
 STATUTORY INSTRUMENTS

1986 No. 599

CIVIL AVIATION

**The Air Navigation (Aircraft and Aircraft Engine Emissions)
Order 1986**

<i>Made - - - -</i>	<i>26th March 1986</i>
<i>Laid before Parliament</i>	<i>8th April 1986</i>
<i>Coming into Operation</i>	<i>1st May 1986</i>

At the Court at Buckingham Palace, the 26th day of March 1986

Present,

The Queen's Most Excellent Majesty in Council

Her Majesty, in exercise of the powers conferred on Her by sections 60, 61, 101 and 102 of the Civil Aviation Act 1982 (a) and of all other powers enabling Her in that behalf, is pleased, by and with the advice of Her Privy Council, to order, and it is hereby ordered, as follows:—

Citation and Operation

1. This Order may be cited as the Air Navigation (Aircraft and Aircraft Engine Emissions) Order 1986 and shall come into operation on 1st May 1986.

Interpretation

2.—(1) In this Order:—

“An International Standard Atmosphere at sea level” has the meaning specified in Schedule 2 to this Order;

“Authorised person” means any constable and any person authorised by the Authority (whether by name or by class or description) either generally or in relation to a particular case or class of cases;

“the Authority” means the Civil Aviation Authority;

“BCAR” means British Civil Airworthiness Requirements Section M833 Aircraft and Aircraft Engine Emissions—Issue 1 dated 1st February 1986 with any modifications which may be prescribed;

“Contracting State” means any state including the United Kingdom which is party to the Convention;

“the Convention” means the Convention on International Civil Aviation signed on behalf of the United Kingdom at Chicago on 7th December 1944;

“Prescribed” means prescribed by Regulations made by the Secretary of State under this Order;

“Smoke” means the carbonaceous materials in exhaust emissions which obscure the transmission of light;

(a) 1982 c.16.

“Subsonic aircraft” means an aircraft which is incapable of sustaining level flight at a speed in excess of Flight Mach 1.0;

“Supersonic aircraft” means an aircraft which is capable of sustaining level flight at a speed in excess of Flight Mach 1.0;

(2) Expressions used in this Order shall, unless the context otherwise requires, have the same respective meanings as in the Air Navigation Order 1985(a).

(3) A power to make regulations under this Order shall include the power to make different provisions with respect to different classes of aircraft or aircraft engine and with respect to different circumstances and to make such incidental and supplementary provisions as are necessary or expedient for carrying out the purposes of this Order.

Application of Order

3. This Order shall apply to:—

- (a) every aircraft which is powered by gas turbine engines whose date of manufacture was on or after 1st May 1986 or in respect of which a certificate of airworthiness was first issued on or after 1st May 1986;
- (b) every turbojet and turbofan engine whose date of manufacture was on or after 1st May 1986.

Fuel Venting Requirements

4. An aircraft to which this Order applies shall not land or take-off in the United Kingdom unless

- (i) the aircraft; or
- (ii) the engines fitted to the aircraft,

are of a type which has been certified as complying with requirements relating to fuel venting —

- (a) by the Authority in accordance with article 7(1); or
- (b) by the competent authority of a Contracting State other than the United Kingdom in pursuance of the Convention; or
- (c) by the competent authority of a country being a country prescribed as one which applies standards which in the opinion of the Secretary of State are substantially equivalent to those required for a certification by the Authority in accordance with article 7(1).

and, in the case of paragraph (i), that the aircraft is fitted with the engines specified in the certification.

Smoke Emission Requirements

5. An aircraft powered by turbojet or turbofan engines to which this Order applies shall not land or take-off in the United Kingdom unless those engines are of a type which have been certified as complying with requirements relating to smoke emission —

- (a) by the Authority in accordance with article 7(2); or
- (b) by the competent authority of a Contracting State other than the United Kingdom in pursuance of the Convention; or

(a) S.I. 1985/1643.

- (c) by the competent authority of a country being a country prescribed as one which applies standards which in the opinion of the Secretary of State are substantially equivalent to those required for a certification by the Authority in accordance with article 7(2).

Limitation of the Prohibition

6. The prohibitions in articles 4 and 5 shall not apply to
- (a) an aircraft flying in accordance with the "A Conditions" or the "B Conditions" set forth in Schedule 2 to the Air Navigation Order 1985;
 - (b) an aircraft landing or taking-off at a prescribed place.

Certification by the Civil Aviation Authority

7.—(1) The Authority shall certify a type of aircraft or a type of engine as complying with requirements relating to fuel venting if it is of the opinion that the type of aircraft, when fitted with the type of engine specified in the certification, or the type of engine is designed and constructed to prevent the intentional discharge into the atmosphere of liquid fuel from the fuel nozzle manifolds resulting from the process of engine shutdown following normal flight or ground operations.

