



Ministry
of Defence

Defence Standard 00-970 Part 5

Issue 8

Date: 14th March 2021

**Certification Specifications for
Airworthiness**

Part 5: LARGE TYPE AIR SYSTEMS

Section 1 Foreword

Defence Standard Structure

Section 1 (Generated by the StanMIS toolset)

- Revision Note
- Historical Record
- Warning
- Standard Clauses

Section 2 (Technical information provided by Subject Matter Expert)

- Title
- Introduction (optional)
- Table of Contents
- Scope
- Technical Information to include Tables and Figures
- Annexes (as required)

Section 3 (Generated by StanMIS toolset)

- Normative References
- Definitions
- Abbreviation

REVISION NOTE

Up-issue to record changes to Part 5 as a result of changes identified by the regulated community and changes resulting from EASA CS amendments.

HISTORICAL RECORD

This standard supersedes the following:

Defence Standard (Def Stan) 00-970 Part 5 Issue 7 dated 28 August 2020
Defence Standard (Def Stan) 00-970 Part 5 Issue 6 dated 28 March 2019
Defence Standard (Def Stan) 00-970 Part 5 Issue 5 dated 14 September 2018
Defence Standard (Def Stan) 00-970 Part 5 Issue 4 dated 28 September 2017
Defence Standard (Def Stan) 00-970 Part 5 Issue 3 dated 19 September 2016
Defence Standard (Def Stan) 00-970 Part 5 Issue 2 dated 14 July 2015
Defence Standard (Def Stan) 00-970 Part 5 Issue 1 dated 30 Jan 2015

WARNING

The Ministry of Defence (MOD), like its contractors, is subject both to United Kingdom law and any EU-derived law that has been retained under the European Union (Withdrawal) Act 2018 regarding Health and Safety at Work. Many Defence Standards set out processes and procedures that could be injurious to health if adequate precautions are not taken. Adherence to those processes and procedures in no way absolves users from complying with legal requirements relating to Health and Safety at Work.

STANDARD CLAUSES

- a) This standard has been published on behalf of the MOD by UK Defence Standardization (DStan).
- b) This standard has been reached following broad consensus amongst the authorities concerned with its use and is intended to be used whenever relevant in all future designs, contracts, orders etc and whenever practicable by amendment to those already in existence. If any difficulty arises which prevents application of the Defence Standard, DStan shall be informed so that a remedy may be sought.
- c) Please address any enquiries regarding the use of this standard in relation to an invitation to tender or to a contract in which it is incorporated, to the responsible technical or supervising authority named in the invitation to tender or contract.

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- d) Compliance with this Defence Standard shall not in itself relieve any person from any legal obligations imposed upon them.
- e) This standard has been devised solely for the use of the MOD and its contractors in the execution of contracts for the MOD. To the extent permitted by law, the MOD hereby excludes all liability whatsoever and howsoever arising (including, but without limitation, liability resulting from negligence) for any loss or damage however caused when the standard is used for any other purpose.

SECTION 2

CERTIFICATION SPECIFICATIONS FOR AIRWORTHINESS

PART 5 - LARGE TYPE AIR SYSTEMS

2.0.1 PREFACE

Applicable EASA Certification Specifications (CS) 25 – Amendment 26

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2.0.2 Changes incorporated in this issue

Requirement		Change	Page
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02	Part 5	Up issue to included reference to CS 25 amendment 26	all
03	CS 25.1460	New CS 25 requirement resulting from CS 25 Amendment 26 up-issue	2-65
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2.1 GENERAL REQUIREMENTS

2.1.1 INTRODUCTION

2.1.1.1 This Part of the Defence Standard has been issued to provide requirements and guidance for the certification of UK Military Large Air Systems for operation in all classes of airspace.

2.1.1.2 This document shall be used as described in Def Stan 00-970 Part 0 - Procedures for Use, Guidance and Definitions. In addition to the requirements of this Part of Def Stan 00-970, users must also include relevant requirements contained in Part 11 and Part 13

2.1.2 SCOPE

2.1.2.1 Where CS 25 makes reference to 'the Agency', this should be considered to mean the certifying authority.

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2.2 CS 25 Related Certification Specifications, Acceptable Means of Compliance (AMC) and Guidance

Requirement	Compliance	Guidance
SUBPART A - GENERAL		
CS 25.1 Applicability	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1a Applicability This standard is applicable to Type 5 (Large, heavy, low to medium manoeuvrability Air Systems) as defined in Part 0 Section 2 Clause 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
SUBPART B - FLIGHT		
GENERAL		
CS 25.20 Scope	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.20a Operation from Surfaces other than Smooth and Hard Airfield Pavements The applicable take off, landing and ground handling requirements of Subpart B shall be satisfied for operations on airfield pavements (including runways) other than those assumed by CS 25, where called for in the Air System specification.	INTENTIONALLY BLANK	UK25.473b provides AMC and Guidance on airfield pavement characterisation and loading cases.
CS 25.21 Proof of Compliance	AMC 25.21	INTENTIONALLY BLANK
CS 25.23 Load Distribution Limits	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.25 Weights Limits	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.27 Centre of Gravity Limits	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.29	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Empty Weight and Corresponding Centre of Gravity		
CS 25.31 Removable Ballast	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.33 Propeller Speed and Pitch Limits	INTENTIONALLY BLANK	INTENTIONALLY BLANK
PERFORMANCE		
CS 25.101 General	AMC 25.101	INTENTIONALLY BLANK
CS 25.103 Stall Speed	AMC 25.103	INTENTIONALLY BLANK
CS 25.105 Take-Off	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.107 Take-Off Speeds	AMC 25.107	INTENTIONALLY BLANK
CS 25.109 Accelerate-Stop Distance	AMC 25.109	INTENTIONALLY BLANK
CS 25.111 Take-Off Path	AMC 25.111	INTENTIONALLY BLANK
CS 25.113 Take-Off Distance and Take-Off Run	AMC 25.113	INTENTIONALLY BLANK
CS 25.115 Take-Off Flight Path	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.117 Climb: General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.119 Landing Climb: All Engines Operating	AMC 25.119	INTENTIONALLY BLANK
CS 25.121 Climb: One Engine-Inoperative	AMC 25.121	INTENTIONALLY BLANK
CS 25.123 Enroute Flight Paths	AMC 25.123	INTENTIONALLY BLANK
CS 25.125 Landing	AMC 25.125	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
<p>UK25.125a Brake parachutes shall be attached as close to the plane of symmetry of the Air System as practicable and shall not foul any part of the Air System during deployment.</p> <p>Issue 7</p>	<p>Streaming of the parachute should not cause undue change of trim.</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.125b It shall be possible to stream the brake parachute at any time during the landing run or preferably just before touchdown.</p> <p>Issue 7</p>	<p>The parachute should be fully inflated, or in the case of a constant drag parachute, in its operating condition:</p> <p>(a). As soon as possible, but within 5 seconds of operation of the pilot's control;</p> <p>(b). When the wheels touch the ground.</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.125c It shall be possible for the pilot to jettison the streamed brake parachute and cable when landing and taxiing.</p> <p>Issue 7</p>	<p>There should be a delay of not more than one second in winds up to 30 knots (55.6 km/h) in any direction.</p>	<p>Parachute instability may be taken into account by assuming the cable attaching it to the aeroplane does not oscillate outside a cone whose semi-angle is 5°</p>
<p>UK25.125d An over-riding jettisoning device or weak link, whose functioning is independent of the pilot, shall be provided to protect the Air System structure from excessive parachute loads.</p> <p>Issue7</p>	<p>This device should be designed to jettison the brake parachute and cable at the proof load of that part of the structure which carries the parachute load, within the limits +0% to -10%.</p>	<p>INTENTIONALLY BLANK</p>
<p>CONTROLABILITY AND MANOEVRABILITY</p>		
<p>CS 25.143 General</p>	<p>AMC 25.143</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.143a The Air System shall meet Level 1 Handling Qualities for the mission task elements defined for the roles stated in the SOI. As a minimum, the Air System shall meet Level 2 Handling Qualities at all other times.</p>	<p>The operational mission requirements of the Air System should be determined and clearly defined:</p> <p>(a) In particular, Adequate and Desired performance for each Mission Task Element (MTE) should be defined in order to provide a basis for the assessment of Handling Qualities:</p>	<p>(a) Handling Qualities have traditionally been assessed using the Cooper-Harper Handling Rating Scale, or variants thereof; see Section 2.4 (2.4.2.1.1 Figure 1 and 2.4.2.1.2). The Applicant may use other assessment methods, where equivalence can be demonstrated.</p>

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Requirement	Compliance	Guidance
Issue 7	<p>(b) The Adequate and Desired performance for each MTE should be defined in terms of the required precision to capture and maintain parameters relevant to that MTE; for example, speed, attitude, altitude, load factor and angle of attack.</p> <p>(c) When identifying each MTE and the Air System performance required to meet the operational requirement, account should be taken of:</p> <ol style="list-style-type: none"> (1) Required manoeuvres; (2) Usable Cue Environment; (3) Environmental conditions, including wind, turbulence, snow, ice, rain, sand, temperature, humidity and air density; (4) All combinations of mass, CG and stores (including expendables and weapons); (5) Air System configuration, including position of undercarriage, high lift devices, airbrakes, weapon bay doors, Cargo doors / Ramps and Para troop doors, Air-to-Air Refuelling (AAR) probe etc. (6) Degraded modes and systems, including flying controls, autopilot, engines and avionics; (7) Landing surface, including slope and movement (8) Aircrew equipment assembly. 	(b) Degraded modes and systems may be the result of bird strikes, lightning strikes, or other environmental factors.
UK25.143b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.145 Longitudinal Control	AMC 25.145	INTENTIONALLY BLANK
UK25.145a Longitudinal Control - External Stores Issue 7	The effects of internal and external stores including expendable stores on the mass and its distribution and on the aerodynamic characteristics of the Air System should be included for each mission flight phase.	INTENTIONALLY BLANK
CS 25.147 Directional and Lateral Control	AMC 25.147	INTENTIONALLY BLANK
UK25.147a Directional and Lateral Control - External Stores	a. The requirements of CS 25.147 should apply for such symmetric and asymmetric combinations of internal and	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Issue 7	external stores as are stated in the Air System Specification. b. The effects of internal and external stores including expendable stores on the mass and its distribution and on the aerodynamic characteristics of the Air System should be included for each mission flight phase.	
CS 25.149 Minimum Control Speed	AMC 25.149	INTENTIONALLY BLANK
TRIM		
CS 25.161 Trim	INTENTIONALLY BLANK	INTENTIONALLY BLANK
STABILITY		
CS 25.171 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.173 Static Longitudinal Stability	AMC 25.173	INTENTIONALLY BLANK
CS 25.175 Demonstration of Static Longitudinal Stability	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.177 Static Directional and Lateral Stability	AMC 25.177	INTENTIONALLY BLANK
CS 25.181 Dynamic Stability	AMC 25.181	INTENTIONALLY BLANK
STALLS		
CS 25.201 Stall Demonstration	AMC 25.201	INTENTIONALLY BLANK
CS 25.203 Stall Characteristics	AMC 25.203	INTENTIONALLY BLANK
CS 25.207 Stall Warning	AMC 25.207	INTENTIONALLY BLANK
GROUND HANDLING CHARECTERISTICS		
CS 25.231 Longitudinal Stability and Control	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.233	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Directional Stability and Control		
UK25.233a INTENTIONALLY BLANK Issue 7	Ground operations with Level 1 Handling Qualities should be demonstrated up to 1.15 times the maximum take-off speed (VTO) under all runway conditions.	Some torsional oscillations inducing shimmy in undercarriage units may be acceptable, provided that: a. They can be shown to be not dangerous; b. They are considered in fatigue analyses; and c. They do not affect the crew's operating ability.
UK25.233b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.235 Taxying Condition	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.237 Wind Velocities	INTENTIONALLY BLANK	INTENTIONALLY BLANK
MISCELLANEOUS FLIGHT REQUIREMENTS		
CS 25.251 Vibration & Buffeting	AMC 25.251	INTENTIONALLY BLANK
CS 25.253 High Speed Characteristics	AMC 25.253	INTENTIONALLY BLANK
CS 25.255 Out-of-Trim Characteristics	AMC 25.255	INTENTIONALLY BLANK
SUBPART C - STRUCTURE		
GENERAL		
CS 25.301 Loads	AMC 25.301	INTENTIONALLY BLANK
UK25.301a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.301b Ramp Loads The ramp and its attachments to the airframe shall achieve the proof and ultimate load factors of CS	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
<p>25.303 / UK25.303a when held directly in line with the main freight floor with a fully loaded platform in any position on its way out and an assumed instantaneous change of incidence from that appropriate to the specified speed, all-up weight and configuration for dropping to that of CL max. for the same configuration.</p> <p>Issue 7</p>		
<p>UK25.301c</p> <p>DELETED Issue 7</p>	INTENTIONALLY BLANK	INTENTIONALLY BLANK
<p>CS 25.302</p> <p>Interaction of Systems and Structures</p>	INTENTIONALLY BLANK	INTENTIONALLY BLANK
<p>UK25.302a</p> <p>DELETED Issue 7</p>	INTENTIONALLY BLANK	INTENTIONALLY BLANK
<p>CS 25.303</p> <p>Factor of Safety</p>	INTENTIONALLY BLANK	INTENTIONALLY BLANK
<p>UK25.303a</p> <p>Unless otherwise provided, a proof factor of 1.125 shall be used.</p> <p>Issue 7</p>	<p>A factor of safety of 1.4 and proof factor of 1 should be used where exceedances of limiting conditions are extremely remote provided all underlying rational cases multiplied by the conventional factors are covered.</p>	INTENTIONALLY BLANK
<p>UK25.303b</p> <p>Anchor Cable Installations for Paratrooping and Aerial Delivery Installation.</p> <p>Issue 7</p>	<p>The anchor cable installation or equivalent system should be compliant with the lesser of the following design cases:</p> <p>(a). Case 1. Hang-up The drag of (N-2) static lines and bags at the maximum drop speed plus the impact or acceleration load, whichever is the greater, caused by the snagged (N-1)st paratrooper plus the maximum load of the normal deployment of the Nth paratrooper.</p> <p>(b). Case 2. Failure The pull of the strongest strop and static line up to the maximum braking load of its weakest element provided</p>	<p>Note: N is the number of paratroopers carried on one cable.</p>

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Requirement	Compliance	Guidance
	that this has been reliably established by ultimate strength tests plus the drag of N-2 static lines and bags at the maximum strop speed plus the maximum load of normal deployment of one paratrooper.	
<p>UK25.303c The Air System structure shall have the following proof and ultimate factors: (a) Normal landing: not less than 1.5 and 2.0 respectively on the combination of aerodynamic loads and the average of the brake parachute opening load when it is streamed at the recommended approach speed, just before touchdown in a normal landing, at landing weight, or at a speed $1.2 V_{S1}$ if this is greater, where V_{S1} = stalling speed at landing weight with flaps and undercarriage down, engines throttled. (b) Emergency landing: not less than 1.0 and 1.2 respectively on the combination of aerodynamic loads and the maximum opening load when the parachute is streamed just before touchdown in an emergency landing at a speed of $1.2V_S$ or higher emergency speed, if appropriate, where V_S = stalling speed at the maximum weight for emergency landing with high lift devices inoperative, engines throttled.</p> <p>Issue 7</p>	INTENTIONALLY BLANK	INTENTIONALLY BLANK
<p>UK25.303d The brake parachute canopy, rigging lines and cables shall have an ultimate factor not less than 1.4 on the maximum loads applied during the emergency landing at a speed of $1.2V_S$ or higher emergency speed, if appropriate, where V_S = stalling speed at the maximum weight for emergency landing with high lift devices inoperative, engines throttled.</p>	INTENTIONALLY BLANK	In the emergency case, the factor is higher to ensure that the parachute is stronger than the weak link.

