REGULATION OF THE MINISTRY OF TRANSPORTATION OF
THE REPUBLIC OF INDONESIA
NUMBER PM 58 OF 2017
ON
THE SECOND AMENDMENT TO THE REGULATION OF THE MINISTER OF TRANSPORTATION NUMBER KM 29 OF 2009 ON CIVIL AVIATION SAFETY REGULATIONS PART 36 AMENDMENT 1 ON NOISE STANDARDS OF AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATIONS

BY THE BLESSINGS OF THE ALMIGHTY GOD

MINISTER OF TRANSPORTATION OF THE REPUBLIC OF INDONESIA,

Considering :

a. that the provisions regarding Noise Standards of Aircraft Type and Airworthiness Certifications have been regulated in Regulation of the Minister of Transportation Number KM 29 of 2009 on Civil Aviation Safety Regulations Part 36 Amendment 1 on Noise Standards of Aircraft Type and Airworthiness Certifications;
b. that it needs refinements to the Regulation of the Minister of Transport as referred to in point a, by adding provisions regarding noise standards of supersonic transport category airplanes and tiltrotors;
c. that based on considerations as referred to in point a and point b, it is necessary to establish Regulation of the Minister of Transportation on the Second Amendment to Regulation of the Minister of Transportation Number KM 29 of 2009 on Civil Aviation Safety Regulations Part 36 Amendment 1 on Noise Standards of Aircraft Type and Airworthiness Certifications;

Observing : 1. Law Number 1 of 2009 on Aviation (State Gazette of the Republic of Indonesia of 2009 Number 1, Supplement to the State Gazette of the Republic of Indonesia Number 4956);
2. Regulation of the Government Number 3 of 2001 on Security And Aviation Safety (State Gazette of the Republic of Indonesia of 2001 Number 9, Supplement to the State Gazzete of the Republic of Indonesia Number 4075);
3. Regulation of the President Number 7 of 2015 on the Organization of the State Ministries (State Gazette of the Republic of Indonesia of 2015 Number 8);
4. Regulation of the President Number 40 of 2015 of the Ministry of Transportation (State Gazette of the Republic of Indonesia of 2015 Number 75);
5. Regulation of the Minister of Transportation Number KM 29 of 2009 on Civil Aviation Safety Regulations Part 36 Amendment 1 on Noise Standards of Aircraft Type And Airworthiness Certifications as amended by Regulation of the Minister of Transportation Number PM 50 of 2015 on Amendment to Regulation of the Minister of Transportation Number KM 29 of 2009 on Civil Aviation Safety Regulations Part 36 Amendment 1 on Noise Standards of Aircraft Type And Airworthiness Certifications (State Bulletin of the Republic of Indonesia of 2015 Number 305);
6. Regulation of the Minister of Transportation Number PM 41 of 2011 on the Organization and Management of the Office of the Airport Authority;
7. Regulation of the Minister of transportation Number PM 189 of 2015 on the Organization and Management of the Ministry of Transportation (State Bulletin of the Republic of Indonesia of 2015 Number 1844) as frequently amended, and last by Regulation of the Minister of Transportation Number PM 44 of 2017 on the Second Amendment to Regulation of the Minister of Transportation Number PM 189 of 2015 on the Organization and Management of the Ministry of Transportation (State Bulletin of the Republic of Indonesia of 2017 Number 816);

HAS DECIDED:

To Issue : REGULATION OF THE MINISTER OF TRANSPORTATION ON THE SECOND AMENDMENT TO THE REGULATION OF THE MINISTER OF TRANSPORTATION NUMBER KM 29 OF 2009 ON CIVIL AVIATION SAFETY REGULATIONS PART 36 AMENDMENT 1 ON NOISE STANDARDS OF AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATIONS.

Article I

To amend the Annex of Regulation of the Minister of Transportation Number KM 29 of 2009 on Civil Aviation Safety Regulations Part 36 Amendment 1 on Noise Standards of Aircraft Type and Airworthiness Certifications as amended by Regulation of the Minister of Transportation Number PM 50 of 2015 on Amendment to Regulation of the Minister of Transportation Number KM 29 of 2009 on Civil Aviation Safety Regulations Part 1 Amendments 36) on on Noise Standards of Aircraft Type and Airworthiness Certifications (State Bulletin of the Republic of Indonesia of 2015 Number 305), as follows:

1. Section 36.1 is amended to read as follows:

36.1 Applicability and Definitions

(a) This part prescribes noise standards for the issue of the following certificates:

(1) Type certificates, and changes to those certificates, and standard airworthiness certificates, for subsonic transport category large airplanes, and for subsonic jet airplanes regardless of category.

