EASA CS-25 Generic Validation Item list

Updated January 2017

This is applicable to FAA Validation Projects. This list constitutes the Generic VI List for the purposes of large transport aeroplane FAA/EASA/JAA validation programs under the Technical Implementation Procedures (TIP) for airworthiness and environmental certification.

This list will be further updated to take into the feedback of both certification and validation projects, technological developments, in-service experience, and to correct any errors, omissions and mistakes.

Subject	Description
Project Management	
New Type Certificate, Significant Product Level Change or Inadequate Certification Basis	It is generally needed an A-01 CRI to establish the certification basis for projects involving new type certificates, significant product level changes or inadequate certification basis. AMC for Part 21.101 provides guidance on significant product level changes and how to assess and proceed when certification basis must be updated.
ETOPS	FAR 25.1 has no equivalent in CS25. A CRI might be required to establish a means of compliance for CS 25.1535 / AMC 20-6 versus FAR 25.1535 and Appendix K. A CRI MoC may be needed for business Jet EDTO A CRI MoC may be needed to define the necessary activities for Early ETOPS compliance demonstration
ALS modifications	Any modification affecting the Airworthiness Limitation Section may require an AD in the case the requirements are more restrictive.
AFM modifications	For those cases, the Aircraft Flight Manual modification is considered major level 1.

Related Non Basic STCs or Level 1 Changes	For those changes having related to non-basic STCs or Level 1 major changes, special attention must be paid to the interfaces between the modifications. In many cases, the related changes should also be classified as non-basic or level 1.
Panel 1 Flight	
Flight in Icing Condition	The flight in icing requirements introduced via CS 25.21(g) mandate ice accretion considerations, which do not address fly-by-wire designs embodying high angle of attack protection. Consequently, a Special Condition might be required, together with interpretative material to consider this stall protection feature.
Contaminated runways; reverse thrust Credit when Operating on Contaminated Runway Surfaces and water depth	Credit may be sought for all-engines operating reverse thrust for accelerate-stop and landing distances on contaminated runways. CS 25 contains provision for reverse thrust credit, provided certain criteria are satisfied. You may need additional interpretative material clarifying the EASA policy for reverse thrust credit. AMC guidelines has deeper water depth compared with FAA AC.
Stalling and Scheduled Operating Speeds	A special condition and interpretative material may be needed to adapt the applicable basic CS 25 requirements to consider high angle of attack protection functioning of a flight control system design. The intent is to permit an equivalent level of safety finding based on the handling quality robustness and reliability of the high AoA protection.
Static Directional, Lateral and Longitudinal Stability and Low energy awareness	A special condition & interpretative material may be needed to address electronic flight control systems, which provide neutral stability in the directional, lateral & longitudinal axes. Additional mitigation relating to low energy awareness may also need to be considered.
Landing in Abnormal Configurations	Interpretative material may be needed to provide guidance with respect to the scheduling of data for landing in abnormal configurations or following the loss of normal services.
Credit for Use of Autobrake During Landing Performance Tests.	Interpretative material is required when credit is sought for use of autobrake which provides earlier braking than that permitted with manual brake application.

Topic EFCS **Formalization of Compliance Demonstration to CS 25.143, 25.1301, 25.1309 for Electronic Flight Control Laws (EFCTL)** **Digital Flight Control System: Out-of-Trim Characteristics** **Design Manoeuvre Requirements for Electronic Flight Control Systems** **Electronic Flight Control Systems (EFCS) / Fly-By-Wire(1)**	On fly-by-wire aeroplanes, the flight controls are implemented according to complex control laws and logics. The handling qualities certification tests usually performed on conventional aircraft to demonstrate compliance with CS 25 SUBPART B – FLIGHT are not considered sufficient to cover the flight control laws behaviour in all foreseeable situations that may be encountered in service. To standardize handling qualities tests, the EASA believes that means of compliance with CS 25.143, 25.1301 and 25.1309 addressing flight control law characteristics need to be explicitly proposed and formalized within certification documents to ensure and record adequate coverage and testing of control laws, logics and characteristics. Consequently, you may need interpretative material requested to improve the level of formalization of the compliance demonstrations. Regarding out of trim characteristics, a digital flight control system does not allow the aircraft to be put in the out-of-trim condition required by CS 25.255(a), therefore direct compliance cannot be shown. However, the other requirements of CS.25.255 remain applicable. The EASA may require the Applicant to detail how it is envisaged to comply with all applicable CS 25.255 requirements and provide a detailed description of the DFCS design and operation, as applicable to support the intended compliance demonstration. The Applicant should also detail the proposal for any flight-testing in the normal and over speed regions. To define the (pitch, yaw, roll) design manoeuvre requirements for aeroplanes equipped with electronic flight control systems, where the motion of the control surfaces does not bear a direct relationship to the motion of the cockpit control devices. This may be based on the relevant regulatory material adopted in CS-25 Am. 13. There are certification issues related to aeroplanes with electronic flight control/fly-by-wire systems. The subject also covers pilot controls (e.g. side stick controllers, rudder pedals) and operation test compliance, electronic flight control system failures, control signal integrity, control surface position awareness, limit of control authority, common mode failure & error consideration, flight control laws validation and mode annunciation. CRIs (including special conditions) may be needed.
Go-Around Performance	CS. 25.101(g) requires that the procedures for the execution of missed approaches associated with the conditions prescribed in CS 25.121(d) must be established. Whilst an aircraft may be able to demonstrate the required climb gradient capability associated with the conditions prescribed in CS 25.121(d), it may not be able to achieve it quickly enough or avoid striking the ground particularly when operating using decision heights below 200ft. Interpretative material giving compliance methods to ensure that any proposed go-around procedure remains safe might be required.
Landing Distances on Wet Porous Friction Course/Grooved Runways	An Applicant may wish to schedule wet landing distances to include consideration of a wet porous friction course (PFC) and/or grooved runway in addition to a conventional smooth surface. Porous friction course and grooved runway surfaces are designed to provide, when wet, a higher friction coefficient than conventional runways. CS 25.109 allows reduced Accelerate-Stop Distances when operating on wet PFC/Grooved runways. In principle, performance credit may also be granted when landing on wet PFC/Grooved runways & in this regard interpretative material may be required.

Topic Side Stick **Motion and Effect of Cockpit Controls** **Pilot Forces for Side Stick Controls 3(P), 1(S), 4(S)**	The introduction of side stick controllers notably associated with electronic flight control systems has required the consistent application of additional requirements to CS 25. You may need a special condition to accommodate such features. To provide limit pilot forces and torques when a side stick controller is used on the flight deck. This may be based on the relevant regulatory material adopted in CS-25 Amdt 13.
Narrow Runway Operations	Applicant may seek to demonstrate the compatibility of aircraft operation on runway widths narrower than those recommended by ICAO Annex 14 within the frame of the certification exercise. You may need interpretative material to support such an exercise.
Normal Load Factor Limiting System	CS 25.143 requirements assume that a conventional non fly-by-wire aeroplane can generate sufficient aerodynamic lift to provide sufficient manoeuvrability with regards to the normal load factor envelope defined by CS 25.333. This capability ensures adequate manoeuvrability to effect sudden changes to the flight path which may be required to avoid obstacles, terrain or the capture of level-off altitudes following climb or descent. For structural or other reasons certain electronic flight control system designs embody a normal load factor limiting system intended to restrict the achievable load factor envelope within that which would have been available taking full credit for the aerodynamic performance of the aeroplane. You may need an additional special condition to ensure that a sufficient manoeuvre capability remains.
Reduced and Derated Take-off thrust (Power) Procedures	CS 25 AMC 25-13 entitled "Reduced And Derated Take-Off Thrust (Power) Procedures" provides acceptable means of compliance (AMC) for the certification and use of reduced thrust (power) for take-off and derated take-off thrust (power) on turbine powered transport category aeroplanes. You may need additional interpretative material should an Applicant wish to pursue the use of reduced thrust settings below the 75% restriction.
Steep Approach	The scope of CS 25 does not cover steep approach landing capability and consequently additional airworthiness requirements are required with provisions to enable an aeroplane to use an approach path angle greater than or equal to 4.5° (a gradient of 7.9%). You may need to raise a special condition to support such operations. To establish the means of compliance with structural design requirements for aeroplanes intended for steep approaches.
Flight Envelope Protection	A special condition may be needed to apply to aeroplane designs which embody flight envelope protections relating to high, low speed and angle of attack implemented in the electrical flight control system to address these features.
Flight Test Guide	The EASA proposes the application of the JAA Flight Test Guide NPA 25B-335 to enhance the interpretation of the means of compliance with flight test related requirements. Additional interpretative material may be required should the FAA Flight Test Guide be proposed for use.