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Requirement	Compliance	Guidance
Issue 7		
CS 25.305 Strength and Deformation	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.305a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.305b In addition to CS 25.305(a) the structure shall be able to support proof loads without detrimental or permanent deformation. At any load up to proof loads, the deformation shall not interfere with safe operation. Issue 7	INTENTIONALLY BLANK	Detrimental deformation includes structural distortion that could induce hazards to essential systems.
CS 25.307 Proof of Structure	AMC 25.307	INTENTIONALLY BLANK
FLIGHT LOADS		
CS 25.321 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.321a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
FLIGHT MANOEUVRE AND GUST CONDITIONS		
CS 25.331 Symmetric Manoeuvring Conditions	AMC 25.331	INTENTIONALLY BLANK
UK25.331a Symmetric Manoeuvring Conditions - Low Level Flight Aspect Issue 7	Dependent upon the role of the Air System, particularly where tactical low-level/terrain-following flight is specified, a combined positive symmetrical manoeuvring load and CS 25.341 / UK25.341a discrete tuned gust load case as published should be evaluated.	INTENTIONALLY BLANK
CS 25.333 Flight Manoeuvring Envelope	AMC 25.333	INTENTIONALLY BLANK
CS 25.335 Design Airspeeds	AMC 25.335	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.337 Limit Manoeuvring Load Factors	AMC 25.337	INTENTIONALLY BLANK
CS 25.341 Gust and Turbulence Loads	AMC 25.341	INTENTIONALLY BLANK
UK25.341a Design Conditions Dependent upon the role of the Air System, particularly where tactical low-level/terrain-following flight is specified, the Air System shall be designed for the case when a vertical gust of 7.6m/s (25 ft/sec) is encountered at the same time as it is performing a manoeuvre of 60% of the maximum limit load factor. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.341b Dependent upon the role of the Air System, particularly where tactical low-level/terrain-following flight is specified, the Design Gust Velocity (U_{ds}) derivation methodology with CS 25.341(a)(4-6) is inappropriate and shall not apply; instead, the following Design Gust Velocity (U_{ds}) shall apply: (a) At speed V_G : $U_{ds} = 20.0$ m/s (66 ft/sec) between sea level and 6100m (20,000 ft) thereafter decreasing linearly to 11.6 m/s (38 ft/sec) at 15200m (50,000 ft), being constant thereafter. (b) At speed V_H : $U_{ds} = 15.2$ m/s (50 ft/sec) between sea level and 6100m (20,000 ft) thereafter decreasing linearly to 7.6 m/s (25 ft/sec) at 15200m (50,000 ft), being constant thereafter. (c) At speed V_D : $U_{ds} = 7.60$ m/s (25 ft/sec) between sea level and 6100m (20,000 ft) thereafter decreasing linearly to 3.8 m/s (12.5 ft/sec) at 15200m (50,000 ft), being constant thereafter.	In addition to the loads at the Design Aeroplane Speeds the Air System should be subjected to appropriate combinations of loads resulting from both vertical, lateral and where relevant, intermediate gusts at all speeds above the static stall boundary. The total load factors for speed intermediate between the Design Aeroplane Speeds should be derived by assuming linear variations in gust velocity between the design cases specified. For speeds below V_G the total normal load factor shall be assumed to vary linearly between unity at zero forward speed and the design value at V_G except for the static stall boundary cut off.	INTENTIONALLY BLANK
CS 25.343 Design Fuel and Oil Loads	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.345 High Lift Devices	AMC 25.345	INTENTIONALLY BLANK
CS 25.349 Rolling Conditions	AMC 25.349	INTENTIONALLY BLANK
UK25.349a Combined Rolling and Pitching The loads arising from the combined application of the pitch and roll motivators shall be considered for all speeds up to the design diving speed, V_D and all altitudes up to the maximum operating altitudes for the following conditions: (a) The deflection, or set of deflections, of the roll motivator shall be: (1) The critical value specified in CS 25.349 for all values of normal acceleration from zero to $0.67n_1g$, and (2) One half of the critical value specified in CS 25.349 associated with a normal acceleration of $0.9n_1g$, and (3) Linear variation between the values specified in (i) and (ii) with normal accelerations between $0.67n_1g$ and $0.9n_1g$ (b) The yaw motivator(s) shall be: (1) Held fixed in the position(s) for trim with the Air System in wings-level flight, and (2) Deflected to reduce the sideslip angle to zero, or if this is not possible, to minimise the sideslip angle (c) Air brakes shall be either open or closed, as appropriate to the speed.	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.351 Yaw Manoeuvre Conditions	AMC 25.351	INTENTIONALLY BLANK
UK25.351a Cross Coupling Considerations In those cases where inertial or aerodynamic cross-coupling results in the Air System rolling or pitching during the manoeuvres described by CS 25.351,	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
<p>unless the Air System flight control system ensures that there are smaller limited values of bank angle and normal acceleration increments, corrective action shall be assumed as follows: (a) Deflection of the roll motivator(s) to arrest the rolling motion, but not until the angle of bank has reached 15° or the maximum yaw angle achieved in showing compliance with CS 25.351 has been achieved, whichever comes first. (b) Deflection of the pitch motivator to reduce the pitching response, but not until the increment in normal acceleration has reached 0.25g.</p> <p>Issue 7</p>		
<p>CS 25.353 Rudder Control Reversal Conditions</p>	<p>AMC 25.353</p>	<p>INTENTIONALLY BLANK</p>
<p>SUPPLEMENTARY CONDITIONS</p>		
<p>CS 25.361 Engine and Auxiliary Power Unit Torque</p>	<p>AMC 25.361</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.362 Engine Failure Loads</p>	<p>AMC 25.362</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.363 Side Load On Engine and Auxiliary Power Unit Mounts</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.365 Pressurised Compartment Loads</p>	<p>AMC 25.365</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.367 Unsymmetrical Loads Due to Engine Failure</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.371 Gyroscopic Loads</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.373 Speed Control Devices</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK.</p>
<p>CONTROL SURFACE AND SYSTEM LOADS</p>		
<p>CS 25.391 Control Surface Loads: General</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>

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Requirement	Compliance	Guidance
CS 25.393 Loads Parallel to Hinge Line	AMC 25.393	INTENTIONALLY BLANK
CS 25.395 Control System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.397 Control System Loads	INTENTIONALLY BLANK	INTENTIONALLY BLANK
<p>UK25.397a Control System Loads - Conventional Controls PRIMARY CIRCUIT DESIGN LOADS – The following maximum pilot forces are assumed to act at the appropriate control grips or pads in a manner simulating flight conditions</p> <p>Conventional Controls</p> <p>(a) Pitch Inceptor</p> <p>(1) Stick control column 800 N (180 lbf) (two hands together on a single hand grip)</p> <p>(2) Wheel or W type 1000 N (225 lbf) (two control column hands, 500 N (112 lbf) at each hand grip)</p> <p>(3) Wheel or W type 500 N (112 lbf) (one hand only) column</p> <p>(b) Roll inceptor</p> <p>(1) Stick type control column 300 N (67.5 lbf)</p> <p>(2) Wheel or W type. The torque resulting from two control column equal and opposite loads of 300 N (67.5 lbf) applied tangentially at diametrically opposed points of the wheel of diameter D metres (inches).</p> <p>(c) Yaw inceptor</p> <p>(1) Rudder bar/pedals 1350 N (303 lbf) (on one side only)</p> <p>(2) Rudder bar/pedals 800 N (180 lbf) (simultaneously on each side in the same direction) except where overridden by brake loads.</p>	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.397b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.399 Dual Control System	INTENTIONALLY BLANK	INTENTIONALLY BLANK DELETED Issue 7
UK25.399a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.405 Secondary Control System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.407 Trim Tab Effects	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.409 Tabs	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.415 Ground Gust Conditions	AMC 25.415	INTENTIONALLY BLANK
CS 25.427 Unsymmetrical Loads	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.445 Outboard Fins	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.457 Wing Flaps	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.459 Special Devices	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.459a Weapons Bay and Door Loads The flight loading cases which arise from the conditions specified in Clauses UK25.349, UK25.351 and CS 25.367 are applicable to weapons bays when the doors are open and to weapons bay doors, their operating mechanisms and supporting structure when the doors are in all positions from fully open to fully closed and locked. Issue 7	Loads should be determined from test data.	INTENTIONALLY BLANK
GROUND LOADS		

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Requirement	Compliance	Guidance
CS 25.471 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.473 Landing Load Conditions and Assumptions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.473a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.473b INTENTIONALLY BLANK Issue 7	If certification for operation from surfaces other than prepared runways (see CS 25.20), the Air System should be designed to withstand loading conditions resulting at point of touch-down from such operation and specified in Section 2.4 (2.4.3.1.1 Table 1)	INTENTIONALLY BLANK
CS 25.477 Landing Gear Arrangement	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.479 Level Landing Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.481 Tail Down Landing Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.483 One Gear Landing Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.485 Side load Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.487 Rebound Landing Condition	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.489 Ground Handling Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.491 Taxi, Take-Off and Landing Roll	AMC 25.491	INTENTIONALLY BLANK
UK25.491a Reverse Taxi Issue 7	INTENTIONALLY BLANK	Attention is to be given to: (a) The controllability of the Air System and effects of braking when moving backwards; (b) The possibility that the Air System will tip onto its tail.

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Requirement	Compliance	Guidance
UK25.491b If certification for traversing an arrestor cable is sought, the landing gear shall withstand the impulse load caused by traversing an arrestor gear hook cable at all speeds up to maximum take-off speed. Issue 7	The cable impulse load case should be superimposed on the taxi, take-off and landing roll conditions from AMC 25.491. However, the AMC 25.491 bump considerations should be reduced to avoid super-position of bumps.	In order to safely traverse an arresting cable, the size of the tyre will be adequate to provide for both normal compression and the extra compression caused by the arresting cable. If this were inadequate there could be an extra impulse load up the leg
CS 25.493 Braked Roll Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.495 Turning	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.497 Tail-Wheel Yawing	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.499 Nose-Wheel Yaw and Steering	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.503 Pivoting	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.507 Reversed Braking	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.509 Towing Loads	AMC 25.509	INTENTIONALLY BLANK
CS 25.511 Ground Load: Unsymmetrical Loads on Multiple Wheel Units	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.519 Jacking and Tie-Down Provisions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.519a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
EMERGENCY LANDING CONDITIONS		
CS 25.561 General	AMC 25.561	INTENTIONALLY BLANK
CS 25.562 Emergency Landing Dynamic Conditions	AMC 25.562	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
UK25.562a The seat, energy absorbers and relevant structure, together with the restraint system and other items shall meet the following dynamic loading conditions equivalent to those of Table 1, see Section 2.4 (2.4.3.2.1 Table 1 Cases 8, 9 and 10.) Issue 7	INTENTIONALLY BLANK	See ETSO-C127A for normal (ie non-ejection) seats.
CS 25.563 Structural Ditching Provisions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
FATIGUE EVALUATION		
CS 25.571 Damage-Tolerance and Fatigue Evaluation of Structure	AMC 25.571	INTENTIONALLY BLANK
UK25.571a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.571b INTENTIONALLY BLANK Issue 7	(a) Following completion of fatigue testing, a tear-down inspection should be conducted to reveal any significant damage to Principle Structural Elements. (b) Pending completion of the tear-down inspection, the test life used for the substantiation of any components that have not failed during the course of the test but may contain undetected damage should be limited to 90% of the demonstrated by test life.	INTENTIONALLY BLANK
UK25.571c DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.571d INTENTIONALLY BLANK Issue 7	(a) A means should be provided to estimate the fatigue damage accumulation on each individual Air System such that a fleet-wide monitoring system can be established for Air System Integrity Management. (b) The fleet-wide monitoring system should be classified safety-related. (c) Validation of the monitor and monitoring system should be by the flight test programme.	(a) Monitoring of service usage links the intrinsic fatigue consumption of the structure, as achieved by design and proven by test, with the damage to which the structure is actually exposed. (b) Either misidentification or underestimation of fatigue damage accumulation is a risk to airworthiness and as such the design and

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Requirement	Compliance	Guidance
		implementation of the fleet-wide monitoring system will be adequate for continued safe operation of Air System where the margins for error from any source may be limited.
LIGHTNING PROTECTION		
CS 25.581 Lightning Protection	AMC 25.581	INTENTIONALLY BLANK
UK25.581a Lightning Protection INTENTIONALLY BLANK	At an early stage in the design process a study of lightning protection should be carried out to check that due attention has been given to lightning, hazards and to decide whether any additional protection need be provided. In doubtful cases the study should recommend a programme of simulated lightning tests. The study should pay particular attention to those external parts of the Air System which may be attachment points for lightning and to the possible lightning current paths through the Air System skin and structure.	Throughout the design of the Air System, consideration will be given to the possible effects of a lightning strike and the incorporation of protected measures to minimise the effects. Where applicable, designs need to comply with the requirements of Def Stan 59-113 and STANAG 3659.
SUBPART D - DESIGN AND CONSTRUCTION		
GENERAL		
CS 25.601 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.603 Materials	AMC 25.603, AMC 20-29	INTENTIONALLY BLANK
UK25.603a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.605 Fabrication Methods	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.607 Fasteners	AMC 25.607	INTENTIONALLY BLANK
CS 25.609 Protection of Structure	AMC 25.609	INTENTIONALLY BLANK
UK25.609a	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
DELETED Issue 7		
CS 25.611 Accessibility Provisions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.613 Material Strength Properties and Material Design Values	AMC 25.613	INTENTIONALLY BLANK
CS 25.619 Special Factors	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.621 Casting Factors	AMC 25.621	INTENTIONALLY BLANK
CS 25.623 Bearing Factors	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.625 Fitting Factors	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.629 Aeroelastic Stability Requirements	AMC 25.629	INTENTIONALLY BLANK
CS 25.631 Bird Strike Damage	AMC 25.631	INTENTIONALLY BLANK
UK25.631a Dependent upon the role of the Air System, particularly where tactical low-level/terrain-following flight is specified, the more critical of the following cases shall apply: (a) CS 25.631 and associated AMC25.631, or (b) 1 kg bird when the velocity of the Air System is V_M , up to 480 knots TAS, at altitude up to 762m (2500 ft) ASL.	INTENTIONALLY BLANK	The military criteria relates to the European theatre of operation and excludes engines and armaments.
CONTROL SURFACES		
CS 25.651 Proof of Strength	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.655 Installation	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.657 Hinges	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CONTROL SYSTEMS		
CS 25.671 General	AMC 25.671	INTENTIONALLY BLANK
UK25.671a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.671b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.672 Stability Augmentation and Automatic and Power Operated Systems	AMC 25.672	INTENTIONALLY BLANK
UK25.672a Issue 7	INTENTIONALLY BLANK	Where necessary for reasons of safety, an override facility for specific active control system modes may be provided as required in the Air System Specification, subject to remaining within structural limits.
CS 25.675 Stops	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.677 Trim Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.679 Control System Gust Locks	AMC 25.679	INTENTIONALLY BLANK
CS 25.681 Limit Load Static Tests	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.683 Operation Tests	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.685 Control System Details	AMC 25.685	INTENTIONALLY BLANK
CS 25.689 Cable Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.689a Ultimate Factor for Cables	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
The ultimate factor for cables shall be 2.0 and for chains shall be 3.0		
CS 25.693 Joints	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.697 Lift and Drag Devices, Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.699 Lift and Drag Device Indicator	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.701 Flap and Slat Interconnection	AMC 25.701	INTENTIONALLY BLANK
CS 25.703 Take-Off Warning System	AMC 25.703	INTENTIONALLY BLANK
CS 25.705 Runway overrun awareness and alerting systems. (CS 25 amdt 24) Issue 7	AMC 25.705	INTENTIONALLY BLANK
LANDING GEAR		
CS 25.721 General	See AMC 25.963 (d)	INTENTIONALLY BLANK
UK25.721a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.721b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.721c DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.721d Ground Clearance With the exceptions of arresting hooks and tail bumpers if fitted, there shall be positive ground clearance of all parts of the Air System, including all	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
control surfaces in the most adverse position with all external stores, on a smooth hard surface in all practicable take-off and landing attitudes, with the maximum undercarriage closure and tyre compression including any combination of burst tyres and total collapse of the shock-absorber.		
UK25.721e DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.723 Shock Absorption Tests	AMC 25.723	INTENTIONALLY BLANK
UK25.723a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.729 Retracting Mechanism	AMC 25.729	INTENTIONALLY BLANK
CS 25.731 Wheels	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.733 Tyres	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.733a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.734 Protection Against Wheel and Tyre Failures	AMC 25.734	INTENTIONALLY BLANK
CS 25.735 Brakes and Braking System	AMC 25.735	INTENTIONALLY BLANK
UK25.735a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.735b DELETED Issue 3	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.735c	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
DELETED Issue 3		
UK25.735d	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		
CS 25.745 Nose-Wheel Steering	AMC 25.745	INTENTIONALLY BLANK
PERSONNEL AND CARGO ACCOMMODATIONS		
CS 25.771 Pilot Compartment	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.771a	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		
UK25.771b	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		
CS 25.772 Pilot Compartment Doors	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.773 Pilot Compartment View	AMC 25.773	INTENTIONALLY BLANK
UK25.773a Crew Station View Issue 7	The external view at all crew workstations should provide a sufficiently extensive, clear, and undistorted view, to enable all crew members to maintain spatial awareness and perform all of their tasks, including during precipitation, fogging and icing conditions	Crew tasks to be considered include, but are not limited to: (a) Air System handling during all manoeuvres within the operating limitations of the Air System; (b) Monitoring external landing aids; (c) Close and tactical formation flying; (d) Lookout; (e) Navigation; (f) Crew members providing information to the handling pilot to support Air System manoeuvring; (g) AAR (including viewing the in-flight refuelling system and associated visual signals

