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JAR-1: DEFINITIONS AND ABBREVIATIONS

The attached pages for JAR-1 Change 5 should be incorporated as follows.

Remove the complete contents and replace with the attached pages.

It is suggested that you archive the old version as appropriate.

ADRIAN YOUNG
Assistant to Regulation Director

Joint Aviation Requirements

JAR-1

**Definitions
and Abbreviations**

Joint Aviation Requirements

JAR-1

Definitions and Abbreviations

Change 5
15 July 1996

The members of the Joint Aviation Authorities Committee are representatives of the Civil Aviation Authorities of the countries that have signed the 'Arrangements Concerning the Development and the Acceptance of Joint Aviation Requirements'. A list of these countries is kept by European Civil Aviation Conference, 3 bis Villa Emile Bergerat, 92522 NEUILLY SUR SEINE Cedex, France. A list of these countries* at the issue date of this document can be found at the end of this page.

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Enquiries regarding the contents should be addressed to the JAA Headquarters, Saturnusstraat 8-10, PO Box 3000, 2130 KA Hoofddorp, The Netherlands. (Fax. No. (31) (0) 23 5621714).

* These countries are:-

Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey & United Kingdom.

Amend the list of JAA member countries to read:

Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey & United Kingdom

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FOREWORD

- 1 The Civil Aviation Authorities of certain European countries have agreed common comprehensive and detailed aviation requirements (referred to as the Joint Aviation Requirements (JAR) with a view to minimising Type Certification problems on joint ventures, and also to facilitate the export and import of aviation products.
- [2 The JAR are recognised by the Civil Aviation Authorities of participating countries as an acceptable basis for showing compliance with their national airworthiness codes.]
- [3 This JAR-1 contains definitions and abbreviations of terms used in other JAR Codes. JAR-1 is based partly on those definitions contained in ICAO Annexes, and partly on the Federal Aviation Administration's FAR Part 1.]
- [4 Definitions which are identical to those in the ICAO Annexes are marked thus #. Definitions which are identical to those in FAR Part 1 are marked thus *.]
- 5 New, amended and corrected text is enclosed within heavy brackets.

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JOINT AVIATION REQUIREMENTS

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PREAMBLES

JAR-1

First Issue

Effective: 9.4.76

This issue of JAR-1 contains definitions and abbreviations pertinent to those Parts of JAR so far issued, hence no reference will be found, for example, to helicopters or helicopter engines.

JAR-1 will be amended as necessary when other Parts of JAR are issued.

Amendment 1

Effective: 30.11.77

Definitions of ' V_D/M_D ', ' V_{Tmax} ' and ' V_3 ' have been added.

Definitions of various terms and abbreviations used in the oxygen system requirements of JAR-25, Sub-part F, have been added.

Definitions of 'Fireproof', 'Fire-resistant' and 'Standard Flame' have been added.

A definition of 'Harness' has been added.

Amendment 2

Effective: 4.8.80

Definitions of 'TSO' and 'MIL Spec' have been added.

Definitions of 'Detent', 'Gate' and 'Safety Catch' have been added.

The definition of 'Accelerate-stop Distance' has been deleted.

A definition of ' V_1 ' has been added.

A definition of 'Notice of Proposed Amendment' has been added.

The definition of 'True Airspeed' has been amended.

Definitions of 'Sailplane' and 'Powered Sailplane' have been added.

Definitions of ' V_H ' and ' V_Y ' have been added.

A definition of 'NPA' has been added.

Amendment 3

Effective: 1.7.81

A definition of 'Normal operating differential pressure' has been added.

A definition of ' V_T ' has been added.

A definition of ' V_W ' has been added.

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Change 4

Effective: 1.6.87

The main purpose of this amendment is to incorporate the engine and propeller definitions which have been temporarily included in JAR-E. The definitions will be deleted from JAR-E by a future amendment.

Also, the definitions applicable to auxiliary power units from JAR-APU have been incorporated.

The following other amendments have also been made:-

An amendment to the JAR Secretariat address on page ii.

Addition of new paragraphs to the Foreword and revision of other paragraphs.

Incorporation of minor editorial improvements in several places.

Boxes have been put round the National Variants.

Addition of the definition of V_{S1g} .

Change 5

Effective 15.7.96

The main purpose of this Amendment is to incorporate the priority definitions contained in NPA 1-7. Many of these derive from the need for definitions following the adoption of JAR-OPS. NPA 1-5 'Rotorcraft definitions', drafted following the adoption of JAR-27 & JAR-29, is also incorporated in this amendment. A number of definitions arising from NPA 25D-181 Rev 3 & NPA 1-2 are included. NPA 25D-181 Rev 3 allows for the deletion of the remaining National Variants in JAR-1 (French NVs for Fireproof & Fire-resistant).

The following amendments have been made:-

An amendment to the addresses and the list of JAA member States on page ii.

Revision of the Foreword.

Incorporation of minor editorial improvements in several places.

A definition of 'Accepted/Acceptable' has been added, arising from NPA 1-7.

A definition of 'Aerial Work' has been added, arising from NPA 1-7.

The definition of 'Aircraft' has been amended, arising from NPA 1-7.

A definition of 'Aircraft Type' has been added, arising from NPA 1-7.

The definition of 'Approved' has been deleted, and is replaced by a definition of 'Approved by the Authority', arising from NPA 1-7.

The definition of 'Authority' has been amended, arising from NPA 1-7.

A definition of 'Autorotation' has been added, arising from NPA 1-5.

A definition of 'Auxiliary rotor' has been added, arising from NPA 1-5.

A definition of 'Category' has been added, arising from NPA 1-5 & NPA 1-7.

The definition of 'Category II operation' is deleted, arising from 'Category' in NPA 1-7.

A definition of 'Commercial Air Transportation' has been added, arising from NPA 1-7.
The definition of 'Commuter aeroplane category', introduced into OP 1/91/1 (NPA 1-4) is deleted, arising from NPA 1-7.

A definition of 'Engine Type' has been added, arising from NPA 1-7.

A definition of 'External load' has been added, arising from NPA 1-5.

A definition of 'External-load attaching means' has been added, arising from NPA 1-5.

A definition of 'Final take-off speed' has been added, arising from NPA 1-2.

The definition of 'Fireproof' has been amended, arising from NPA 25D-181 Rev 3.

The French NV for 'Fireproof' has been deleted, arising from NPA 25D-181 Rev 3.

The definition of 'Fire-resistant' has been amended, arising from NPA 25D-181 Rev 3.

The French NV for 'Fire-resistant' has been deleted, arising from NPA 25D-181 Rev 3.

The definition of 'Flight Time' has been amended, arising from NPA 1-7.

A definition of 'Gyroplane' has been added, arising from NPA 1-5.

A definition of 'Helicopter' has been added, arising from NPA 1-5 & NPA 1-7.

A definition of 'Heliport' has been added, arising from NPA 1-5.

The definition of 'Large aeroplane' has been amended, first by OP 1/91/1 (NPA 1-4), and subsequently further amended by NPA 1-7.

A definition of 'Main rotor(s)' has been added, arising from NPA 1-5.

A definition of 'Maintenance' has been added, arising from NPA 1-7.

A definition of 'Reference landing speed' has been added, arising from NPA 1-2.

A definition of 'Rotorcraft' has been added, arising from NPA 1-5.

A definition of 'Rotorcraft-load combination' has been added, arising from NPA 1-5.

The definition of 'Standard Flame' is deleted, arising from NPA 25D-181 Rev 3.

A definition of 'Take-off safety speed' has been added, arising from NPA 1-5.

Texts in Section 2 have been re-named as either IEM or AMC from the existing title, 'ACJ'.

The definition of 'CAT II' is deleted, arising from the introduction 'Category' in NPA 1-7.

A definition of 'LDP' has been added, arising from NPA 1-5.

A definition of 'OEI' has been added, arising from NPA 1-5.

A definition of 'rpm' has been added, arising from NPA 1-5.

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A definition of 'TDP' has been added, arising from NPA 1–5.

The definition of 'V_{AT}' is deleted, arising from NPA 1–2.

A definition of 'V_{FTO}' has been added, arising from NPA 1–2.

A definition of 'V_{REF}' has been added, arising from NPA 1–2.

A definition of 'V_{TOSS}' has been added, arising from NPA 1–5.

An IEM to 'Commercial Air Transportation' has been added, arising from NPA 1–7.

JAR 1.1 General Definitions

'Abortive Start' (turbine engines) means an attempt to start, in which the engine lights up, but fails to accelerate.

NOTE: The handling of the engine is assumed to be in accordance with the instructions laid down by the engine manufacturer to be followed in these circumstances.

'Acceleration Datum Conditions' (turbine engines) means the engine conditions, e.g. rotational speed, torque, exhaust gas temperature, as appropriate, from which, during the type endurance test, the specified accelerations to 95% of take-off power and/or thrust is timed. Unless otherwise agreed by the Authority, the power and/or thrust at the acceleration datum conditions is not greater than 10% of take-off power and/or thrust and the time to 95% of take-off power and/or thrust is not greater than 5 seconds.

['Accepted/Acceptable' means not objected to by the Authority as suitable for the purpose intended.]

'Adjustable Pitch Propeller' means a propeller, the pitch setting of which can be conveniently changed in the course of ordinary field maintenance, but which cannot be changed when the propeller is rotating.

['#Aerial Work' means an aircraft operation in which an aircraft is used for specialised services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.]

***'Aerodynamic coefficients'** means non-dimensional coefficients for aerodynamic forces and moments.

***'Aeroplane'** means an engine-driven fixed-wing aircraft heavier than air, that is supported in flight by the dynamic reaction of the air against its wings. (FAR Part 1 definition of 'Airplane')

***'Airborne'** means entirely supported by aerodynamic forces (JAR-25 only).

['#Aircraft' means a machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.]

['Aircraft Type' as used with respect to;

- a. licensing and operations of flight crew, is defined in JAR-FCL;
- b. type certification of aircraft, is defined in JAR-21;
- c. cabin crew, is defined in JAR-OPS; or
- d. certifying staff, is defined in JAR-145.]

['Aircraft Variant' as used with respect to the licensing and operation of flight crew, means an aircraft of the same basic certificated type which contain modifications not resulting in significant changes of handling and/or flight characteristic, or flight crew complement, but causing significant changes to equipment and/or procedures.]

***'Airframe'** means the fuselage, booms, nacelles, cowlings, fairings, aerofoil surfaces (including rotors but excluding propellers and rotating aerofoils of engines), and landing gear of an aircraft and their accessories and controls.

***'Alternate airport'** means an airport at which an aircraft may land if a landing at the intended airport becomes inadvisable.

(NPA 1-8)

JAR 1.1 - Aircraft Component

Add the following text to JAR 1.1:

'Aircraft Component' see Component, Parts, Appliances, Product.

(NPA 1-6)
JAR 1.1 - Acceleration Datum Conditions
Delete the definition

***Appliance** means any instrument, mechanism, equipment, part, apparatus, appurtenance, or accessory, including communications equipment, that is used or intended to be used in operating or controlling an aircraft in flight, is installed in or attached to the aircraft, and is not part of an airframe, engine, or propeller.

Applicant means a person applying for approval of an aircraft or any part thereof.

Approved by the Authority means documented by the Authority as suitable for the purpose intended.]

Atmosphere, International Standard means the atmosphere defined in ICAO Document 7488/2. For the purposes of JAR the following is acceptable:—

- a. The air is a perfect dry gas;
- b. The temperature at sea-level is 15°C;
- c. The pressure at sea-level is 1.013250×10^5 Pa (29.92 in Hg) (1013.2 mbar);
- d. The temperature gradient from sea-level to the altitude at which the temperature becomes -56.5°C is 3.25°C per 500 m ($1.98^\circ\text{C}/1000$ ft);
- e. The density at sea level ρ_0 , under the above conditions is 1.2250 kg/m^3 ($0.002378 \text{ slugs/ft}^3$); for the density at altitudes up to 15 000 m (50 000 ft) see Table 1.

NOTE: ρ is the density appropriate to the altitude and ρ/ρ_0 the relative density is indicated by σ .

Authority means the competent body responsible for the safety regulation of Civil Aviation. (See IEM 1.1, Authority).]

Autorotation means a rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.]

Auxiliary Power Units:—

Definitions applicable to auxiliary power units:—

- a. **Accessory drives** means any drive shaft or utility mounting pad, furnished as a part of the auxiliary power unit, that is used for the extraction of power to drive accessories, components, or controls essential to the operation of the auxiliary power unit or any of its associated systems.
- b. **Auxiliary Power Unit (APU)** means any gas turbine-powered unit delivering rotating shaft power, compressor air, or both which is not intended for direct propulsion of an aircraft.
- c. **Blade** means an energy transforming element of the compressor or turbine rotors whether integral or attached design.
- d. **Compressor air** means compressed air that is provided by the APU to do work whether it is extracted or bled from any point of the compressor section of the gas turbine engine or produced from a compressor driven by the APU.
- e. **Containment** means retention within the APU of all high energy rotor fragments resulting from the failure of a high energy rotor.
- f. **Critical rotor stage** means the compressor and turbine stages whose rotors have the smallest margin of safety under the conditions of speed and temperature shown in Appendix 1, paragraph 7.10 of JAR-APU.
- g. **Demonstrate** means to prove by physical test under the conditions specified in Appendix 1 of JAR-APU.

(NPA 1-8)

JAR 1.1 - Appliance

Delete current text and replace with the following text to JAR 1.1:

'Appliances' see Component, Parts, Appliances, Product.

- h. **'Essential APU'** means an APU which produces bleed air and/or power to drive accessories necessary for the dispatch of the aircraft to maintain safe aircraft operation.
- i. **'High energy rotor'** means a rotating component or assembly which, when ruptured, will generate high kinetic energy fragments.
- j. **'Major part'** means a part of whose failure might adversely affect the operational integrity of the unit.
- k. **'Maximum allowable speed'** means the maximum rotor speed which the APU would experience under overload or transient conditions and is limited by installed safety devices.
- l. **'Maximum allowable temperature'** means the maximum exhaust gas temperature (EGT) or turbine inlet temperature (TIT) which the APU would experience during overload or transient conditions and is limited by installed safety devices.
- m. **'Minor part'** means a part which is not a major part.
- n. **'Non-essential APU'** means an APU which may be used on the aircraft as a matter of convenience, either on the ground or in flight, and may be shut down without jeopardising safe aircraft operations.
- o. **'Output provisions'** means any drive pad or compressed air output flange intended for aircraft use to extract usable shaft or pneumatic power from the APU.
- p. **'Rated output'** means the approved shaft power or compressed air output or both, that is developed statically at standard sea-level atmospheric conditions for unrestricted periods of use.
- q. **'Rated temperature'** means the maximum turbine inlet or exhaust gas temperature at which the engine can operate at rated output and speed.
- r. **'Rotor'** means a rotating component or assembly including blades with the exception of accessory drive shafts and gears.
- s. **'Start'** means an acceleration from the initiation of operation or starter torque to a stabilised speed and temperature in the governed ranges without exceeding approved limits.
- t. **'Substantiate'** means to prove by presentation of adequate evidence obtained by demonstration or analysis or both.
- u. **'Type'** means all of a series of units each one of which was developed as an alternative configuration or refinement of the same basic unit.

