159(a) to (g)	Equipment Requirements: Carrying Passengers under VFR at Night or under VFR Over The Top Conditions	Complies	
135.161	Radio and Navigational Equipment: Aircraft Carrying Passengers Under VFR at Night or under VFR Over The Top	Complies	
135.163(a) to (e) (g)(h)	Equipment Requirements: Aircraft Carrying Passengers Under IFR	Complies	
135.165	Radio and Navigational Equipment: Extended Overwater or IFR Operations	Complies	
135.167	Emergency Equipment: Extended Overwater Operations	Operator Responsibility	
135.169(a)	Additional Airworthiness Requirements.	Complies	

14 CFR §	Title	Compliance	Remark(s)
135.170(b) and (c)	Materials for Compartment Interiors	Complies	
135.171(a)	Shoulder Harness Installation at Flight Crewmember Stations	Complies	
135.173	Airborne Thunderstorm Detection Equipment	Complies	
135.175	Airborne Weather Radar Equipment	Complies	
135.179(a)	Inoperable Instruments and Equipment	Operator Responsibility	The FAA provides a Master Minimum Equipment List (MMEL) document. Gulfstream provides a Maintenance / Operational / Placarding / Procedures (MOPP) Manual.
135.180(a) and (b)	Traffic Alert and Collision Avoidance System	Complies	.
135.181(a) (2)	Performance Requirements: Aircraft Operated Over The Top or in IFR Conditions	Operator Responsibility	

14 CFR §	Title	Compliance	Remark(s)
135.183(c)	Performance Requirements: Land Aircraft Operated Over Water	Operator Responsibility	
135.185	Empty Weight and Center of Gravity: Currency Requirement	Operator Responsibility	
135.227(a), (b), (c), (e), and (f)	Icing Conditions: Operating Limitations	Operator Responsibility	
135.363 (b)	Turbine Powered Large Transport Category Airplanes Performance Operating Limitations	Operator Responsibility	
135.419	Approved Aircraft Inspection Program	Operator Responsibility	
135.425	Maintenance, Preventive Maintenance and Alteration Programs	Operator Responsibility	
135.427(b)	Manual for Maintenance, Preventive Maintenance and Alterations	Operator Responsibility	

APPENDIX 4

HEAD-UP DISPLAY (HUD) SYSTEMS

Flight crewmember training must be accomplished using a level ‘C’ simulator, with a daylight visual display, or a level ‘D’ simulator. The FSB has determined that each pilot in command of an aircraft equipped with a HUD system should receive a minimum of 3 hours of ground school training followed by a minimum of 4 hours of simulator training in the left seat of a level ‘C’, with a daylight visual display, or level ‘D’ simulator. A HUD equipped aircraft may also be used for in-flight training. In-flight training should consist of a minimum of 4 hours of flying in the left seat of the HUD equipped aircraft.

The 3 hours of ground school training listed above is intended for pilots receiving “stand alone” training on the HUD system. A pilot who is progressing successfully through an initial training program that has HUD training (including all 3 elements listed below) integrated into the curriculum, is recommended by an instructor, and successfully completes the appropriate HUD proficiency check by a person authorized by the Administrator, need not complete the 3 “stand alone” hours of ground school training.

The 4 hours of simulator or aircraft in-flight training listed above is intended for pilots receiving “stand alone” training on the HUD system. A pilot who is progressing successfully through an initial training program that has HUD training (including all 10 elements listed below) integrated into the curriculum, is recommended by an instructor, and successfully completes the appropriate HUD proficiency check by a person authorized by the Administrator, need not complete the 4 “stand alone” hours of simulator/aircraft in-flight training.

The FSB recommends special training emphasis in the following areas:

Ground Training:

- 1) Crew coordination
- 2) Crew briefings and callouts
- 3) Duties of pilot flying (PF) and pilot monitoring (PM).
- 4) Flight Training:
 - a) Use of caged, uncaged and clear modes (especially in crosswind conditions)
 - b) Use of the pitch limit indicator (PLI) during windshear escape
 - c) Approaches to ‘black hole’ airports using the flight path angle (FPA)
 - d) Use of the acceleration cue as a potential FPA
 - e) Relationship of the glide path angle to the symbolic runway
 - f) Approaches into the top of an undercast during daylight and night conditions.
 - g) Recovery from unusual attitudes
 - h) TCAS resolution advisory
 - i) Takeoff using the FPA to meet a required climb gradient.