(2) The Authority shall certify a type of turbojet or turbofan engine as complying with requirements relating to smoke emission if it is of the opinion that it complies with the applicable standards specified in paragraphs (4) and (5) of this article.

(3) For the purpose of certification under this Article the applicant for certification shall furnish such evidence and subject aircraft or engines of a type in respect of which the application for certification has been made to such trials and other tests as the Authority may require.

(4) The standards applicable to turbojet or turbofan engines fitted to subsonic aircraft shall be those specified in Part I of Schedule 1 to this Order.

(5) The standards applicable to turbojet or turbofan engines fitted to supersonic aircraft shall be those specified in Part II of Schedule 1 to this Order.

(6) The certification by the Authority of a type of aircraft or type of engine shall be evidenced by a declaration to that effect in the official record of the Authority.

(7) For the purposes of this article the Authority may accept reports furnished to it by a person whom it may approve, either absolutely or subject to such conditions as it thinks fit, as qualified to furnish such reports.

Power to prevent aircraft flying

8.—(1) If it appears to the Authority or an authorised person that any aircraft is intended or likely to be flown in such circumstances that articles 4 and 5 of this Order would be contravened in relation to the flight, the Authority or that authorised person may direct the operator or the commander of the aircraft that he is not to permit the aircraft to make the flight or any other flight of such description as may be specified in the direction, until the direction has been revoked by the Authority or by an authorised person, and the Authority or that authorised person may take such steps as are necessary to detain the aircraft.

(2) If the operator or commander of an aircraft fails without reasonable excuse to comply with a direction given to him pursuant to paragraph (1) of this article, he shall be guilty of an offence.

(3) For the purposes of paragraph (1) of this article, the Authority or any authorised person may enter upon and inspect any aircraft.

Right of access to aerodromes and other places

9. The Authority and any authorised person shall have, for the purpose of ascertaining whether the provisions of this Order are being complied with, the right of access at all reasonable times:—

- (a) to any aerodrome for the purpose of inspecting any aircraft on the aerodrome and for the purpose of detaining any aircraft under this Order, and
- (b) to any place where an aircraft has landed, for the purpose of inspecting the aircraft and for the purpose of detaining the aircraft under this Order:

Provided that access to a Government aerodrome shall only be obtained with the permission of the person in charge of the aerodrome.

Obstructing of persons

10. A person shall not intentionally obstruct or impede any person acting in the exercise of his powers or the performance of his duties under this Order.

Penalties

11.—(1) If any provision of this Order or of any regulations made thereunder is contravened in relation to an aircraft, the operator of the aircraft and the commander thereof shall (without prejudice to the liability of any other person under this Order for that contravention) be deemed for the purposes of the following provisions of this article to have contravened that provision unless he proves that the contravention occurred without his consent or connivance and that he exercised all due diligence to prevent the contravention.

(2) If it is proved that an act or omission of any person which would otherwise have been a contravention by that person of a provision of this Order or any regulations made thereunder was due to any cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention by that person of that provision.

(3) If any person contravenes any provision of this Order, he shall be liable on summary conviction to a fine not exceeding £1000.

Application of Order to the Crown and visiting forces etc.

12.—(1) Subject to the following provisions of this article, the provisions of this Order shall apply to, or in relation to, aircraft, together with the engines fitted thereto, belonging to or exclusively employed in the service of Her Majesty, as they apply to or in relation to other aircraft and for the purposes of such application the Department or other authority for the time being responsible on behalf of Her Majesty for the management of the aircraft shall be deemed to be the operator of the aircraft and in the case of an aircraft belonging to Her Majesty, to be the owner of the interest of Her Majesty in the aircraft:

Provided that nothing in this article shall render liable to any penalty any Department or other authority responsible on behalf of Her Majesty for the management of any aircraft.

(2) The naval, military and air force authorities and members of any visiting force and any international headquarters and the members thereof and property held or used for the purpose of such a force or headquarters shall be exempt from the provisions of this Order and of any regulations made thereunder to the same extent as if that force or headquarters formed part of the forces of Her Majesty raised in the United Kingdom and for the time being serving there.

(3) Nothing in this Order shall apply to or in relation to any military aircraft.

Exemption

13. The Authority after consultation with the Secretary of State may exempt from any of the provisions of this Order or any Regulations made thereunder any aircraft, aircraft engine or person or classes of aircraft, aircraft engines or persons either absolutely or subject to such conditions as it thinks fit.