['Auxiliary rotor' means a rotor that principally serves to counteract the effect of the main rotor torque on a rotorcraft and/or to manoeuvre the rotorcraft about one or more of its three principle axes.]

'Beta Control' means a system whereby the propeller can be operated at blade angles directly selected by the air crew, or by other means, and normally used during the approach and ground handling.

'Boost Pressure' (piston engines) means the manifold pressure measured relative to standard sea-level atmospheric pressure.

***'Brake Horsepower'** means the power delivered at the propeller shaft (main drive or main output) of an aircraft engine.

***'Calibrated airspeed'** means indicated airspeed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.

['Category' as used with respect to;

- a. licensing of flight crew, is defined in JAR-FCL;
- b. type certification of aircraft, is defined in JAR-21;
- c. certifying staff, is defined in JAR-145.
- d. aerodrome operating minima required in JAR-OPS, is defined in JAR-OPS 1.430;
- e. all weather operations in accordance with JAR-AWO, is defined in JAR-AWO 201; or
- f. all weather operations in accordance with JAR-OPS, is defined in JAR-OPS 1.430.

Category A, with respect to rotorcraft, means a multi-engined rotorcraft designed with engine and system isolation features specified in JAR-27 / JAR-29 and capable of operations using take-off and landing data scheduled under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off in the event of engine failure.

Category B, with respect to rotorcraft, means a single-engine or multi-engine rotorcraft which does not meet Category A standards. Category B rotorcraft have no guaranteed capability to continue safe flight in the event of an engine failure, and unscheduled landing is assumed.]

'Charge Cooling' (piston engines) means the percentage degree of charge cooling, quantitatively expressed as:-

$$\left(\frac{t_2 - t_3}{t_2 - t_1} \right) \times 100$$

where

t_1 is the temperature of the air entering the charge cooler coolant radiator in the power-plant,

t_2 is the temperature of the charge without cooling, and

t_3 is the temperature of the charge with cooling.

'Clearway' means, for turbine engine powered aeroplanes certificated after August 29, 1959, an area beyond the runway, not less than 152 m (500 ft) wide, centrally located about the extended centreline of the runway, and under the control of the airport authorities. The clearway is expressed in terms of a clearway plane, extending from the end of the runway with an upward slope not exceeding 1.25%, above which no object or terrain protrudes. However, threshold lights may protrude above the plane if their height above the end of the runway is 0.66 m (26 ins) or less and if they are located to each side of the runway.

Climates, Standard

NOTE: This sub-paragraph defines three standard climates – Temperate, Tropical and Arctic – by stating the envelope conditions applicable to each. The conditions thus represented are acceptable as giving suitable design criteria for aeroplanes intended for operation in such regions. They are drawn up on the basis of conditions unlikely to be exceeded more often than on one day per year except that they do not cover the extremes of temperature occasionally reached in tropical deserts or in Siberia in winter.

The Temperate, Tropical and Arctic climates are defined by:-

- a. The temperature envelopes enclosed by the appropriate maximum and minimum temperature lines of Fig. 1, from zero metres (feet) to the selected height (e.g. the temperatures appropriate to 0 – 10 000 m (0 – 30 000 ft)) in the standard Temperate climate are those within the envelope A, B, C, D, in Fig. 1;

(NPA 1-8)

JAR 1.1 - Civil Aircraft

Add the following text to JAR 1.1:

'Civil Aircraft' means any aircraft on the civil register of a State, other than those which that State treats as being in the service of the State, either permanently or temporarily.

(NPA 1-8)

JAR 1.1 - Class

Add the following text to JAR 1.1:

'Class'

- a. As used with respect to aeroplanes means a group of single-pilot aeroplane types having similar handling and flight characteristics.
- b. Reserved.
- c. Reserved.

- b. Every point included in these envelopes being associated with a relative humidity range of 20% to 100%; except that in the conditions represented by the area E, F, G in Fig. 1 the relative humidities shall be assumed to vary from 100% maximum and 20% minimum respectively at the line EF to the value appropriate to the height at the line GF. The value of relative humidity on the line GF shall be taken to vary linearly from 100% maximum and 20% minimum at F to some lower values at G (given here as 10% maximum and 2% minimum);
- c. Every point included in these envelopes being associated with the International standard pressure (ICAO) appropriate to the height, as shown in Table 1;
- d. Every point included in these envelopes being associated with the density corresponding to the temperature, pressure and humidity; extreme values are given in Table 1.

These conditions do not cover variation of pressure from the International standard. This shall be allowed for by assuming a variation of pressure 5% above and below the International standard pressure (ICAO) associated with the International standard temperature (ICAO). (see IEM 1.1, Climates, Standard.)

['Commercial Air Transportation' means the transportation by air of passengers, cargo or mail for remuneration or hire. (See IEM 1.1, Commercial Air Transportation.)]

'Continuous Maximum Icing' (see 'Icing Atmospheric Conditions')

***'Crewmember'** means a person assigned to perform duty in an aircraft during flight time.

'Critical Altitude' (piston engines) means the maximum attitude at which, in standard atmosphere, it is possible to maintain, at a specified rotational speed without ram, a specified power or a specified manifold pressure. Unless otherwise stated, the critical altitude is the maximum altitude at which it is possible to maintain, without ram, at the maximum continuous rotational speed, one of the following:—

- a. The maximum continuous power, in the case of engines for which this power rating is the same at sea level and at the rated altitude.
- b. The maximum continuous rated manifold pressure, in the case of engines the maximum continuous power of which, is governed by a constant manifold pressure.

***'Critical Engine'** means the engine whose failure would most adversely affect the performance or handling qualities of an aircraft.

'Critical Part.' Where the failure analysis shows that a part must achieve and maintain a particularly high level of integrity if Hazardous Effects are not to occur at a rate in excess of Extremely Remote then such a part shall be identified as a Critical Part.

'Decision Height', with respect to the operation of aircraft, means the wheel height above the runway elevation by which a go-around must be initiated unless adequate visual reference has been established and the aircraft position and approach path have been visually assessed as satisfactory to continue the approach and landing in safety.

'Detent' means a mechanical arrangement which indicates, by feel, a given position of an operating control. Once the operating control is placed in this position the detent will hold the lever there and an additional-to-normal force will be required to move the operating control away from the position. (Applicable to JAR-25 only.)

'Engine' means an engine used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for the functioning and control, but excludes the propeller.

(NPA 1-8)

JAR 1.1 - Commander

Add the following text to JAR 1.1:

'Commander' as used with respect to aircraft operations, is defined in JAR-OPS.

(NPA 1-8)

JAR 1.1 - Co-pilot

Add the following text to JAR 1.1:

'Co-pilot' means a pilot serving in any piloting capacity other than as pilot-in-command or commander, but excluding a pilot who is on board the aircraft for the sole purpose of receiving flight instruction for a licence or rating.

(NPA 1-8)

JAR 1.1 - Component Parts, Appliances, Product

Add the following text to JAR 1.1:

'Component, Parts, Appliances, Product' have, when used in a JAR, the same meaning as specified in either the JAA Arrangements or the Council Regulation (EEC) No. 3922/91, except when defined in any other way, either in this JAR, or in an individual JAR, or unless the contrary is otherwise indicated.

When used with respect to:

- a. maintenance, **Aircraft Component** is defined in JAR 145.5, and is valid for all maintenance JARs (e.g. JAR-66, JAR-147 etc.);
- b. certification, **Product** is defined in JAR 21.2, and is valid for all airworthiness JARs (e.g. JAR-25, JAR-23, etc.); and
- c. certification, **Parts and Appliances** is defined in JAR 21.2, and is valid for all airworthiness JARs (e.g. JAR-25, JAR-23 etc.).

'Engine Dry Weight' means the weight of an engine as type certificated or a weight which is clearly derived from this by specified additions or omissions.

['Engine Type' means engines which are similar in design (See JAR-21).]

***'Equivalent airspeed'** means the calibrated airspeed of an aircraft corrected for adiabatic compressible flow for the particular altitude. Equivalent airspeed is equal to calibrated airspeed in standard atmosphere at sea level.

'Exhaust Gas Temperature' (turbine engines) means the average temperature of the exhaust gas stream obtained in an approved manner.

['External load' means a load that is carried, towed or extends, outside the aircraft fuselage.]

['External load attaching means' means the structural components used to attach an external load to an aircraft, including external-load containers, the backup structure at the attachment points, and any quick-release device used to jettison the external load.]

'False Start' (turbine engines) means an attempt to start in which the engine fails to light up.

NOTE: The handling of the engine is assumed to be in accordance with the instructions laid down by the engine manufacturer to be followed in these circumstances.

'Feathered Pitch' means the pitch setting, specified in the appropriate propeller manual, which in flight with the engine stopped, gives approximately the minimum drag, and corresponds with a windmilling torque of approximately zero.

['Final take-off speed' means the speed of the aeroplane that exists at the end of the take-off path in the en-route configuration with one engine inoperative.]

['Fireproof.' With respect to materials, components and equipment, means the capability to withstand the application of heat by a flame, for a period of 15 minutes without any failure that would create a hazard to the aircraft. The flame will have the following characteristics:—

Temperature 1100°C ± 80°C

Heat Flux Density 116 KW/m² ± 10 KW/m²

NOTE: For materials this is considered to be equivalent to the capability of withstanding a fire at least as well as steel or titanium in dimensions appropriate for the purposes for which they are used.]

['Fire-resistant.' With respect to materials, components and equipment, means the capability to withstand the application of heat by a flame, as defined for 'Fireproof', for a period of 5 minutes without any failure that would create a hazard to the aircraft.

NOTE: For materials this is considered to be equivalent to the capability of withstanding a fire at least as well as aluminium alloy in dimensions appropriate for the purposes for which they are used.]

'First aid oxygen' means the additional oxygen provided for the use of passengers, who do not satisfactorily recover following subjection to excessive cabin altitudes, during which they had been provided with supplemental oxygen.

'Fixed Pitch Propeller' means a propeller, the pitch of which cannot be changed, except by processes constituting a workshop operation.

'Flame resistant' means not susceptible to combustion to the point of propagating a flame, beyond safe limits, after the ignition source is removed.

'Flammable', with respect to a fluid or gas, means susceptible to igniting readily or exploding.

(NPA 1-8)

JAR 1.1 - Fire-resistant

Amend the Note to the definition in JAR 1.1 by changing the phrase 'this is considered' to read 'this may be considered'.

'Flap extended speed' means the highest speed permissible with wing-flaps in a prescribed extended position.

'Flash resistant' means not susceptible to burning violently when ignited.

***'Flight crewmember'** means a pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time.

['Flight Time' as used with respect to;

- a. licensing of flight crew, is defined in JAR-FCL;
- b. aircraft operations, is defined in JAR-OPS;
- c. type certification of aircraft, is defined in JAR-21;
- d. maintenance, is defined in JAR-OPS Subpart M.]

'Gate' means a mechanical arrangement which provides positive stops at given positions of an operating control and is such that a separate movement of the operating control in another direction is necessary in order to initiate movement beyond one of the stops. (Applicable to JAR-25 only.)

'Ground Idling Conditions' (turbine engines) means the conditions of minimum rotational speed associated with zero forward speed and the maximum exhaust gas temperature at this speed.

['Gyroplane' means a rotorcraft the rotors of which are not engine driven except for initial starting, but are made to rotate by action of the air when the rotorcraft is moving, and the means of propulsion of which, consisting usually of conventional propellers, is independent of the rotor system.]

'Harness' means the equipment, consisting of two shoulder straps and a lap belt, which is provided to restrain a member of the flight crew against inertia loads occurring in emergency conditions.

['*Helicopter' means a rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.]

['*Heliport' means an area of land, water, or structure used or intended to be used for the landing and take-off of helicopters.]

'Icing Atmospheric Conditions'. The definitions of atmospheric conditions are given in this subparagraph and Figures 2 to 7:—

- a. **'Continuous Maximum Icing'**. The maximum continuous intensity of atmospheric icing conditions (continuous maximum icing) is defined by the variables of the cloud liquid water content, the mean effective diameter of the cloud droplets, the ambient air temperature, and the inter-relationship of these three variables as shown in Fig. 2. The limiting icing envelope in terms of altitude and temperature is given in Fig. 3. The inter-relationship of cloud liquid water content with droplet diameter and altitude is determined from Fig. 2 and Fig. 3. The cloud liquid water content for continuous maximum icing conditions of a horizontal extent, other than 17.4 n miles, is determined by the value of liquid water content of Fig. 2, multiplied by the appropriate factor from Fig. 4.
- b. **'Intermittent Maximum Icing'**. The intermittent maximum intensity of atmospheric icing conditions (intermittent maximum icing) is defined by the variables of the cloud liquid water content, the mean effective diameter of the cloud droplets, the ambient air temperature, and the inter-relationship of these three variables as shown in Fig. 5. The limiting icing envelope in terms of altitude and temperature is given in Fig. 6. The inter-relationship of cloud liquid water content with droplet diameter and altitude is determined from Fig. 5 and Fig. 6. The cloud liquid water content for intermittent maximum icing conditions of a horizontal extent, other than 2.6 n miles, is determined by the value of cloud liquid water content of Fig. 5 multiplied by the appropriate factor in Fig. 7 .

(NPA 25B-238)

JAR 1.1

Delete the definition for '**Gate**' in JAR 1.1

***IFR conditions**' means weather conditions below the minimum for flight under visual flight rules.

***Indicated airspeed**' means the speed of an aircraft as shown on its pitot static airspeed indicator calibrated to reflect standard atmosphere adiabatic compressible flow at sea level uncorrected for airspeed system errors.

***Instrument**' means a device using an internal mechanism to show visually or aurally the attitude, altitude, or operation of an aircraft or aircraft part. It includes electronic devices for automatically controlling an aircraft in flight.

'Intermittent Maximum Icing' (see 'Icing Atmospheric Conditions')

***Landing gear extended speed**' means the maximum speed at which an aircraft can be safely flown with the landing gear extended.

***Landing gear operating speed**' means the maximum speed at which the landing gear can be safely extended or retracted.

['Large aeroplane' means an aeroplane of more than 5700 kg (12,500 pounds) maximum certificated take-off weight. The category 'Large Aeroplane' does not include the commuter aeroplane category (For commuter aeroplane category, see JAR 23.1 and JAR 23.3).]

***Load factor**' means the ratio of a specified load to the total weight of the aircraft. The specified load is expressed in terms of any of the following: aerodynamic forces, inertia forces, or ground or water reactions.

***Mach number**' means the ratio of true air speed to the speed of sound.

['Main rotor(s)' means the rotor or rotors that supply the principal lift to a rotorcraft.]