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Requirement	Compliance	Guidance
		when approaching and when in the refuelling position); (h) Weapon aiming; (l) Delivery of stores; (k) Surface and maritime search; (l) Contrail formation observation; (m) Night vision device operation.
UK25.773b Pilot Compartment View (AAR) Issue 7	In Air Systems utilising in-flight refuelling, sufficient vision should be provided for the pilot to see the tanker, refuelling signal lights, boom and probe (or drogue) when approaching and when in position for refuelling.	INTENTIONALLY BLANK
UK25.773c DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.773d DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.773e DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.775 Windshields and Windows	AMC 25.775	INTENTIONALLY BLANK
UK25.775a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.777 Cockpit Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.777a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.777b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.777c	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
DELETED Issue 7		
UK25.777d DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.777e The requirements of CS 25.1302 and CS 25.1322 shall apply to Towed Assemblies and installations shall incorporate sufficient controls and indicators to ensure the safe operation of the towed system by the flight crew, in all phases of flight.	The following cockpit controls should be installed in the Air System: (a) Launch (air-launched systems); (b) Discard or recover towed assembly; (c) Jettison Towed Assembly by: (1) Pilot's emergency circuit selection; (2) Ejection synchronised selection; (3) Operator's selection. (d) Jettison External Installation (where permitted) by Pilot's emergency circuit selection; (e) Stop streaming (variable tow length systems only).	INTENTIONALLY BLANK
CS 25.779 Motion and Effect of Cockpit Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.781 Cockpit Control Knob Shape	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.783 Fuselage Doors	AMC 25.783	INTENTIONALLY BLANK
UK25.783a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.783b It shall be possible: (a) To manually operate the doors, hoods or hatches and secure in an open position, and also release from the open position from inside and outside the Air System, in all winds of up to 20 m/s (39 kts), from any direction. (b) To taxi with the hoods open in the taxiing position, when provisioned, in head winds of up to 28 m/s (55 kts).	The design should minimise the possibility of jamming of doors, hoods, hatches, external handgrips or steps due to any foreseeable cause.	This includes consideration for: (a) Manual reversion for power operated hoods, (b) The effect of ice or snow in cold weather or when operating on or near to snow covered ground. (c) The effect of rapid change in ambient temperature (eg when landing after cold soak at altitude). (d) Ingress by airborne particles (eg sand).

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Requirement	Compliance	Guidance
(c) On Air Systems without ejection seats, to abandon the Air System in flight. Issue 7		
UK25.783c DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.783d Parachute Doors Doors used for jumping shall be not less than 1.83 metres high by 0.91 metres wide (6 feet high by 3 feet wide) with corners rounded to approximately 100 mm (4 in) radius and the sides of the exits shall be designed so as to avoid injury to paratroops or damage to strops. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.783e Parachute Door Opening It shall not be possible to open the paratroop doors while residual pressure remains in the cabin.	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.785 Seats, Berths, Safety Belts and Harnesses	AMC 25.785	INTENTIONALLY BLANK
UK25.785a Open Doors in Flight, Crew Restraint Structural attachment points shall be provided for the attachment of crew harness configurations when operations require crew members to stand near an open door in flight. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.785b (a) Crew harness shall prevent injury to the user caused by multi-directional forces acting singly or together up to the level of human tolerance.	The design of the structure, seats, harnesses and all relevant systems should consider: (a) ejection, where an ejection seat is fitted.	(a) Human Tolerance Limits are provided in Section 2.4 (2.4.4.1.1 Table 1) (b) Maximum practical surface area is to be provided by the harness webbing in order to distribute the loads without injury.

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Requirement	Compliance	Guidance
<p>(b) The occupant mass for design cited in CS 25.785(f) shall not apply; it is inappropriate for military aircrew; instead:</p> <p>(1) Occupant mass for seat design shall use the platform Target Audience Description, wearing Aircrew Equipment Assemblies as required.</p> <p>(2) Occupant mass for stretcher design shall use 114kg.</p> <p>Issue 8</p>	<p>(b) the relevant technical guides supporting Def Stan 00-251;</p> <p>(c) the anthropometric range specified for that Air System within the platform Target Audience Description (TAD); and</p> <p>(d) the clothing and equipment detailed in the Aircrew Equipment Assembly Schedule appropriate to the particular Air System;</p> <p>(e) if the Air System's intended role includes the possible use of an Air System arresting system during normal or emergency landings.</p> <p>Issue 8</p>	
<p>UK25.785c</p> <p>DELETED Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.785d</p> <p>Seats (Troop Carrying Role)</p> <p>Removable troop seats and anchorages shall be provided to meet the requirements of CS 25.561 / CS 25.562 (and associated UK military deltas). They shall either pick up the cargo tie-down fittings or special seat rails shall be provided. Seat rails shall be at constant track throughout the fuselage. The design of the floor and load paths to the seat attachments shall be as such that they are capable of sustaining the loads of the seat system in applicable crash load conditions.</p> <p>Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.785e</p> <p>DELETED Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.785f</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>

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Requirement	Compliance	Guidance
DELETED Issue 7		
UK25.785g Unoccupied seats shall be provided with a means of preventing the movement of articles attached to or associated with the seat. Issue 7	The stowage arrangements should ensure the security of the articles under all conditions and manoeuvres throughout the flight envelope.	INTENTIONALLY BLANK
CS 25.787 Stowage Compartments	AMC 25.787	INTENTIONALLY BLANK
CS 25.788 Passenger Amenities	AMC 25.788	INTENTIONALLY BLANK
UK25.788a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.789 Retention of Items of Mass in Passenger and Crew Compartments and Galleys	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.791 Passenger Information Signs and Placards	AMC 25.791	INTENTIONALLY BLANK
CS 25.793 Floor Surfaces	AMC 25.793, AMC 25 810(c)	INTENTIONALLY BLANK
UK25.793a Interior Finishes Issue 7	INTENTIONALLY BLANK	Effective protection is to be provided from the effects of contamination by cargo and fluid spillage for all Air System structure and essential systems.
CS 25.795 Security Considerations	AMC 25.795	INTENTIONALLY BLANK
EMERGENCY PROVISIONS		
CS 25.801 Ditching	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.803 Emergency Evacuation	AMC 25.803	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
UK25.803a Emergency Evacuation Issue 7	Evacuation testing appropriate to role should include military-specific requirements, such as personnel wearing/carrying body armour, weapons and kit.	INTENTIONALLY BLANK
CS 25.807 Emergency Exits	AMC 25.807	INTENTIONALLY BLANK
CS 25.809 Emergency Exit Arrangement	AMC 25.809	INTENTIONALLY BLANK
CS 25.810 Emergency Egress Assist Means and Escape Routes	AMC 25.810	INTENTIONALLY BLANK
CS 25.811 Emergency Exit Marking	AMC 25.811	INTENTIONALLY BLANK
UK25.811a Emergency Exit Marking Where applicable to the type and role of the Air System determined by the TAA, the words "EMERGENCY EXIT", plus any supplementary information, eg "DITCHING EXIT", that may be deemed necessary, together with instructions in simple terms for operating, eg "PULL" or "TURN", with an arrow indicating the direction of operation shall be placed as near as possible to the control Issue 7	Emergency exit markings should be in accordance with DAP 119A-0601-0 (latest edition).	Marking conventions: a. Arrows - golden yellow. b. Letters - black on a golden yellow background. c. Title letters - not less than 25 mm high. d. Instruction letters - not less than 13 mm high. e. Emergency exit contours (transport and maritime Air Systems) - indicated by slanting alternatively black and golden yellow stripes.
UK25.811b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.812 Emergency Lighting	AMC 25.812	INTENTIONALLY BLANK
CS 25.813 Emergency Exit Access	AMC 25.813	INTENTIONALLY BLANK
UK25.813a Stretchers	Stretchers, harnesses and support structure should be designed to minimise interference with evacuation.	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Issue 7		
CS 25.815 Width of Aisle	AMC 25.815	INTENTIONALLY BLANK
UK25.815a Minimum Aisle Width Minimum Aisle Widths shall be increased above the values of CS 25.815 if required by the TAA to meet military specific requirements.	Compliance should include passengers flying with bulky equipment while seated (eg body armour, weapons/kit etc).	INTENTIONALLY BLANK
Issue 7		
CS 25.817 Maximum Number of Seats Abreast	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.819 Lower Deck Service Compartments (Including Galleys)	AMC 25.819	INTENTIONALLY BLANK
CS 25.820 Lavatory Doors	INTENTIONALLY BLANK	INTENTIONALLY BLANK
VENTILATION AND HEATING		
CS 25.831 Ventilation	AMC 25.831	INTENTIONALLY BLANK
UK25.831a Ventilation Compartments susceptible to contamination from smoke, gun gas and hazardous gases and vapours etc. shall be sealed from adjacent compartments.	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Issue 7		
CS 25.832 Cabin Ozone Concentration	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.833 Combustion Heating Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.833a	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		

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Requirement	Compliance	Guidance
PRESSURISATION		
CS 25.841 Pressurised Cabins	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.841a Pressurised Cabins In addition to the requirements of CS 25.841 (provision of cabin pressure altitude of not more than 2438 m (8000 feet) at the maximum operating altitude under normal operating conditions), the maximum cabin differential pressure shall be as high as possible, consistent with weight and other considerations. Issue 7	A cabin altitude of not more than 1,850 m (6,060 feet) should be maintained at the maximum cruising altitude stated in the Air System Specification.	INTENTIONALLY BLANK
UK25.841b Pressurised Cabins (a) Means shall be provided whereby the pressure differential can be reduced to zero at any altitude. (b) Caution information shall be provided to alert the crew when the Air System is under controlled depressurisation flight conditions above 8 000 ft. to remind them that oxygen supply for the crew and occupants is required. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.843 Tests for Pressurised Cabins	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.843a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
FIRE PROTECTION		
CS 25.851 Fire Extinguishers	AMC 25.851	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
UK25.851a Fire Extinguishers Where the role or specific mission of the Air System increases the likelihood of fire or smoke in the cabin to a greater extent than a CS 25 certified Air System, additional hand-held extinguishers shall be fitted. Issue 7	The design of the extinguisher bracket should minimise the possibility of inadvertent opening of the release by snagging of clothing, etc.	For mission systems, adequate numbers of fire extinguishers will be installed to meet mandatory safety requirements and support recommendations to the ADH that fire risks are managed to ALARP
UK25.851b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.853 Compartment Interiors	AMC 25.853	INTENTIONALLY BLANK
UK25.853a Interior Air System Colours Issue 7	Military Air System internal colour schemes should comply with the requirements of DAP 119A-0601-0 Ch 9 and Def Stan 05-018 (latest issue) unless otherwise agreed by the TAA	INTENTIONALLY BLANK
CS 25.854 Lavatory Fire Protection	AMC 25.854	INTENTIONALLY BLANK
CS 25.855 Cargo or Baggage Compartments	AMC 25.855, AMC 25.857	INTENTIONALLY BLANK
CS 25.856 Thermal/Acoustic Insulation Materials	AMC 25.856	INTENTIONALLY BLANK
CS 25.857 Cargo Compartment Classification	AMC 25.855, AMC 25.857	INTENTIONALLY BLANK
CS 25.858 Cargo or Baggage Compartment Smoke or Fire Detection Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.858a Weapons Bays (a) A separate approved smoke detector or fire detection system shall be installed in weapons bays to give warning at the pilot or flight engineer's station.	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
<p>(b) If the safety analysis confirms that a fire suppression system is required in the weapons bay:</p> <p>(1) An approved built-in fire extinguishing system shall be installed controllable from the pilot or flight engineer's station.</p> <p>(2) There shall be means to exclude hazardous quantities of smoke, or extinguishing agent, from any compartment occupied by the crew or passengers.</p> <p>(3) There shall be means to control ventilation and draughts within the weapons bay so that the extinguishing agent used can control any fire that may start in the weapons bay.</p> <p>Issue 7</p>		
<p>CS 25.859 Combustion Heater Fire Protection</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.863 Flammable Fluid Fire Protection</p>	<p>AMC 25.863</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.865 Fire Protection of Flight Controls, Engine Mounts, and Other Flight Structure</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.867 Fire Protection: Other Components</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.869 Fire Protection Systems</p>	<p>AMC 25.869</p>	<p>INTENTIONALLY BLANK</p>
<p>MISCELLANEOUS</p>		
<p>CS 25.871 Levelling Means</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.875 Reinforcement Near Propellers</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.899 Electrical Bonding and Protection Against Static Electricity</p>	<p>AMC 25.899</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.899a</p>	<p>INTENTIONALLY BLANK</p>	<p>Refer to:</p>

