

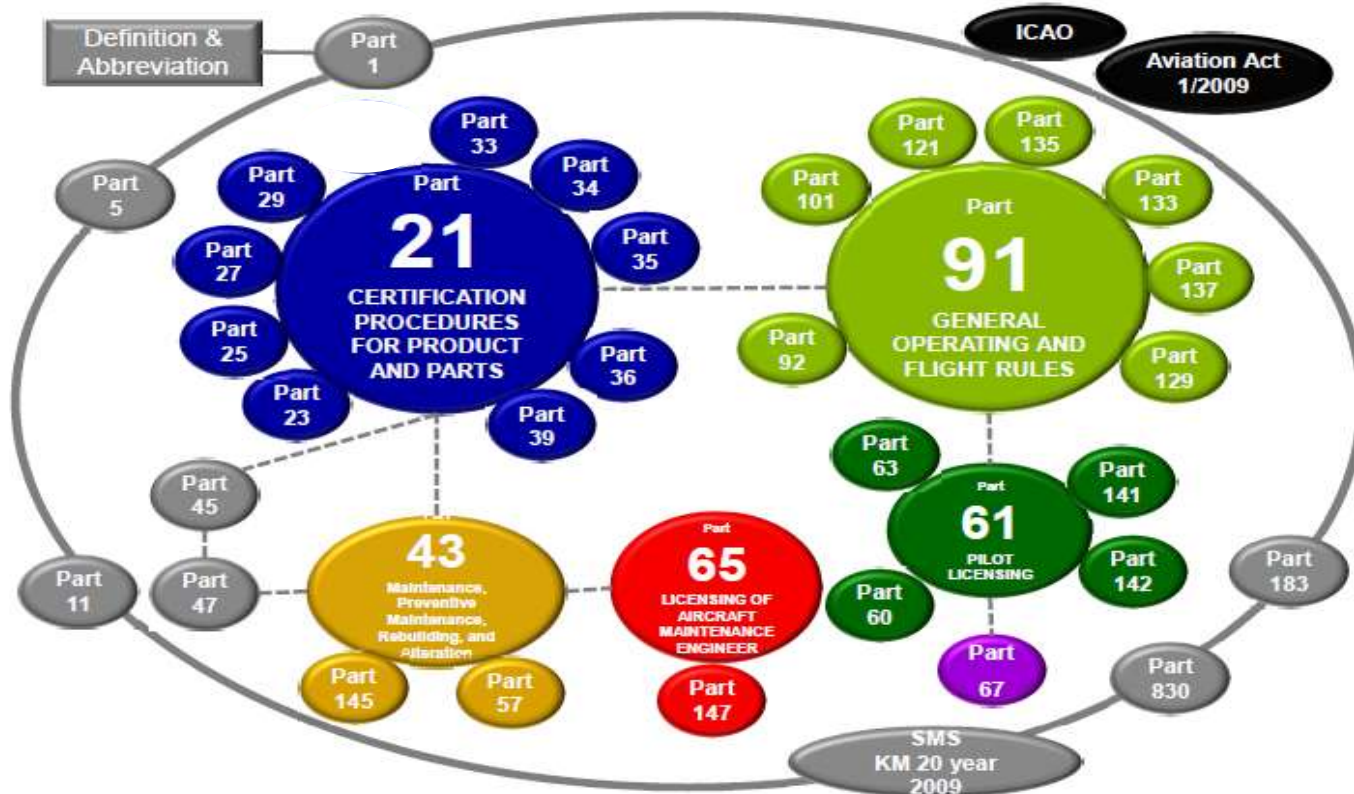
Sosialisasi *Perubahan CASR 34*



Direktorat Kelaikudaraan dan Pengoperasian Pesawat Udara (DKPPU)
15 Desember 2021



Civil Aviation Safety Regulatory Structure





DASAR PERUBAHAN:

- Indonesia sebagai salah satu anggota International Civil Aviation Organization (ICAO) mempunyai kewajiban terhadap updating regulasi-regulasi yang dipakai dalam bidang penerbangan.
- Dalam rangka pemenuhan Standard International yang ditentukan oleh ICAO, dimana Indonesia wajib melakukan revisi terhadap regulasi.
- Sesuai dengan ICAO State Letter AN 1/17.14-17/49 dan AN 1/17.14-17/50 tanggal 21 April 2017 tentang amendment 9 Annex 16 Volume 2 dan Annex 16 Volume 3 First Edition, maka CASR Part 34 dianggap perlu dilakukan revisi sesuai ketentuan Annex tersebut.



LAMPIRAN KEPUTUSAN MENTERI PERHUBUNGAN
NOMOR : PM 49 TAHUN 2015
TANGGAL : 20 FEBRUARI 2015

CIVIL AVIATION SAFETY REGULATIONS (C.A.S.R.)