['Maintenance' means any one or combination of overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft/aircraft component.]

'Manifold Pressure' piston engines means the absolute static pressure measured at the appropriate point in the induction system, usually in inches or millimetres of mercury.

'Maximum Engine Overspeed' (20 second-piston engines) means the maximum engine rotational speed, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

'Maximum Engine Overspeed(s)' (20 second-turbine engines) means the maximum rotational speed of each mechanically independent main rotating system of an engine, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause). NOTE: For each main rotating system this speed is normally not less than the maximum transient rpm in non-fault conditions.

'Maximum Engine Over-torque' (20 second-applicable only to turbo-propeller and turbo-shaft engines incorporating free power-turbines) means the maximum torque of the free power-turbine, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

'Maximum Power-turbine Overspeed' (20 second-applicable only to free power-turbine engines for helicopters) means the maximum rotational speed of the free power-turbine, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

'Maximum Exhaust Gas Overtemperature' (20 second-turbine engines) means the maximum engine exhaust gas temperature, inadvertent use of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

NOTE: This is not to be confused with maximum temperatures established for use during starting operations.

'Maximum Power-turbine Speed for Autorotation' (applicable only to free power-turbine engines for helicopters) means the maximum rotational speed of the power-turbine permitted during autorotation for periods of unrestricted duration.

'Maximum Governed Rotational Speed' (variable pitch (governing) propellers) means the maximum rotational speed as determined by the setting of the propeller governor or control mechanism.

'Maximum Permissible Rotational Speed' (fixed, adjustable or variable (non-governing) pitch propellers) means the maximum propeller rotational speed permitted in normal or likely emergency operation.

'Maximum Propeller Overspeed' (20 second) means the maximum propeller rotational speed, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the propeller from service or maintenance action (other than to correct the cause).

'Minimum Drainage Period After a False Start' (turbine engines) means the minimum period necessary to allow surplus fuel to drain from the engine prior to making a further attempt to start the engine. The period is measured from the time at which the starter is switched off and/or the engine fuel cock is closed during a false start.

'Minimum Governed Rotational Speed' (variable pitch (governing) propellers) means the minimum rotational speed as determined by the setting of the propeller governor or control mechanism .

'Minimum Take-off Crankshaft Rotational Speed' (piston engines) means the minimum crankshaft rotational speed permissible for use with the maximum take-off manifold pressure.

'Modified Engine' means an engine, previously approved, in which hitherto unapproved modifications have been embodied.

'Modified Propeller' means a propeller previously approved, in which hitherto unapproved modifications have been embodied.

'Module'. An engine (or propeller) Module is a group of engine (or propeller) components defined by the constructor and designed to be replaceable without mechanical or performance difficulties. It is uniquely identified and amenable to the setting of an overhaul life separate from other parts of the engine (or propeller).

'New Engine' means an engine which has not been subjected to in-service operations, essentially identical in design, materials and methods of construction with one which has been type certificated.

'New Propeller' means a propeller which has not been subjected to in-service operations, essentially identical in design, materials and methods of construction with one which has been type certificated .

'Normal operating differential pressure' means the pressure differential between the cabin pressure and the outside ambient pressure, including the tolerances of the normal pressure regulating system.

'Notice of Proposed Amendment' means a notice of a proposed amendment to a JAR Code.

'Overhauled Engine or Module' means an engine or module which has been repaired or re-conditioned to a standard which renders it eligible for the complete overhaul period agreed by the Authority for the particular type of engine.

(NPA 1-10)

JAR 1.1 - Microlight

Add the following text to JAR 1.1:

'Microlight' is an aeroplane having no more than two seats, V_{so} not exceeding 35 knots (65 KM/h) CAS, and a maximum take-off mass of no more than:-

- 300 kg for a landplane, single seater; or
- 450 kg for a landplane, two-seater; or
- 330 kg for an amphibian or floatplane, single seater; or
- 495 kg for an amphibian or floatplane, two-seater, provided that a microlight capable of operating as both a floatplane and a landplane falls below both MTOM limits, as appropriate.

Note: Foot-launched aircraft are excluded from this definition.

'Overhauled Propeller' means a propeller which has been repaired or re-conditioned to a standard which renders it eligible for the complete overhaul period agreed by the Authority for the particular type of propeller.

##'Pilot in command' means the pilot responsible for the operation and safety of an aircraft during flight time.

Piston Engines :-

Power definitions applicable to engines for aeroplanes and helicopters:-

- a. **'Take-off Power'** means the output shaft power identified in the performance data for use during take-off, discontinued approach and baulked landing and limited in use to a continuous period of not more than 5 minutes,
- b. **'Take-off Power Rating'** means the test bed minimum acceptance output shaft power as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the declared maximum coolant/cylinder head temperatures and within the appropriate acceptance limitations.
- c. **Maximum Continuous Power'** means the output shaft power identified in the performance data for use during periods of unrestricted duration.

NOTE: It should not be assumed that maximum continuous power is necessarily appropriate to normal operations. The power to be used in such operations is a matter between the constructor and the operator.

- d. **'Maximum Continuous Power Rating'** means the minimum test bed acceptance power, as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the declared maximum coolant/cylinder head temperatures and within the appropriate acceptance limitations.
- e. **'Maximum Recommended Cruising Power Conditions'** means the crankshaft rotational speed, engine manifold pressure and any other parameters recommended in the engine manuals as appropriate for cruising operation.
- f. **'Maximum Best Economy Cruising Power Conditions'** means the crankshaft rotational speed, engine manifold pressure and any other parameters recommended in the engine manuals as appropriate for use with economical-cruising mixture strength.

'Pitch Setting' means the propeller blade setting determined by the blade angle, measured in a manner and at a radius declared by the manufacturer and specified in the appropriate Engine Manual.

'Powered sailplane' means an aircraft, equipped with one or more engines having, with engine(s) inoperative, the characteristics of a sailplane.

'Propeller' means a complete propeller including all parts attached to and rotating with the hub and blades, and all equipment required for the control and operation of the propeller.

'Propeller Equipment' means all equipment used with, or necessary for the control and operation of the propeller.

'Protective breathing equipment' means breathing equipment for protection against smoke, fumes and other harmful gases.

'Prototype Engine' means the first engine, of a type and arrangement not previously approved, to be submitted for type-approval test.

'Prototype Propeller' means the first propeller of a type and arrangement not previously approved, to be submitted for type-approval tests.

JAR-1

SECTION 1

JAR 1.1 - Parts

Add the following text to JAR 1.1:

'Parts' see Component, Parts, Appliances, Product.

(NPA 1-8)

JAR 1.1 - Parts and Appliances

Add the following text to JAR 1.1:

'Parts and Appliances' see Component, Parts, Appliances, Product.

(NPA 1-8)

JAR 1.1 - Pilot-in-command

Delete existing text and replace with the following text to JAR 1.1:

'Pilot-in-command' means a pilot who is responsible for the operation and safety of the aircraft during flight time.

(NPA 1-8)

JAR 1.1 - Pilot flying (PF)

Add the following text to JAR 1.1:

'Pilot flying (PF)' means the pilot, who for the time being, is in charge of the controls of an aircraft.

(NPA 1-8)

JAR 1.1 - Pilot not flying (PNF)

Add the following text to JAR 1.1:

'Pilot not flying (PNF)' means the pilot who is assisting the *Pilot flying* in accordance with the multi-crew co-operation concept, when the required flight crew is more than one.

(NPA 1-8)

JAR 1.1 - Product

Add the following text to JAR 1.1:

'Product' see Component, Parts, Appliances, Product.

[**'Reference landing speed'** means the speed of the aeroplane, in a specified landing configuration, at the point where it descends through the landing screen height in the determination of the landing distance for manual landings.]

'Reverse Pitch' means the blade angle used for producing reverse thrust with a propeller.

'Rotational Direction of Equipment' means the direction of rotation as observed when looking at the drive face of the equipment (usually described as 'clockwise' or 'anti-clockwise').

'Rotational Speed' (engine) means, unless otherwise qualified (e.g. propeller rotational speed), the rotational speed in revolutions per minute of the engine crankshaft or its equivalent.

'Rotational Speed' (propeller) means, unless otherwise specified (e.g. propeller rpm), the speed in revolutions per minute of the engine crankshaft or its equivalent.

[**'Rotorcraft'** means a heavier-than-air aircraft that depends principally for its support in flight on the lift generated by one or more rotors.]

[**'Rotorcraft-load combination'** means the combination of a rotorcraft and an external-load, including the external load attaching means. Rotorcraft-load combinations are designated as Class A, Class B, Class C and Class D as follows:

- a. **Class A rotorcraft-load combination** means one in which the external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear.
- b. **Class B rotorcraft-load combination** means one in which the external load is jettisonable and is lifted free of land or water during the rotorcraft operation.
- c. **Class C rotorcraft-load combination** means one in which the external load is jettisonable and remains in contact with land or water during the rotorcraft operation.
- d. **Class D rotorcraft-load combination** means one in which the external load is other than a Class A, B or C and has been specifically approved by the Authority for that operation.]

'Safety catch' means a mechanism which locks an operating control in a given position. It engages automatically whenever the operating control is put into that position but has to be manually taken out of engagement in order to move the operating control away from that position. (Applicable to JAR-25 only.)

'Sailplane' means a heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its fixed lifting surfaces, the free flight of which does not depend on an engine.

'Series Propeller' means a propeller essentially identical in design, materials, and methods of construction, with one which has been previously approved.

'Standard Atmosphere' See 'Atmosphere, International Standard'.

'Stopway' means an area beyond the take-off runway, no less wide than the runway and centred upon the extended centreline of the runway, able to support the aeroplane during an abortive take-off, without causing structural damage to the aeroplane, and designated by the airport authorities for use in decelerating the aeroplane during an abortive take-off.

'Supplemental oxygen' means the additional oxygen required to protect each occupant against the adverse effects of excessive cabin altitude and to maintain acceptable physiological conditions.

[**'Take-off safety speed'** means a referenced airspeed obtained after lift-off at which the required one-engine-inoperative climb performance can be achieved.]

Terms associated with probabilities (for engines):–

NOTE: Because an Effect can only be assessed in relation to a complete aircraft and as, for airworthiness purposes, each category of Effect is related to a particular frequency of occurrence, the definitions and associated numerical values are given in aircraft terms (hours in flight).

Frequency of occurrences:–

- a. **'Reasonably Probable'** means unlikely to occur often during the operation of each aircraft of the type but which may occur several times during the total operational life of each aircraft of the types in which the engine may be installed.

NOTE: Where numerical values are used this may normally be interpreted as a probability in the range 10^{-3} to 10^{-5} per hour of flight.

- b. **'Remote'** means unlikely to occur to each aircraft during its total operational life but may occur several times when considering the total operational life of a number of aircraft of the type in which the engine is installed.

NOTE: Where numerical values are used this may normally be interpreted as a probability in the range 10^{-5} to 10^{-7} per hour of flight.

- c. **'Extremely Remote'** means unlikely to occur when considering the total operational life of a number of aircraft of the type in which the engine is installed, but nevertheless, has to be regarded as being possible.

NOTE: Where numerical values are used this may normally be interpreted as a probability in the range 10^{-7} to 10^{-9} per hour of flight.

'Total Equivalent Static Power' (turbine engines) means:–

Total equivalent static power kW (S.I. Units) =

$$\text{Propeller shaft power} + \frac{\text{Static jet thrust (N)}}{15}$$

Total equivalent static power (horse-power) (Non-S.I. Units) =

$$\text{Propeller shaft HP} + \frac{\text{Static jet thrust (lbf)}}{2.6}$$

***'True airspeed'** means the airspeed of an aircraft relative to undisturbed air. True airspeed is equal to equivalent airspeed multiplied by $(\rho_0/\rho)^{1/2}$.

Turbine Engines:–**Power/thrust definitions applicable to engines for aeroplanes and helicopters:–**

NOTES: (1) The performance data are provided by the engine constructor and give the power and/or thrust produced by an engine under specified conditions (e.g. intake efficiency, forward speed, atmospheric temperature) when operating within the limitations (e.g. rpm, exhaust gas temperature) which have been approved for use with the defined power/thrust condition.

(2) Definitions of power/thrust in terms of usage and duration (and the use of these to form the basis of certain Flight Manual limitations) is not intended to remove the pilot's right to judge whether and to what extent such limitations may be ignored in emergency conditions.

- a. **'Maximum Contingency Power and/or Thrust'** means the power and/or thrust identified in the performance data for use when a power-unit has failed or been shut down during take-off, baulked landing or prior to a discontinued approach and limited in use for a continuous period of not more than $2\frac{1}{2}$ minutes.

NOTE: The $2\frac{1}{2}$ minute period for use of maximum contingency power and/or thrust is additional to the 5 minute or 10 minute period at take-off power and/or thrust (see c.) and may be added to the take-off limitation at any point in time.

(NPA 1-9)

a. **Maximum Contingency Power and/or Thrust**

Replace the existing title with the following:

a. **2½-Minute OEI Power and/or Thrust**

(NPA 1-9)

Note associated to reference a)

Amend the Note to the definition in JAR 1.1 by changing the phrase 'maximum contingency power and/or thrust' to read '2½-Minute OEI Power and/or Thrust'

- b. **'Maximum Contingency Power and/or Thrust Rating'** means the minimum test bed acceptance power and/or thrust, as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.
- c. **'Take-off Power and/or Thrust'** means the power and/or thrust identified in the performance data for use during take-off, discontinued approach and baulked landing; and
- i. for aeroplanes and helicopters, limited in use to a continuous period of not more than 5 minutes; and
 - ii. for aeroplanes only (when specifically requested), limited in use to a continuous period of not more than 10 minutes in the event of a power-unit having failed or been shut down.
- d. **'Take-off Power and/or Thrust Rating'** means the minimum test bed acceptance power and/or thrust as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.
- e. **'Intermediate Contingency Power and/or Thrust'** means the power and/or thrust identified in the performance data for use after take-off when a power-unit has failed or been shut down, during periods of unrestricted duration.
- f. **'Intermediate Contingency Power and/or Thrust Rating'** means the minimum test bed acceptance power and/or thrust, as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.
- g. **'30-Minute Contingency Power'** (applicable to multi-engined helicopters only) means the power identified in the performance data for use after take-off when an engine has failed or been shut down, and limited in scheduled use for a total period of not more than 30 minutes in any one flight.
- h. **'30-Minute Contingency Power Rating'** (applicable to multi-engined helicopters only) means the minimum test bed acceptance power, as stated in the engine type certificate data sheet, of series and overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.
- j. **'Maximum Continuous Power and/or Thrust'** means the power and/or thrust identified in the performance data for use during periods of unrestricted duration.
- NOTE: It should not be assumed that the maximum permitted continuous power and/or thrust is appropriate to normal operations. The power to be used in such conditions can only be arrived at by discussion between the constructors and operators, due regard being paid to the effect of such factors as the type of operation envisaged, the route and climatic conditions, together with the overhaul period and overhaul costs which it is desired to achieve.
- k. **'Maximum Continuous Power and/or Thrust Rating'** means the minimum test bed acceptance power and/or thrust, as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.