G. I. de Doney,
Clerk of the Privy Council.

Article 7

SCHEDULE 1

PART I

STANDARDS REQUIRED IN RESPECT OF THE EMISSION OF SMOKE FROM TURBOJET OR TURBOFAN ENGINES FITTED TO SUBSONIC AIRCRAFT SPECIFIED IN ARTICLE 7(4)

The smoke number of an engine type fitted to a subsonic aircraft shall not exceed the smoke level determined by the following expression—

$$\text{SN} = 83.6 (\text{Foo})^{-0.274}$$

or a value of 50, whichever is lower,

whereby the smoke number (“SN”) at any thrust setting of the engine is measured and computed in accordance with the procedures specified in BCAR and converted to a characteristic level which is the arithmetical mean of the values of all the engines of a type which are tested, measured and corrected to the reference standard engine and reference ambient conditions specified in BCAR divided by the co-efficient corresponding to the number of engines tested by the Authority as required by article 7(3) of the Order and in accordance with the procedures specified in BCAR, and

“Foo” is the rated output which, for the purposes of this Schedule is the maximum thrust expressed in kilonewtons of the engine available for take-off under normal operating conditions at an International Standard Atmosphere at sea level, without the use of water injection, as approved by the Authority in BCAR.

PART II

STANDARDS REQUIRED IN RESPECT OF THE EMISSION OF SMOKE FROM TURBOJET OR TURBOFAN ENGINES FITTED TO SUPERSONIC AIRCRAFT SPECIFIED IN ARTICLE 7(5)

The smoke number of an engine type fitted to a supersonic aircraft shall not exceed the smoke level determined by the following expression—

$$\text{SN} = 83.6 (\text{F*oo})^{-0.274}$$

or a value of 50, whichever is lower,

whereby the smoke number (“SN”) at any thrust setting of the engine is measured and computed in accordance with the procedures specified in BCAR and converted to a characteristic level which is the arithmetical mean of the values of all the engines of a type which are tested, measured and corrected to the reference standard engine and reference ambient conditions divided by the co-efficient corresponding to the number of engines tested by the Authority as required by article 7(3) of the Order and in accordance with the procedures specified in BCAR and

“F*oo” is the rated output with afterburning applied which, for the purposes of this Schedule, is the maximum thrust expressed in kilonewtons of the engine available for take-off under normal operating conditions at an International Standard Atmosphere at sea level, without the use of water injection, as approved by the Authority in BCAR.

SCHEDULE 2

Article 2

“An International Standard Atmosphere at sea level” means an atmosphere having the following characteristics:—

- (a) the air is a perfect dry gas:
- (b) the physical constants are:
 - (i) sea level mean molecular weight:
 $M_o = 28.9644$
 - (ii) sea level atmospheric pressure:
 $P_o = 1013.250$ millibars
 1.013250×10^5 newtons m^{-2}
 - (iii) sea level temperature:
 $t_o = 15^\circ C$
 $T_o = 288.15^\circ K$
 - (iv) sea level atmospheric density:
 $p_o = 1.2250$ Kg $/m^3$
 - (v) temperature of the ice point:
 $T_i = 273.15^\circ K$
 - (vi) universal gas constant:
 $R = 8.31432$ joules $(^\circ K)^{-1} mol^{-1}$

EXPLANATORY NOTE

(This Note is not part of the Order.)

The Order prohibits an aircraft, wherever registered, which is powered by gas turbine engines whose date of manufacture was on or after 1st May 1986 or in respect of which a certificate of airworthiness was first issued on or after 1st May 1986 from landing or taking-off in the United Kingdom unless the aircraft or its engines are of a type which has been certified as complying with requirements relating to fuel venting (article 4). The CAA are to certify a type of aircraft or engine if it is of the opinion that the type is designed and constructed to prevent the intentional discharge into the atmosphere of fuel from the fuel nozzle manifolds resulting from the process of engine shutdown following normal flight or ground operations.

The Order also prohibits both subsonic and supersonic aircraft, wherever registered, which are powered by turbojet or turbofan engines manufactured after 1st May 1986 from landing or taking-off in the United Kingdom unless the engines are of a type which has been certified as complying with smoke emission requirements (article 5). The CAA are to certify a type of engine if it is of the opinion that it complies with the Standards set out in Schedule 1 to the Order.

The competent authority of a contracting state to the Chicago Convention or of another country which in the opinion of the Secretary of State applies standards substantially equivalent to those applied by the CAA may certify aircraft for the purposes of the Order. Certification by the CAA shall be evidenced by a declaration to that effect in the official record of the CAA.

The official record of the CAA and the publication *British Civil Airworthiness Requirements Section M Aircraft and Aircraft Engine Emissions—Issue 1, M833*, referred to in article 2, can be purchased from the Civil Aviation Authority, Greville House, 37 Gratton Road, Cheltenham, Glos. GL50 2BN.

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