Checking requires a proficiency check conducted in a level 'C' simulator, with a daylight visual display, in a level 'D' simulator, or on a HUD equipped aircraft. The proficiency check will include at least one takeoff and departure procedure and one instrument approach and landing utilizing the HUD. Testing and checking will also include a minimum of one takeoff or missed approach and one instrument approach and landing without utilizing the HUD. This is to ensure proficiency without the use of the HUD.

APPENDIX 5

ENHANCED VISION SYSTEM (EVS)

EVS meets the requirements of Enhanced Flight Vision System (EFVS) as defined in 14 CFR section 91.175.

Flight crewmembers may use EVS to meet the visibility requirements of 14 CFR section 91.175 provided that vertical guidance with reference to an obstacle-free path is used.

Flight crewmember training must include a review of 14 CFR section 91.175 and a review of the associated EVS AFM system description, limitations, and procedures.

Flight crewmember training must be accomplished using a level 'C' simulator, with a daylight visual display, or a level 'D' simulator that has been qualified by the National Simulator Program for EVS, or the aircraft. The FSB has determined that each pilot in command of an aircraft equipped with EVS should receive a minimum of 4 hours of ground school training followed by a minimum of 2 hours of simulator training in the left seat of a level 'C', with a daylight visual display, or level 'D' simulator. An EVS equipped aircraft may also be used in lieu of a simulator for training. In-flight training should consist of a minimum of 2 hours of flying in the left seat of the EVS equipped aircraft. The flight portion of the training should consist of a minimum of two day and two night approaches each with vertical guidance.

The 4 hours of ground school training listed above is intended for pilots receiving "stand alone" training on the EVS system. A pilot who is progressing successfully through an initial training program that has EVS training (including all 9 elements listed below) integrated into the curriculum, is recommended by an instructor, and successfully completes the appropriate EVS proficiency check by a person authorized by the Administrator, need not complete the 4 "stand alone" hours of ground school training.

The 2 hours of simulator or aircraft in-flight training listed above is intended for pilots receiving "stand alone" training on the EVS system. A pilot who is progressing successfully through an initial training program that has EVS training (including all 7 elements listed below) integrated into the curriculum, is recommended by an instructor, and successfully completes the appropriate EVS proficiency check by a person authorized by the Administrator, need not complete the 2 "stand alone" hours of simulator/aircraft in-flight training.

The FSB recommends special training emphasis in the following areas:

Ground Training:

- 1) Transition from EVS imagery to non-EVS, visual conditions. Maximum use should be made of videotapes of actual EVS approaches as seen through the combiner.

- 2) Crew briefings and callouts including annunciation of published minima and operation below the DA(H) or MDA(H) with EVS.
- 3) Duties of pilot flying (PF) and pilot monitoring (PM).
- 4) Crew coordination.
- 5) Visual anomalies such as “noise” parallax, and “blooming”.
- 6) Importance of cross checking the HUD instrumentation presentations against the EVS visual scene presentation to enable the pilot to recognize malfunctions of the ground based ILS equipment and improper presentation of elements in the visual scene during the approach.
- 7) Use of barometric altitude and/or radio altitude at low heights, including temperature correction if applicable.
- 8) Importance of vertical guidance to enhance situational awareness with respect to the obstacle environment.
- 9) Importance of ensuring descent on an obstacle-free glide path when operating below the MDA during non-precision approaches.

Flight/Simulator Training:

- 1) Transition from EVS imagery to non-EVS, visual conditions and runway acquisition.
- 2) Crew briefings and callouts including annunciation of published minima and operation below the DA(H) or MDA(H) with EVS.
- 3) Importance of the “design eye position” in acquiring the proper EVS image
- 4) Use of on/off switch “clear” mode.
- 5) Precision and non-precision instrument approaches in both day and night conditions
- 6) Use of caged and uncaged modes in crosswind conditions.
- 7) EVS repeater (if installed) – Imagery quality and crew coordination.

Checking requires a proficiency check conducted in a level ‘C’ simulator, with a daylight visual display, in a level ‘D’ simulator, that has been qualified by the National Simulator Program for EVS, or on an EVS equipped aircraft. The proficiency check will include at least one instrument approach to published minimums and landing utilizing the EVS. This check can be accomplished concurrently with a proficiency or competency check under 14 CFR sections 61.57, 61.58, 135.293, or 135.297.

Currency: If 14 CFR section 61.57 (c) is being used for currency, at least one of the 6 required instrument approaches must be accomplished using EVS to published minimums.