'Variable Pitch Propellers' means a propeller, the pitch setting of which changes or can be changed, when the propeller is rotating or stationary. This includes:—

- a. A propeller, the pitch setting of which is directly under the control of the flight crew (controllable pitch propeller).
- b. A propeller, the pitch setting of which is controlled by a governor or other automatic means which may be either integral with the propeller or a separately mounted equipment and which may or may not be controlled by the flight crew (constant speed propeller).
- c. A propeller, the pitch setting of which may be controlled by a combination of the methods of a. and b.

(NPA 1-9)

b. Maximum Contingency Power and/or Thrust Rating'

Replace the existing title with the following:

'b) 2½-Minute OEI Power and/or Thrust Rating'

(NPA 1-9)

e) Intermediate Contingency Power and/or Thrust

Replace the existing title with the following:

e) Continuous OEI Power and/or Thrust

(NPA 1-9)

f) Intermediate Contingency Power and/or Thrust Rating

Replace the existing title with the following:

f) Continuous OEI Power and/or Thrust Rating

(NPA 1-9)

g) 30-Minute Contingency Power

Replace the existing title with the following:

g) 30-Minute OEI Power

(NPA 1-9)

h) 30-Minute Contingency Power Rating

Replace the existing title with the following:

h) 30-Minute OEI Power Rating

JAR 1.2 Abbreviations and symbols

'**ACJ**' means Advisory Circular, Joint.

'**APU**' means auxiliary power unit.

'**BTPS**' means body temperature, pressure, saturated, i.e. 37°C, ambient pressure and saturated with water vapour at 47 mmHg partial pressure.

'**BTPD**' means body temperature, pressure, dry, i.e. 37°C, ambient pressure and no water vapour.

*'**CAS**' means calibrated airspeed.

*'**EAS**' means equivalent airspeed.

*'**IAS**' means indicated airspeed.

*'**ICAO**' means International Civil Aviation Organisation.

#*'**IFR**' means instrument flight rules.

*'**ILS**' means instrument landing system.

'**JAR**' means Joint Aviation Requirements.

['**LDP**' with respect to rotorcraft means the landing decision point.]

*'**M**' means mach number.

'**MIL Spec**' means USA Military Specification.

'**NPA**' means Notice of Proposed Amendment.

'**NTPD**' means normal temperature, pressure, dry, i.e. 21°C, 760 mmHg and no water vapour.

[*'**OEI**' means one engine inoperative.]

['**rpm**' means revolutions per minute.]

'**STPD**' means standard temperature, pressure, dry, i.e. 0°C, 760 mmHg and no water vapour.

'**TAS**' means true airspeed.

'**TSO**' means Technical Standard Order.

['**TDP**' with respect to rotorcraft means take-off decision point.]

*'**V_A**' means design manoeuvring speed.

*'**V_B**' means design speed for maximum gust intensity.

*'**V_C**' means design cruising speed.

'**V_D/M_D**' means design diving speed.

*'**V_{DF}/M_{DF}**' means demonstrated flight diving speed.

*'**V_F**' means design flap speed.

(NPA 1-8)

Add the following text to JAR 1.2:

'PF' means Pilot flying.

'PNF' means Pilot not flying.

(NPA 25B, D, G-244
JAR 1.2
Add the following definition to JAR 1.2

'V_{EF}' means the speed at which the critical engine is assumed to fail during take-off.

'**V_{F1}**' means the design flap speed for procedure flight conditions.

*'**V_{FC}/M_{FC}**' means maximum speed for stability characteristics.

*'**V_{FE}**' means maximum flap extended speed.

['**V_{FTO}**' means final take-off speed.]

#*'**V_{FR}**' means visual flight rules.

'**V_H**' means maximum speed in level flight with maximum continuous power.

*'**V_{HF}**' means very high frequency.

*'**V_{LE}**' means maximum landing gear extended speed.

*'**V_{LO}**' means maximum landing gear operating speed.

*'**V_{LOF}**' means lift-off speed.

*'**V_{MC}**' means minimum control speed with the critical engine inoperative.

'**V_{MCA}**' means the minimum control speed, take-off climb.

'**V_{MCG}**' means the minimum control speed, on or near ground.

'**V_{MCL}**' means the minimum control speed, approach and landing.

*'**V_{MO}/M_{MO}**' means maximum operating limit speed.

*'**V_{MU}**' means minimum unstick speed.

*'**V_{NE}**' means never-exceed speed.

*'**V_R**' means rotation speed.

*'**V_{RA}**' means rough airspeed.

['**V_{REF}**' means reference landing speed.]

'**V_S**' means the stall speed or the minimum steady flight speed at which the aeroplane is controllable.

'**V_{SO}**' means the stall speed or the minimum steady flight speed in the landing configuration.

'**V_{S1}**' means the stall speed or the minimum steady flight speed obtained in a specified configuration.

'**V_{S1g}**' means the one-g stall speed at which the aeroplane can develop a lift force (normal to the flight path) equal to its weight.

'**V_T**' means maximum aerotow speed (JAR-22 only).

'**V_T**' means threshold speed.

'**V_{Tmax}**' means maximum threshold speed.

[*'**V_{TOSS}**' means take-off safety speed for Category A rotorcraft.]

'**V_W**' means maximum winch-launch speed (JAR-22 only).

(NPA 25B-215)

JAR 1.2

Add the following definitions to JAR 1.2

'V_{SR}' means reference stall speed.

'V_{SR0}' means reference stall speed in the landing configuration.

'V_{SR1}' means reference stall speed in a specific configuration.

'V_{SW}' means speed at which onset of natural or artificial stall warning occurs.

***V_Y**' means speed for best rate of climb.

***V₁**' means take-off decision speed.

***V₂**' means take-off safety speed.

***V_{2min}**' means minimum take-off safety speed.

'**V₃**' means steady initial climb speed with all engines operating.

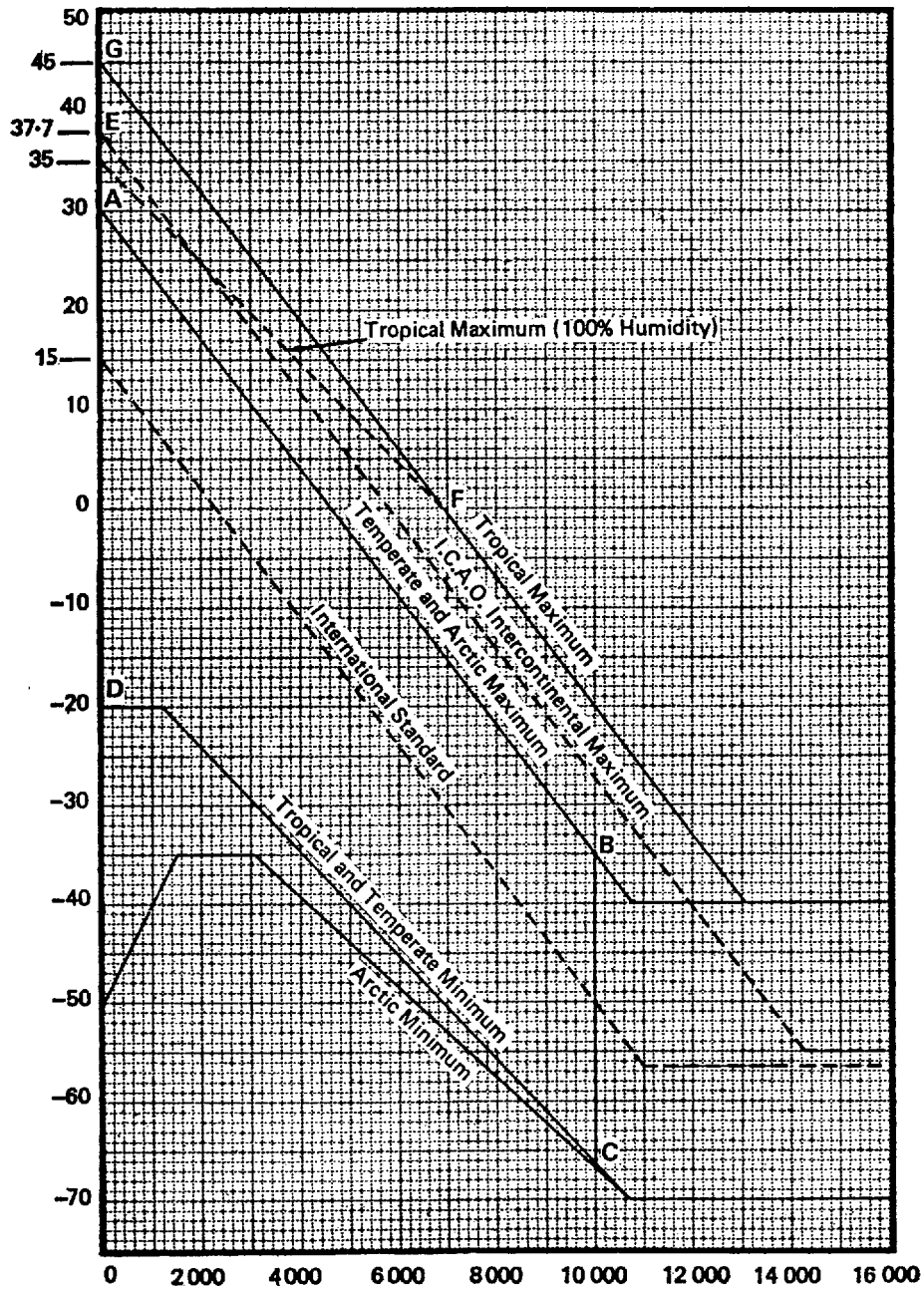
(NPA 25B, D, G-244)

JAR 1.2

Amend the definition of V_1 to read as follows:

' V_1 ' means the maximum speed in the take-off at which the pilot must take the first action (e.g. apply brakes, reduce thrust, deploy speed brakes) to stop the aeroplane within the accelerate-stop distance. V_1 also means the minimum speed in the take-off, following a failure of the critical engine at V_{EF} , at which the pilot can continue the take-off and achieve the required height above the take-off surface within the take-off distance.

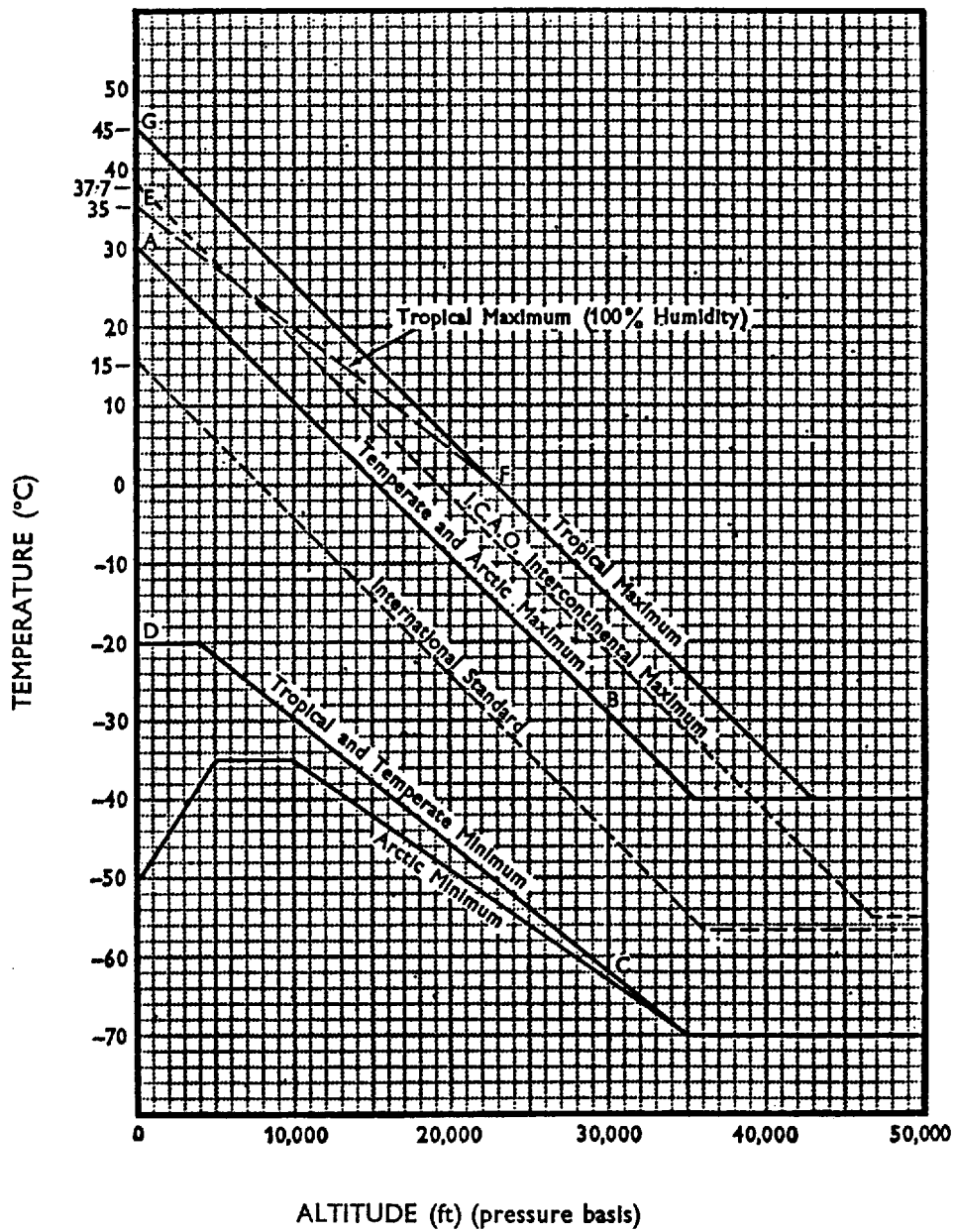
ALTITUDE (m) (pressure basis)



STANDARD CLIMATES – S.I. UNITS

Fig. 1

- NOTES: (1) This diagram gives envelope conditions for design purposes; it does not constitute an accurate representation of any particular climate.
- (2) The line BC has no significance other than as illustrating the text.



STANDARD CLIMATES – NON S.I. UNITS

Fig. 1

- NOTES: (1) This diagram gives envelope conditions for design purposes; it does not constitute an accurate representation of any particular climate.
- (2) The line BC has no significance other than as illustrating the text.