15 kts Tailwind Take-off & Landing Operations	You may need interpretative material to support the application relating to take-off and landing operations with tail winds beyond 10 & up to 15 knots.
Topic Autoland **Autoland Distances** **Autoland Structural Requirements**	CS-AWO 142 entitled "Landing distance" states that the landing distance required must be established and scheduled in the flight manual if it exceeds the distance scheduled for manual landing. You may need interpretative material to provide a means of determining the autoland distances. To establish the means of compliance with the autoland structural requirements (sink rate, bank angle and lateral velocity) of CS-AWO 131(c).
Topic Head-Up Display **Landing Distances using Head-Up Display** **Occupant Protection with Dual Head-up Display (HUD) Installation**	The use of a head-up display system during CAT III manual landings may lead to changes in operational procedures and/or piloting control techniques, which may invalidate the landing distances scheduled in compliance with CS 25.125. If there is any feature of the system or the associated procedures which would result in an increase to the landing distance required, the appropriate increment must be established and scheduled in the aeroplane Flight Manual. A respective compliance methodology is then required. Installation of HUD over both pilots may result in a single incident affecting both pilots and affect continued safe flight and landing. You may need a CRI to establish Interpretative Material compliance with CS 25.785 for the occupant injury requirements.
Runway Overrun Protection System (ROPS)	Performance aspects of runway overrun prevention system: The ROPS or RSAT or XXX system aims at protecting the aircraft actively against a runway-end overrun. This feature provides an automatic detection of the landing runway and in case of runway overrun risk detection, it triggers alerts in flight at landing. The intent of this GVI is to mainly address performance certification issues linked to the peculiarities of such a system.
Topic Vibration and Buffeting Requirements for External Modifications.	CS 25.251(b) requires that each part of the airplane must be demonstrated in flight to be free from excessive vibration under any appropriate speed and power conditions up to Vdf/Mdf'. The EASA has determined that if it can be shown by an acceptable method that the original compliance finding for this rule remains valid (i.e., no vibration/buffet issues exist due to the change), an equivalent level of safety may be shown. However, if the original certification for this rule does not remain valid due to potential effects of the external modification, direct compliance with the rule must be re-demonstrated. To establish the means of compliance with vibration and buffeting requirement related to large antenna and/or radome installations.

TOLD as primary source of take-off performance information (CAI available)	The TOLD function is intended to provide take-off and landing data such as take-off and landing speeds, take-off and landing distances and thrust setting. The TOLD application may be hosted by the FMS and the interface is managed through the MCDU. The computed data includes take-off and landing speeds that can be sent directly to the Primary Flight Displays. The information computed by the TOLD function is intended to be the primary source of information, and the computed information would not need any kind of crosscheck with AFM information before being used on the flight deck. This primary nature of the TOLD function is a novel feature and raises concerns with regard to data integrity and identification of approved and unapproved performance information. There is currently no dedicated regulatory material addressing the TOLD function as primary source of information. The EASA may require to raise addition special conditions together with advisory guidance material to address these aspects.
Topic: Automatic Take Off Thrust Control System **Automatic Take Off Thrust Control System during Go-Around** **Automatic Take-off Thrust Control System (ATTCS)**	The power plant is equipped with an Automatic Take-off Thrust Control System. Appropriate requirements are provided by CS 25 Appendix I, for ATTCS operating during the take-off phase. In addition, the design of the ATTCS may embody this function during a go-around enhancing the aircraft performance. A CRI may be required to provide a special condition together with interpretative material. For power plant, a Special Condition (SC) is raised to consider the non-necessity of manual ATTCS de-activation. An Equivalent Safety Finding is normally raised to address the effect of lack of manual de-activation and indication that the APR is armed during take-off. A special condition can be raised regarding the lack of manual means to obtain MTO or APR power on both engines
Human Factors	Some significant differences are observed in the way demonstration to CS/FAR 25.1302 is processed. Most of the time a CRI and/or a CAI need to be issued.
Customization of electronic check lists	Most manufacturers allow operators to freely customize contents and structure of electronic check list. EASA considers eC/L to be part of the type design, at least concerning abnormal and emergency material. A CRI is generally used for that purpose.
Airport Map Displays (AMD)	NEXTGEN Technology: a CRI may be needed for installations of AMDs with own-ship position that are not part of an Electronic Flight Bag (EFB).
Baro VNAV	A CRI documenting a mean of compliance with §§ 25.1301, 25.1302 and 25.1523 is needed for newly installed Baro VNAV systems not incorporating automated temperature compensation for all segments in the approach procedure, including the missed approach holding waypoint. This CRI will evaluate procedures for manual altitude corrections, effect on crew workload and protections from erroneous altitude entries.
Sharing of avionics resources or A/C capability with non-certified EFB systems or functions	This is typically one novelty were EASA may have a different approach than FAA. Typical examples would be architectures allowing the display of EFB (i.e. non certified) data on avionics displays units, or control of the EFB applications from certified control devices (e.g. KCCU or certified touchscreens).

Topic: EFB **Human factor: Class 3 Electronic Flight Bags (EFB)** **Sharing of avionics resources or A/C capability with non-certified EFB systems or functions**	For human factor, NEXTGEN Technology: A CRI may be required for EFB projects with Class 3 hardware or Type C software applications. For avionics: This is typically one novelty were EASA may have a different approach than FAA. Typical examples would be architectures allowing the display of EFB (i.e. non certified) data on avionics displays units, or control of the EFB applications from certified control devices (e.g. KCCU or certified touchscreens).
Display of Aeronautical Charts	A means of compliance CRI may be needed for approval of the display of aeronautical charts on any of the installed displays (e.g., display of departure, arrival and approach procedures).
Enhanced Vision Systems (EVS) and Enhanced Flight Vision Systems (EFVS)	For human factor, a Special condition may be needed for display of video from infrared or other sensor-based vision systems on head-up displays to provide a level of safety equivalent to § 25.773. For avionics, the multi-sensor vision systems feature new and novel technology to generate video raster imagery in the pilot field of view. A CRI proposes a special condition regarding pilot's compartment view (CS 25.773) and some general requirements (in line with CRI F-XX Head-Up Display (HUD) installation). It also proposes acceptable means of compliance for the airworthiness approval of this system. Specific operational minima may be established in accordance with operational regulations.
Synthetic Vision Systems (SVS) **1) on Head Up Display; or** **2) SVS on head down display for operational credit.**	For human factor, NEXTGEN Technology: a Special condition may be needed for the display of SVS video on a head-up display to provide a level of safety equivalent to § 25.773. Avionics aspects: the SVS system provides the pilot with a synthetic view of the external scene. When SVS is displayed on a head-down PFD it is typically accepted "for situational awareness" only. However, 1) Applications for the use of SVS for operational credit (a.k.a. SVGS) requires a CRI; 2) SVS displayed on the Head-Up Display requires a special condition regarding pilot's compartment view (CS 25.773). The SC also proposes acceptable means of compliance for the airworthiness approval of this system.
Unique Flight Deck Failure Modes and Effects	A CRI may be needed for complex integrated avionics installations incorporating many airplane functions that were historically supported with federated (i.e., non-integrated) systems. Many system functions that were typically separated with limited interdependence are now very interrelated and highly integrated. Certain failure modes having a limited effect in federated systems may now have a cascading effect on other systems.
Using Autopilot/Auto Throttles/Flight Director During Traffic Alert and Collision Avoidance System (TCAS) Resolution Advisory	NEXTGEN Technology: a CRI may be needed to establish an acceptable means of compliance for using the Autopilot/Auto Throttles/Flight Director during a TCAS Resolution Advisory manoeuvre such that the behaviour is predictable and unambiguous to the flight crew.