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Requirement	Compliance	Guidance
Electrical Bonding and Protection Against Static Electricity The Air System shall incorporate effective electrical bonding and protection against static electricity. Issue 7		(a) Def Stan 59-113; (b) STANAG 3659;
SUBPART E - POWERPLANT		
GENERAL		
CS 25.901 Installation	AMC 25.901	INTENTIONALLY BLANK
CS 25.903 Engines	AMC 25.903	INTENTIONALLY BLANK
UK25.903a Engines fitted to Part 5 Air Systems shall be certified Issue 7	Engines should be certified to the requirements of Def Stan 00-970 Part 11. (a) Where reference is made in CS 25 to a requirement in CS-E this should be interpreted to mean the corresponding requirement in Def Stan 00-970 Part 11. (b) Dependent upon the role of the Air System, the requirements of Part 11 Section 3, should be applied.	INTENTIONALLY BLANK
CS 25.904 Automatic Take-Off Thrust Control System (ATTCS)	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.905 Propellers	AMC 25.905	INTENTIONALLY BLANK
CS 25.907 Propeller Vibration	CS-P 530, CS-P 550	INTENTIONALLY BLANK
CS 25.925 Propeller Clearance	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.929 Propeller De-Icing	AMC 25.929	INTENTIONALLY BLANK
CS 25.933	AMC 25.933	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Reversing Systems		
CS 25.934 Turbo-jet Engine Thrust Reverser System Tests	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.937 Turbo-propeller - Drag Limiting Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.937a Feathering: (a) Each propeller shall have the capability of being feathered under the most adverse conditions of altitude and airspeed likely to arise following sudden engine failure. (b) A cycle of feather, unfeather and feather shall be possible over the range of operating conditions approved for the Air System. (c) The feathering system for each propeller shall be separate from and independent of those of other propellers. Means to prevent inadvertent operation shall be provided. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.939 Turbine Engine Operating Characteristics	AMC 25.939	INTENTIONALLY BLANK
CS 25.941 Inlet, Engine, and Exhaust Compatibility	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.943 Negative Acceleration	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.945 Thrust or Power Augmentation System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
FUEL SYSTEM		
CS 25.951 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.951a	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		
CS 25.952	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Fuel System Analysis and Test		
CS 25.953 Fuel System Independence	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.954 Fuel System Lightning Protection	AMC 25.954	INTENTIONALLY BLANK
CS 25.955 Fuel Flow	AMC 25.955	INTENTIONALLY BLANK
UK25.955a In multi-engine Air Systems, all usable fuel, including fuel for power augmentation, shall be available for any engine or combination of engines. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.957 Flow Between Interconnected Tanks	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.959 Unusable Fuel Supply	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.961 Fuel System Hot Weather Operation	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.963 Fuel Tanks: General	AMC 25.963	INTENTIONALLY BLANK
UK25.963a Fuel Tanks General There shall be no leakage from or permanent distortion of the tanks at any proof load or combination of loads. Issue 7	Each tank (or tank structure where flexible tanks are fitted) should have proof and ultimate factors not less than 1.5 and 2.0 respectively on the loads resulting from pressures in each of the following cases considered separately: (a) The combination of the internal pressure applied to transfer fuel or to prevent fuel boiling and the local external pressure in straight and level flight under maximum cruising conditions at all heights up to the maximum attainable. (b) The pressure developed during refuelling and defueling.	INTENTIONALLY BLANK
CS 25.965 Fuel Tank Tests	AMC 25.965	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
UK25.965a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.967 Fuel Tank Installations	AMC 25.967	INTENTIONALLY BLANK
CS 25.969 Fuel Tank Expansion Space	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.971 Fuel Tank Sump	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.973 Fuel Tank Filler Connection	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.973a Pressure refuelling connectors, recessed behind access panels, shall incorporate positive provisions whereby the access doors cannot be physically secured unless the sealing cap is properly installed. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.975 Fuel Tank Vents	AMC 25.975	INTENTIONALLY BLANK
UK25.975a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.977 Fuel Tank Outlet	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.979 Pressure Fuelling System	AMC 25.979	INTENTIONALLY BLANK
CS 25.981 Fuel Tank Ignition Prevention	AMC 25.981	INTENTIONALLY BLANK
UK25.981a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.981b	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
DELETED Issue 7		
FUEL SYSTEM COMPONENTS		
CS 25.991 Fuel Pumps	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.993 Fuel System Lines and Fittings	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.994 Fuel System Components	AMC 25.994	INTENTIONALLY BLANK
CS 25.995 Fuel Valves	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.997 Fuel Strainer or Filter	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.999 Fuel Systems Drains	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1001 Fuel Jettisoning System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
OIL SYSTEM		
CS 25.1011 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1013 Oil Tanks	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1015 Oil Tank Tests	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1017 Oil Lines and Fittings	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1019 Oil Strainer or Filter	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1021 Oil System Drains	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1023 Oil Radiators	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1025 Oil Valves	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.1027 Propeller Feathering System	AMC 25.1027	INTENTIONALLY BLANK
COOLING		
CS 25.1041 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1043 Cooling Tests	AMC 25.1043	INTENTIONALLY BLANK
CS 25.1045 Cooling Test Procedures	INTENTIONALLY BLANK	INTENTIONALLY BLANK
AIR INTAKE SYSTEM		
CS 25.1091 Air Intake	AMC 25.1091	INTENTIONALLY BLANK
CS 25.1093 Air Intake System De-Icing and Anti-Icing Provisions	AMC 25.1093	INTENTIONALLY BLANK
CS 25.1103 Air Intake System Ducts and Air Duct Systems	AMC 25.1103	INTENTIONALLY BLANK
EXHAUST SYSTEM		
CS 25.1121 General	AMC 25.1121	INTENTIONALLY BLANK
CS 25.1123 Exhaust Piping	INTENTIONALLY BLANK	INTENTIONALLY BLANK
POWERPLANT CONTROLS AND ACCESSORIES		
CS 25.1141 Powerplant Controls: General	AMC 25.1141	INTENTIONALLY BLANK
CS 25.1143 Engine Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1145 Ignition Switches	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1149 Propeller Speed and Pitch Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1153 Propeller Feathering Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.1155 Reverse Thrust and Propeller Pitch Settings Below the Flight Regime	AMC 25.1155	INTENTIONALLY BLANK
CS 25.1161 Fuel Jettisoning System Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1163 Powerplant Accessories	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1165 Engine Ignition Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1167 Accessory Gearboxes	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Powerplant Fire Protection		
CS 25.1181 Designated Fire Zones Regions Included	AMC 25.1181	INTENTIONALLY BLANK
CS 25.1182 Nacelle Areas Behind Firewalls, and Engine Pod Attaching Structures Containing Flammable Fluid Lines	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1183 Flammable Fluid-Carrying Components	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1185 Flammable Fluids	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1187 Drainage and Ventilation of Fire Zones	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1189 Shut-Off Means	AMC 25.1189	INTENTIONALLY BLANK
CS 25.1191 Firewalls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1193 Cowling and Nacelle Skin	AMC 25.1193	INTENTIONALLY BLANK
CS 25.1195 Fire-Extinguisher Systems	AMC 25.1195	INTENTIONALLY BLANK
CS 25.1197	AMC 25.1197	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Fire-Extinguishing Agents		
CS 25.1199 Extinguishing Agent Containers	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1201 Fire Extinguishing System Materials	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1203 Fire-Detector System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1207 Compliance	INTENTIONALLY BLANK	INTENTIONALLY BLANK
SUBPART F - EQUIPMENT		
GENERAL		
CS 25.1301 Function and Installation	AMC 25.1301	INTENTIONALLY BLANK
UK25.1301a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1301b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1301c TEMPEST Requirements INTENTIONALLY BLANK Issue 7	INTENTIONALLY BLANK	For TEMPEST aspects of the design, refer to JSP440.
UK25.1301d Electromagnetic Compatibility Requirements Military specific EMC/EMI and bonding testing shall be performed. Issue 7	Air System EMC should comply with: (a) Defence Standard 59-411 "Electromagnetic Compatibility Parts 1-5" (latest edition) (b) Defence Standard 59-114 "Safety Principles for Electrical Circuits in Systems Incorporating Explosive Components" (latest edition) (c) Defence Standard 59-113 "Lightning Strike Protection Requirements for Service Aircraft" (latest edition).	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.1302 Installed Systems and Equipment for use by the Flight Crew	AMC 25.1302	INTENTIONALLY BLANK
UK25.1302a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1302b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1302c Installed Systems and Equipment for use by the Flight / Mission Crew Where operation of the Air System requires additional crew members not located on the flight deck to use equipment that could influence the safety of the Air System, the design, crew member interfaces with and behaviour of these systems and equipment shall meet the requirements of CS 25.1302. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1302d INTENTIONALLY BLANK Issue 7	The requirements for the installed equipment within the flight deck should also apply to all crew workstations and consider all members of the crew.	The design of all crew workstations including the pilot compartment may consider the relevant technical guides supporting Def Stan 00-251 (Human Factors Integration for Defence Systems).
CS 25.1303 Flight and Navigation Instruments	AMC 25.1303	INTENTIONALLY BLANK
CS 25.1305 Powerplant Instruments	AMC 25.1305	INTENTIONALLY BLANK
UK25.1305a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1307 Miscellaneous Equipment	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
UK25.1307a Intercommunication shall be provided between all operating stations inside the Air System and also to a point(s) on the outside of the Air System for use by ground personnel. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1307b INTENTIONALLY BLANK Issue 7	INTENTIONALLY BLANK	The Air System Specification will list the AEA to be used, as defined in AP 108B-1000-1. Individual items are described in AP 3456.
CS 25.1309 Equipment, Systems and Installations	AMC 25.1309	INTENTIONALLY BLANK
UK25.1309a INTENTIONALLY BLANK Issue 7	The design should include means for checking and adjusting the alignment of all directionally sensitive equipment and weapons with respect to a reference datum in the Air System and to a tolerance acceptable to the whole system.	INTENTIONALLY BLANK
UK25.1309b Safety-Related Programmable Elements (PE) Verification and validation of safety-related Programmable Elements (PE) shall be undertaken in accordance with Def Stan 00-055. Issue 7	To meet the stated requirement, compliance is provided in four sections: (a) System-level Safety; (b) Air System Safety-Related Software (SRS); (c) Air System Safety-related Electronic Hardware; and (d) Safety-related Multi-Core Processors: (a) System-level Safety (1) At the system level, the Safety Assessment process should define the top-level safety requirements and design objectives of the PE, as detailed in the guidance contained in Aerospace Recommended Practices (ARPs) 4761 and 4754A. (2) All aspects of the PE should be supported by a Safety Assessment Report, as described in Def Stan 00-056. Where data integrity is identified as contributing to airworthiness, assurance of the entire data chain should be explicitly addressed in the Safety Assessment Report.	See Section 2.4 (2.4.6.1.1)

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Requirement	Compliance	Guidance
	<p>(b) Air System Safety-related Software (SRS)</p> <p>(1) RTCA DO-178C and its appropriate supplements (DO-248C, DO-330, DO-331, DO-332 and DO-333), should be used as an AMC to provide design assurance of Air System SRS when supported by a robust, documented and auditable Safety Assessment, as described in Def Stan 00-056.</p> <p>(2) For legacy SRS which is intended to be used in a new application, or as a significant development of an existing system, the following principles should apply:</p> <p>(a) For systems developed under Def Stan 00-55 Issue 2, it may continue to be applied as an AMC, provided the requirements of that standard continue to be met.</p> <p>(b) For software developed using RTCA DO-178B, it should continue to be used as an AMC under the following circumstances:</p> <ul style="list-style-type: none"> i. The new application does not require a higher level of software assurance; ii. The development life-cycle is not updated to include technologies that have specific supplements in RTCA DO-178C; iii. No new software criteria 1 or 2 (as defined in RTCA DO-178C) tool qualification is required. If this is the only differentiator, then DO-178B should continue to be applied, with the tool qualification objectives provided by DO-330 being used for the new tools; iv. No new Parameter Data Item files (as defined in RTCA DO-178C) are introduced. Where this is the case, DO-178C should be applied to all affected areas of the software and an argument developed in the supporting safety case to show that the change has been contained. Where this is not feasible, DO-178C should be applied; and 	

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Requirement	Compliance	Guidance
	<p>v. All the lifecycle processes and artefacts from prior certification have been maintained.</p> <p>(c) Air System Safety related Electronic Hardware (1) RTCA DO-254/EUROCAE ED-80 should be used as an AMC to provide design assurance of Air System Safety-related Electronic Hardware, when supported by a robust, documented and auditable Safety Assessment, as described in Def Stan 00-056.</p> <p>(d) Safety-related Multi-Core Processors (MCP) (1) There is currently no definitive AMC for the assurance of MCPs in safety related applications.</p>	
<p>UK25.1309c The cumulative probability of all failure conditions that result in fatalities (catastrophic and hazardous failure conditions, or as otherwise agreed with the MAA) shall be equal to, or less than, the agreed Design Safety Target at Air System level.</p> <p>Issue 7</p>	<p>Hazard analysis should be in accordance with Defence Standard 00-056 (latest version).</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.1310 Power Source Capacity and Distribution</p>	<p>AMC 25.1310</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.1315 Negative Acceleration</p>	<p>AMC 25.1315</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1315a DELETED Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.1316 Electrical and Electronic System Lightning Protection</p>	<p>AMC 25.136</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1316a DELETED Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.1317 High Intensity Radiated Fields (HIRF) Protection</p>	<p>AMC 20-158</p>	<p>INTENTIONALLY BLANK</p>

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Requirement	Compliance	Guidance
CS 25.1319 Equipment, systems and network information protection (CS 25 amdt 25). Issue 7	AMC CS 25.1319	INTENTIONALLY BLANK
UK25.1319a INTENTIONALLY BLANK Issue 7	Cyber Security Airworthiness (a) For air systems that are under development or are being modified and where the effects of information security can affect air system safety, RTCA DO-326A/EUROCAE ED-202A and associated RTCA DO-356A/EUROCAE ED-203A, combined with arguments against JSP 440, should be used as an Acceptable Means of Compliance (AMC). (b) For air systems that are being operated, supported or maintained, consideration should be given to how the information security aspects of the operating, supporting and maintaining processes affect air system safety. RTCA DO-355/EUROCAE ED-204 combined with arguments against JSP 440 should be used as an AMC.	Guidance Material (GM) can be found in Section 2.4 (2.4.6.1.1.1)
INSTRUMENTS: INSTALLATION		
CS 25.1321 Arrangement and Visibility	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1321a DELETED Issue 3	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1322 Flight Crew Alerting	AMC 25.1322	INTENTIONALLY BLANK
UK25.1322a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1323 Airspeed Indicating System	AMC 25.1323	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.1324 Flight Instruments External Probes	AMC 25.1324	INTENTIONALLY BLANK
CS 25.1325 Static Pressure Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1326 Pitot Heat Indication Systems	AMC25.1326	INTENTIONALLY BLANK
CS 25.1327 Direction Indicator	AMC 25.1327	INTENTIONALLY BLANK
CS 25.1329 Flight Guidance System	AMC No 1 to CS 25.1329 AMC No 2 to CS 25.1329	INTENTIONALLY BLANK
UK25.1329a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1331 Instruments Using A Power Supply	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1333 Instrument Systems	AMC 25.1333	INTENTIONALLY BLANK
CS 25.1337 Powerplant Instruments	INTENTIONALLY BLANK	INTENTIONALLY BLANK
ELECTRICAL SYSTEMS AND EQUIPMENT		
CS 25.1351 General	AMC 25.1351	INTENTIONALLY BLANK
CS 25.1353 Electrical Equipment and Installations	AMC 25.1353	INTENTIONALLY BLANK
CS 25.1355 Distribution System	AMC 25.1355	INTENTIONALLY BLANK
CS 25.1357 Circuit Protection Devices	AMC 25.1357	INTENTIONALLY BLANK
CS 25.1360 Precautions Against Injury	AMC 25.1360	INTENTIONALLY BLANK
CS 25.1362 Electrical Supplies for Emergency Conditions	AMC 25.1362	INTENTIONALLY BLANK
CS 25.1363	AMC 25.1363	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Electrical System Tests		
CS 25.1365 Electric Appliances, Motors and Transformers	AMC 25.1365	INTENTIONALLY BLANK
LIGHTS		
CS 25.1381 Instrument Lights	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1381a Where the Air System's intended role includes the use of crew-worn night vision devices, the crew workstation controls, indications and compartment lighting shall be compatible. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1381b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1383 Landing Lights	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1383a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1383b DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1385 Position Light System Installation	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1385a All Air Systems shall be equipped with sufficient illumination for night formation flying. Issue 7	INTENTIONALLY BLANK	On all Air Systems required to operate at night, the external lighting circuits may be controlled by a single master switch.
CS 25.1387 Position Light System Dihedral Angles	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1389	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Position Light Distribution and Intensities		
CS 25.1391 Minimum Intensities in The Horizontal Plane of Forward and Rear Position Lights	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1393 Minimum Intensities in Any Vertical Plane of Forward and Rear Position Lights	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1395 Maximum Intensities in Over-lapping Beams of Forward and Rear Position Lights	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1397 Colour Specifications	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1401 Anti-Collision Light System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1403 Wing Icing Detection Lights	AMC 25.1403	INTENTIONALLY BLANK
SAFETY EQUIPMENT		
CS 25.1411 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1411a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1411b First-Aid Kits Stowages for first-aid kits shall be provided on all Air System to the scale specified for the particular type of Air System. Issue 7	At least one first-aid kit should: (a) Be located as far to the rear as possible; (b) Be accessible from outside the Air System in the event of a crash landing; and (c) Have its location marked in accordance with DAP119A-0601-0 (latest edition).	INTENTIONALLY BLANK
UK25.1411c DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1411d	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
DELETED Issue 7		
CS 25.1415 Ditching Equipment	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1419 Ice Protection	AMC 25.1419	INTENTIONALLY BLANK
UK25.1419a The Air System vents and drains shall be designed or protected against blockage where the cause is a direct consequence of icing conditions. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1419b (a) In addition to the requirements of CS 25.1419, weapon systems carried by Air Systems in icing or snow shall not be adversely affected by accretions during carriage, release and jettison. (b) Ice accretion on weapons systems shall not hazard the Air System during use of the weapon system. Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1420 Supercooled Large Drop Icing Conditions	AMC 25.1420	INTENTIONALLY BLANK
CS 25.1421 Megaphones	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1423 Public Address System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1423a Public Address System, Pilot Priority Control Issue 7	Side tone should be available at the pilots' stations.	INTENTIONALLY BLANK
MISCELLANEOUS EQUIPMENT		
CS 25.1431 Electronic Equipment	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1433	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Vacuum Systems		
CS 25.1435 Hydraulic Systems	AMC 25.1435	INTENTIONALLY BLANK
CS 25.1436 Pneumatic Systems - High Pressure	AMC 25.1436	INTENTIONALLY BLANK
CS 25.1438 Pressurisation and Low Pressure Pneumatic Systems	AMC 25.1438	INTENTIONALLY BLANK
CS 25.1439 Protective Breathing Equipment	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1439a Protective Breathing Equipment Dependent on the role of the Air System, a supply of oxygen for smoke and fumes protection shall be required for a duration longer than that required by CS 25.1439 (b)(5). Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1439b Protective Breathing Equipment In addition to the requirements of CS 25.1439 and UK25.1439a, the equipment shall meet the requirements of UK25.1441 and UK25.1441a	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1441 Oxygen Equipment and Supply	AMC 25.1441	INTENTIONALLY BLANK
UK25.1441 Oxygen Systems Large Air System General Issue 7	INTENTIONALLY BLANK	These specifications define the physiological requirements for, and the design and installation of, Air System breathing systems employing stored gaseous oxygen (GOX), stored liquid oxygen (LOX) or oxygen generating systems as the breathing gas source. It considers general and physiological aspects of Air System breathing systems, as well as issues specific to the source of breathing gas, the type of system, and the role