TABLE 1

RELATIVE PRESSURES AND DENSITIES – S.I. UNITS

Air density at sea-level (barometer 1.013250×10^3 Pa
temp 15°C) is 1.2250 kg/m^3

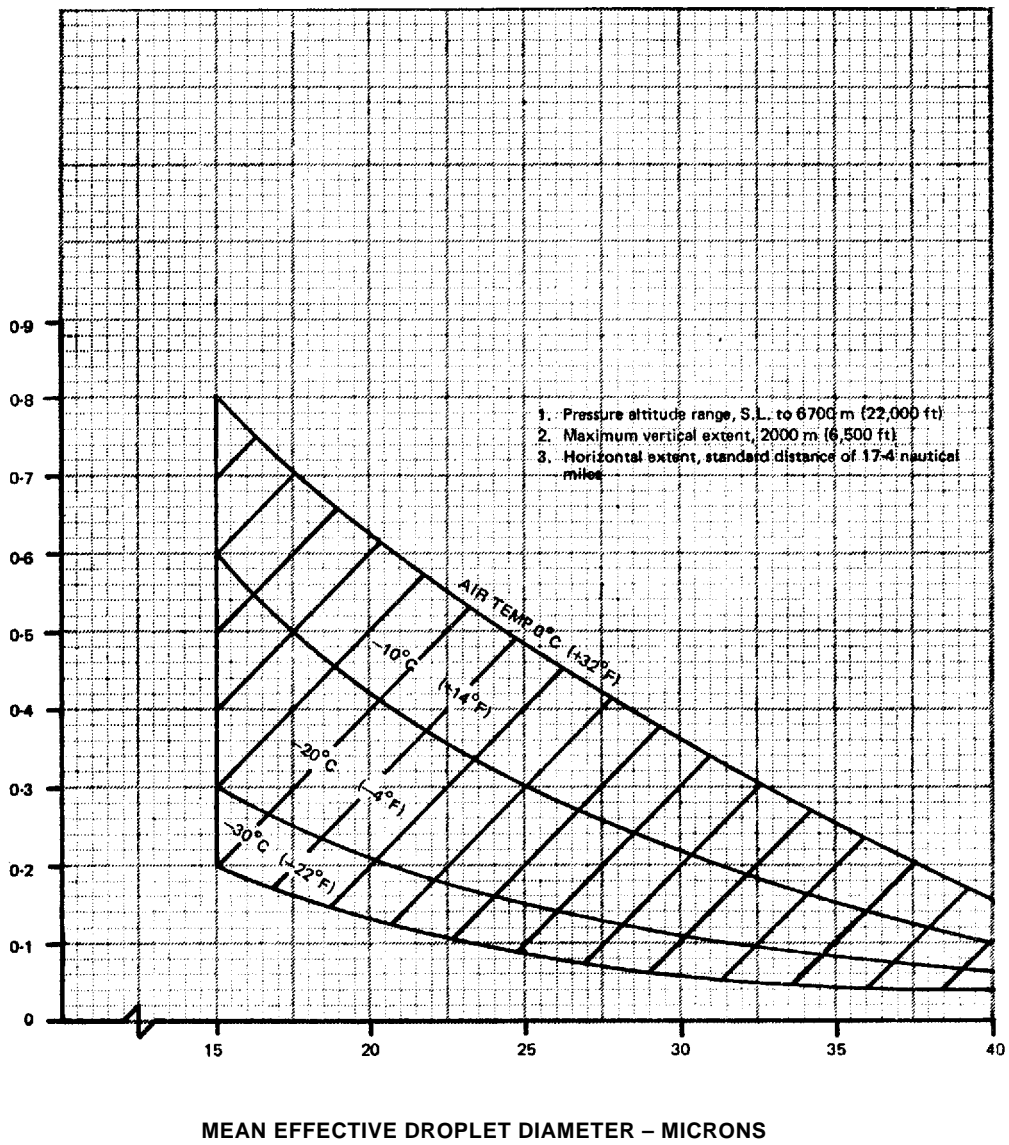
Altitude (Pressure Basis) m	Relative Pressures (I.C.A.O.)	Relative Densities Associated with Conditions Stated				
		International Standard (I.C.A.O.)	Tropical Maximum	Temperature and Arctic Maximum	Tropical and Temperature Minimum	Arctic Minimum
0	1.000	1.000	0.906	0.951	1.138	1.291
500	0.942	0.953	0.862	0.905	1.072	1.190
1000	0.887	0.907	0.820	0.862	1.010	1.097
1500	0.835	0.864	0.780	0.820	0.955	0.011
2000	0.785	0.822	0.741	0.779	0.908	0.949
2500	0.737	0.781	0.703	0.740	0.862	0.892
3000	0.692	0.742	0.668	0.703	0.818	0.837
3500	0.649	0.705	0.633	0.667	0.776	0.792
4000	0.608	0.669	0.600	0.632	0.735	0.750
4500	0.570	0.634	0.568	0.599	0.696	0.709
5000	0.533	0.601	0.538	0.568	0.659	0.670
5500	0.498	0.569	0.509	0.537	0.623	0.633
6000	0.466	0.539	0.481	0.508	0.589	0.597
6500	0.435	0.509	0.454	0.480	0.556	0.563
7000	0.405	0.481	0.428	0.453	0.525	0.531
7500	0.378	0.454	0.404	0.428	0.495	0.500
8000	0.351	0.429	0.380	0.403	0.466	0.470
8500	0.327	0.404	0.358	0.380	0.439	0.442
9000	0.303	0.381	0.337	0.357	0.412	0.415
9500	0.282	0.358	0.316	0.336	0.388	0.389
10000	0.261	0.337	0.297	0.316	0.364	0.365
10500	0.242	0.317	0.279	0.296	0.341	0.341
11000	0.223	0.297	0.261	0.276	0.317	
11500	0.206	0.275	0.244	0.255	0.293	
12000	0.191	0.254	0.229	0.236	0.271	
12500	0.176	0.235	0.214	0.218	0.250	
13000	0.163	0.217	0.201	0.201	0.231	
13500	0.151	0.200	0.186		0.214	
14000	0.139	0.185	0.172		0.197	
14500	0.129	0.171	0.159		0.182	
15000	0.119	0.158	0.147		0.169	

TABLE 1

RELATIVE PRESSURES AND DENSITIES – NON S.I. UNITS

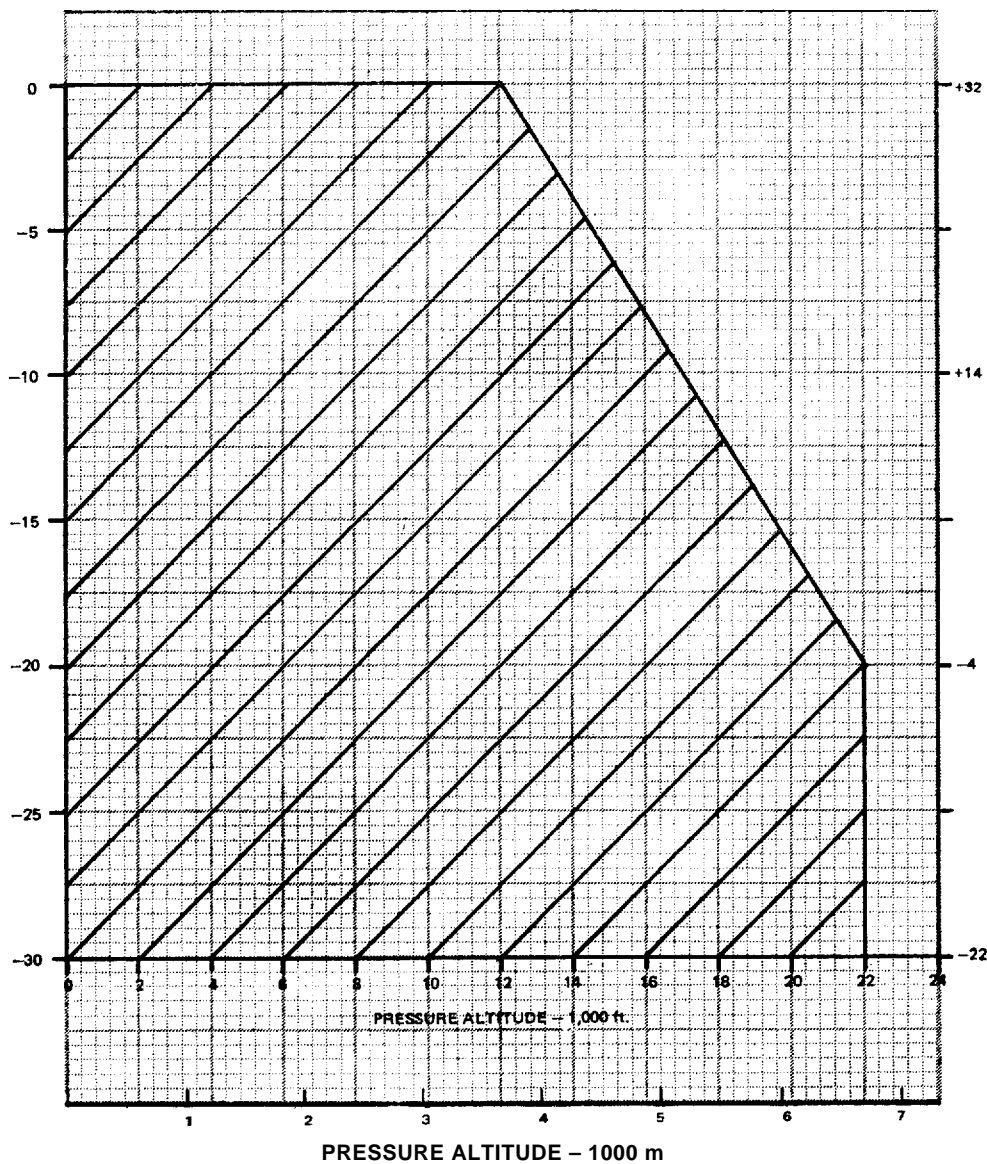
Air density at sea-level (barometer 29.92 in (1013.2 mbar) temp 15°C) is
0.002378 slugs/ft³

Altitude (Pressure Basis) ft	Relative Pressures (I.C.A.O.)	Relative Densities Associated with Conditions Stated				
		International Standard (I.C.A.O.)	Tropical Maximum	Temperate and Arctic Maximum	Tropical and Temperate Minimum	Arctic Minimum
0	1.000	1.000	0.906	0.951	1.138	1.291
1000	0.964	0.971	0.879	0.923	1.098	1.229
2000	0.930	0.943	0.853	0.896	1.058	1.169
3000	0.896	0.915	0.827	0.869	1.020	1.112
4000	0.864	0.888	0.802	0.843	0.983	1.058
5000	0.832	0.862	0.778	0.818	0.953	1.007
6000	0.801	0.836	0.754	0.793	0.923	0.970
7000	0.772	0.811	0.731	0.769	0.895	0.934
8000	0.743	0.786	0.708	0.745	0.868	0.899
10000	0.688	0.738	0.664	0.699	0.814	0.832
12000	0.636	0.693	0.623	0.656	0.763	0.779
14000	0.587	0.650	0.583	0.615	0.714	0.728
16000	0.542	0.609	0.545	0.575	0.668	0.680
18000	0.499	0.570	0.509	0.538	0.624	0.634
20000	0.460	0.533	0.475	0.502	0.583	0.590
22000	0.422	0.498	0.443	0.469	0.543	0.550
24000	0.388	0.464	0.413	0.437	0.504	0.511
26000	0.355	0.432	0.384	0.407	0.470	0.474
28000	0.325	0.403	0.357	0.378	0.437	0.440
30000	0.297	0.374	0.331	0.351	0.405	0.407
32000	0.271	0.347	0.306	0.326	0.375	0.377
33000	0.259	0.334	0.295	0.313	0.361	0.362
34000	0.247	0.322	0.283	0.302	0.347	0.348
35000	0.235	0.310	0.273	0.290	0.334	
36000	0.224	0.298	0.262	0.277	0.318	
37000	0.214	0.284	0.252	0.264	0.303	
38000	0.204	0.271	0.242	0.252	0.289	
39000	0.194	0.258	0.232	0.240	0.275	
40000	0.185	0.246	0.223	0.229	0.263	
41000	0.176	0.235	0.214	0.218	0.250	
42000	0.168	0.224	0.206	0.208	0.238	
44000	0.153	0.203	0.189		0.217	
46000	0.139	0.185	0.171		0.197	
48000	0.126	0.168	0.156		0.179	
50000	0.114	0.152	0.141		0.162	



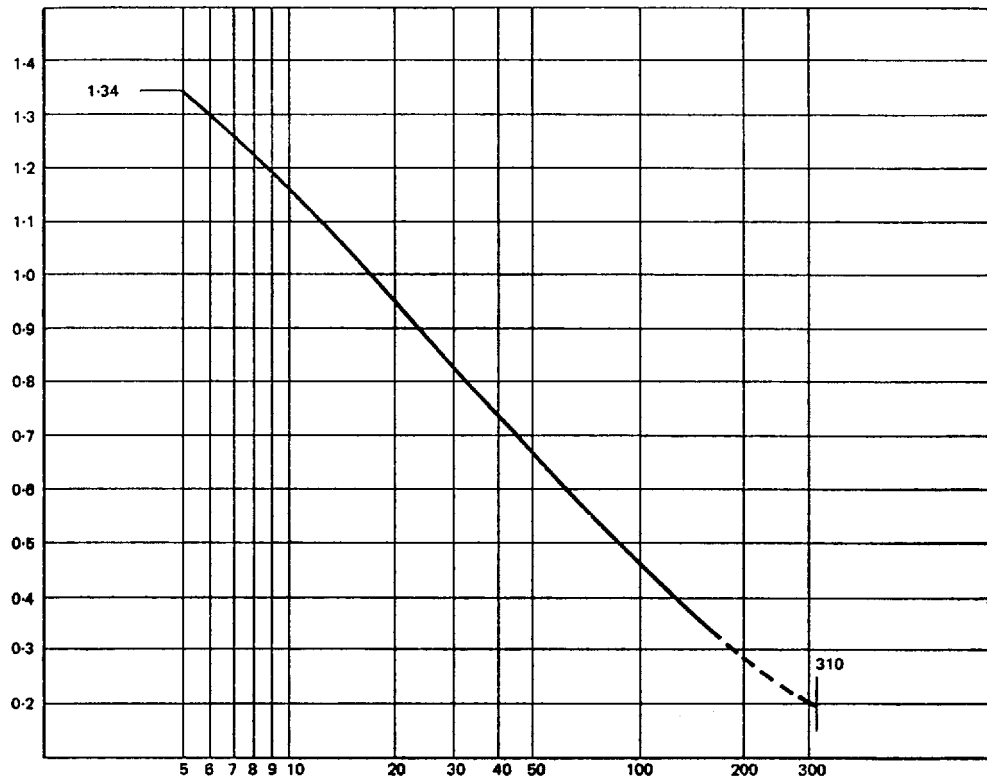
CONTINUOUS MAXIMUM (STRATIFORM CLOUDS)
 ATMOSPHERIC ICING CONDITIONS
 LIQUID WATER CONTENT VS MEAN EFFECTIVE DROP DIAMETER
 Fig. 2

NOTES: Source of data – NACATNo. 1855, Class III-M, Continuous Maximum.