Flight Crew Electronic Voice Checklist	For flight crew electronic voice checklists, a means of compliance CRI may be needed for designs not previously approved, or for any design intended for non-normal checklists.
Touch Screen Interface and Control Device in Flight Deck	For human factor, a CRI may be needed to determine an acceptable means of compliance for installing touch screens in the flight deck in lieu of physical controls (e.g., knobs, buttons, and levers). The CRI would address the effect of touch screen controls on pilot workload, the demand for pilot attention, and the potential for crew error or inadvertent control inputs. The use of touch screen controls in place of more traditional knobs, buttons and levers may affect pilot workload, the demand for pilot attention, and the potential for crew error or inadvertent control inputs. The EASA considers the touch screen user interface to be a new and novel technology for use on Transport Category Aeroplanes (CS-25).
<u>Panel 3 structures</u>	
Loads & Aeroelasticity	
Interaction of Systems and Structures	To evaluate the interaction of systems and structures for aircraft equipped with systems (such as electronic/automatic flight control systems, autopilots, stability augmentation systems, load alleviation systems, flutter control systems, and fuel management systems) that affect structural performance, either directly or as a result of a failure or malfunction. This may be based on the relevant regulatory material adopted in CS-25 Am. 1.
Automatic (Over)speed Protection System	To evaluate aeroplanes equipped with an automatic (over)speed protection system. This may be based on the relevant regulatory material adopted in CS-25 Am. 13.
Limit Engine Torque Loads for Sudden Engine Stoppage / Sustained Engine Imbalance	To evaluate if the size, configuration, and failure modes of the proposed turbine engine installation is considerably different from those envisioned by earlier requirements. This may be based on the relevant regulatory material adopted in CS-25 Am. 8.
Aeroservoelastic Stability Requirements	To establish the means of compliance with aeroelastic stability requirements for aeroplanes equipped with feedback control systems that can affect the aeroelastic stability of the aeroplane.
Failure Criteria Considered Under the Aeroelastic Stability Requirements	To establish the failure criteria to be considered for compliance with aeroelastic stability requirements, when the Applicant uses the failure criteria specified in the ARAC FCHWG proposals that addresses CS/FAR 25.671 and CS/FAR 25.1309. In addition, those systems covered under CS 25.302 need to comply with the aeroelastic stability requirements of Appendix K.

Aeroelastic Stability Envelopes For Takeoff, Approach, and/or Landing Configurations	To establish the means of compliance with aeroelastic stability requirements for devices (such as flaps and slats) used in take-off, landing or approach configurations.
Reliance on Retained Stiffness with Dual Hydraulic Actuators in Lieu of Mass Balance for Flutter Prevention	To establish the means of compliance with aeroelastic stability requirements for aeroplanes equipped with control surfaces that depend on actuator stiffness/damping instead of mass balance for flutter prevention, to address Limit Cycle Oscillations (LCO) due to free-play.
Unconventional Landing Gear Arrangements	To evaluate ground loads requirements for aeroplanes configured with unconventional landing gear arrangements. This may be based on the ARAC LDHWG recommendations.
Gust and Turbulence Loads	To establish the means of compliance for gust and turbulence loads. This may be based on the relevant regulatory material adopted in CS-25 Am. 1.
Checked Pitching Manoeuvre	To establish the means of compliance for checked pitching manoeuvres. This may be based on the relevant regulatory material adopted in CS-25 Initial Issue.
Ground Gust Conditions	To establish the means of compliance for ground gust conditions. This may be based on the relevant regulatory material adopted in CS-25 Initial Issue.
Design Dive Speed	To establish the means of compliance for defining the margin between Vc/Mc and Vd/Md. This may be based on the relevant regulatory material adopted in CS-25 Initial Issue.
Taxi, Take-off and Landing Roll	To establish the means of compliance for ground loads during taxi, take-oof and landing roll. This may be based on the relevant regulatory material adopted in CS-25 Initial Issue.
Stall speed (Vs1g)	To ensure that the 1-g stall speed (and not Vs,min) is used as the basis for structural design speeds. This may be based on the relevant regulatory material adopted in CS-25 Am. 13.
Flight Control Jamming	For structure aspects, to establish the load conditions to be considered in the event of flight control jamming. This may be based on the ARAC FCHWG recommendations. For flight controls, a CRI may be needed to define and agree on the acceptable means of compliance with CS 25.671(c)(3).
Yaw Manoeuvre Conditions	To ensure that when performing the yaw manoeuvre analysis, the cockpit rudder control is deflected so as always to maintain the maximum rudder deflection available. This may be based on the relevant regulatory material adopted in JAR-25 Change 15.
Flight Loads Validation	To establish the need for, and extent of, validation of flight loads. This may be based on the relevant regulatory material adopted in CS-25 Am. 1.

Limit Manoeuvring Load Factors	To establish the means of compliance when constraints are present which may limit the aircraft's ability to attain the manoeuvring envelope load factor boundary. This may be based on the regulatory material adopted in AMC 25.373.
High Lift Devices – En-Route	To establish the means of compliance when high lift devices are used en-route. This may be based on the regulatory material adopted in AMC 25.345(c).
Loads Parallel to Hinge Line	To establish the means of compliance for loads parallel to the hinge line on primary control surfaces and other movable surfaces. This may be based on the regulatory material adopted in AMC 25.393(a).
Aileron Control Reversal	To establish the means of compliance with CS 25.629, for aeroplanes equipped with ailerons that are used only at lower speeds and "locked out" at higher speeds to preclude aileron control reversal.
Automatic Braking System	To establish the means of compliance for aeroplanes equipped with an automatic braking system that may apply maximum braking at the main wheels before the nose touches down and thereby cause a high nose gear sink rate and potentially higher gear and airframe loads.
Static Strength	
Proof of Structure	To establish the need for, and extent of, limit and ultimate load tests to be performed to validate the structural analysis. This may be based on the regulatory material adopted in AMC 25.307.
Fatigue & Damage Tolerance	
Fatigue & Damage Tolerance	The showing of compliance with the fatigue and damage tolerance requirements of CS 25.571(a)(b)(c) is a complex task, with many issues to be considered, and with various possible compliance approaches. Given the importance of the subject for the overall safety level of the aircraft, the means of compliance needs to be agreed with the Agency.
Damage Tolerance of Engine Mounts	To establish the means of compliance with CS 25.571 for engine mounts. Damage tolerance of engine mounts is not "impractical" and is, therefore, normally needed.
Crashworthiness / Occupant Survivability	
Crashworthiness of Composite Structure	To ensure the survivable crashworthiness characteristics (e.g., maintenance of a survivable volume for occupants, maintenance of emergency evacuation paths) for a composite fuselage are equal to or better than those of a similarly sized airplane fabricated from traditionally used metallic materials.
Ditching **Structural Conditions** **Ditching Dam**	For structure, to define the planned ditching structural conditions to be considered. For cabin safety, on several programs, a ditching dam has been utilized to allow a floor level exit to qualify as a ditching exit. The dam effectively raises the bottom sill of the door to a level higher than the water level outside. You will likely need a CRI to establish an ESF with CS 25.807(i) for this installation.

Seat Adapter Plates	To establish the means of compliance for seats installed on adapter plates (pallets or plinths) for aeroplanes that include CS 25.562 in their certification basis.
Wear & Tear Factor	EASA CM S-002 contains additional guidance on compliance with the 1.33 "wear and tear" factor of CS 25.561(c)(2).
Fuel Tank Integrity **Structural Integrity** **UERF Small fragment vs CFRP fuel tank**	To address prevention of fuel spillage due to fuel tank rupture under different gear extended/retracted conditions, as well as under landing gear or nacelle/pylon/engine breakaway scenarios. This may be based on the relevant regulatory material adopted in CS-25 Am. 3. A CRI might be required to detail the interpretation (IM) for a composite fuel tank and different approaches (penetration resistance, equivalence approach to aluminium and combination. CS 25.963(e) amended with CS 25 Amdt 14
Fuel Tank in Horizontal Stabilizer	To establish the means of compliance for fuel tank installations in the horizontal stabilizer. This may be based on the relevant regulatory material adopted in CS-25 Am. 3.
Wing Fuel Tank Pressures	To establish the means of compliance for wing fuel tank pressures under emergency landing conditions. This may be based on the relevant regulatory material adopted in CS-25 Am. 3.
Emergency Landing Conditions	Guidance material on installation of seats and equipment, and stowage compartments, are contained in AMC's 25.561, 25.561(b) (3), 25.561(d) and AMC 25.787(b).
Materials & Processes	
Additive Manufacturing Design & Construction (Materials, Fabrication Methods)	Additive Manufacturing, often referred to as 3-D printing or rapid prototyping, is a new emerging technology to manufacture aeroplane parts and components. The means of compliance needs to be established to develop appropriate design values for additive manufactured parts and components that account for variability in materials, geometry and manufacturing processes.
Composite Structure Design & Construction (Materials, Fabrication Methods)	Although AMC 20-29 is now harmonised with FAA AC 20-107B, the showing of compliance for composite structures is a complex task, with many issues to be considered, and with various possible compliance approaches Given the importance of the subject for the overall safety level of the aircraft, the means of compliance needs to be agreed with the Agency.
Composite seats	To establish the means of compliance for composite seats, in addition to the ETSO seat approval process.
Damage Tolerance for Composite Bonded Joints	To establish the means of compliance for damage tolerance of composite bonded joints.
Standard Fasteners	EASA CM S-003 contains guidance on standard fasteners used in critical applications.
Composites – Shared Database	EASA CM S-004 contains guidance regarding acceptance of composite material data developed specifically using the NCAMP shared database process.