As a prerequisite for EVS training, pilots should have successfully completed HUD training in the Gulfstream GVI or GV-SP (G-550) or GIV-X (G-450) Level C or D simulator, or GVI or GV-SP (G-550) or GIV-X (G450/G350) aircraft in accordance with the requirements of Appendix 4 of this report. These EVS requirements assume that a pilot entering an EVS training program is trained and proficient in the use of the HUD.

NOTE 1: This does not preclude the display of the EVS during initial HUD training for purposes of EVS familiarization. However, such familiarization is not creditable toward EVS training as specified in this Appendix.

NOTE 2: The EVS is also certified for use as an aid during all phases of flight: taxi, takeoff, climb, cruise, descent and landing.

The GV-SP (G-550) and GIV-X (G-450) EVS were evaluated by the FSB and have been found to be functionally equivalent to the GVI EVS. Therefore a pilot transitioning from the GV-SP (G-550) or GIV-X (G-450) to the GVI does not require any additional EVS training. Conversely, a pilot transitioning from the GVI to the GV-SP (G-550) or GIV-X (G-450) does not require any additional EVS training.

APPENDIX 6

PLANEVIEW II AVIONICS SOFTWARE VERSION “BLOCK POINT I” (ASC 901)

The PlaneView II Avionics Software version ‘Block Point I’ upgrade will be installed in all Gulfstream GVI (G650) airplanes S/N 6001 through 6093 via Aircraft Service Change (ASC) 901 and as standard equipment in S/N 6094 and subsequent, and 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
- 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
- Future Air Navigation System (FANS) 2 – Protected Mode (PM) CPDLC²
- Graphical Make FROM Waypoint
- 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 Capability²
- 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 U.S. designated airspace (e.g., FAA OPSPEC/MSPEC/LOA A353, EASA Approved Means of Compliance (AMC) 20-24, and Australian Advisory Circular (AC) 21-45) and is not sufficient for compliance with 14 CFR sections 91.225 and 91.227.

² FANS 2 / ATN B1 functionality will be an optional installation for aircraft S/N 6001 through 6093 via Aircraft Service Change (ASC) 039.

³ RNAV RNP AR approach capability authorization will be acquired separately.

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) should be trained on the differences using any one of the following level "C" differences training media: interactive computer-based training, cockpit systems simulators, cockpit procedures trainers, or part task trainers. There are no checking or currency requirements for the PlaneView II Avionics Software version upgrade installed with ASC 901.

APPENDIX 7

PLANEVIEW II AVIONICS SOFTWARE VERSION “BLOCK 2” (ASC 902)

The PlaneView II Avionics Software version “Block 2” upgrade will be installed in all Gulfstream GVI (G650 / G650ER) airplanes S/N 6001 through 6249 via Aircraft Service Change (ASC) 901 and as standard equipment in S/N 6250 and subsequent, and includes the following operationally significant changes:

- Advisory CAS message text changed from “Rudder Steering Off” to “Pedal Steering Off”
- Autopilot disengage indication on PFD changed to red for commanded disengagement
- Caution CAS message “Landing Gear Maint Req’d” logic changed to include tire overspeed
- Caution CAS message text changed from “Rudder Steering Fail” to “Pedal Steering Fail”
- Corrections to FMS TOLD takeoff data
- Datalink Weather coverage expanded to world-wide
- DME Hold available with FMS as navigation source
- Flight Controls 2/3 synoptic retains last-selected format
- Flight Director FLCH vertical mode reverts to PIT when autopilot disengaged
- FMS TOLD landing performance using autobrakes
- Forward and Aft Emergency Batteries voltages displayed on DC Power synoptic
- Hydraulic Aux Pump auto-activation with brake application (when SPDS Build 10 (ASC 051) is also installed)
- I-NAV MAP VSD reverts to Track mode when autopilot disengaged and FMS LNAV active
- Incremental Terminal Charts database loading

Pilots transitioning to the PlaneView II Avionics Software “Block 2” upgrade installed with ASC 902 in the Gulfstream GVI (G650 / G650ER) should be trained on the differences using Level “A” training, which can be accomplished through self-instruction by reviewing the changes incorporated in G650 AFM Revision 12 or G650ER AFM Revision 3, and the Gulfstream Operating Manual Supplement G650-OMS-08 describing the operationally significant changes. There are no checking or currency requirements for the PlaneView II Avionics Software Version “Block 2”.