CONTINUOUS MAXIMUM (STRATIFORM CLOUDS)
ATMOSPHERIC ICING CONDITIONS
AMBIENT TEMPERATURE VS PRESSURE ALTITUDE
Fig. 3

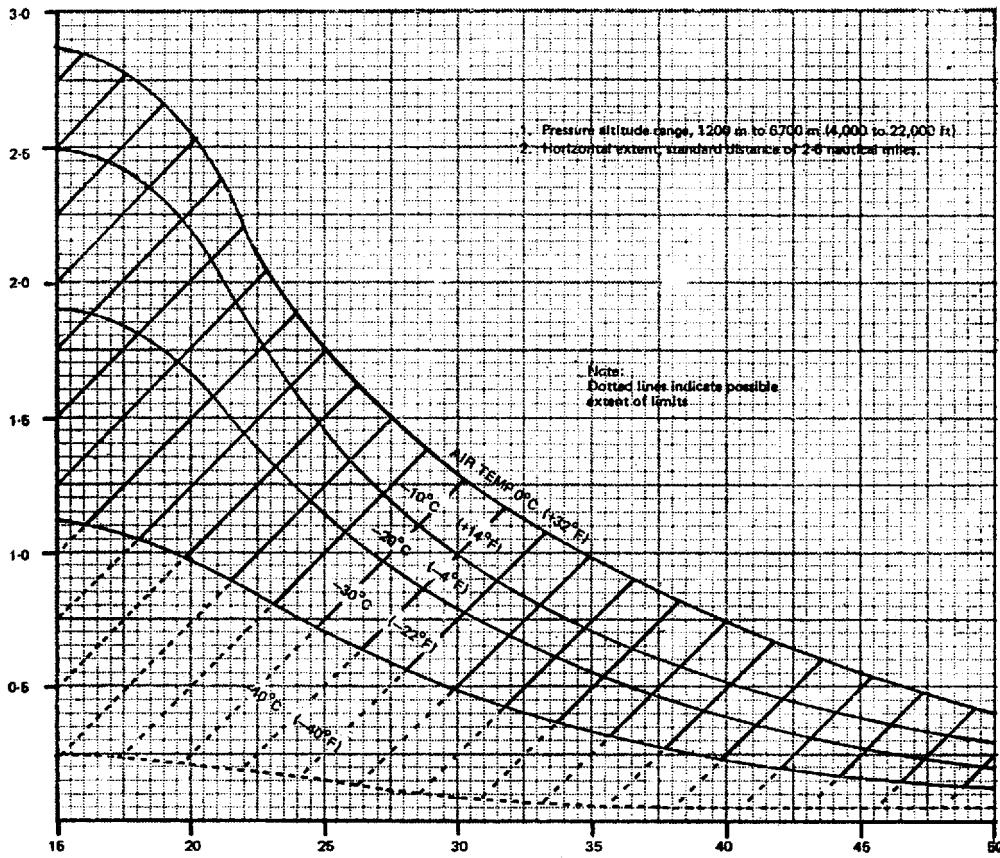
NOTES: Source of data – NACATN No. 2569.



CLOUD HORIZONTAL EXTENT – NAUTICAL MILES

CONTINUOUS MAXIMUM (STRATIFORM CLOUDS)
ATMOSPHERIC ICING CONDITIONS
LIQUID WATER CONTENT FACTOR VS CLOUD HORIZONTAL DISTANCE
Fig. 4

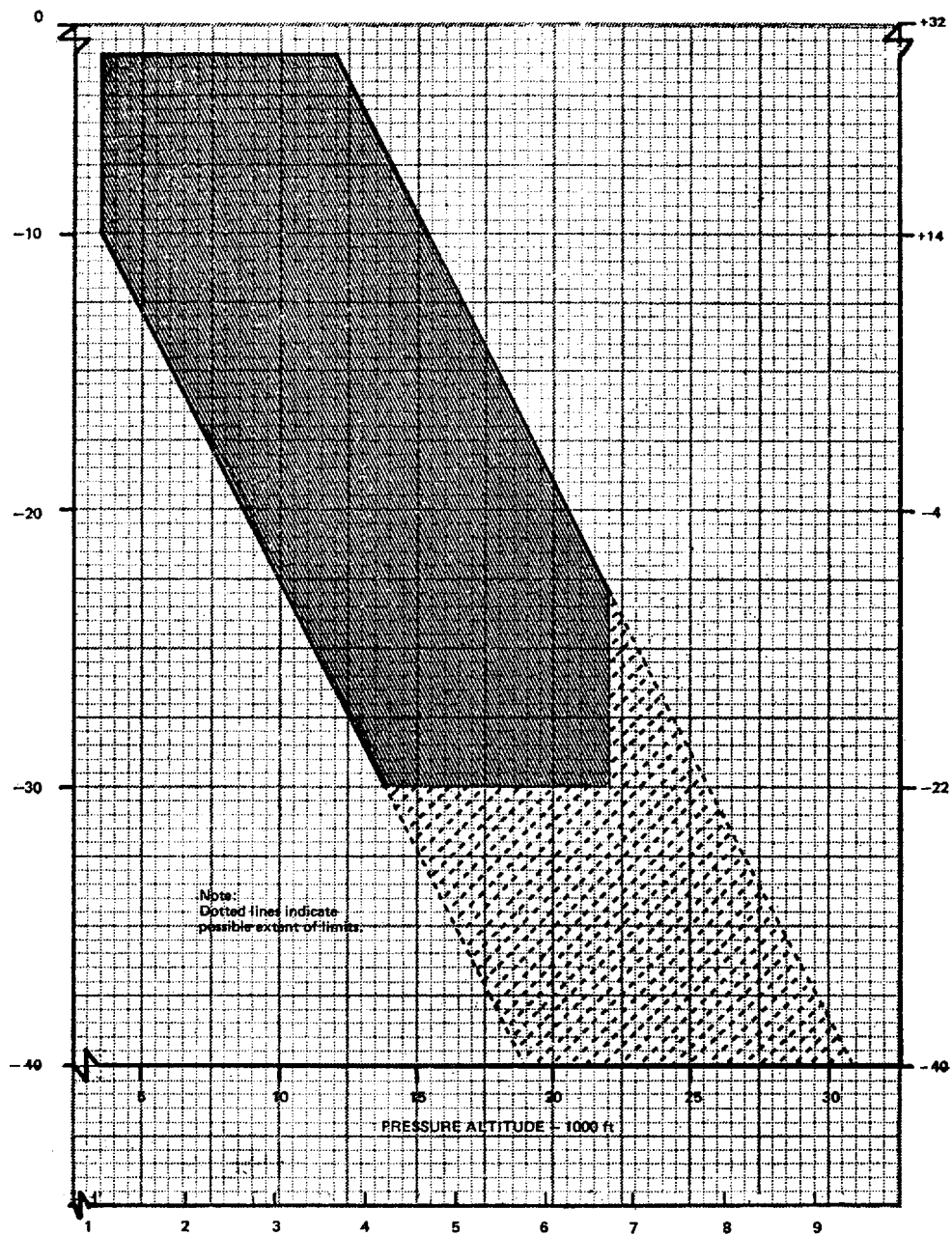
NOTES: Source of data – NACATNNo. 2738.



MEAN EFFECTIVE DROPLET DIAMETER – MICRONS

INTERMITTENT MAXIMUM (CUMULIFORM CLOUDS)
 ATMOSPHERIC ICING CONDITIONS
 LIQUID WATER CONTENT VS MEAN EFFECTIVE DROP DIAMETER
 Fig. 5

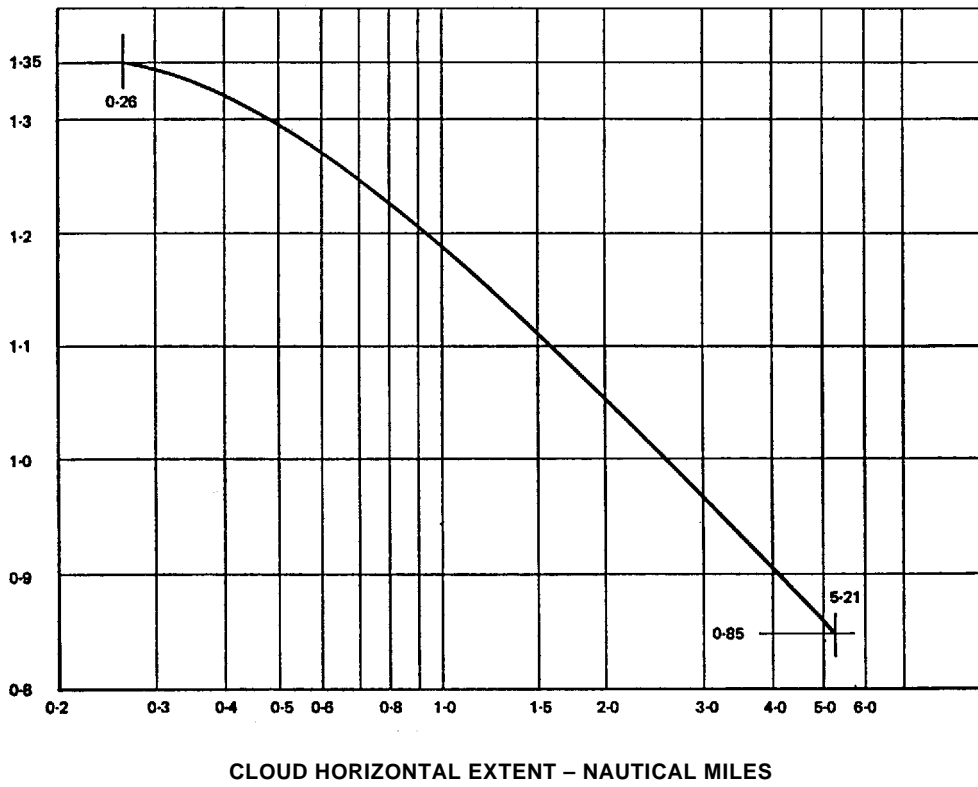
NOTE: Source of data – NACA TN N. 1855, Class II-M, Intermittent Maximum



PRESSURE ALTITUDE - 1000 m

INTERMITTENT MAXIMUM (CUMULIFORM CLOUDS)
ATMOSPHERIC ICING CONDITIONS
AMBIENT TEMPERATURE VS PRESSURE ALTITUDE
Fig. 6

NOTE:Source of data - NACATN No. 2569.



INTERMITTENT MAXIMUM (CUMULIFORM CLOUDS)
 ATMOSPHERIC ICING CONDITIONS
 VARIATION OF LIQUID WATER CONTENT FACTOR WITH
 CLOUD HORIZONTAL EXTENT
 Fig. 7

Source of data – NACATN No. 2738.

SECTION 2 – ACCEPTABLE MEANS OF COMPLIANCE AND INTERPRETATIVE/EXPLANATORY MATERIAL (AMC & IEM)**1 GENERAL**

1.1 This Section contains Acceptable Means of Compliance and Interpretative/Explanatory Material that has been agreed for inclusion in JAR-1.

1.2 Where a particular JAR paragraph does not have an Acceptable Means of Compliance or any Interpretative/Explanatory Material, it is considered that no supplementary material is required.

2 PRESENTATION

2.1 The Acceptable Means of Compliance and Interpretative/Explanatory Material are presented in full page width on loose pages, each page being identified by the date of issue or the Change number under which it is amended or reissued.

2.2 A numbering system has been used in which the Acceptable Means of Compliance or Interpretative/Explanatory Material uses the same number as the JAR paragraph to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material from the JAR itself.

2.3 The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC (which may be additional to an existing AMC) will be amended into the document following consultation under the NPA procedure.

Interpretative/Explanatory Material (IEM) helps to illustrate the meaning of a requirement.

2.4 New AMC or IEM material may, in the first place, be made available rapidly by being published as a Temporary Guidance Leaflet (TGL). Operations TGLs can be found in the Joint Aviation Authorities Administrative & Guidance Material, Section 4 – Operations, Part Three: Temporary Guidance. The procedures associated with Temporary Guidance Leaflets are included in the Operations Joint Implementation Procedures, Section 4 – Operations, Part 2 Chapter 10.

Note: Any person who considers that there may be alternative AMCs or IEMs to those published should submit details to the Operations Director, with a copy to the Regulation Director, for alternatives to be properly considered by the JAA. Possible alternative AMCs or IEMs may not be used until published by the JAA as AMCs, IEMs or TGLs.

2.5 Explanatory Notes not forming part of the AMC or IEM text appear in a smaller typeface.

2.6 New, amended or corrected text is enclosed within heavy brackets.

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[IEM 1.1

Authority

See JAR 1.1

In this context, 'regulation' means not only the drafting of requirements, but also, though not limited to, such activities as implementation, interpretation and application of the statutory aviation requirements.]

IEM to JAR 1.1

Climates, standard

See JAR 1.1

Climatic conditions:–

- a. The standard climatic conditions are intended primarily for use in designing aircraft structure and equipment which should remain airworthy when subjected to the appropriate conditions.
- b. Aircraft performance will vary considerably within the defined climates. It is not intended that any one stated performance should be achievable throughout the whole envelope of conditions but rather that sufficient performance data should be scheduled for an operator to determine the performance which will be achieved in particular conditions.
- c. The climatic conditions given are conditions of the free atmosphere. The temperatures achieved in an aircraft in these atmospheric conditions may be considerably higher. In the absence of precise information as to the surface finish, ventilation and type of engine, etc., the following maximum ambient temperatures should be assumed:–

	Temperate and Arctic	Tropical
i. in the interior of an aircraft;	45°C	60°C
ii. for portions of the outer covering liable to be in the sun and parts attached directly to such covering;	55°C	80°C
iii. in an engine compartment for parts not attached directly to the engine.	100°C	100°C

NOTE: Parts connected to the engine may attain higher temperatures.

[IEM 1.1

Commercial Air Transportation

See JAR 1.1

Commercial Air Transportation is not intended to cover Aerial Work or Corporate Aviation.]

NPA 1-8)
IEM 1.1 - Class
Add the following text to IEM 1.1:

IEM 1.1
Class
See JAR 1.1

Aeroplane classes may comprise aeroplanes having different type certification bases or be variants of certificated types.

The establishment of class ratings for single pilot aeroplanes not requiring a type rating is set out in JAR-FCL 1.215(a).

NPA 1-8)
IEM 1.1 - Commander
Add the following text to IEM 1.1:

IEM 1.1
Commander
See JAR 1.1

The requirements for the commander's functions and responsibilities are found in JAR-OPS.

(NPA 1-8)
IEM 1.1 - Component, Parts, Appliances, Product
Add the following text to IEM 1.1:

IEM 1.1
Component, Parts, Appliances, Product
See JAR 1.1

The following terms appear in both the JAA Arrangements and EC Regulation 3922/91, Article 2, paragraph 1, and are quoted for ease of reference:

- b. **Product**, means a civil aircraft, engine, propeller or appliance.
- c. **Appliance**, means any instrument, equipment, mechanism, apparatus or accessory used or intended to be used in operating an aircraft in flight, whether installed in, intended to be installed in, or attached to, a civil aircraft, but not forming part of an airframe, engine or propeller.
- d. **Component**, means a material, part or sub-assembly not covered by the definitions in b. or c. for use on civil aircraft, engines, propeller or appliances.