Castings	To establish the means of compliance for critical and non-critical castings, including premium castings. This may be based on the relevant regulatory material adopted in CS-25 Am. 1.
Bonded Repairs	EASA CM S-005 contains guidance on bonded repair size limits.
Welding (laser beam, Friction Stir,..)	To establish the means of compliance when welded joints are used in structural applications.
Decompression	
Decompression - Windshield loss	To establish the means of compliance with decompression requirements, considering the loss of a cockpit windshield.
Decompression - Small Compartments	To establish the means of compliance with decompression requirements, in relation to small compartments.
Pressurisation into Normally Non-pressurised Areas	To ensure pressurisation into normally non-pressurised areas is considered in the decompression analyses. This may be based on the relevant regulatory material adopted in JAR-25 Ch. 14.
Impact Conditions	
Bird Strike	EASA CM S-001 contains guidance on several compliance aspects related to bird strike damage. In addition, for windshields, certain items such as the choice of test impact locations and temperature conditions need to be agreed with the Agency.
Other Subjects	
Structural Elements in Systems	To establish the means of compliance with CS 25.671 and CS 25.1309 for structural failures to be considered.
Windshields and Windows	To establish the means of compliance for the structural integrity of windshields and windows. This may be based on the relevant regulatory material adopted in CS-25 Initial Issue.
Large Antenna and Radome Installations	To establish the means of compliance with (mainly) structural requirements related to large antenna and/or radome installations.
Operation on Unpaved Runways	To establish the means of compliance with CS 25.235 for aeroplanes intended to be operating on unpaved runways.
Towbarless Towing	For structure, to establish the means of compliance with CS 25.509 for aeroplanes intended for towbarless towing operations. This may be based on the relevant regulatory material adopted in CS-25 Am. 13. For system aspects, a special condition and interpretative material may be required for aircraft allowing towbarless towing operations.

Landing Gear Drop Tests	To establish the need for, and extent of, drop testing of the landing gears. This may be based on the relevant regulatory material adopted in CS-25 Initial Issue.
Panel 4 Hydromechanics	
Rudder control reversal conditions	A special condition and acceptable means of compliance CRI is required to address the EASA safety concern. This may be based on the ARAC FCHWG recommendations (Authority position).
Operation Tests Applicability to High Lift System(1)	A CRI may be needed to ensure 25.683(b) and (c) are also applied to high lift system and to address model validation per ARP 4754(A). 25.683(b) & (c) is also an EASA SSD (until 14 CFR 25 Amdt 25-139).
Landing Gear position indicator and warning device	A CRI may be needed to establish a means of compliance with CS 25.729(e).
Wheel and Tyre Failure	A CRI may be needed to establish the failure model and approach for this Particular Risk Assessment. Addressed from CS -25 amdt 14.
Tyre speed rating	A CRI may be needed to establish an approach if the tyre speed rating could be exceeded in service.
Tyre Pressure Indication / Monitoring System	A CRI may be needed to address the use of tyre pressure indication / monitoring systems and their relationship with MMEL.
Electric brakes	Due to the novelty, a means of compliance CRI may be needed to address electric brakes.
Fuselage doors	Due to interpretation differences, a CRI may be needed or high level of involvement required to address the compliance with CS 25.783.
Respecting Brake Energy Qualification Limits(1)	A CRI may be required to ensure the guidance defined in the EASA Certification Memorandum CM-HS-001 "Respecting Brake Energy Qualification Limits" is followed.
Flight Control in unusual Attitudes	A CRI may be required to address continued functionality of flight control systems in conditions of unusual attitudes.
Flight Control System Failure Criteria	A CRI may be required to establish an equivalent safety finding (ESF) with CS 25.671(c)(2) to use the Aviation Rulemaking Advisory Committee's (ARAC) proposed means of compliance.
Aeroplane Control Following Failure of All Engines	A CRI may be required to address the flare to a landing and stopping phases should a suitable runway be available.
Engine off taxi system	Due to the novelty, a CRI may be required.
Panel 5 Electrical Systems	
Lithium Batteries- Non-Rechargeable	Special Conditions are needed to deal with the particular risks associated with this technology, which are not addressed in CS-25 requirements.

Lithium batteries – Rechargeable	Special Conditions are needed to deal with the particular risks associated with this technology, which are not addressed in CS-25 requirements.
Operation without Normal Electrical Power	A MoC CRI will be issued to deal with battery endurance during operation without normal electrical power.
Arc Fault Circuit Breakers	Arc Fault Circuit Breakers are a technology still on development, which differs from the classic circuit breakers, a MoC CRI may need to be issued to address specific risks associated to this technology.
Solid State Power Contactors	As SSPC technology differs from the classic circuit breaker, a MoC CRI may need to be issued to address specific risks associated to this technology.
Electrical generation - High voltage DC Sources (270Vdc)	A MoC CRI may need to be issued to cope with the new risks associated to these high voltages.
Electrical generation - High voltage AC sources (>230Vac)	A MoC CRI may need to be issued to cope with the new risks associated to these high voltages.
Electrical generation - Variable frequency	A MoC CRI may need to be issued to cope with specifics risks associated to the electrical networks of AC with variable frequency.
Return Current System in composite aircraft	Composite structure does not distribute electrical currents as a metallic structure does, therefore aircraft with composite fuselage may need a specific network to ensure the classical electrical functions provided by the structure, notably return path for functional electrical currents and fault currents. This design is unconventional and deserves a new certification approach. A MoC CRI may be needed.
EWIS **ICA** **accessibility provisions EWIS ICA**	Panel 5: Specific EWIS requirements (Subpart H) are introduced in CS-25 Amdt 5 to cope with Safety concerns about wiring systems in aeroplanes. For aircraft when previous CS-25 Amdts are applicable a MoC CRI may need to be issued to cope with these concerns. Panel 14(ICA): a- Specific EWIS ICA requirements (Subpart H) +AMC are introduced in CS-25 Amdt 5. b- Specific EWIS ICA requirements (Subpart H) +AMCs are introduced in CS-25 Amdt 5 to cope with Safety concerns about wiring systems in aeroplanes. AMC Appendix H, H25.4(a)(3) AMC Appendix H, H25.5 AMC20-21
Single Flight Deck Switch Control for Left and Right Landing Lights.	A CRI documenting an equivalent level of safety with CS 25.1383(b) is needed to address the use of a single switch in the flight deck for controlling both the left and right landing lights.

HIRF, Lightning and EMC	
HIRF	HIRF requirements have been introduced in CS-25 Amdt 17. For any product where previous Amdts are applicable, EASA may need to issue a Special Condition CRI to deal with the interferences created by High Intensity Radiated Fields.
Systems lightning protection	25.1316(c) Exposure to severe Lightning environment has no equivalent requirements in 14 CFR Part 25. This paragraph has been deleted in CS-25 Amdt 17, but for aircraft where previous Amdts are applicable a MoC CRI may need to be issued.
Lightning Protection of Fuel Tank	An Interpretative Material CRI is raised for ignition risk due to lightning strike on structure. Considerations for lightning and fuel tank flammability probability are given, as well as particular considerations for composite fuel tank.
PED tolerance demonstration	A means of compliance CRI may be needed to address the electromagnetic interferences of TPEDs that are planned to be allowed to be used inside the aircraft.
Cabin Systems	
Power Supply System for Portable Electronic Devices	A means of compliance CRI may be needed to address electromagnetic interferences, system interface and installation of a PSS for PED.
In-Flight Entertainment System	A means of compliance CRI may be needed to address electromagnetic interferences, system interface and installation of the IFE system
WLAN Installation	A means of compliance CRI may be needed to address electromagnetic interferences, system interface and installation of the WLAN system and to address the electromagnetic interferences due to the use of TPEDs inside the aircraft.
Airplane Mobile Telephone System	A means of compliance CRI may be needed to address electromagnetic interferences, system interface and installation of the Mobile Telephone System and to address the electromagnetic interferences due to the use of TPEDs inside the aircraft.
Panel 6 Avionics	
Integrated Modular Avionics (IMA) Systems	Functions performed by the IMA must be evaluated and approved by EASA as part of the aircraft installation. There is no automatic credit for E/TSO C153.
RVSM	There have been several instances of divergent CAA opinions with regards to interpretation of the updated data certification.
ADS-B In	Differences concerning the CDTI standard require EASA involvement.