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Requirement	Compliance	Guidance
		<p>of the Air System for which it is intended. Aspects of system testing are also covered. The requirements for aircrew (including pilots, co-pilots, communications operatives, loadmaster, etc) and passengers are defined herein. Typically, large Air System have a maximum differential pressure capability of around 55 kPa (8 psi). In this type of Air System, the crew (and passengers) normally breathe cabin air at pressurised cabin altitudes of up to 8000 feet, the degree of hypoxia experienced at this altitude having been deemed acceptable by service practice and international standards.</p>
<p>UK25.1441a Oxygen Equipment and Supply If certification with supplemental oxygen equipment is requested, the equipment shall prevent significant hypoxia following decompression of the pressure cabin to the maximum cabin altitude which can occur in flight.</p> <p>Issue 7</p>	<p>To achieve this, the equipment should meet the requirements of this clause and of:</p> <ul style="list-style-type: none"> (a) Protective breathing equipment – Smoke and Fumes (CS 25.1439, UK25.1439a-b) (b) Minimum mass flow of supplemental oxygen (CS 25.1443, UK25.1443a) (c) Equipment standards for the oxygen distributing system (CS 25.1445) (d) Equipment standards for oxygen dispensing units (CS 25.1447, UK25.1447a-b) (e) Breathing gas endurance (UK25.1447c) (f) Routine depressurised operations (where applicable) (UK25.1447d-j) (g) Means for determining use of oxygen (CS 25.1449) (h) Chemical Oxygen Generators (CS 25.1450) (i) Gas generating systems (UK25.1450a-h) (j) Protection of oxygen equipment from rupture (CS 25.1453) 	<p>INTENTIONALLY BLANK</p>
<p>CS 25.1443 Minimum Mass Flow of Supplemental Oxygen</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1443a Minimum Mass Flow of Supplemental Oxygen</p>	<p>The mean mask cavity pressure (averaged over the respiratory cycle) should increase linearly with the fall of cabin pressure altitude from 11582 m (38000 ft.) to</p>	<p>The alveolar oxygen tension (PAO₂) when 100% oxygen is breathed at ambient pressure falls below 7.3 kPa (55 mmHg) on exposure to</p>

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<p>In addition to CS 25.1443 (b), at cabin pressure altitudes between 38000 and 50000 feet pressure breathing with an oxygen mask shall be used to provide additional short-term protection against hypoxia.</p> <p>Issue 7</p>	<p>15240 m (50000 ft.). The mean mask cavity pressure should be within the range +0.1 to +1.0 kPa (0.75 to 7.5 mmHg) at 12192 m (40000 ft.), and within 4.0 to 4.5 kPa (30.0 to 33.8 mmHg) at 15240 m (50000 ft.).</p>	<p>altitudes above 40000 feet, this value of PAO2 being that below which tasks requiring complex hand-eye coordination are affected (it is equivalent to breathing air at about 10000 feet altitude). Continuous positive pressure breathing with 100% oxygen is employed above 40000 feet to provide short duration protection against hypoxia on decompression of the cabin and during subsequent emergency descent in the Air System.</p>
<p>CS 25.1445 Equipment Standards for the Oxygen Distributing System</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445a DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445b DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445c DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445d DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445e DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445f DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445g DELETED Issue 4</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1445h</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>

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Requirement	Compliance	Guidance
DELETED Issue 4		
UK25.1445i DELETED Issue 4	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1445j DELETED Issue 4	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1447 Equipment Standards for Oxygen Dispensing Units	AMC 25.1447	INTENTIONALLY BLANK
UK25.1447a Equipment Standards for Oxygen Dispensing Units If required in the Air System Specification, it is necessary for flight deck crew to wear masks routinely during certain phases of flight, the design of flight crew masks shall provide adequate comfort and robustness for long duration wear. Issue 7	AMC 25.1447	INTENTIONALLY BLANK
UK25.1447b Equipment Standards for Oxygen Dispensing Units It shall be possible for the crewmember to check the integrity of connections and the absence of leaks, as well as the functioning of the oxygen system on the ground before take-off. To enable the user to test the integrity of the breathing gas and the pressure breathing system up to and including the mask-to-face seal, for Air System operating above a pressure altitude of 38000 ft a facility whereby pressure breathing may be obtained by the operation of a manual control shall be provided, together with indication of zero or continuous flow. Issue 7	Verification of breathing gas connections to the pilot should be conducted prior to take-off by means of activating the press-to test. In Molecular Sieve Oxygen Concentrator (MSOC) systems the oxygen monitor should conduct necessary built-in-test functions to verify correct operation.	The presence of a flow indicator (typically a blinker showing white for flow and black for no flow) allows for leak detection in the components downstream of the regulator (including the mask) during press-to-test with breath held and gives visual indication of normal regulator function during the breathing cycle.

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<p>UK25.1447c Breathing Gas Endurance The quantity of oxygen carried shall be sufficient to provide a mixture of breathing air and oxygen of acceptable quality, or 100% oxygen, as required by the cabin altitude and the breathing demands of each crewmember. The equipment shall be capable of supplying the crew member(s) with breathing gas of appropriate composition and quality, at satisfactory pressure and flow, under all flight conditions and at all altitudes to which the Air System is required to operate.</p> <p>Issue 7</p>	<p>The quantity provided should be sufficient to meet the requirements under the more severe of the following conditions:</p> <p>(a) The maximum endurance of the Air System in the most critical case (for oxygen) in the roles specified, including any role in which the Air System is refuelled in flight.</p> <p>(b) A return to base after loss of cabin pressure at half the maximum range of the Air System.</p> <p>In both cases, account should be taken of the possible need to provide increased breathing pressure automatically to the mask in the event of a loss of cabin pressure at high altitude</p>	<p>See Section 2.4 (2.4.6.2.1)</p>
<p>UK25.1447d Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as required in the Air System Specification), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, the temperature of the inspired gas shall not induce discomfort or distraction.</p> <p>Issue 7</p>	<p>The temperature of the breathing gas at the mask should be within ± 10 °C of the cabin ambient temperature under both normal and emergency operating conditions.</p>	<p>It is probable that heat transfer between the cabin environment and the breathing gas distribution ducts will accomplish this. A temperature control system is unlikely to be necessary.</p> <p>Specialist MOD establishments such as the Royal Air Force Centre of Aviation Medicine (RAFCAM) need to be approached for further advice / guidance where required.</p>
<p>UK25.1447e Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as required in the Air System Specification), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, at cabin altitudes between 0 and 38000 ft the relationship between mask cavity pressures and respiratory demands (flows) shall be such as to reflect minimal impedance to respiration.</p>	<p>In systems which automatically provide positive pressure above 12,000 feet cabin altitude it should be possible to manually select positive pressure at lower cabin altitudes.</p> <p>The minimum pressure, maximum pressure and total change of pressure in the mask cavity over the respiratory cycle ("pressure swing") for the specified demand flows at altitudes up to 38000 ft. should not exceed the limits listed in Table 1. See Section 2.4 (2.4.6.3.1 Table 1)</p> <p>The maximum permissible breathing gas hose length should be agreed with the TAA.</p>	<p>In certain Air System installations using OBOGS as the primary gas source the pressures at which air is supplied to the OBOG at the low engine power settings associated with idle descent and engine idle on the ground may be insufficient to provide flow of product gas to an adequate pressure. To meet this requirement, it will be necessary to advise the airframe and engine manufacturers of the need for a minimum air supply pressure. The ideal minimum supply pressure at the inlet to the</p>

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Issue 7	<p>For systems using On Board Oxygen Generating Systems (OBOGS) as the primary gas source, the mask cavity pressures and pressure swings (which are an indication of the impedance to respiration imposed by the breathing system) should not normally exceed the limits listed in Table 1.</p> <p>At the worst-case (lowest) OBOGS supply pressure (engine idle power setting) the breathing system should be capable of meeting individual pulmonary ventilations of at least 25 L/min ATPD and peak inspiratory demands of at least 1.5 L/s (90 L/min) ATPD with mask cavity pressure swings not exceeding 1.5 kPa (6.0 in wg).</p>	<p>breathing regulator to attain a peak flow of 200 L/min is 100 kPag (15 psig). Specialist MOD establishments such as RAFCAM needs to be approached for further advice / guidance where required.</p>
<p>UK25.1447f Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as required in the Air System Specification), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, mask cavity pressures in excess of the requirements above (which may be induced by short-term effects, transient events or equipment failure) shall be limited to levels which do not cause distress or discomfort to the crew member.</p> <p>Issue 7</p>	<p>The rise of mask cavity pressure induced by realistic head movement (mask hose pumping) or the maximum rate of climb of the Air System should not exceed 0.25 kPa (1.0 in wg).</p>	<p>The performance of a breathing system on rapid decompression is to be initially tested using a suitable lung simulator. See Oxygen System Test Requirements. Specialist MOD establishments such as RAFCAM need to be approached for further advice / guidance where required.</p>
<p>UK25.1447g Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as directed by the TAA), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, there shall be minimal oscillatory activity in the mask cavity when the oxygen system is used – such activity is disconcerting for the crew member, may induce</p>	<p>The double amplitude of any oscillation of pressure within the mask cavity that lasts 0.25 seconds or longer should not exceed 0.06 kPa (0.25 in wg).</p>	<p>Mechanical tests of the oscillatory behaviour of a breathing gas system are made by the sudden application of various flow rates to the complete system through several different levels of resistance that simulate the range of impedances of the human respiratory tract to oscillatory behaviour. Test of the absence of unacceptable oscillatory behaviour needs to be made using human subjects. The subjects impose a variety of respiratory demands (rest, and light exercise with and without speech) on</p>

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Requirement	Compliance	Guidance
<p>hyperventilation and can interfere with verbal communications.</p> <p>Issue 7</p>		<p>the complete system (or at a minimum the breathing gas demand regulator, low pressure delivery system and oronasal mask) at ground level and at selected altitudes.</p>
<p>UK25.1447h Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as directed by the TAA), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, the equipment shall prevent any inadvertent admixture of greater than 2% cabin air with Air System supplied breathing gas (this does not include deliberate oxygen dilution as part of the breathing regulator function).</p> <p>Issue 7</p>	<p>The regulator should provide a positive pressure such that the pressure in the mask cavity does not fall below cabin ambient pressure at peak inspiratory flow rates of up to 1.2 L/s (72 L/min) ATPD at cabin altitudes above 12,000 feet (and preferably at all other altitudes). If positive pressure above 12,000 feet is provided automatically there should also be a means of selecting it manually at other cabin altitudes.</p>	<p>It is desirable for positive pressure to be present at all cabin altitudes for protection against smoke and fumes. A typical characteristic maintains the mean mask cavity pressure between 0.25 and 0.50 kPag (1.0 and 2.0 in wg) at cabin altitudes up to 38,000 feet.</p>
<p>UK25.1447i Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as directed by the TAA), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, the breathing system shall not impose excessive rebreathing of expired gas.</p> <p>Issue 7</p>	<p>The dead space of the mask volume should not exceed 0.2 litres.</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1447j Routine Depressurised Operations When oxygen equipment is to be used routinely by flight deck and rear crew (as directed by the TAA), for example during pre-oxygenation with 100% oxygen, or depressurised operations in cargo or parachute despatch, the equipment shall prevent pressure generated by trapped gas during rapid</p>	<p>The pressure in the mask cavity during and immediately after rapid decompression should not exceed that of the environment by more than 5.5kPa for longer than 50 ms.</p>	<p>The performance of a breathing system on rapid decompression is to be initially tested using a suitable lung simulator. See Oxygen System Test Requirements.</p>

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Requirement	Compliance	Guidance
<p>decompression from exceeding acceptable physiological limits.</p> <p>Issue 7</p>		
<p>CS 25.1449 Means for Determining Use of Oxygen</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1449a Means for Determining Use of Oxygen When directed by the TAA, oxygen system warnings and indications shall be provided at the crew stations. The warning of oxygen failure shall be provided on the Standard Warning System.</p> <p>Issue 7</p>	<p>(a) A means should be provided in the supply line to the regulator to give warning of a failure in a gaseous oxygen system. (b) MSOC systems should be provided with a low oxygen partial pressure sensing device or equivalent oxygen monitor.</p>	<p>The warning system will where possible or feasible be provided with a sensor or sensors to monitor breathing gas quality. Individual low-pressure warnings may not be required in systems where all the breathing gas is derived from a common source (eg an MSOC). In this instance a single system pressure warning may be sufficient. The low oxygen warning level needs to be set to ensure that the aircrew tracheal oxygen partial pressure does not fall below the values specified in Section CS 25.1443</p>
<p>CS 25.1450 Chemical Oxygen Generators</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1450a Gas Generating Systems If an Air System is fitted with an On-board Oxygen Generator (OBOG) based system producing oxygen-enriched breathing gas from pressurised engine bleed air and/or from an auxiliary source of pressurised air, aircrew (and passengers, if applicable) shall be physiologically protected in the event of a failure in the OBOG or its air supply.</p> <p>Issue 7</p>	<p>A back-up supply of gaseous oxygen should be provided for use during temporary loss of supply pressure to the Molecular Sieve Oxygen Concentrator (MSOC) or failure of the MSOC to provide physiologically acceptable breathing gas as required by CS 25.1443</p>	<p>The back-up source needs to be of sufficient quantity to meet the breathing demands of Air System personnel under representative workloads during a descent to a cabin altitude at which it is physiologically acceptable to breathe air at ambient pressure (typically 8,000 feet).</p>
<p>UK25.1450b Gas Generating Systems If an Air System is fitted with an OBOGS , back pressure in the vent path of the molecular sieve beds shall be minimised, as any back pressure will</p>	<p>If vent ducts are required they should be sized and routed to offer minimal impedance to vent flows, such that the MSOC vent port references true Air System ambient pressure.</p>	<p>This requirement applies in particular to systems in which vent ducts are fitted to the MSOC. In many installations the MSOC is located in an unpressurised bay and the beds may be freely vented into the compartment.</p>

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Requirement	Compliance	Guidance
<p>reduce OBOG performance and product gas oxygen concentration.</p> <p>Issue 7</p>		<p>When the on-line bed becomes saturated with nitrogen, the bleed air is switched to another bed to ensure a continuous delivery of product gas. The off-line bed is then rapidly de-pressurised to Air System ambient pressure and the regeneration step completed by flowing a proportion of the product gas back through the vented bed. If a vent duct is necessary to pipe vent gas to Air System altitude, then any backpressure will reduce MSOC performance.</p>
<p>UK25.1450c Gas Generating Systems If an Air System is fitted with an OBOG based system, the installation shall be designed such that contamination (eg by oil and fuel vapours, combustion products or particulate matter) in the compressed air (engine bleed air) supply to the OBOG is minimised and preferably eliminated.</p> <p>Issue 7</p>	<p>Consideration should be given to the installation of filters to prevent particulate matter (a) entering the MSOC, and (b) being carried to the breathing mask(s) (in accordance with STANAG 7187).</p>	<p>An MSOC system acts to remove contaminants which may be present, not least because ~80% of the supply air is vented overboard as nitrogen-rich exhaust, but also because the molecular sieve beds act as efficient filters. However, in “filtering” any contaminants from the gas stream the efficiency of the MSOC in terms of oxygen enrichment (nitrogen removal) may be adversely affected. Also, after in-service exposure to a harsh operating environment there is a risk of small particles of sieve material being carried in the breathing gas unless outlet filtering is present in the MSOC unit. Further guidance is available in ASIC ADV PUB ACS (ASMG) 4060).</p>
<p>UK25.1450d Gas Generating Systems If an Air System is fitted with an OBOG based system, the installation shall be designed such that the frequency and quantity of free water entering an OBOG is minimised and preferably eliminated.</p> <p>Issue 7</p>	<p>A water separator/extractor device should be installed if analysis of the operating envelope of the system indicates that free water is likely to evolve at the MSOC inlet. The system should be designed such that the operating temperature and pressure of the water separator/extractor relative to those of the MSOC itself are conducive to the extraction of water from the MSOC air supply. The bleed air or other air supply system should be fitted with adequate and sufficient drains to prevent the collection of condensate in the pipe work or other parts of the supply system. Consideration should</p>	<p>The molecular sieve materials used in MSOC applications typically have an affinity with substances other than nitrogen, water being principal amongst these (indeed such sieves are also used in desiccant applications). The contaminant substances block the receptor sites in the molecular lattice, thus reducing the sieve's effectiveness at nitrogen adsorption. It is also highly desirable to minimise the quantity of water vapour in the supply gas to the MSOC because of the possibility of condensation</p>