(NPA 1-8)
IEM 1.1 - Pilot flying
Add the following text to IEM 1.1:

IEM 1.1
Pilot flying
See JAR 1.1

This is a task assignment only and should not be confused with the command authority of the pilot-in-command.

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JAR-1

AMENDMENT 1/97/1

The requirements and other material contained in this Orange Paper Amendment 1/97/1 have been accepted by the Joint Aviation Authorities Committee for inclusion in JAR-1 and become effective on the date printed on these sheets.

Amendment 1/97/1 consists of the following:-

NPA 1-8
Editorial corrections

This Amendment 1/97/1 will be incorporated into Change 6 to JAR-1 at a future date.

Each of the pages of this Amendment has been given a number prefixed by '(OP)', denoting 'Orange Paper'. The orange pages should be inserted between the text pages of JAR-1 in the positions indicated below, but the pages in JAR-1 bearing the corresponding numbers should not be removed.

The orange pages to be inserted into JAR-1 (at Change 5) are:-

Section 1

(OP) P-4/1-1	between pages P-4/1-1
(OP) 1-2/1-3	between pages 1-2/1-3
(OP) 1-4/1-5	between pages 1-4/1-5
(OP) 1-6/1-7	between pages 1-6/1-7
(OP) 1-10/1-11	between pages 1-10/1-11
(OP) 1-14/1-15	between pages 1-14/1-15

Section 2

(OP) 2-0-2/2-1	between pages 2-0-2/2-1
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Note:

At the back of this Orange Paper Amendment will be found summaries of responses to the various comments that were made on the NPAs during the consultation period. This information is intended to help the reader to understand how the final text has been developed.

It is suggested that these pages be filed at the back of JAR-1.

Addendum to Comment/Response Document

JAAHQ has been notified that during the introduction of the above NPA into JAR-1 at Change 5 an important typographical error was made.

The Note accompanying the definition to 'Fire-resistant' was inadvertently changed to state that aluminium 'is considered ...' to be Fire-resistant, rather than (as was originally agreed) '... may be considered ...'.

The Note is thus corrected.

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COMMENT/RESPONSE DOCUMENT

NPA-1-8

1 Introduction

NPA 1–8; ‘Further Priority Definitions for JAR–1’ was sent out for consultation under the NPAScheme between 1 December 1995 and 2 March 1996. Comments were received from those persons and organisations listed in Appendix 1 during consultation to NPA 1–8.

In response to a number of enquiries, the format of this document differs from that used for NPA 1–7, in that the DEFWG has tried to provide more background to each proposal before disposing of the comments. You should note that the material used is derived from that used in the NPA 1–8 itself, and is only included for the convenience of readers who may not have access to the original NPA.

2 Background

The NPA proposed a number of definitions for JAR–1, Definitions & Abbreviations. The NPA was developed by the JAA’s Definitions Working Group (DEFWG). Its Terms of Reference called for the group to work on ensuring a level of consistency in the use of Terms and Definitions within the JAA system.

3 Analysis of NPA Comments

Of the 6 proposals, containing a total of 13 proposed definitions, in the NPA all were commented upon to some extent or another. The following pages provide a summary of those comments and the DEFWG’s response:

General Comments

A number of general points were raised that dealt with either JAR–1 or NPA 1–8 in general. Three NAAs and one crew organisation submitted general supportive comments, and these are acknowledged.

The DEFWG’s terms of reference indicate that JAR–1 should be used for terms that apply to more than one JAR. Two commentators thus questioned the inclusion of Proposals 1 & 6 in the NPA. The WG has included a definition of Class in JAR–1 in anticipation of its use by other JARs. The rationale for the inclusion of Proposal 1 in JAR–1 reflected the close relationship between the various terms, that appear in various JARs, and other regulatory documents (e.g. EC Regulation 3922/91). This idea of a ‘central reference’ for these related topics seemed to fit with the concept of JAR–1.

Harmonisation

Commentors from US industry noted that although the DEFWG has indicated that definitions should, to the extent possible, be harmonised with ICAO and/or FAR Part 1, the proposals in this NPA did not reflect that intent. The JAA does consider harmonisation with FAA texts, as a routine step in developing proposals. The fact that JAR–OPS and JAR–FCL are not based on US requirements, and that the JAA is still trying to accomplish a harmonised position within Europe, these priority terms, mainly, for licensing and operations may not be the best example of that intent.

Proposal 1: Aircraft Component, Appliances, Component, Parts and Appliances, and Product

These terms appear throughout the JARs, and in accordance with its terms of reference, the DEFWG attempted to rationalise the use of these words. After a lengthy exchange of views within the group and with other committees, two options were possible:

Firstly to try to achieve consistency throughout the JAA system, using the definitions in the EU Regulation 3922/91 (they are the same as those included in the JAA Arrangements) as this is the 'highest level' text we have. They could be included in JAR-1, but this would imply standardising definitions for Products, Appliances and Components, implying numerous changes to JAR-21, JAR-145 and the draft BASAs. This would also reduce the level of harmonisation with FARs (notably Form 1).

Secondly, and it was this option that was consulted upon, accept the 'inconsistency' throughout the JAA system and let JAR-1 simply list the various words as used in JAR-21, JAR-145, and EU Regulation 3922/91. This would imply no changes to existing JARs and would have no impact on JAA/FAA Harmonisation. This implied drafting a list of terms, that are not defined, but it is indicated where their definition is found in JARs and indicate that they actually are valid for a particular 'field' (e.g. maintenance, certification etc.). This manner would be similar to that adopted in NPA 1-7 for Aircraft Type and Category.

Of the ten comments received to this proposal, half of the commentators supported the proposal, although a number regretted the fact that complete definitions were not being proposed.

The remainder of the commentators noted that the proposal did not contain definitions, and should thus be withdrawn pending the development of consistent definitions as described in the first of the possible options above. These comments were not generally well supported with reasons as to why the commentator preferred the former option. Where arguments were put forward, they were as follows:

- current proposal has potential to diverge from ICAO texts;
- not everyone has access to EC Regulation 3922/91;
- amendments to the above Regulation are outside the JAA's control; and
- JAR-1 should not be a cross-reference document.

The DEFWG did accept that the proposal was likely to lead to divergence from ICAO, and did not find the other arguments compelling enough to embark on a fundamental rewrite of the JARs, and the 'dis-harmonisation' that this implies. The text of the Arrangements and 3922/91 (they are identical) will, however, be added as IEM to this definition. Additionally ICAODoc 9569 does not have any of these terms in it.

One commentator preferred to see 'certification' instead of 'type certification', as this made the text more generic to all JAR-21 related issues, and not just JAR-21 Subpart B. The comment is agreed.

The definition is then essentially unchanged (other than the two modifications above), and although it may not be an ideal definition, the DEFWG concluded that the adopted text is the best possible solution, and does at least provide readers of JAR-1 with a means to follow the various JAA and other texts.

Proposal 2: Commander, Pilot-in-Command and Co-pilot

A WG paper was discussed, that led to the proposal in NPA 1-8, containing a summary of all the existing draft texts in JAR-OPS and JAR-FCL. The discussion focused on the need to have both a Commander and a Pilot-in-command defined. It was agreed that the point of defining Commander was to have one pilot in overall authority on each flight. This would often be the same person as the Pilot-in-command, but where augmented crews were carried, the Commander might not always be physically 'in command', but he/she would still have responsibility for the overall safety of the flight.

The definition for Pilot-in-Command is derived from JAR-OPS 1.940(a)(5) and concentrates on the delegation and limited duration of functions during the flight (for the time being).

The FCL Committee's proposal for Co-pilot is similar to that in ICAO Annex I, and was modified slightly from the working paper to make it even closer to the ICAO term. Two small additions were added; the first to add that the Co-pilot could not be the Commander, and to add, 'license or rating' to clarify the final statement.

It was this proposal that drew the most difficult comments, and has caused problems for the DEFWG to resolve. A summary of the comments received is given below:

- The term commander is new, not in ICAO Annex VI, and causes confusion. The use of the term pilot-in-command (an ICAO term) was supported.*
- There is an inconsistency between JAR-OPS and JAR-FCL in that commander only appears in the former. Additionally, the term pilot-in-command in JAR-OPS is not the same as in ICAO Annex VI – JAR-OPS uses commander where ICAO uses pilot-in-command. The JAR-OPS meaning of pilot-in-command does not appear in Annex VI.*
- Drafting the definition to account for the fact that the commander will, usually, also be the pilot-in-command is not the point. The text should concentrate on the issue that the commander is designated, and is responsible for the safe operation of the flight; that he/she is a pilot is co-incidental. The same is true for the pilot-in-command; he/she is obviously a pilot.*

Others disagreed, and insisted that the definition of commander must include a statement to the effect that the commander is qualified and current in the aircraft being flown. One commentor wanted to avoid the use of retired pilots in a non-flying role.

- Some commentors believed that the commander's authority and responsibility could be transferred in flight, whilst others felt that the commander was the commander for the whole flight, even if resting. Others saw the other view, and that if the pilot-in-command of an enlarged crew was flying, the commander of the resting crew was no longer responsible.*
- One proposal, supported by a number of commentors, implied that the commander was responsible for the safety of the flight, but the pilot-in-command was in charge of the piloting. This allows the commander and Pilot-in-command to be the same person, and lets him/her delegate the flying to another, but not for the commander to be relieved of the overall responsibility for the safety of the flight.*
- Another alternative proposed that a new term relief commander be drafted to allow for delegation of the overall safety function.*
- The phrase 'for the time being' is too imprecise. Substitute with 'for a certain period of time or a certain part of the route.'*
- New terms, relief co-pilot and pilot under supervision, are needed to complete the picture.*

From the above combinations of ideas, the DEFWG discussed, in great detail, a possible way forward.

From the viewpoint of the Operations Committee/Division, the matter was not as difficult as some suggested. The origin of a designated commander is from the United Kingdom's system, and has been in place for many years. It was introduced into the operating requirements following an accident where crew co-ordination was compromised by issues of crew seniority between the pilots following an engine failure shortly after take-off. Additionally, ICAO's texts were written long before the introduction of 'ultra-long' haul flights where multiple flight crews were carried. The essence of the text in JAR-OPS is that a commander is a designated person, and always has overall responsibility; a responsibility which cannot be transferred in flight. It was noted that although Appendix 1 to JAR-OPS 1.940 referred to the 'relief' of the commander, it is not specified, what, precisely 'relief' entails. Additionally, Appendix 1 to JAR-OPS 1.1045, para 4.3 refers to procedures following flight crew incapacitation. This is seen as only being valid for the most exceptional cases (force majeure etc.), and the wording of these two paragraphs should not be allowed to cause confusion.

The Licensing Committee view, in the DEFWG, was that the issue of commander is a purely operational one, and it did not affect JAR-FCL – so long as the pilot-in-command in JAR-OPS

meant the same as in JAR–FCL. Some members could not wholly concur with the idea that JAR–FCL could not be affected by the operational requirements. In addition, although if commander was only operational, then it is only valid for commercial operations. In addition, there was a view that the use of commander and pilot-in-command in JAR–OPS was not consistent within itself.

The WG did consider whether ‘control’ or ‘conduct’ was more appropriate than ‘command’ in the term pilot-in-command, but concluded that the term was correct as is and did not modify it.

There was some concern in the WG, reflecting comments received, that the situation was not as clear as had been suggested. The privileges conferred in JAR–FCL as a pilot-in-command could be seen as less than those in other States when JAR–OPS implies that a pilot-in-command is not necessarily the commander. Such a view could prejudice the validation of JAA licenses in States outside Europe. In addition, it did appear clear, from the comments that the requirements behind the definitions were consistent with each other.

The DEFWG, in trying to take all of the above into account, concluded that the revised term respected the privileges conferred by ICAO, and made the two roles quite clear. The layout has been modified to try and further clarify the JAA’s intentions. Commander is only being defined in JAR–1 as a cross-reference for the sake of completeness. The DEFWG reviewed a possible text for Commander and commends the following to the Operations Committee; ‘Commander means the pilot-in-command, designated by the operator for a specific flight, who may delegate responsibility to another pilot-in-command’.

Adoption of the terms does, however, imply that the JAA’s Operations Committee will need to review JAR–OPS to ensure the internal consistency of the use of the two terms. This work will include reviewing, at least, crew qualification, training, crew composition and responsibilities. The Operations Committee confirmed that it was ready to perform such a review, and will further no longer use pilot-in-command unless really required.

Comments regarding a possible new term ‘relief commander’ were reviewed. The term is not, following the above discussions, deemed to be required and would introduce confusion.

Co-pilot This term was much simpler to handle; a number of comments all moving away from ICAO were discussed and rejected on that basis. It is retained, as is.

Proposal 3: Pilot flying (PF) and Pilot not flying (PNF)

The terms are used in relation to training in JAR–FCL and JAR–OPS, and the proposal was based on the FCL Committee’s work. The DEFWG added a short clarification to make it clear that during a flight in an aircraft where only one pilot is required, the concept of Pilot not flying does not apply.

Most commentators were generally supportive of the proposal. Based on the comments an IEM was prepared using the clarification that was in parenthesis in the NPA. The comment proposing that the term to be defined be altered to read ‘handling’ in place of ‘flying’, however descriptively accurate, was not adopted. This was due to the proposed term being well understood, and most familiar to the aviation community.

A licensing comment objected to the addition of the clarification of the single pilot issue in Pilot not flying, but did not give any reason. The DEFWG feels that the clarification is important due to ‘historical’ confusion for the recording of flight time and responsibility in single pilot aircraft, when two pilots are on board. The clarification makes it clear that only one person is the pilot in such a case, and the other, although he/she may be licensed, is for the purposes of the flight, a passenger.

Proposal 4: Infant

It was confirmed that a definition of an infant would be required for JAR–OPS, and that the intent was to include all children under the age of 2 years in that grouping. The FAA has a standard phrase for an Infant, although it was not in FAR Part 1. A proposal was drafted with the above intent in mind.

Only three comments were received, of which one was supportive. Two commentators noted that the phrase proposed did not account for persons born on 29 February, or for those who chose to count a person's date of birth as the first birthday. In order to retain the same words as the FAA uses (even though the definition isn't in FARPart 1), the definition is not altered, but to take account of the obtuse readings of the text described above, IEM material was drafted by the DEFWG. The DEFWG note that the FAA only defines the term in FARPart 121 for operations. It was thus decided in the DEFWG to withdraw the term from JAR–1 and offer the text to JAA's Operations Committee for their consideration of a possible NPA to JAR–OPS 1 and 3. The DEFWG's final text is as follows:

Definition of Infant

***Infant** means a person who has not yet reached his/her second birthday.*

IEM to above definition

It is not intended that a person's date of birth is their first birthday, and persons born on 29 February will be considered to have reached their second birthday on 1 March, two years after their birth.