RNP AR Approaches	Specific operational approval is required for AR Approaches.
Security Protection of Aircraft Systems and Networks	The Airborne Systems and Networks may introduce the potential for unauthorised electronic access to Aircraft Systems. It may contain security vulnerabilities due to the possible introduction of intentionally forged malware, intentional alteration of critical data, aircraft networks, systems or databases. CS-25 does not address Information Security and AMC 25.1309 explicitly exclude act of sabotage from the list of events to be addressed during the safety assessment. Therefore, a Special Condition (SC), in accordance with Part 21A.16B (a)1 and (a)3, is proposed to ensure that safety is not compromised by security threats.
Topic Management of Erroneous Air Data Parameters, by Aircraft Systems, and their Effects at Aircraft Level **Human factor: Air Data Sensor Heat Activation and Alerting** **Management of Erroneous Air Data Parameters, by Aircraft Systems, and their Effects at Aircraft Level**	The varied use of air data parameters within complex integrated flight systems is becoming increasingly common. Many aircraft systems are dependent on the availability and integrity of these parameters to perform their functions. This, together with the highly integrated nature of functions can lead to unique failure cases. For human factor aspects, there have been several in-service incidents in which the flight crew has failed to activate the air data sensor heat. Under severe weather conditions, this condition may be catastrophic. If the applicant's design does not include automatic activation of air data sensor heating, a CRI may be needed to establish acceptable means of compliance to §§ 25.1301, 25.1309, 25.1322, and 25.1326 with regard to air data sensor heating for projects that do not include § 25.1302 in the certification basis.
Airborne Traffic Situational Awareness (AIRB / VSA Applications)	ATSA is a new application using ADS-B IN technology to present the flight crew with improved situational awareness with regard to surrounding airborne traffic. The improved awareness has allowed for the development of new procedures, which are likely to improve the efficiency of flight operations. The implementation of the ATSA functions affects flight deck display systems, warnings and cautions, TCAS and cockpit controls. Changes of, and additions to operational procedures and standards will be required and crew workload may be affected. Guidance material for the airworthiness certification of the ATSA applications is also limited.
Data Link Services for the Single European Sky	Data Link services will be used in the Single European Sky for ATC communications. With the introduction of Data Link technology, much of the information which was previously transmitted by voice communications may be replaced by Data Link messages. To maintain adequate safety levels, there is also a need to ensure appropriate interoperability of aircraft installed systems with ground communications facilities. Special Condition (SC) provides Interpretative Material to demonstrate compliance with the required interoperability and performance requirements.

Flight Recorders and Data Link Recording	Aircraft equipped with the capability to provide DLS, are not being required to record the DLS messages. Current Certification Specifications requirements on recording of voice (CS XX.1457) and aircraft data (CS XX.1459) are not considered adequate to deal with this new technology. These requirements were never intended to also cover the recording of data link communications Therefore, in accordance with Part 21A.16B(a)1, a Special Condition and associated interpretative material are proposed to prescribe recording requirements associated with the introduction of data link
Swiftbroadband as a Viable Sub-Network Supporting Air Traffic Services (ATS) Communications	The EASA has not approved the use of Swift broadband for use with ATN datalink.
3D Airport Moving Map (AMM)	A 3D AMM makes use of an exocentric mode that provides a "third person" view of the aircraft and airport environment from a location above and behind the aircraft. This mode, only intended to be available when the aircraft is on ground, may reduce the effectiveness of PFD symbology to support position awareness on airport surface. For further details, a CAI is available on GVII program
Introduction of a display mode that alters and/or automates the visibility of the Standby Indicator	Despite being solely dedicated to display of standby flight parameters, each SFD has the capability to be de-selected (blanked) by the pilot or co-pilot. Because of this feature called the "declutter" function, Gulfstream intends to use an automatic "pop-up" feature to reactivate the SFDs in the event of a predefined list of failures. For further details, a CAI is available on GVII program
Introduction of an electronic map function to depict chart information (i.e., arrival, approach, departure) superimposed and/or otherwise integrated with the flight plan depiction of the lateral and/or vertical navigation displays	This is a mix between chart information and FMS flight plan: The intended function is to facilitate the flight crew's awareness of available and selected chart data information (e.g., approach minima information, and missed approach information with minimum referral to the fixed chart viewer). There are inherent difficulties when non-conformal information depicted on paper charts, is superimposed upon conformal geographic/topographic displays. Additional difficulties involve the creation, maintenance, and integrity of the databases used.
Using Autopilot to conduct Emergency Descent Manoeuvre	EASA has not received an application for such a function yet, but we expect to be involved if one is submitted.

CS-ACNS - Clarifications Relating to Mode S ELS, EHS and ADS-B .	
Runway Alerting and Awareness System (RAAS)	There is currently no EASA policy or guidance material addressing such a system. EASA may use a CRI to establish the certification objectives and to propose acceptable means of compliance associated with a RAAS installation on transport category airplanes
Flight Crew Alerting	CS 25.1322 addresses various aspects of flight crew alerting such as warning, caution, and advisory messages, lights, and other alerting methods that are installed in the flight deck. Early amendments of CS 25.1322 addressed only the visual component of annunciation displays typically installed in the flight deck. To address these concerns, EASA initiated a revision to the text of CS 25.1322. It introduced revised requirements and guidance material developed with the ARAC Avionics Systems Harmonization Working Group (ASHWG). Final versions of the revised text for CS 25.1322 and AMC 25.1322 are found in CS-25 Amendment 11 and later amendments. While the CS requirements are fully harmonised with the FAR at amendment 11, interpretation of several aspects may have to be co-ordinated (e.g., 25.1322(d)(2)).
Panel 7 Power plant	
Fire protection of flight controls, engine mounts, and other flight structure	CS and FAR rules are identical however difference in FAR 1 / CS Definitions and in interpretation have created difficulties. A CRI might be required to establish an Acceptable Means of Compliance (AMC) with CS 25.865 (Fire protection of flight controls, engine mounts, and other flight structure) for structure composed of materials such as titanium or non-metallic materials, to identify load conditions and recognized fireproof material. You may need a CRI to establish an Equivalent Level Of Safety (ESF) for compliance other than based on material (i.e installation level, redundancy, alternate path)
Fire protection: other components	Both rules considered equivalent even if FAR is normally more stringent (as it explicitly requires fire resistant surfaces, whereas CS refers to equivalency to aluminium), however interpretation of the rule has been variable. A CRI might be required to establish the EASA interpretation (IM) and an Acceptable Means of Compliance (AMC) with CS 25.867 to define the 2D nacelle zone, affected surfaces, and the acceptable mean of compliance. CRI has more consideration on seals, gaps than FAA IP. 2D zone projection onto wing lower surface is more conservative on FAA IP. Acceptable Mean of Compliance (AMC) for the fire testing withstanding capability equivalency to aluminium.
Fire withstanding Capability of CFRP Wing Fuel Tanks	A Special Condition (SC) is needed to set criteria for composite wing (5min or aluminium equivalency with considerations of fuel loading, environmental conditions, external airflow)
Thrust Control Malfunction	Single failure(s) of thrust control malfunction accommodation has been an issue on several project.