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Requirement	Compliance	Guidance
	be given to the provision of at least one U-bend in the supply pipe work with a drain at its lowest point.	under certain temperature conditions (see Clause UK25.1450e below).
<p>UK25.1450e Gas Generating Systems If an Air System is fitted with an OBOG based system, the installation shall be designed such that temperature differences between the MSOC beds and the ambient environment do not give rise to water condensation in the beds.</p> <p>Issue 7</p>	<p>The climate/environment in which the Air System will operate should be considered and if necessary heating or lagging of the MSOC or its compartment should form part of the installation.</p>	<p>It is preferable that during operation the MSOC temperature is kept stable, and not allowed to cool below the ambient or air supply temperature. MSOC performance is generally optimised at an air supply and ambient temperature of 20°C. Performance can be expected to change with decreasing or increasing temperatures from this point.</p>
<p>UK25.1450f Gas Generating Systems If an Air System is fitted with an OBOG based system, the management of the air supply to the MSOC shall be such that all contaminants harmful to the molecular sieve are minimised or eliminated.</p> <p>Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK25.1450g Gas Generating Systems If an Air System is fitted with an OBOG based system, the need for filters shall be minimised by design.</p> <p>Issue 7</p>	<p>Where required efficient filters, designed to minimise pressure losses (especially in MSOC systems) should be provided to prevent the ingress of foreign matter. Filter elements should be readily removable for cleaning or replacement.</p>	<p>Where filters are fitted they will be readily accessible to permit replacement and inspection.</p>
<p>UK25.1450h Gas Generating Systems If an Air System is fitted with an OBOG based system, a particulate filter shall be incorporated downstream of the molecular sieve beds.</p> <p>Issue 7</p>	<p>Tests should be made of the filter element and of the MSOC package to demonstrate compliance. The filter element should be rated at no greater than 1 micron (< 1µm).</p>	<p>Filters need to be readily accessible to permit replacement and inspection.</p>
<p>CS 25.1453 Protection of Oxygen Equipment from Rupture</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>CS 25.1455</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>

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Requirement	Compliance	Guidance
Draining of Fluids Subject to Freezing		
CS 25.1457 Cockpit Voice Recorders Issue 7	AMC 25.1457	INTENTIONALLY BLANK
CS 25.1459 Flight Recorders	AMC 25.1459	INTENTIONALLY BLANK
UK25.1459a Underwater Locating Devices (ULD) At least two ULDs shall be installed in service Air Systems, such that: (a) They are afforded free contact with the water on immersion; (b) They do not separate from the recording device or airframe when subjected to shock impact. (c) The sonic energy is best transferred to the surroundings. Issue 7	(a) One low-frequency ULD should be secured to the airframe and should operate iaw SAE AS6254 (latest edition). (b) Additional high-frequency ULDs, operating iaw SAE AS8045 (latest edition), should be securely attached to: (1) The Crash Survivable Memory Unit (CSMU), for Air Systems fitted with a Health and Usage Monitoring System (HUMS) which records parameters relevant to post-crash analysis. (2) Both the Flight Data Recorder (FDR) and a Cockpit Voice Recorder (CVR), for Air Systems fitted with both an FDR and a CVR in separate crash protected units. (3) The airframe in the area of the cockpit, for Air Systems not fitted with HUMS or FDR/CVR.	INTENTIONALLY BLANK
CS 25.1460 Data link recorders Issue 8	AMC 25.1460	INTENTIONALLY BLANK
CS 25.1461 Equipment Containing High-Energy Rotors	INTENTIONALLY BLANK	INTENTIONALLY BLANK DELETED Issue 7
SUBPART G - OPERATING LIMITATIONS AND INFORMATION		
CS 25.1501 General	AMC 25.1501	INTENTIONALLY BLANK
OPERATING LIMITATIONS		
CS 25.1503	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Airspeed Limitations: General		
CS 25.1505 Maximum Operating Limit Speed	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1507 Manoeuvring Speed	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1511 Flap Extended Speed	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1513 Minimum Control Speed	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1515 Landing Gear Speeds	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1516 Other Speed Limitations	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1517 Rough Air Speed, VRA	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1519 Weight, Centre of Gravity and Weight Distribution	AMC 25.1519	INTENTIONALLY BLANK
CS 25.1521 Powerplant Limitations	AMC 25.1521	INTENTIONALLY BLANK
CS 25.1523 Minimum Flight Crew	AMC 25.1523	INTENTIONALLY BLANK
CS 25.1525 Kinds of Operation	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1527 Ambient Air Temperature and Operating Altitude	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1527a	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		
CS 25.1529 Instructions for Continued Airworthiness	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1529a	INTENTIONALLY BLANK	INTENTIONALLY BLANK
DELETED Issue 7		

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Requirement	Compliance	Guidance
CS 25.1531 Manoeuvring Flight Load factors	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1533 Additional Operating Limitations	AMC 25.1533	INTENTIONALLY BLANK
UK25.1533a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1535 ETOPS Design Approval	INTENTIONALLY BLANK	INTENTIONALLY BLANK
MARKINGS AND PLACARDS		
CS 25.1541 General	AMC 25.1541	INTENTIONALLY BLANK
UK25.1541a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1543 Instrument Markings; General	AMC 25.1543	INTENTIONALLY BLANK
CS 25.1545 Airspeed Limitation Information	AMC 25.1545	INTENTIONALLY BLANK
CS 25.1547 Magnetic Direction Indicator	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1549 Powerplant Instruments	AMC 25.1549	INTENTIONALLY BLANK
CS 25.1551 Oil Quantity Indicator	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1553 Fuel Quantity Indicator	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1555 Control Markings	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1555a Emergency Controls (a) CS 25.1555(d)(1) shall not apply. It is inappropriate for Part 5 Air System.	The stripes on the emergency controls should be 5mm +/- 1mm wide, separated by black bands twice as wide. At least two complete yellow stripes will appear on any emergency control.	(a) Liferaft release, flotation controls and fire extinguisher buttons will be classed as emergency controls and will be coloured accordingly.

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Requirement	Compliance	Guidance
(b) Emergency controls shall be coloured matt black with diagonal golden yellow stripes. When electrical switches are emergency controls, an area of at least 25mm square around each shall bear the appropriate emergency colour markings. Issue 7		(b) Golden-yellow is referenced as BS381 No 356.
CS 25.1557 Miscellaneous Markings and Placards	AMC 25.1557	INTENTIONALLY BLANK
UK25.1557a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1561 Safety Equipment	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1563 Airspeed Placard	INTENTIONALLY BLANK	INTENTIONALLY BLANK
AIR SYSTEM FLIGHT MANUAL		
CS 25.1581 General	AMC 25.1581	INTENTIONALLY BLANK
CS 25.1583 Operating Limitations	AMC 25.1583	INTENTIONALLY BLANK
CS 25.1585 Operating Procedures	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1587 Performance Information	AMC 25.1587	INTENTIONALLY BLANK
Supplementary Information		
CS 25.1591 Performance Information for Operations with Contaminated Runway Surface Conditions	AMC 25.1591	INTENTIONALLY BLANK
CS 25.1593 Exposure to Volcanic Cloud Hazards	AMC 25.1593	INTENTIONALLY BLANK
SUBPART H - ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS)		
CS 25.1701 Definitions	AMC 25.1701	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
UK25.1701a EWIS - Fibre Optic Systems For UK military Air Systems, fibre optics shall be included under the general description of EWIS. Issue 7	Fibre optic EWIS should be evaluated under: (a) EWIS - AP 101A-0005-1 (latest edition). (b) Fibre optics - AP 101A-0006-1 (latest edition).	INTENTIONALLY BLANK
CS 25.1703 Function and Installation; EWIS	AMC 25.1703	INTENTIONALLY BLANK
CS 25.1705 System and Functions; EWIS	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK25.1705a System and Functions; EWIS, Additional Systems The military systems that shall also be included are Ordinance, Munitions and Explosive (OME) and AAR. Issue 7	INTENTIONALLY BLANK	Refer to Part 13.
CS 25.1707 System Separation; EWIS	AMC 25.1707	INTENTIONALLY BLANK
UK25.1707a DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1709 System Safety; EWIS	AMC 25.1709	INTENTIONALLY BLANK
CS 25.1711 Component Identification; EWIS	AMC 25.1711	INTENTIONALLY BLANK
CS 25.1713 Fire Protection; EWIS	AMC 25.1713	INTENTIONALLY BLANK
CS 25.1715 Electrical Bonding and Protection Against Static Electricity; EWIS	AMC 25.1715	INTENTIONALLY BLANK
CS 25.1717 Circuit Protective Devices; EWIS	AMC 25.1717	INTENTIONALLY BLANK
CS 25.1719 Accessibility Provisions; EWIS	AMC 25.1719	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
CS 25.1721 Protection of EWIS	AMC 25.1721	INTENTIONALLY BLANK
CS 25.1723 Flammable Fluid Protection; EWIS	AMC 25.1723	INTENTIONALLY BLANK
CS 25.1725 Powerplants; EWIS	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1727 Flammable Fluid Shutoff Means; EWIS	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1729 Instructions for Continued Airworthiness; EWIS	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25.1731 Powerplant and APU Fire Detection System; EWIS	INTENTIONALLY BLANK	INTENTIONALLY BLANK
SUBPART J - AUXILIARY POWER UNIT INSTALLATIONS		
GENERAL		
CS 25J901 Installation	AMC 25J901	INTENTIONALLY BLANK
CS 25J903 Auxiliary Power Unit	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J939 APU Operating Characteristics	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J943 Negative Acceleration	AMC 25J943	INTENTIONALLY BLANK
FUEL SYSTEM		
CS 25J951 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J952 Fuel System Analysis and Test	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J953 Fuel System Independence	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J955 Fuel Flow	AMC 25J955	INTENTIONALLY BLANK
CS 25J961	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Fuel System Hot Weather Operation		
CS 25J977 Fuel Tank Outlet	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J991 Fuel Pumps	AMC 25J991	INTENTIONALLY BLANK
CS 25J993 Fuel System Lines and Fittings	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J994 Fuel System Components	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J995 Fuel Valves	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J997 Fuel Strainer or Filter	INTENTIONALLY BLANK	INTENTIONALLY BLANK
OIL SYSTEM		
CS 25J1011 Oil System General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1017 Oil Lines and Fittings	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1019 Oil Filter	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1021 Oil System Drains	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1023 Oil Radiators	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1025 Oil Valves	INTENTIONALLY BLANK	INTENTIONALLY BLANK
COOLING		
CS 25J1041 General	AMC 25J1041	INTENTIONALLY BLANK
CS 25J1043 Cooling Tests	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1045 Cooling Test Procedures	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
AIR INTAKE AND BLEED AIR DUCT SYSTEMS		
CS 25J1091 Air Intake	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1093 Air Intake System Icing Protection	AMC 25J1093	INTENTIONALLY BLANK
CS 25J1103 Air Intake System Ducts	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1106 Bleed Air Duct systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
EXHAUST SYSTEM		
CS 25J1121 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1123 Exhaust Piping	INTENTIONALLY BLANK	INTENTIONALLY BLANK
APU CONTROLS AND ACCESSORIES		
CS 25J1141 APU Controls	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1163 APU Accessories	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1165 APU Ignition Systems	INTENTIONALLY BLANK	INTENTIONALLY BLANK
APU FIRE PROTECTION		
CS 25J1181 Designated Fire Zone	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1183 Lines, Fittings and Components	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1185 Flammable Fluids	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1187 Drainage and Ventilation of fire Zones	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1189 Shut-Off Means	AMC 25.1189	INTENTIONALLY BLANK
CS 25J1191	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Firewalls		
CS 25J1193 APU Compartment	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1195 Fire Extinguishing Systems	AMC 25J1195	INTENTIONALLY BLANK
CS 25J1197 Fire Extinguishing Agents	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1199 Extinguishing Agent Containers	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1201 Fire Extinguishing System Materials	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1203 Fire-Detector System	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1207 Compliance	INTENTIONALLY BLANK	INTENTIONALLY BLANK
GENERAL		
CS 25J1305 APU Instruments	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1337 APU Instruments	INTENTIONALLY BLANK	INTENTIONALLY BLANK
OPERATING LIMITATIONS		
CS 25J1501 General	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1521 APU Limitations	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1527 Ambient Air Temperature and Operating Altitude	INTENTIONALLY BLANK	INTENTIONALLY BLANK
MARKINGS AND PLACARDS		
CS 25J1549 APU Instruments	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1551 Oil Quantity Indicator	INTENTIONALLY BLANK	INTENTIONALLY BLANK
CS 25J1557	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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Requirement	Compliance	Guidance
Miscellaneous Markings and Placards		
AIR SYSTEM FLIGHT MANUAL		
CS 25J1583 Operating Limitations	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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CS 25 APPENDICIES		
Appendix A Basic Landing Gear Dimension Data	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix C Part I - Atmospheric Icing Conditions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix C Part II - Airframe Ice Accretions		
Appendix D Criteria for Determining Minimum Flight Crew	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix F Part I – Test Criteria and Procedures for Showing Compliance with CS 25.853, 25.855 or 25.869	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix F Part II – Flammability of Seat Cushions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix F Part III – T Test Method to Determine Flame Penetration Resistance of Cargo Compartment Liners	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix F Part IV – Test Method to Determine the Heat Release Rate from Cabin Materials Exposed to Radiant Heat	AMC to Appendix F, Part IV	INTENTIONALLY BLANK
Appendix F Part V – Test Method to Determine the Smoke Emission Characteristics of Cabin Materials	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix F Part VI – Test Method to Determine the Flammability and Flame Propagation Characteristics of Thermal/Acoustic Insulation Materials	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix F Part VII – Test Method to Determine the Burn through Resistance of Thermal/Acoustic Insulation Materials	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix H Instructions for Continued Airworthiness	AMC to Appendix H	Any Civil Derived Limits of Validity (LOV) for an Air System will be revisited to take into account

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		the military usage and role and the impact it may have on the LOV. Additionally, each mandatory modification time, replacement time, structural inspection interval and related structural inspection procedure approved will also consider military usage and role.
Appendix I Automatic Take-off Thrust Control System (ATTCS)	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix J Emergency Demonstration	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix K Interaction of Systems and Structure	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix L Proof and Ultimate Strength	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix M Fuel Tank Flammability Reduction Means (FRM)	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix N Fuel Tank Flammability Exposure	AMC to Appendix N	INTENTIONALLY BLANK
Appendix O Supercooled Large Drop icing conditions Part I - Meteorology	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix O Supercooled Large Drop icing conditions Part II - Airframe ice accretions	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix P Mixed Phase and Ice Crystal Icing Envelope (Deep Convective Clouds)	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix Q Additional airworthiness requirements for approval of a Steep Approach Landing (SAL) capability	AMC to Appendix Q	INTENTIONALLY BLANK
Appendix R HIRF Environments and Equipment HIRF Test Levels	INTENTIONALLY BLANK	INTENTIONALLY BLANK
Appendix S Airworthiness Requirements for Non-Commercially Operated Air System and Low-Occupancy Air System	AMC to Appendix S	INTENTIONALLY BLANK

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2.3 Certification Specifications, Acceptable Means of Compliance and Guidance, Military Specific Not CS 25 Related