International Civil Aviation Organization	Organisation de l'Aviation civile Internationale	Organización de Aviación Civil Internacional	Международная Организация Гражданской Авиации	منظمة الطيران المدني الدولي	國際民用 航空組織
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PART 34 Amendment 2

Tel: +1 (514) 954-8219 ext. 6726

Ref: AN 1/17.14 – 17/49

21 April 2017

Subject: Adoption of Amendment 9 to Annex 16,
Volume II

Action Required: a) Notify any disapproval before
21 July 2017; b) Notify any differences and compliance
before 1 December 2017; c) Consider the use of the
Electronic Filing of Differences System (EFOD) for
notification of differences and compliance

Sir/Madam,

I have the honour to inform you that Amendment 9 to the *International Standards and Recommended Practices, Environmental Protection – Aircraft Engine Emissions* (Annex 16, Volume II to the Convention on International Civil Aviation) was adopted by the Council at the seventh meeting of its 210th Session on 3 March 2017. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>).

REPUBLIC OF INDONESIA
MINISTRY OF TRANSPORTATION



International Civil Aviation Organization	Organisation de l'Aviation civile Internationale	Organización de Aviación Civil Internacional	Международная Организация Гражданской Авиации	منظمة الطيران المدني الدولي	國際民用 航空組織
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Tel: +1 (514) 954-8219 ext. 6726

Ref: AN 1/17.14 – 17/50

21 April 2017

Subject: Adoption of the First Edition of Annex 16,
Volume III

Action Required: a) Notify any disapproval before
21 July 2017; b) Notify any differences and compliance
before 1 December 2017; c) Consider the use of the
Electronic Filing of Differences System (EFOD) for
notification of differences and compliance

Sir/Madam,

I have the honour to inform you that the First Edition of Annex 16, Volume III to the *International Standards and Recommended Practices, Environmental Protection – Aircraft CO₂ Emissions* (Annex 16, Volume III to the Convention on International Civil Aviation) was adopted by the Council at the seventh meeting of its 210th Session on 3 March 2017. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>).



CASR 34 (ref. Annex 16 Vol III)

ATTACHMENT A to State letter AN 1/17.14 – 17/50

2.2 CO₂ emissions evaluation metric

THE FOREWORD OF THE FIRST EDITION OF ANNEX 16, VOLUME III

The metric shall be defined in terms of the average of the I/SAR values for the three reference masses defined in 2.3 and the RGF defined in Appendix 2. The metric value shall be calculated according to the following formula:

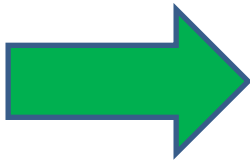
$$\text{CO}_2 \text{ emissions evaluation metric value} = \frac{\left(\frac{1}{\text{SAR}}\right)_{\text{AVG}}}{(\text{RGF})^{0.24}}$$

Note 1. — The metric value is quantified in units of kg/km.

Note 2. — The CO₂ emissions evaluation metric is a SAR based metric adjusted to take into account fuselage size.

Add the following at the end of Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Apply Effective Applicable</i>
1st Edition	Tenth meeting of the Committee on Aviation Environmental Protection (CAEP/10)	Introduction of Annex 16, Volume III containing Standards and Recommended Practices relating to the CO ₂ emissions certification for subsonic aeroplanes.	3 March 2017 21 July 2017 1 January 2018



4. The proposed Annex 16 Volume III contains the first global design Standard for CO₂ emissions of any sector, and will apply to new aeroplane type designs from 2020 and to aeroplane type designs that are already in-production in 2023. In 2028 there is a production cut-off, meaning that in-production aeroplanes that do not meet the Standard from 2028 can no longer be produced, unless the designs are modified to comply with the Standard. The proposed global Standard is especially stringent for larger aeroplanes, those with a maximum take-off mass of greater than 60 tonnes, where it will have the greatest impact.



- **GAMBARAN UMUM**

- Peraturan Keselamatan Penerbangan Sipil (PKPS)/ *Civil Aviation Safety Regulations* (CASR) Bagian 34 mengatur sertifikasi standar persyaratan bahan bakar terbuang, gas buang untuk pesawat udara yang digerakkan dengan mesin turbin, dan emisi CO₂ pesawat udara.
- CASR/PKPS Bagian 34 merupakan PKPS yang berkaitan dengan Airworthiness Standard untuk proses sertifikasi design.
- Proses **pengujian** ini dilaksanakan oleh pabrikan pesawat, dan **disertifikasi** oleh Ditjen Hubud (DKPPU).



PERATURAN INI BERLAKU UNTUK:

- Turbofan/Turbojet (TF), Turboprop(TP), Engine untuk pesawat supersonic (TSS), JT3D, JT8D
- Pesawat terbang kecepatan subsonic dengan type certificate yang diterbitkan per 1 Januari 2020,
- Pesawat terbang subsonic dengan type certificate yang diterbitkan sebelum januari 2020 dan belum memenuhi pkps 34 harus dilakukan modifikasi untuk pemenuhan PKPS 34 pada 1 January 2023 atau setelahnya.
- Pesawat terbang subsonic dengan penerbitan sertifikat kelaikudaraan (CofA) pertama kali pada atau setelah 1 Januari 2028.