FADEC Environmental Qualification	A CRI IM / AMC might be required to ensure that the environmental qualification of the FADEC includes a deterministic and systematic demonstration of the FADEC behaviour in environment such as under heat and/or fire
Engine / APU Combustor Burn through	A CRI might be required to detail the Interpretation (IM) and Acceptable Mean of Compliance (AMC) as the material in section 2 of CS-25 is outdated.
Fan Blade Fragment	A CRI establishing the mean of compliance with uncontained fan blade failure and confirm fan blade small fragment definition has been required on specific projects.
Uncontained Engine and Tire Failure - Debris Penetration of Fuel Tank	To ensure that impacts to fuel tank structure (metallic and CFRP), including fuel tank access covers, from uncontained engine or wheel/tire failures do not penetrate or otherwise induce fuel tank deformation, rupture (for example, through propagation of pressure waves), or cracking sufficient to allow leakage of hazardous quantities of fuel. This may be based on the relevant regulatory material adopted in CS-25 Amdt 14. This includes debris definition consideration.
In-Flight Engine Restart	A CRI IM might be required to detail the flight cases to demonstrate the in-flight restart capability. FAA IP and associated materials (AC 25-7C, PS ANM 100-2001-116, PS ANM 25-02) does not allow for Restart after Suction Feed Flameout to consider a 10Kft in opposition to CRI that offers this threshold for fuel with volatility > Jet A.
Propeller debris	Both rules identical however, the AMC does mention release of a complete blade which is not normally addressed under the usual FAR interpretation.
Reversing system	AMC has not equivalent published AC material.
Thrust Reverser Testing	You may need an ESF to cover the CS –E 890(b) endurance testing without representative aircraft thrust reverser cowl/system.
Negative G	25.943 refers to 25.1315; corresponding AMC conditions are different from FAA practices. Applies also to APU installation.
Auxiliary Fuel Tank	To establish the means of compliance for aeroplanes with unusual fuel tank configurations, such as belly-mounted fuel tanks, fuel tanks installed in cargo compartments or in passenger compartments. AC 25-8 is used as a basis.
Water Icing in Fuel	In-service experience has shown rule water in ice need special attention, a Special Condition is usually raised.
Fuel System Independence	An acceptable mean of compliance CRI may be required to address engine fuel feeding from a same fuel tank

Fuel Tank Safety **ICA for Fuel Tank safety**	For fuel systems, AMCs differ from corresponding ACs in several aspects including acceptable figures for energy, current, temperature increase (unique to EASA), etc. A MoC CRI may be required because installation of ground fault interrupters or other devices to protect fuel pumps may be required to address fuel tank ignition sources. Interpretative Material CRI might be raised for ignition risk due to lightning strike on structure. Considerations for lightning and fuel tank flammability probability are given, as well as particular considerations for composite fuel tank. For ICA, Specific FRM ICA requirements are introduced in CS-25 Amdt 6.
Air intake de-icing and Freezing Fog	Natural icing has been subject of discussions on some projects. Issus included freezing fog, engine behaviour under ice forming conditions, etc. This also applies to essential APUs. Icing rule updated with CS-25 Amdt 16 including SLD An IM CRI may be issued to clarify EASA policy for operation in Freezing Fog conditions regarding temperature and time duration. An IM CRI may be needed to show compliance to § 25.1093(b). This CRI clarifies the need for protection of the engine during icing conditions at all engine power settings, including in-flight idle conditions, and the regulatory need for consideration of the airframe as part of the engine inlet.
Fuel Shut Off Valve Indication	An equivalent level of safety finding may be needed if the position of the fuel shutoff valve is not adequately indicated in compliance with CS 25.1141. Note that CS 25J1141 differs from CS 25.1141
Reverser Controls	AMC has no AC equivalent.
Engine cowling	Regarding fire resistance, rules identical, however EASA has implemented a systematic approach on the ground and flight conditions (in CS25 Amdt 13: new rule + new AMC). As a result of adverse in service experience, EASA has issued a generic special condition for fan cowl latch.
Powerplant Fire Testing	You may need a CRI to ensure use of representative environmental conditions, and burner representative of a fuel fed fire for fire testing compliance demonstration for powerplant fire testing.
Engine zone re-classification	An ESF may be needed to classify a fan zone as non-DFZ. An ESF may be needed to cover the non-full compliance to CS 25.1182 in zones adjacent to DFZ (i.e. non presence of fire detection, fire extinguishing)
Zones adjacent to DFZ	A CRI IM may be needed to define applicability of CS 25.1182 addressing areas adjacent to designated fire zone.

Fire, Extinguishing and Suppression Agent **Halon Replacement** **Halon Simulation**	Halon is being phased out of airplane applications per ICAO deadlines / EU 744/2010. The use of non-Halon fire extinguishing/suppression agents for use in lavatory trash receptacle bottles, handheld fire extinguishers, and engine/APU fire extinguishing and cargo compartment fire suppression should be documented by a means of compliance CRI. Halon use being restricted, instead of performing halon concentration test, alternative agent HFC125 might be used as simulant of Halon. You may need a CRI to detail the acceptable mean of compliance. Note: this potentially applies to all fire extinguishers, not only powerplant.
Powerplant indicating parameter	A CRI ESF may be needed to address the non-direct compliance to the green/red powerplant parameter display
APU installation	FAR does not feature a dedicated APU installation subpart J – equivalent requirements can be however introduced in the FAA certification basis through an IP (ESF)
Electronic control of Essential APU	An interpretative material CRI may be needed for APU ECU qualification
APU – Bleed Contamination From APU fire (composite)	A mean of compliance CRI may be required to address toxic gases migration towards aircraft upon an APU fire with composite ducting and structure
Volcanic Ash	Introduced into CS-25 Amdt 13 – A CRI might be needed for applicant electing to comply to CS 25.1593 (CS-25 Amdt13) whereas the engine is not at CS-E Amdt4
<u>Environmental Control System and Icing</u>	
Icing	
Icing Environment, Icing Exposure and Ice Shapes	An IM CRI may be may be issued to clarify EASA policy regarding the icing environment, icing exposure and resulting ice shapes used to demonstrate safe performance and handling
Icing Protection for Supercooled Large Droplets (SLD)	A CRI should be initiated for airplanes with unpowered roll control and pneumatic de-icing boots. CS 25, Appendix C is not adequate to address freezing drizzle and freezing rain conditions (e.g., SLD).
Flight Instrument External Probes – Qualification in icing conditions	A SC CRI may be issued to clarify EASA policy regarding icing conditions (liquid and ice crystals) for external probes certification
Primary In flight Ice detection system	An IM CRI may be issued to clarify EASA policy regarding certification approach for Primary Ice detection systems

Airframe IPS Performance above 30.000ft	An IM CRI may be issued to clarify EASA policy regarding the IPS performance to be demonstrated when flying above App.C maximum altitudes
Wing Surface Contamination caused by Cold Soaked Surfaces (CSS)	An IM CRI may be issued to clarify EASA policy with regard to the issues related to wing surface contamination caused by cold soaked surface accretion/contamination
Pilot's non openable window	A MoC CRI may be issued to clarify EASA policy with regard to non-openable window for the first pilot. This CRI provides acceptable means to show compliance with CS 25.773(b)(4)
ECS	
Crew determination of Quantity of Oxygen in Passenger Oxygen Systems	An Equivalent level of Safety Finding to § 25.1441(c) may be needed for chemical or one-time use gaseous bottles which do not provide oxygen quantity information to the crew members
Minimum Mass Flow of Supplemental Oxygen	An ESF CRI may be issued when the means to determine minimum oxygen quantity according to 25.1443(c) are based on SaO2 measurement
Oxygen outlets in the galley work areas	An IM CRI may be necessary to clarify the interpretation of CS 25.1447(c)(3) for oxygen masks in galley area
Distributed High Pressure Oxygen Bottles in the Passenger Cabin	An IM CRI may be issued to clarify EASA policy when multiple oxygen bottles are distributed in cabin
Cabin Crew Portable Oxygen Equipment	An IM CRI may be issued to clarify EASA policy regarding POE Performance and Location
Oxygen Equipment Qualification above 40.000ft	An IM CRI may be issued to clarify EASA policy regarding Oxygen Equipment Qualification above 40.000ft
Oxygen Fire Hazard in Gaseous Oxygen Systems	An IM / MoC CRI may be issued to clarify EASA policy regarding CS 25.869(c) and CS 25.1453 with respect to Oxygen Fire Hazard in Gaseous Oxygen Systems, centralised, decentralised or portable.
High Altitude Operation / High Cabin Heat Load	A Special Condition CRI may be issued to clarify EASA policy for A/C certified to fly above 41.000ft in terms of pressure vessel integrity, ventilation, air conditioning, pressure and Oxygen.
High Elevation Airfield Operation	An IM CRI may be issued to clarify EASA policy for take-off and landing operations at high altitude airports, up to 14 600 feet pressure altitude
Packs off operation	A Special Condition CRI may be issued to clarify EASA policy regarding some air-conditioning packs off operation periods
Pneumatic Systems – Harmonised 25.1438	An ESF CRI may be issued to propose a new Pneumatic and Pressurisation rule harmonised to satisfy both EASA and FAA