Proposal 5: Civil Aircraft

The Operational Committee has decided to use the terms 'civil aeroplane' and 'civil helicopter' in the applicability paragraph to JAR–OPS. The statement made in NPA 1–7 that production of a definition of 'Civil Aircraft' would not be required prior to the adoption of a JAA Convention has been superseded by events.

The NPA proposal was based on the one included in the draft Convention which is a 'high level' text. It was written in a positive sense as the Convention says what is not a Civil Aircraft. The necessary flexibility needed to allow for the different treatment of police, customs aircraft, etc. in the various states today was introduced by the word 'treats as being in the service of the State'. The definition is different from the ICAO one (see Art. 3 of Chicago Convention: 'Aircraft used in military, customs and police services are deemed to be State Aircraft') as this definition is not appropriate in some JAAS states (e.g. UK).

The words 'permanently' or 'temporarily' indicate that an aircraft could be treated as being in service of the State for just one flight. Finally the definition is not limited to the aircraft on JAAS registers.

Although a few comments were received on this topic, it was clear to the WG that the term causes difficulty in certain States. However, those NAAs who questioned whether or not the proposal implied that the exact determination had been left to the State are correct, and the WG notes their support that this should be the case.

One NAA wished to see all aircraft on the civil register declared as civil aircraft. This would have left no flexibility, and would have caused great problems for those States who do not do as proposed. The comment was not adopted.

Only one commentor disagreed wholly with the proposal. An industry body felt that the definition should take account of who the operator of the aircraft is. If the operator is a civil organisation then even if the operation is on behalf of the police or military, the aircraft remains a civil aircraft. This comment does not take account of the fact that the determination needed is related more to the operation than the aircraft being used; hence the inclusion of the word ‘temporarily’.

The proposal was unchanged and is retained; both JAR–OPS and JAR–FCL require a definition prior to the adoption of a future Convention.

Proposal 6: Class

It is noted that the definition of Class is only required at the time being for FCL, but as it is a word that may be needed elsewhere it has been included in JAR–1. The format is based on that used and agreed following NPA 1–7. The reserved sub-paragraphs are to indicate that we may, in the future, propose texts for use in other contexts.

The explanation that it is expected that other JARs will use the term in the future is offered as a reply to those commentors who felt that the term should only be in JAR–FCL.

The comment proposing deletion of the term as the requirements for JAR–FCL were not yet clear is rejected on the basis that it is not the place of the definition to contain the requirements, and once in place, they will not affect the definition of what class is.

One commentor proposed adding the words ... and training ... to the initial phrase to indicate the link with JAR–OPS. This was agreed in principle, but the WG considered that the link was better established in an IEM. During the review of NPA comments, the text was altered to make it clearer and to make it read more like a definition of what ‘class’ is, rather than an explanation of a JAR–FCL requirement. A proposed improvement was adopted to indicate that class is only a term used when referring to a group of single-pilot aeroplanes. This required that the term be modified to delete ‘crew complement’.

Comments to Explanatory Note and Other Comments

One NAA proposed that JAR–1 contain a definition of ‘Quality Assurance’ on the basis that JAR–21, JAR–145 and JAR–OPS all addressed quality systems. The issues raised by the commentor addressed concerns of consistency of application of quality-system requirements. The group concluded that a simple definition of what quality is would not solve these issues. Furthermore, the JAAC has already tasked the JAA to work on improving the consistency of the requirements in this field. The comment is seen as supportive of that planned work – work that is to be done outside the DEFWG.

New terms for relief co-pilot and pilot under supervision were proposed. These comments proposing that new definitions be developed will be built into the DEFWG’s future work programme and reviewed at a later stage. These comments are thus not forgotten.

List of Commentors to NPA 1-8

AEA
AECMA
AIA, US
ALPA, US
Austrian Airlines
Austro Control GmbH (ACG)
Boeing
CAA, Monaco
CAA, UK
CAAd, Finland
DGAC, France
JAAHQ Licensing Director
Fachverband der Luftfahrtunternehmen, Austria
FOCA, Switzerland
GAMA, US
LBA, Germany
LFV, Sweden
MOT, Austria
Northern Executive Aviation
RLD, The Netherlands
SLV, Denmark

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JOINT AVIATION REQUIREMENTS

18 October 1999

JAR-1AMENDMENT 1/99/1

The requirements and other material contained in this Orange paper Amendment 1/99/1 have been accepted by the Joint Aviation Authorities Committee for inclusion in JAR-1 and become effective on the date printed on these sheets.

Amendment 1/99/1 consists of the following:

NPA	1-6
	1-9
	1-10
	25-B, D, G-244
	25B-215
	25B-238

This Amendment 1/99/1 will be incorporated into Change 6 to JAR-1 at a future date.

Each of the pages of this Amendment has been give a number prefixed by '(OP)', denoting 'Orange Paper'. The orange papers should be inserted between the text pages of JAR-1 in the positions indicated below, but the pages in JAR-1 bearing the corresponding numbers should not be removed.

The orange papers to be inserted into JAR-1 (at Change 5) are:

(OP) ii/C-1	between pages ii/C-1
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Section 1

(OP) P-4/1-1	between pages P-4/1-1
(OP) 1-6/1-7	between pages (OP) 1-7/1-7
(OP) 1-8/1-9	between pages 1-8/1-9
(OP) 1-12/1-13	between pages 1-12/1-13
(OP) 1-14/1-15	between pages (OP) 1-15/1-15
(OP) 1-16/1-17	between pages 1-16/1-17

Note:

At the back of this Orange Paper Amendment will be found summaries of responses to the various comments that were made on the NPAs during the consultation period. This information is intended to help the reader to understand how the final text has been developed.

It is suggested that these pages be filed at the back of JAR-1.

Comment Response Document to NPA 1-6

Definition of 'Acceleration Time'

A total of 12 comments were received on NPA 1-6, all of which were supporting the proposal.

Comment Response Document to NPA 1-9

Definition of 'OEI & Contingency'

A total of 7 comments were received on NPA 1-9, all supporting the proposal.

Two of the commentors, however, pointed out that the NPA made reference to a previous version of JAR-1. These comments have been noted

Comment Response Document to NPA 1-10, rev. 1
Definition of 'Microlight'

NPA 1-10, rev. 1 resulted in 16 responses from 11 JAA member Authorities, 1 non-JAA member Authority, 2 European organisations, 1 European manufacturer and 1 individual.

The proposal was accepted without comments by 6 JAA member Authorities, 1 European organisation, 1 European manufacturer and 1 individual.

Other comments received were:

- 1) Comment: MOT Austria proposed deletion of the words "or amphibian" in the definition as this is in any case an aeroplane.

Reply: The comment is accepted.

- 2) Comment: MOT Austria proposed amending the word "microlight" with the word "ultralight"

Reply: The comment is rejected. "Microlight" was accepted as the definition.

- 3) Comment: LFV Sweden proposed to add 65 km/h before the speed limit in knots.

Reply: The comment is accepted and the text will be amended as proposed.

- 4) Comment: LFV Sweden proposed to simplify the weight limits to two similarly to the definition in JAR-VLA and in JAR-23.

Reply: The comment is rejected. The NPA proposal was developed following comments to the first NPA consultation, including the adoption of a number of elements proposed by FAI and Europe Airports.

- 5) Comment: FAI proposed to use the term "aircraft" instead of "aeroplane" as it covers a wider variety of existing and future microlight aircraft.

Reply: This will be included in a future NPA.

- 6) Comment: FAI proposed to include an IEM in JAR 1-2 defining aircraft in the microlight context and to enable incorporation of potentially life saving systems.

Reply: This will be included in a future NPA.

- 7) Comment: DGAC Spain proposed inclusion of V_{SO} in S.I units.
Reply: 65 km/h will be included.
- 8) Comment: DGAC Spain proposes to include autogyros in relation to microlight.
Reply This will be included in a future NPA.
- 9) Comment: CAA-UK reiterates previous comment that there is little point in having a definition without associated design requirements This could lead to unacceptable divergence in Safety Regulation for this class of aircraft in individual JAA member states which could complicate future harmonisation in Europe.. Many countries supported this view in the development phase and already use BCAR Section S. This should be conveyed to the JAAC for consideration.
Reply: JAA HQ will present the issue to JAAC for consideration.
- 10) Comment: CAA-UK cannot support increasing the weight limit above 450 to accommodate floatplanes, as there is no compelling reason of justification for this increase.
Reply: The present definition is a compromise reached through discussion between authorities and interested parties.
- 11) Comment: The removal of the wing loading criterion goes against the decision of the NAAs meeting of September 1995 and is not supported by the CAA. A criterion based on stall speed would need to establish the technique used to approach the stall, since stall speed in this class of aircraft is highly dependent on the approach technique For aeroplanes that have a V_{SO} close to the defined limit the complexity of accurately determining V_{SO} is far greater, and if done properly will cost the manufacturer a not inconsiderable amount of time, effort and money. This would necessitate the use of complicated and expensive equipment in order to show compliance with such a criterion during type certification testing. The increased complexity involved in accurately determining V_{SO} may well be reflected in the effort required of the "Authority".
Alternatively, a criterion based on wing loading, which has a direct correlation with stall speed, can be seen as a relatively inexpensive option. The arguments against a wing loading criteria are not accepted, particularly the JAA response in the comment/response document which suggests that higher values for wing loading contribute to keeping the aircraft a low energy one. In addition, the JAA comment that aspect ratio would be a preferred additional discriminator is not supported since aspect ratio has no first order effects on stall speed.
It is accepted , however, that the use of the wing loading criterion alone may suppress innovative design. The CAA would therefore recommend the retention of both wing loading and stall speed criteria, with compliance required for either one, as originally proposed. It would then

be up to individual manufacturers to assess the trade-off between possible performance benefits against the increased cost and regulatory burden.

Reply: This may be used as an AMC to the definition and will be included in a future NPA.

- 12) Comment: CAA-UK: Definition of V_{so} should use the value of 35 kts. 35.1 kts is unrealistic and misleading.

Reply: The comment is accepted.

- 13) Comment: CAA-UK: proposes amended text to the phrasing in Section 5.3 of the justification and paragraph 2 of the comment response document.

Reply: The comment is accepted.

- 14) Comment: CAA UK do not find it clear whether amphibian covers also rotorcraft as well as aeroplanes. To avoid misunderstanding, its use should either be avoided in the proposed text, or alternatively, explicitly defined within JAR-1.

Reply: The term 'amphibian' has been deleted.

- 15) Comment: CAA-UK would like to have a foot note indicating that foot-launched aircraft are specifically excluded from this definition.

Reply: The comment is accepted.

- 16) Comment: CAA-UK notes that the use of amphibian in the first sentence is incorrect and proposes a revised definition.

Reply: The comment on the use of the amphibian is accepted. This will be deleted.
The revised definition is not accepted.

- 17) Comment: CAA-UK regrets that the definition of landplane and floatplane was not included as part of this revised NPA.

Reply: This will be considered for a future NPA.

- 18) Comment: LBA proposes revised definition.

Reply: See above in 16)

19) Comment; LBA proposed to use wing loading as the primary criterion for checking of limits.

Reply: See above 11).

3.2 Discussion of Comments on Individual NPA Proposals.

3.2.1 Definition of Take-off Decision Speed (NPA paragraph 2.1.1).

A number of comments were received on the proposal to introduce a definition of "Take-off Decision Speed" into JAR 1. These invoked the philosophies behind the take-off go/no-go decision process and the treatment of pilot recognition and reaction delays. Some commentators pointed out that the emphasis of advice from manufacturers and modern crew training programmes was that the decision speed, V_1 , was the point by which the pilot should have initiated actions to bring the aircraft to a halt in the event of a decision to reject the take-off. Others take the view that with as little as 1 second between the assumed engine failure speed, V_{EF} , and V_1 , this is inadequate for the pilot to complete the recognition, analysis and response process, thus making "decision speed" a misnomer.

JAA recognises that even with the benefit of effective crew training, a critical failure close to V_1 is a rare and unpredictable event for the line crew to deal with. Human factors considerations and the evidence of past RTO overrun accidents confirm that a safety margin based solely on a 1 second delay between engine failure and initiation of braking action is inadequate to cover the recognition and reaction process. However, the safety provided for by the requirements is a combination of the V_{EF} to V_1 delay time and the distance margin added to the certification demonstration of accelerate-stop distance to address operational contingencies. A balance needs to be achieved between the commercially penalising operational implications of performance margins and what it is reasonable to expect an adequately trained crew to achieve when faced with a critical, but rare, event. This balance needs to be achieved by a combination of performance scheduling and attention to the decision and reaction process in crew training. The training aspects are being emphasised through other initiatives, including the Take-off Safety Training Aid package produced by leading manufacturers, in consultation with FAA, as a further product of the task force recommendations. JAA concludes that it is right for the regulations to support and confirm the accepted training philosophies, with V_1 emphasised as the speed by which action should be initiated in an RTO, albeit with the additional margin of a distance safety factor.

In response to these comments this proposal of the NPA is further revised to delete reference to the term "Take-off Decision Speed" but to amend the existing definition of the abbreviation " V_1 ", emphasising the intended nature of this as a crew action speed. However, the recognised short duration of the delay time portion of the overall safety margin emphasises the need for the additional distance margin to be adequate. In particular, it should be used only to cover random operational contingencies. Significant predictable factors, such as alignment distance, need to be addressed separately and not treated as random events that are covered adequately by the general safety margins.

3.2.2 Definition of Screen Height. (NPA paragraph 2.1.1).

No comments were received on this aspect of the NPA. However, such a definition was not included in NPRM 93-8. While it is a commonly used term, it is not used in the requirements specifying the determination of take-off distance and only arose in the context of the NPA due to the proposed definition of Take-off Decision Speed. In seeking harmonisation with FARs, and given the changes discussed in the previous section, this proposal is deleted.

3.2.3 Definition of V_{EF} . (NPA paragraph 2.1.2).

One commentator proposed that the definition of V_{EF} should include the constraint that it must not be less than V_{MCG} . For large aeroplanes, certificated to JAR 25, this is adequately addressed by JAR 25.107(a)(1). The purpose of the definition in JAR 1 is to introduce a standard term that may then be used in various other JAR parts. These may include design codes for other categories of aircraft (e.g. small aeroplanes or rotorcraft) where the concept of V_{MCG} is either not used or is inappropriate. Thus, this proposed addition to the JAR 1 definition is not appropriate and the NPA proposal is adopted unchanged.

Excerpt of Comment Response Document for NPA 25B-215

No comments were received on the proposals for amendments of JAR 1 definitions.

Proposals were adopted unchanged.

Excerpt of Comment Response Document for NPA 25B-238

No comments were received on the proposals for amendment of JAR 1 definitions.

Proposals were adopted unchanged.