Requirement	Compliance	Guidance
2.3.1 GENERAL		
UK5.3.1.1 DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK5.3.1.3 DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK5.3.1.5 DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
UK5.3.1.7 DELETED Issue 7	INTENTIONALLY BLANK	INTENTIONALLY BLANK
OXYGEN SYSTEM TEST REQUIREMENTS		
UK5.3.1.9 Oxygen System Test Requirement Qualification testing is the process of verifying and declaring conformance with each requirement of the customer's equipment specification. Issue 7	Environmental testing should be performed to the requirements of BS 3G 100 or equivalent as directed by the TAA.	Qualification may be achieved by test of a production standard system or unit, by analogy/design with similar equipment or by analysis. An alternative method is for the equipment to be cleared by in-service experience following satisfactory completion of a risk based assessment.
UK5.3.1.11 Oxygen System Test Requirement	Functional testing should be performed to the requirements of ASIC AIR STD ACS (ASMG) 4038 (Physiological Evaluation of Air System Oxygen Delivery Systems) or equivalent as directed by the TAA. The pre	Clearance of the system or unit under test to any one qualification test is achieved by demonstration of satisfactory performance of the unit under test for key performance

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Requirement	Compliance	Guidance
<p>The test parameters and environment shall be selected to stress the equipment in the way that reflects worst-case conditions.</p> <p>Issue 7</p>	<p>and post qualification tests performed to verify that no permanent damage results from the qualification test conditions provides the clearance for that qualification environment. The pre and post tests should comprise critical performance parameters that the qualification tests are likely to stress.</p> <p>Functional endurance test work should form part of qualification testing. This may be performed as part of the system.</p>	<p>parameters before and after each qualification test to demonstrate that no significant degradation has occurred. When operation of the test item is required during the test exposure, suitable tests will be performed to determine whether the test exposure is producing changes in performance when compared with pre and post-test data.</p>
<p>UK5.3.1.13</p> <p>Oxygen System Test Requirement</p> <p>Where full Formal qualification of the equipment cannot be performed prior to first flight, then there shall be, at minimum, sufficient testing performed to provide evidence for safe development flying.</p>	<p>This testing should stress the unit to the worst conditions stated in the respective equipment specification.</p>	<p>Typically, Preliminary qualification endurance testing need to be performed as a simple functional test in real time, preferably in conjunction with other components in the system. Formal qualification endurance testing is a real-time test as in the preliminary endurance test but may incorporate the application of realistic vibration levels.</p>
<p>UK5.3.1.15</p> <p>Oxygen System Test Requirement</p> <p>Following engineering Qualification Testing of a life support related system; its performance shall be verified by testing with human subjects.</p> <p>Issue 7</p>	<p>Minimum requirements are contained in ASIC AIR STANDARD ACS (ASMG) 4038 (Physiological Evaluation of Air System Oxygen Delivery Systems).</p> <p>At least three examples of mask/regulator combinations covering the minimum, mean and maximum values of:</p> <ul style="list-style-type: none"> (a) impedance to breathing, (b) safety pressure, and (c) pressure breathing characteristics (if applicable) should be tested with human subjects. 	<p>Machine-based testing as is typically used in engineering qualification testing cannot easily simulate certain aspects of human physiology (such as gas diffusion between lung gases and the blood, or the impedance to flow of the respiratory tract), nor can it cover the variation in physiology that might be expected in the aircrew population. It is therefore mandatory to demonstrate satisfactory performance with human subjects unless it can be shown, to the satisfaction of the TAA and his/her aeromedical advisors, that the system is sufficiently comparable to existing in-service or qualified equipment for such testing to be unnecessary.</p>

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Requirement	Compliance	Guidance
		<p>All aspects of testing with human subjects (eg subject selection and training, suitability of test facility, test protocols, ethical considerations) will be in accordance with national standards in the country in which testing will take place. In the UK such aspects will be subject to prior approval by a nationally-recognized Research Ethics Committee. Advice may also be sought from the RAF Centre of Aviation Medicine.</p>
<p>UK5.3.1.17</p> <p>Oxygen System Test Requirement</p> <p>Human subject testing shall verify performance of the system under abnormal Air System conditions for which the equipment was designed.</p>	<p>The test parameters employed should cover any relevant abnormal events including (but not limited to) cockpit / cabin decompression, low temperature environment, operation of backup and / or emergency systems.</p> <p>Testing should be as representative as is safely possible of realistic conditions in the Air System at the time of the abnormal event. Actual aircrew drills should be followed for abnormal system operation, as far as is practicable in the test environment, in order to verify their suitability.</p>	<p>Changes in equipment operating mode requiring particular attention are, for example, changes in breathing regulator outlet pressure characteristic / breathing gas mixture at certain cockpit / cabin altitudes, changes in demand flow due to auxiliary loads (eg demisting), or changes in cyclic control of MSOC units.</p>
<p>UK5.3.1.19</p> <p>Oxygen System Test Requirement</p> <p>Human subject testing shall demonstrate satisfactory steady-state and dynamic performance of the Air System life support system in accordance with the physiological requirements set out in Clause UK25.1443 and UK25.1447d-j.</p>	<p>Tests should be defined covering breathing impedance, stability, and prevention of hypoxia. A representative range of breathing rates and flows should be tested. Safety permitting, these rates and flows should be tested both with the subject at rest and with the subject undergoing a work rate representative of the workloads to be encountered by aircrew during Air System operations.</p> <p>In both cases (resting & working), a period of testing in which the subject speaks or reads aloud should be included.</p>	<p>A cycle ergo meter is typically used to establish different subject work rates in a controlled and reproducible manner. Reading aloud is included so that the high inspiratory peak flows and rates of change of flow that are characteristic of human speech may be tested. A standardised test may be used to demonstrate breathing system stability. This consists of 50 breaths at rest, 50 breaths at rest with speech, 50 breaths at light to moderate work rate (50 - 80W), and 50 breaths at this work rate with speech. This test is repeated with 5 different human subjects and is</p>

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Requirement	Compliance	Guidance
		usually conducted at ground level (since experience has shown that instabilities are more likely to occur with the densest gas). However, additional stability tests may be necessary at altitude for particular systems. It is important that the AEA used for stability testing is fully representative of that to be worn by aircrew. Instrumentation used will not alter the characteristics of the system and typically consists of a single transducer measuring mask cavity pressure, with a flat response to at least 100Hz.
<p>UK5.3.1.21</p> <p>Oxygen System Test Requirement</p> <p>Human subject testing shall demonstrate that satisfactory performance of the Air System life support system is not limited to a particular set of physiological characteristics.</p>	<p>Each test case should be satisfactorily completed at least twice, using a different human subject for each run.</p> <p>In all applications, aeromedical advice should be sought as to the minimum number of human subjects for each test case necessary to verify satisfactory performance of the system.</p>	<p>It is preferable to carry out each test multiple times using a range of human subjects whose relevant physiological characteristics cover the extremes of the intended aircrew population. However, it is recognized that logistics, cost and the availability or otherwise of a sufficient number of suitable subjects may render this impracticable.</p>
<p>TRANSPORT AIR SYSTEM ROLE EQUIPMENT</p>		
<p>UK5.3.1.23</p> <p>DELETED Issue 7</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>
<p>UK5.3.1.24</p> <p>DELETED Issue 3</p>	<p>INTENTIONALLY BLANK</p>	<p>INTENTIONALLY BLANK</p>

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2.4 General Military Acceptable Means of Compliance (AMC) and Guidance (Additional To CS AMC)

Index	Detail
2.4.1	SUBPART A – GENERAL
2.4.2	SUBPART B — FLIGHT
2.4.2.1	UK 25.143a
2.4.2.1.1	Figure 1: Handling Qualities Rating Scale

Index	Detail																																						
	<div style="text-align: center;"> <h3>Handling Qualities Rating Scale</h3> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Aircraft Characteristics</th> <th style="width: 30%;">Demands on the Pilot in selected Mission Task Element or Required Operation*</th> <th style="width: 10%;">Pilot Rating</th> <th style="width: 30%;">Handling Qualities Level</th> </tr> </thead> <tbody> <tr> <td>Excellent – highly desirable</td> <td>Pilot compensation not a factor for desired performance</td> <td style="text-align: center;">1</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">①</td> </tr> <tr> <td>Good – negligible deficiencies</td> <td>Pilot compensation not a factor for desired performance</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Fair – some mildly unpleasant deficiencies</td> <td>Minimal pilot compensation required for desired performance</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Minor but annoying deficiencies</td> <td>Desired performance requires moderate pilot compensation</td> <td style="text-align: center;">4</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">②</td> </tr> <tr> <td>Moderately objectionable deficiencies</td> <td>Adequate performance requires considerable pilot compensation</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Very objectionable but tolerable deficiencies</td> <td>Adequate performance requires extensive pilot compensation</td> <td style="text-align: center;">6</td> </tr> <tr> <td>Major deficiencies</td> <td>Adequate performance not attainable with maximum tolerable pilot compensation. Controllability not in question</td> <td style="text-align: center;">7</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">③</td> </tr> <tr> <td>Major deficiencies</td> <td>Considerable pilot compensation is required for control</td> <td style="text-align: center;">8</td> </tr> <tr> <td>Major deficiencies</td> <td>Intense pilot compensation is required to retain control</td> <td style="text-align: center;">9</td> </tr> <tr> <td>Major deficiencies</td> <td>Control will be lost during some portion of the required operation</td> <td style="text-align: center;">10</td> <td></td> </tr> </tbody> </table> <p style="text-align: center; font-size: small;">* Definition of Required Operation involves designation of flight phase and/or sub-phases with accompanying conditions.</p> <p style="text-align: center; font-size: x-small;">Cooper-Harper Ref NASA TND.5153</p>	Aircraft Characteristics	Demands on the Pilot in selected Mission Task Element or Required Operation*	Pilot Rating	Handling Qualities Level	Excellent – highly desirable	Pilot compensation not a factor for desired performance	1	①	Good – negligible deficiencies	Pilot compensation not a factor for desired performance	2	Fair – some mildly unpleasant deficiencies	Minimal pilot compensation required for desired performance	3	Minor but annoying deficiencies	Desired performance requires moderate pilot compensation	4	②	Moderately objectionable deficiencies	Adequate performance requires considerable pilot compensation	5	Very objectionable but tolerable deficiencies	Adequate performance requires extensive pilot compensation	6	Major deficiencies	Adequate performance not attainable with maximum tolerable pilot compensation. Controllability not in question	7	③	Major deficiencies	Considerable pilot compensation is required for control	8	Major deficiencies	Intense pilot compensation is required to retain control	9	Major deficiencies	Control will be lost during some portion of the required operation	10	
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2.4.2.1.2	ADVISORY INFORMATION																																						
2.4.2.1.2.1	Qualitative assessment forms a major part of many tests and pilot opinion usually constitutes the principal means of assessing the acceptability of the handling characteristics exhibited.																																						
2.4.2.1.2.2	To avoid the possibility of bias, qualitative assessments are to be based (in all but minor matters) on the views of at least two pilots. However, minority views are not be disregarded, but the reasons for them resolved. Note is to be made of the prior experience of the pilots involved in the assessment, in terms of their flying hours in total, on the type or on similar types of Air Systems, and in particular role(s) involved.																																						

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2.4.2.1.2.3	To facilitate consistent expression and interpretation of pilot opinion, the Cooper-Harper Handling Qualities Rating Scale presented at Figure 1 may be adopted.																																										
2.4.2.1.2.4	In order to assess the significance of events (such as autopilot runaways) which cause a disturbance to the initial steady-flight conditions, it is necessary to take into account, inter alia, the time required for the relevant cues and/or warnings to be recognised by the pilot, and the subsequent time lapse before recovery action is initiated. The choice of appropriate cue recognition, warning and pilot response times will need to be based, ultimately, on the judgement of the pilots involved in the assessment.																																										
2.4.3	SUBPART C — STRUCTURE																																										
2.4.3.1	UK25.473b																																										
2.4.3.1.1	<p>Table 1: AIR SYSTEM PRIMARY STRESSING CASES</p> <table border="1" data-bbox="678 635 1693 1093"> <thead> <tr> <th>No.</th> <th>Case</th> <th>Vertical Force</th> <th>Drag Force</th> <th>Side Force</th> <th>Shock Absorber Closure</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Combined drag and side load</td> <td>R</td> <td>0.4R</td> <td>±0.25R</td> <td>30%</td> </tr> <tr> <td>2</td> <td>Side load inboard</td> <td>0.5R</td> <td>0</td> <td>0.4R</td> <td>50%</td> </tr> <tr> <td>3</td> <td>Side load outboard</td> <td>0.5R</td> <td>0</td> <td>0.3R</td> <td>50%</td> </tr> <tr> <td>4</td> <td>High drag and spring back</td> <td>0.8R</td> <td>±0.64R</td> <td>0</td> <td>15%</td> </tr> <tr> <td>5</td> <td>One-wheel landing</td> <td>R</td> <td>0.4R</td> <td>±0.25R</td> <td>30%</td> </tr> <tr> <td>6</td> <td>Rebound of un-sprung parts</td> <td>20W</td> <td>0</td> <td>0</td> <td>0%</td> </tr> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> For main units R = R_m. For nose units R = R_n. For auxiliary units R = R_a. <p>R Undercarriage design peak vertical reaction-any undercarriage unit. R_a Auxiliary unit design peak vertical reaction. R_m Main unit design peak vertical reaction. R_n Nose unit design peak vertical reaction.</p>	No.	Case	Vertical Force	Drag Force	Side Force	Shock Absorber Closure	1	Combined drag and side load	R	0.4R	±0.25R	30%	2	Side load inboard	0.5R	0	0.4R	50%	3	Side load outboard	0.5R	0	0.3R	50%	4	High drag and spring back	0.8R	±0.64R	0	15%	5	One-wheel landing	R	0.4R	±0.25R	30%	6	Rebound of un-sprung parts	20W	0	0	0%
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6	Rebound of un-sprung parts	20W	0	0	0%																																						

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	<p>W Weight of un-sprung parts.</p> <p>2. All side forces between zero and the values given are to be considered.</p> <p>3. Tyre closure appropriate to the vertical reaction may be assumed.</p> <p>4. For a unit on the centreline of the Air System, Case 2 will apply to both port and starboard, and will override Case 3.</p> <p>5. Cases 2, 3 and 5 do not apply to nose-wheels.</p> <p>6. In all cases, shock absorber closure may be determined by dynamic analysis, if preferred.</p> <p>7. In Cases 1 and 5, the value of the drag force co-efficient will be maintained at 0.4 until spin-up is complete but may be relaxed to zero thereafter.</p> <p>8. In Case 4, the value of the vertical force coefficient and of the drag force coefficient may be determined by dynamic analysis, starting from the design vertical velocity (V_v) on a surface having a coefficient of friction of 0.8, if preferred.</p>																																										
2.4.3.2	UK25.562a																																										
2.4.3.2.1	<p>Table 1: Design and Test Cases</p> <table border="1" data-bbox="687 826 1682 1398"> <thead> <tr> <th rowspan="2">Case No.</th> <th rowspan="2">Parts Affected</th> <th rowspan="2">Direction</th> <th colspan="2">Velocity Change</th> <th rowspan="2">Plateau Duration (millisecond)</th> </tr> <tr> <th>m/s</th> <th>ft/sec</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Cockpit</td> <td>longitudinal forward</td> <td>6.1</td> <td>20</td> <td>100</td> </tr> <tr> <td>2</td> <td>Cabin</td> <td>longitudinal forward</td> <td>12.1</td> <td>40</td> <td>100</td> </tr> <tr> <td>3</td> <td>All</td> <td>vertical down</td> <td>12.8</td> <td>42</td> <td>50</td> </tr> <tr> <td>4</td> <td>All</td> <td>lateral</td> <td>9.1</td> <td>30</td> <td>100</td> </tr> <tr> <td rowspan="2">5</td> <td rowspan="2">All</td> <td>vertical down</td> <td>12.8</td> <td>42</td> <td>50</td> </tr> <tr> <td>longitudinal forward</td> <td>8.2</td> <td>27</td> <td>100</td> </tr> </tbody> </table>	Case No.	Parts Affected	Direction	Velocity Change		Plateau Duration (millisecond)	m/s	ft/sec	1	Cockpit	longitudinal forward	6.1	20	100	2	Cabin	longitudinal forward	12.1	40	100	3	All	vertical down	12.8	42	50	4	All	lateral	9.1	30	100	5	All	vertical down	12.8	42	50	longitudinal forward	8.2	27	100
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Index	Detail						
		6	All	vertical down	4.3	14	50
				longitudinal forward	30.5	100	100
		7	Airframe & Seats	vertical down	7.9	26	50
		8	All Seats	vertical down	13.0	42.6	50
				longitudinal forward	7.6	35.0	100
				lateral	2.6	8.7	100
		9	All Seats	longitudinal forward	13.2	43.3	100
				lateral	7.6	25.0	100
		10	Crew Seats	vertical down	12.6	42.0	50