Panel 10 Software and Airborne Electronic Hardware	
General Hardware Guidance	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing Airborne Electronic Hardware components. (Ref. Eurocae ED-80/ RTCA DO-254)
Hardware Development Assurance for Circuit Board Assemblies	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems to address development of complex circuit board assembly. (Ref. Eurocae ED-80/ RTCA DO-254 - DAL D)
Development of Simple Electronic Hardware	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems to address development of simple electronic hardware. (Ref. section 8 of EASA CM - SWCEH – 001 Issue 1 Rev 1)
Use of COTS devices in AEH development	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing Commercial-Off-The-Shelves (COTS) devices. (Ref. section 9 of EASA CM - SWCEH – 001 Issue 1 Rev 1)
Use of COTS Graphical Processor devices in AEH development	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing Graphical Processor Commercial-Off-The-Shelves (COTS) devices. (Ref. section 10 of EASA CM - SWCEH – 001 Issue 1 Rev 1)
Use of COTS Intellectual Property in AEH development	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing AEH (PLD/ASIC/FPGA) developed using Commercial-Off-The-Shelves Intellectual Property (COTS IP)
Use of Multicore Processors	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing AEH Multicore Processors devices, hosting Software components on different cores.
Topic OPRs **Management and assessment of Open Problem Reports**	As the systems mature towards certification open, problem reports may still be applicable. The EASA needs awareness of such open problem reports applicable at TC together with the proposed means of mitigation including associated AFM limitations or OEBs. The total effects on the use & availability of systems needs to be summarised. The risk exposure & rectification schedule also needs to be assessed. A means of compliance CRI will likely be needed if an applicant or any of their suppliers intends to defer the resolution and correction of AEH or Software problems past the date of certification.
General Software Guidance	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A).
Embedded Software Configuration Files	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not applicable when using EUROCAE ED-12C / RTCA DO-178C.

Formal Software Development Methods and Tools	A means of compliance CRI may be needed if an applicant or supplier proposes to use formal methods and tools for software development for airborne systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not needed when using EUROCAE ED-216 / RTCA DO-333.
Model-Based Development (MBD) Methods and Tools	A means of compliance CRI may be needed if an applicant or supplier proposes to use Model-Based Development methods and tools to develop software for airborne systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not needed when using EUROCAE ED-218 / RTCA DO-331.
Object Code Coverage Analysis	A means of compliance CRI may be needed if an applicant or supplier proposes to use object code structural coverage instead of Modified Condition Decision Coverage (MCDC) at source code level (e.g., Assembly Branch Coverage (ABC) instead of MCDC) for airborne systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not needed when using EUROCAE ED-12C / RTCA DO-178C and following ED-94C / DO-248C FAQ#42.
Object Oriented Methods and Languages	A means of compliance CRI may be needed if an applicant or supplier proposes to use object oriented methods and programming languages, such as C++, ADA, and Java for airborne systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not needed when using EUROCAE ED-217C / RTCA DO-332.
Clarifications on Data Coupling and Control Coupling Analyses	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing software components.
Use of Pseudocode as Low-Level Requirements	A means of compliance CRI may be needed if an applicant or supplier proposes to use of pseudocode as low-level requirements for systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not needed when using EUROCAE ED-12C / RTCA DO-178C and following ED-94C / DO-248C FAQ#82.
Use of Single Level of Software Requirements	A means of compliance CRI may be needed if an applicant or supplier proposes to use a single level of Software requirements (merge of Low Level Requirements and High Level Requirements) for systems containing software components developed to previous EUROCAE ED-12 / RTCA DO-178 (versions B or A). Note: VI not needed when using EUROCAE ED-12C / RTCA DO-178C and following ED-94C / DO-248C FAQ#81.
Software Non-Deterministic Behaviour (e.g. Stack Overflows)	A means of compliance CRI may be needed for most aircraft programs and modification projects for airborne systems containing level A software components.

Panel 11 Cabin Safety	
FIRST PART: COMMON WITH FAA	
Child Shoulder Harnesses for Seats	Special conditions are issued for child shoulder harnesses for seats. The airworthiness regulations do not contain adequate or appropriate safety standards for safety restraint devices, such as a shoulder harness, specifically designed for use by small children.
Composite Fuselage In-Flight Fire Safety/Flammability	Special condition is required to ensure that composite fuselage construction does not reduce the level of in-flight fire safety when compared with a conventional metallic fuselage. These special conditions include evaluation of a fire propagating along the inside surface of the fuselage and the potential for toxic by-products.
Composite Fuselage Post-Crash Fire Survivability	A CRI to establish an equivalent level of safety (ESF) with CS 25.853 and 25.856(b) is required to show a composite fuselage is as safe for passengers as a similarly sized metallic fuselage during a post-crash fire. The ESF needs to address flame penetration, smoke and toxic gas emission.
Cooktops	Special conditions are required for cooktops because the regulations do not contain the necessary safety standards. Cooktops introduce high heat, smoke, and the possibility of fire into the passenger cabin environment.
Emergency Exit Marker & Locator Signs	A CRI might be required to establish an equivalent level of safety with CS 25.812(b) to allow text-based emergency-exit signs differing than required by CS 25.812(b) in small cabins.
Escape Slides	Escape slides have historically been part of the airplane type certificate and are seldom changed, except by the original equipment manufacturer. The ETSO C69C for escape slides provides much of the necessary performance standards to show compliance with the installation requirements, but is not complete. For example, the escape slide affects compliance with CS 25.803, requiring evacuation of the airplane within 90 seconds. Because such projects are rare, there is not extensive published guidance. Escape slide certification is a complex process, and is considered a significant project. Therefore, any escape slide installation projects should be coordinated with EASA.
Outside viewing	A method of compliance CRI may be needed to demonstrate design compliance with outside viewing requirements in CS 25.809(a)
Glass in the Cabin (e.g., Glass Floor, Glass Partition)	A CRI might be required to establish special conditions or a means of compliance with CS 25.561, 25.603 and 25.789 depending on the extent of use of glass in the cabin. You do not need a CRI if you are following AC 20-168 for glass video monitors.
Graphical/Symbolic Exit Signs	A MoC CRI might be required to establish compliance with CS 25.811(g) and CS 25.812(b) when using specific graphics/symbols in lieu of the text-based exit signs.

Inflatable Restraints in Seats/Walls	Special conditions is needed for inflatable restraints in seats and walls because the regulations do not contain adequate or appropriate safety standards for inflatable restraints. The special conditions address the safety performance of the system and the system's integrity against inadvertent activation.
Inflight Access to Class C Cargo Compartments	If the airplane certification basis has CS 25.813(e) at Amendment before 12, a Deviation will be required for installation of an interior door that separates passenger compartments, The EASA has only granted deviations for airplanes that are privately operated. If the airplane certification basis has CS 25.813(e) at Amendment 12 or higher, a Deviation might be required for an interior door that is installed in any egress path between any passenger seats that is occupied for take-off, landing, and any passenger emergency exit.
Interior Doors	If the airplane certification basis has CS 25.813(e) at Amendment before 12, a Deviation for installation of an interior door that separates passenger compartments might be required. The EASA has only granted deviations for airplanes that are privately operated. If the airplane certification basis has CS 25.813(e) at Amendment 12 or higher, you need to apply for a Deviation for an interior door that is installed in any egress path between any passenger seat that is occupied for take-off and landing and any passenger emergency exit.
Large Surface Area Seat Panels	Special conditions/ means of compliance might be required to address heat release and smoke emission requirements for seats with large surface area composite or plastic panels (such as those often installed in first class or business class sections) in airplanes with 20 or more passenger seats.
Medical Stretchers	If the airplane certification basis has CS 25.785(b) at Amendment before 12, a deviation might be required for installation of medical stretchers for an airplane certification basis that includes CS§ 25.562. If the airplane certification basis has CS 25.785(b) at Amendment 12 or higher, an Interpretative Material CRI might be needed. For installation of large number of medical stretchers a Deviation will be required to allow related CS regulation alleviations.
Mini-suites	Installation of mini-suites, i.e., single occupant seat installations surrounded by 4 walls, may require a CRI to address several compliance concerns. Direct view, egress and potential ramifications on security are all areas that require specific Special Condition/Methods of Compliance CRI.
New or Modified Cargo Unit Load Devices (ULD)	A CRI might be required to address nonstandard design which may impact compliance to CS 25.561(c)(1), 25.855(h), 25.857(c) or 25.858.
Overhead or Under Floor Crew Rest Area	A special conditions might be required for overhead or under floor crew rest areas because the regulations may not contain adequate or appropriate safety standards.