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Subpart A

- GENERAL PROVISIONS

Subpart B

- ENGINE FUEL VENTING EMISSIONS (NEW AND IN-USE AIRCRAFT GAS TURBINE ENGINES)

Subpart C

- EXHAUST EMISSIONS (NEW AIRCRAFT GAS TURBINE ENGINES)

Subpart D

- EXHAUST EMISSIONS (IN-USE AIRCRAFT GAS TURBINE ENGINES)

Subpart E

- CERTIFICATION PROVISIONS

Subpart F

- [RESERVED]



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Subpart G

- TEST PROCEDURES FOR ENGINE EXHAUST GASEOUS EMISSIONS (AIRCRAFT AND AIRCRAFT GAS TURBINE ENGINES)

Subpart H

- TEST PROCEDURES FOR ENGINE SMOKE EMISSIONS (AIRCRAFT GAS TURBINE ENGINES)

Subpart I

- CERTIFICATION STANDARD FOR AIRPLANE CO₂ EMISSIONS BASED ON THE CONSUMPTION OF FUEL (SUBSONIC JET AIRPLANES OVER 5 700 kg and PROPELLER-DRIVEN AIRPLANES OVER 8618 kg)

Appendix A

- DETERMINATION OF THE AIRPLANE CO₂ EMISSIONS EVALUATION METRIC VALUE

Appendix B

- REFERENCE GEOMETRIC FACTOR



Maximum permitted CO2 emissions evaluation metric value

- The CO2 emissions evaluation metric value shall not exceed the value defined in the following paragraphs:
 - (1) For airplanes with a maximum take-off mass less than or equal to 60 000 kg:
Maximum permitted value = $10 (-2.73780 + (0.681310 * \log_{10}(\text{MTOM})) + (-0.0277861 * (\log_{10}(\text{MTOM}))^2))$
 - (2) For airplanes with a maximum take-off mass greater than 60 000 kg, and less than or equal to 70 395 kg:
Maximum permitted value = 0.764
 - (3) For airplanes with a maximum take-off mass of greater than 70 395 kg:
Maximum permitted value = $10 (-1.412742 + (-0.020517 * \log_{10}(\text{MTOM})) + (0.0593831 * (\log_{10}(\text{MTOM}))^2))$
 - (4) For airplanes with a maximum certificated take-off mass less than or equal to 60 000 kg:
Maximum permitted value = $10 (-2.57535 + (0.609766 * \log_{10}(\text{MTOM})) + (-0.0191302 * (\log_{10}(\text{MTOM}))^2))$
 - (5) For airplanes specified in with a maximum certificated take-off mass greater than 60 000 kg, and less than or equal to 70 107 kg:
Maximum permitted value = 0.797
 - (6) For airplanes specified in with a maximum take-off mass of greater than 70 107 kg:
Maximum permitted value = $10 (-1.39353 + (-0.020517 * \log_{10}(\text{MTOM})) + (0.0593831 * (\log_{10}(\text{MTOM}))^2))$



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- CO2 emissions evaluation metric value =
$$\frac{\left(\frac{1}{SAR}\right)_{avg}}{(RGF) 0.24}$$

- Note 1. — The metric value is quantified in units of kg/km.
- Note 2. — The CO2 emissions evaluation metric is a SAR based metric adjusted to take into account fuselage size.

The 1/SAR value shall be established at each of the following three reference airplane masses, when tested in accordance with these requirements:

- (1) high gross mass: 92% MTOM
- (2) mid gross mass: Simple arithmetic average of high gross mass and low gross mass
- (3) low gross mass: $(0.45 \times MTOM) + (0.63 \times (MTOM \times 0.924))$

Calculation of SAR

- SAR is calculated from the following equation: $SAR = TAS/W_f$

where:

- TAS is the true air speed; and
- W_f is total airplane fuel flow.



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The reference geometric factor (RGF) is a non-dimensional parameter used to adjust $(1/SAR)_{AVG}$. RGF is based on a measure of fuselage size normalized with respect to $1m^2$

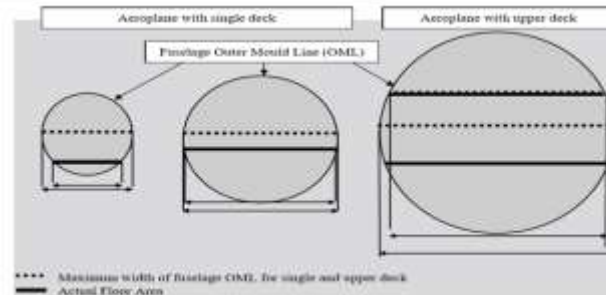


Figure A2-1. Cross-sectional View

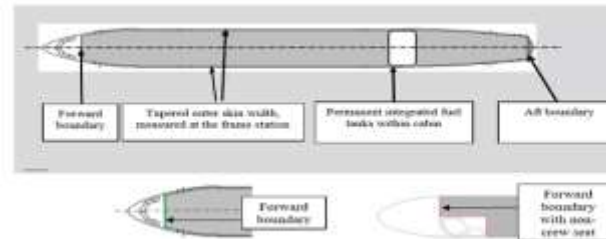


Figure A2-2. Longitudinal View



TERIMA KASIH



Safety, security and services