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2.4.4	SUBPART D — DESIGN AND CONSTRUCTION																																																																											
2.4.4.1	UK25.785b																																																																											
2.4.4.1.1	<p>Table 1: Limits of Human Tolerance</p> <table border="1" data-bbox="696 379 1727 778"> <thead> <tr> <th rowspan="2">Direction (See Note 1)</th> <th colspan="9">Impulse Duration (ms)</th> <th rowspan="2">Max Jerk (g/s) (see Note 2)</th> </tr> <tr> <th>1000</th> <th>500</th> <th>200</th> <th>100</th> <th>60</th> <th>40</th> <th>20</th> <th>10</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>Forward</td> <td>12</td> <td>17</td> <td>25</td> <td>33</td> <td>40</td> <td>45</td> <td>50</td> <td>60</td> <td>60</td> <td>500</td> </tr> <tr> <td>Aft</td> <td>20</td> <td>23</td> <td>30</td> <td>36</td> <td>38</td> <td>40</td> <td>45</td> <td>47</td> <td>47</td> <td>500</td> </tr> <tr> <td>Lateral</td> <td>(4)</td> <td>(5)</td> <td>(10)</td> <td>12</td> <td>(13)</td> <td>(14)</td> <td>(15)</td> <td>(16)</td> <td>(16)</td> <td>500</td> </tr> <tr> <td>Down</td> <td>5</td> <td>7</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> <td>500</td> </tr> <tr> <td>Up</td> <td>5</td> <td>7</td> <td>10</td> <td>12</td> <td>13</td> <td>14</td> <td>17</td> <td>18</td> <td>19</td> <td>100</td> </tr> </tbody> </table> <p>(1) Directions are those of the pilot's eyeball movement, during the impulse, relative to Air System axes.</p> <p>(2) Jerk is also known as 'aggravation' and 'onset rate'.</p> <p>(3) Forward, aft, down and up values have been taken from USARTL-TR-79-22B</p> <p>(4) For lateral accelerations the value 12 at 100 ms has been taken from USARTL-TR-79-22B. Other values have been derived by proportion using forward and aft values for comparison. These are bracketed.</p> <p>(5) The times given are the plateau durations. Total times will in each case be longer because of the time required for the initial jerk.</p> <p>(6) For design purposes acceleration factors given may be assumed to be whole-body tolerance limits for all seated, fully-restrained occupants</p>	Direction (See Note 1)	Impulse Duration (ms)									Max Jerk (g/s) (see Note 2)	1000	500	200	100	60	40	20	10	1	Forward	12	17	25	33	40	45	50	60	60	500	Aft	20	23	30	36	38	40	45	47	47	500	Lateral	(4)	(5)	(10)	12	(13)	(14)	(15)	(16)	(16)	500	Down	5	7	10	15	20	25	25	25	25	500	Up	5	7	10	12	13	14	17	18	19	100
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2.4.5	SUBPART E – POWERPLANT
2.4.6	SUBPART F — EQUIPMENT
2.4.6.1	UK25.1309b
2.4.6.1.1	<p>GM for DS970 Part 5 S2.2 UK25.1309b</p> <p>Guidance for this requirement is provided in four sections mirroring those for compliance.</p> <p>(a) Guidance for System-level Safety</p> <p>(1) Civil system developers apply SAE Aerospace Recommended Practices (ARP) to ensure that the system design is failure-tolerant and that a catastrophic failure condition (e.g. loss of aircraft) does not result from the failure of a critical function implemented in a PE component. For some airworthiness-related systems, correct data is a necessary and an essential component.</p> <p>(2) The associated Safety Assessment process defines the top-level Safety requirements and design objectives of the PE, as detailed in the guidance contained within ARPs 4761 and 4754A.</p> <p>(3) Data integrity can be a key component of Safe system behaviour. Further guidance relating to risk assessment and treatment of data integrity can be found in the Data Safety Guidance published by the Data Safety Initiative Working Group.</p> <p>Note: Data Safety is not further explicitly addressed in this clause. It would be expected that where data Safety risks are identified at this stage, they would be explicitly addressed by the applicant throughout the PE lifecycle. Use of the Data Safety Guidance is not a specific requirement of this clause; however, it can be used as guidance by the applicant to underpin the justification of their approach to data-related risk.</p> <p>(4) As required by Def Stan 00-056, the Safety Assessment Report provides a complete, evidence-based, robust, compelling, documented and auditable argument for all aspects of the safety-related PE, including providing evidence that the criticality of any previously developed PE remains valid, when used in the context of the Military Air Environment (MAE).</p> <p>(5) Both the Safety Assessment process and resulting Safety Assessment Report activities need to be cognizant of the security assessment requirement detailed below.</p> <p>(b) Guidance for Air System Safety-related Software (SRS)</p> <p>(1) The guidance in Def Stan 00-055 Issue 4 on the adoption of the RTCA DO-178 family identifies additional considerations relating to governance and shortfalls against the Def Stan 00-055 requirements. These need to be addressed along with any 'military delta' particular to the application.</p> <p>Note: Def Stan 00-055 permits the adoption of any Open Standards that meet Recognised Good Practice. If standards other than those detailed as AMC in this Clause are to be proposed, these would need to be discussed and agreed with the MAA in the form of an MCRI prior to adoption, in accordance with extant MAA regulatory policy.</p> <p>(2) For legacy software which is intended to be used in a new application, or as a significant development of an existing system, the acceptability of remaining with the legacy means of compliance is based on the principle that switching development activities to a different standard may inherently increase the risk of introducing errors into the software, due to applicants applying unfamiliar processes, methods or</p>

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	<p>techniques. Should this not be an issue for the applicant, it is acceptable to switch to the current AMC (i.e. RTCA DO-178C), provided that a complete and coherent assurance argument can be maintained for all the SRS.</p> <p>(3) When considering the use of software previously developed for civilian applications using civil aviation standards, including RTCA DO-178C, the applicant should note that some SRS components applied in the MAE would require additional mitigation, e.g. additional functional, design or physical independence. Where the appropriate functional, design or physical independence cannot be obtained, an alternate military SRS system design should be sought with either a higher-level of assurance chosen or the civil standard applied, but with additional assurance methods, in order to gain the necessary level of confidence to meet the requirements of Def Stan 00-055 Issue 4.</p> <p>(4) The re-use of previously developed Def Stan 00-055 Issue 2 or RTCA DO-178B (and DO-178A) SRS within a new or existing military airborne system can only be considered to be acceptable to the authority on a case-by-case basis. The SRS should be supported by documented evidence and a have a full audit trail of its development history.</p> <p>(c) Guidance for Air System Safety-related Electronic Hardware</p> <p>(1) Electronic Hardware can be broken into two distinct complexity categories, Simple Electronic Hardware (SEH) and Complex Electronic Hardware (CEH) also known as complex custom micro-coded components. Defining differences in complexity is based on the feasibility and level of difficulty necessary to accomplish acceptable verification coverage by deterministic means.</p> <p>i. SEH is identified as hardware only if a comprehensive combination of deterministic tests and analyses appropriate to the design assurance level can ensure correct functional performance under all foreseeable operating conditions with no anomalous behaviour. For SEH items, extensive documentation of the design process is unnecessary. The supporting processes of verification and configuration management are however required.</p> <p>ii. When an item cannot be classified as simple, it should be classified as CEH. Noting that an item completely constructed entirely from simple items may be itself CEH. This means that, if the item is so complex that it is impossible or impractical to test and analyse it completely, one must rely on design assurance to give confidence in its correct operation.</p> <p>(2) Any contractor using Safety-Related Electronic Hardware that has been previously developed and does not use RTCA DO-254/ED-80 or are proposing Alternative AMC as its means of compliance are required to justify the alternative means to the authority. Justification for the use of the alternative means of compliance must show that those means meet the safety objectives of the regulations and are supported by documented evidence, including a full audit trail of the development history of the Safety-related Electronic Hardware.</p> <p>(d) Guidance for Safety-related MCPs</p> <p>(1) For systems operating on Multicore Processors (MCPS) the objectives provided in RTCA DO-178C and RTCA DO-254 are deemed insufficient in providing assurance of correct behaviour. Until such time that AMC has been developed for their development, the applicant may produce an MCRI, for agreement by the authority, detailing their approach to MCP assurance. Useful guidance has been provided in CAST-32A .</p> <p>Note: although CAST-32A only applies to MCPs utilising more than one core, the applicant is guided to presenting an MCRI for MCP assurance regardless of the number of cores in use.</p>
2.4.6.1.1.1	<p>Guidance for Cyber Security Airworthiness:</p> <p>(a) It is necessary to ensure that platform cyber security vulnerabilities do not purposefully or accidentally threaten airworthiness.</p>

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	<p>(b) In keeping with threats to the continued Safe operation of SRS and Electronic Hardware, Def Stan 00-055 (Issue 3 and later) places a requirement to demonstrate that potential cyber security threats to safe operation are mitigated. Def Stan 00-055 highlights that JSP 440 provides guidance on security policy, but the latter does not specifically provide AMC for design assurance of the security aspects of airworthiness, therefore a combined approach is required.</p> <p>(c) It is recognised that RTCA DO-326A/ED-202A has been developed for use on large civil aircraft. As such, some tailoring of the guidance provided therein may be required for military air systems and the MAE.</p> <p>(d) As is the case for conventional software assurance, the level of airworthiness-related security assurance needs to be commensurate with the risk associated with failure. Usefully, some of the activities associated with safety assurance and airworthiness-related security overlap. It is therefore recommended that an integrated and coherent approach is taken to reduce unnecessary overheads.</p> <p>(e) As cyber security threats are dynamic by nature, it is now paramount to determine how cyber security is considered throughout the life-cycle of the Air System.</p>
2.4.6.2	UK25.1447c
2.4.6.2.1	<p>The rate of consumption of stored 100% oxygen may be calculated from the appropriate curves of the oxygen requirements for aircrew graph, in which allowance has been made for:</p> <ul style="list-style-type: none"> • Type of Air System • Number of aircrew • Mask leakage • Variations in work rate • Variations in regulators • Individual variation <p>The rate of consumption of 100% oxygen for use with an air-mix regulator is shown below in Figure 1 for a typical panel mounted air-mix regulator in curves 4, 5, & 6. As the Air System Specification may require the continuous use of 100% oxygen, the quantity of oxygen required will be calculated for both the use of air-mix and of 100% oxygen and the results reported to the TAA. Absolute oxygen endurance requirements vary with platform role and will need to be agreed with TAA. For example, a watch-keeping pilot may be required to use the oxygen system routinely during flight operations above 40,000ft.</p>

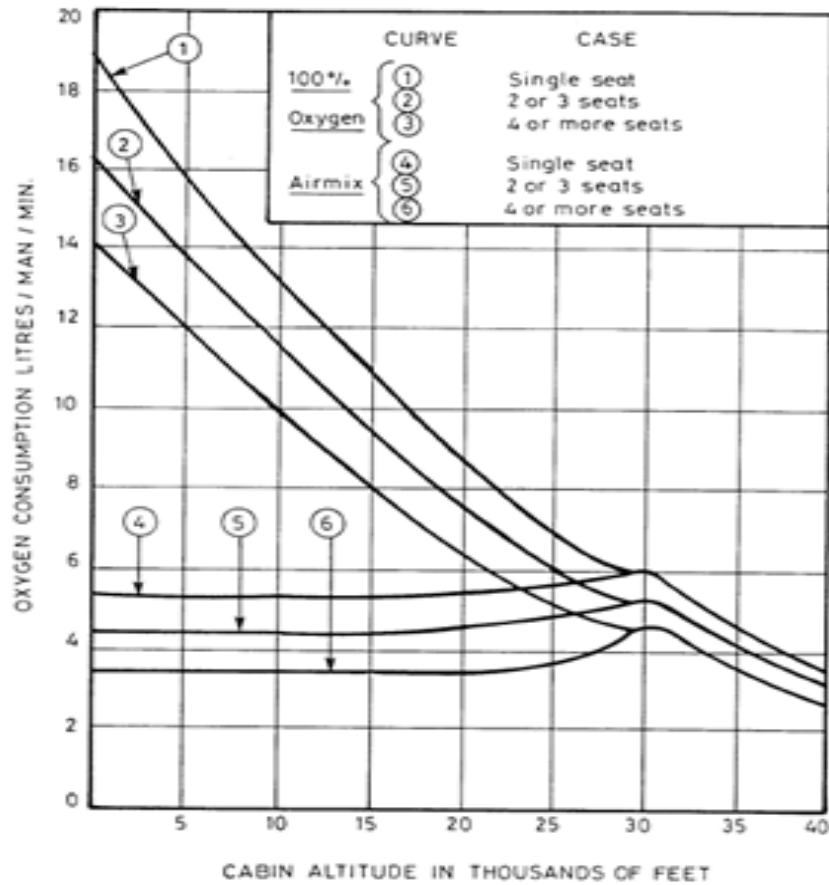


Figure 1. Rate of consumption of 100% oxygen for use with an air-mix regulator.
 Specialist MOD establishments such as RAFCAM will need to be approached for further advice / guidance where required.

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2.4.6.3	UK25.1447e																																															
2.4.6.3.1	<p>Table 1. Limits to mask cavity pressure at altitudes between 0 and 38000 feet.</p> <table border="1" data-bbox="353 323 1601 1002"> <thead> <tr> <th rowspan="2">Peak inspiratory and expiratory flows (litres ATPD per sec)</th> <th colspan="3">Mask Cavity Pressure kPa (in Wg)</th> </tr> <tr> <th colspan="2">Limits to</th> <th rowspan="2">Maximum swing</th> </tr> <tr> <th>Without Safety Pressure</th> <th>Minimum</th> <th>Maximum</th> <th></th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>-0.38 (-1.5)</td> <td>+0.38 (+1.5)</td> <td>0.50 (2.0)</td> </tr> <tr> <td>1.5</td> <td>-0.55 (-2.2)</td> <td>+0.65 (+2.6)</td> <td>0.85 (3.4)</td> </tr> <tr> <td>2.5</td> <td>-1.12 (-4.5)</td> <td>+1.00 (+4.0)</td> <td>1.75 (7.0)</td> </tr> <tr> <td>3.3</td> <td>-1.90 (-7.6)</td> <td>+1.50 (+6.0)</td> <td>3.00 (12.0)</td> </tr> <tr> <th>With Safety Pressure</th> <td></td> <td></td> <td></td> </tr> <tr> <td>0.5</td> <td>+0.02 (+0.1)</td> <td>+0.75 (+3.0)</td> <td>0.50 (2.0)</td> </tr> <tr> <td>1.5</td> <td>-0.20 (-0.8)</td> <td>+0.95 (+3.8)</td> <td>0.85 (3.4)</td> </tr> <tr> <td>2.5</td> <td>-0.90 (-3.5)</td> <td>+1.25 (+5.0)</td> <td>1.75 (7.0)</td> </tr> <tr> <td>3.3</td> <td>-1.75 (-7.0)</td> <td>+1.65 (+6.6)</td> <td>3.00 (12.00)</td> </tr> </tbody> </table>	Peak inspiratory and expiratory flows (litres ATPD per sec)	Mask Cavity Pressure kPa (in Wg)			Limits to		Maximum swing	Without Safety Pressure	Minimum	Maximum		0.5	-0.38 (-1.5)	+0.38 (+1.5)	0.50 (2.0)	1.5	-0.55 (-2.2)	+0.65 (+2.6)	0.85 (3.4)	2.5	-1.12 (-4.5)	+1.00 (+4.0)	1.75 (7.0)	3.3	-1.90 (-7.6)	+1.50 (+6.0)	3.00 (12.0)	With Safety Pressure				0.5	+0.02 (+0.1)	+0.75 (+3.0)	0.50 (2.0)	1.5	-0.20 (-0.8)	+0.95 (+3.8)	0.85 (3.4)	2.5	-0.90 (-3.5)	+1.25 (+5.0)	1.75 (7.0)	3.3	-1.75 (-7.0)	+1.65 (+6.6)	3.00 (12.00)
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2.4.7	SUBPART G – OPERATING LIMITATIONS AND INFORMATION																																															
2.4.8	SUBPART H – ELECTRICAL WIRING INTERCONNECTION SYSTEM																																															
2.4.9	SUBPART J – AUXILIARY POWER UNIT INSTALLATIONS																																															

Section 3

Please refer to Def Stan 00-970 part 0 Issue 23 for the master list of Normative references, Informative references, Definitions and Acronyms.

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