Side-Facing Seat	Special conditions for single and Deviation for multiple place 90 deg side-facing seats are required on aeroplanes that include CS 25.562 in their certification basis. An ESF may be needed for single place more than 18 deg and up to 30deg side-facing seats on airplanes that include CS 25.562 in their certification basis. The applicant should discuss with EASA for single place more than 30 deg less than 90 deg side-facing seats on airplanes that include CS 25.562 in their certification basis.
Flammable Fluid Fire Protection	A means of compliance may be needed, to provide acceptable compliance guidance for flammable fluid fire protection regulations CS 25.863.
Main Deck Class C Cargo Compartment Halon Fire Extinguishing Agent Penetration into Occupied Cabin Areas	A CRI may be needed to ensure an adequate design means is included and appropriate flight test compliance shown to ensure fire extinguishing agent penetration into occupied areas of the airplane does not occur or occurs at an acceptable level.
Stowage/Baggage Compartment Fire Protection	A special condition may be needed for fire protection measures on stowage that contain combustibles and ignition sources not classified as cargo compartment per CS25.857.
Use of Magnesium in the Cabin and Flightdeck	Special conditions might be required where a design uses magnesium in the cabin or flight deck because magnesium is a flammable metal that has historically not been used in the cabin and has been limited in the flightdeck. Flammable metals are not addressed by the current fire safety regulations.
Class E Cargo Compartments	If couriers (including animal handlers) are to be carried, at a minimum, a Special Condition / Deviation might be required to address CS 25.812(e), 25.812(h), 25.813(b), 25.857(e), 25.1447(c)(1), and 25.1449, because they are considered as passengers.
Airplane Security	A CRI to establish a means of compliance might be needed for any new aeroplane (design) security measure that has not been previously implemented. These installations requires EASA awareness and involvement.
Chemical Oxygen Generators	CS 25, amendment 17, amended the type certification requirements for COGs installed on transport category airplanes so the generators are secure and not subject to misuse. If amendment 17 is not in the certification basis of the airplane, you may need a CRI to establish special conditions to address COGs that are installed in areas that are remote from the passenger cabin or isolated from the passenger cabin by doors, and therefore potential security concerns. Alternatively, you can upgrade the certification basis of your project to include CS 25.795(d), amendment 17.
Secondary Flight Deck Door (AKA Secondary Door)	A CRI might be needed to come to agreement on the CS 25 regulations that must be met by a door installed between the flight deck door and the passenger cabin. The regulation most applicable to the secondary door is CS 25.772. Additional requirements include, but are not limited to, regulations relating to rapid decompression, emergency access to the flight deck, emergency evacuation, structural strength, and markings and placards

Security Concerns with Inflight Passenger Access to Class B or C Cargo Compartments	A special condition is required when passengers can access checked cargo in flight. The EASA has approved aircraft with cargo compartments accessible to passengers in flight. Since checked cargo does not have the same screening requirements as carry-on baggage, this accessibility raises security concerns not anticipated in CS 25.
Potable and Waste Water Systems	A method of compliance CRI may be needed for systems designed to minimize the possibility of leaks and minimize the potential for formation of ice that may result from leaks which could pose a hazard to the airplane, its occupants, and/or persons and property on the ground
Minimum Cabin Crew number	A CRI may be needed to address demonstration of required Cabin Crew number differing from those listed in TCDS
SECOND PART: EASA SPECIFIC	
Obstruction of Type III emergency exits	A means of compliance CRI or ESF may be needed to address seat or monument in-flight obstructions to Type III emergency exit as explained in CM-CS-002
Cargo seat bags	A CRI may be needed to address cargo placed on seats as explained in CM-CS-003
Installation of a shower	Special conditions are needed to certify the installation of a shower
The use of Surrogate Panels for Flammability Testing	With CS-25 Amendment 17 EASA has introduced a reference to AC 20-178 in AMC 25.853, a MOC CRI may be needed to address non direct adherence the AC options
Cabin LED	A means of compliance CRI may be needed to address continued compliance of required illumination levels using several LEDs.
Excess Seat	A means of compliance may be needed, to provides acceptable compliance guidance for installation of Cabin Crew seats in addition to the minimum required
Isolated compartments	You may need special conditions for fire protection in isolated compartments because the regulations may not contain adequate or appropriate safety standards.
Emergency exit deactivation	You may need a CRI for evacuation assessment in case of emergency exit deactivation in order to address compliance to CS 25.807(e) &(f)(4) and dead end zone consideration.
Cockpit phone	A means of compliance CRI may be needed to address interference with critical flight phase from installation of cockpit phone
Certification of multi-criteria smoke detectors	A method of compliance CRI may be needed for multi-criteria smoke detectors
Oversized class B cargo compartment	You need a CRI for installation of a class B baggage compartment not meeting the standards of AMC 25.855 & 25.857

Class F Cargo Compartment	You need a MOC CRI for installation of a class F baggage compartment meeting the standards of AMC 25.855 & 25.857
Emergency Evacuation Demonstration	A method of compliance CRI may be needed to use non-standard methods to demonstrate compliance to CS25.803(c)
Flight deck egress	A method of compliance CRI may be needed to define methods to demonstrate compliance to CS 25.772(a) &(b), CS25.810(a)(2).
Encroachment into required Width of Aisle	A MOC CRI may be needed to address non-direct compliance to CS25.815 for typical in seat deployable items such as video monitors and tables.
Minimum Cabin Crew number	The EASA TCDS should incorporate the number of cabin crew used during the type certification demonstration.

DASA Panel 12	
Topic 1309 safety assessment **Aeroplane Level Safety Assessment** **Development Assurance Process based on Eurocae ED-79A / SAE ARP4754A**	The EASA need a correct understanding of the methodology related to the classification of failures at aeroplane safety level. Additional documentation may be requested that describes the methodology used, all considered failure conditions and their justifications. In particular, those failures related to runway excursions should also be addressed. The intention is to choose certain failure cases as candidates for EASA assessment in the simulator or on the aeroplane to ensure that findings are assessed according to European practice. Legacy methods of demonstrating compliance to EASA CS-25.1309 using development assurance techniques at the software and airborne electronic hardware levels do not adequately support the complexity of system integration, nor do they adequately address potential errors in the development of requirements for standalone systems that may incorporate software and complex electronic hardware. Therefore, the EASA requests additional methods to reduce and mitigate requirement errors in the system development process. You may need a CRI to define the scope of application of development assurance activities in line with guidelines contained in Eurocae ED-79A / SAE ARP4754A, "Guidelines for Development of Civil Aircraft and Systems" (dated 2010-12) as a means of compliance with CS-25.1309. The actual level of EASA involvement in the oversight of applicant's development assurance process will be tailored based on their experience using this guideline.

EASA CS-25 Generic Validation Item list

Revision 1 updated January 2017

Appendix: Items Added or Removed

Added

Panel 1 Flight - Loads & Aeroelasticity

- Aileron Control Reversal
- Automatic Braking System

Panel 4 Hydromechanics

- Flight Control in unusual Attitudes
- Flight Control System Failure Criteria
- Aeroplane Control Following Failure of All Engine
- Engine off taxi system

Panel 6 Avionics

- Swift broadband as a Viable Sub-Network Supporting Air Traffic Services (ATS) Communications
- 3D Airport Moving Map (AMM)
- Introduction of a display mode that alters and/or automates the visibility of the Standby Indicator
- Introduction of an electronic map function to depict chart information (i.e., arrival, approach, departure) superimposed and/or otherwise integrated with the flight plan depiction of the lateral and/or vertical navigation displays
- Using Autopilot to conduct Emergency Descent Manoeuvre

Panel 11 Cabin Safety

- Minimum Cabin Crew number

Revised

Panel 1 Flight

- Human Factors – EFB: Second paragraph modified to add "Sharing of avionics resources or A/C capability with non-certified EFB systems or functions"