(2) Type certificates and changes to those certificates, standard airworthiness certificates, and restricted category airworthiness certificates, for propeller driven, small airplanes, and for propeller driven, commuter category airplanes except those airplanes that are designed

for "agricultural aircraft operations" or for dispersing firefighting materials to which Sec. 36.1583 of this part does not apply.

(3) A type certificate and changes to that certificate, and standard airworthiness certificates, for Concorde airplanes

(4) Type certificates, and changes to those certificates, for helicopters except those helicopters that are designated exclusively for "agricultural aircraft operations", for dispensing firefighting materials, or for carrying external loads.

(5) Type certificates, changes to those certificates, and standard airworthiness certificates, for tiltrotors.

(b) Each person who applies under CASR Part 21 for a type of airworthiness certificate specified in this part must show compliance with the applicable requirements this part, in addition to the applicable airworthiness requirements.

(c) Each person who applies under CASR Part 21 for approval of an acoustical change described in Sec. 21.93(b) must show that the aircraft complies with the applicable provisions of Secs. 36.7, 36.9 or 36.11 in addition to the applicable airworthiness requirements.

(d) Each person who applies for the original issue of a standard airworthiness certificate for a transport category large airplane or for a jet airplane under Sec. 21.183 must, regardless of date of application, show compliance with the following provisions of this part (including Appendix B):

(1) The provisions of this part in effect after the date of this Decree come into force for subsonic airplanes with maximum weights greater than 75,000 pounds.

(2) [Reserved]

(3) [Deleted]

(e) Each person who applies fot the original issue of standard airworthiness certificate under Sec 21.183 or for the original issue of a restricted category airworthiness certificate under Sec 21.185, for propeller-driven, commuter category airplanes for a propeller driven small airplane that has not had any flight time before 1 January 1980, must show compliance with the applicable provisions of this part.

(f) For the purpose of showing compliance with this part for transport category large airplanes and jet airplanes regardless of category, the following termshave the following meanings:

(1) A "Stage 1 noise level" means a flyover, lateral or approach noise level greater than the Stage 2 noise limits prescribed in section B36.5(b) of Appendix B of this part.

(2) A "Stage 1 airplane" means an airplane that has not been shown under this part to comply with the flyover, lateral, and approach noise levels required for Stage 2 or Stage 3 airplanes.

(3) A "Stage 2 noise level" means a noise level at or below the Stage 2 noise limits prescribed in section B36.5(b) of Appendix B of this part but higher than the Stage 3 noise limits prescribed in section B36.5(c) of Appendix B of this part.

(4) A "Stage 2 airplane" means an airplane that has been shown under this part to comply with Stage 2 noise levels prescribed in section B36.5 of Appendix B of this part (including use of the applicable tradeoff provisions specified in section B36.6) and that does not comply with the requirements for a Stage 3 airplane.

(5) A "Stage 3 noise level" means a noise level at or below the Stage 3 noise limits prescribed in section B36.5(c) of Appendix B of this part.

(6) A "Stage 3 airplane" means an airplane that has been shown under this part to comply with Stage 3 noise levels prescribed in section B36.5(c) of appendix B of this part (including use of the applicable tradeoff provisions specified in section B36.6).

(7) A “subsonic airplane” means an airplane for which the maximum operating limit speed, M_{mo} , does not exceed a Mach number of 1.

(8) A “supersonic airplane” means an airplane for which the maximum operating limit speed, Mmo , exceeds a Mach number of 1.

(9) A “Stage 4 noise level” means a noise level at or below the Stage 4 noise limit prescribed in section B36.5(d) of appendix B of this part.

(10) A “Stage 4 airplane” means an airplane that has been shown under this part not to exceed the Stage 4 noise limit prescribed in section B36.5(d) of appendix B of this part.

(11) A “Chapter 4 noise level” means a noise level at or below the maximum noise level prescribed in Chapter 4, Paragraph 4.4, Maximum Noise Levels, of the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, 7th Edition, Amendment 11-B, effective 1 January 2015”.

(g) For the purpose of showing compliance with this part for transport category large airplanes and jet airplanes regardless of category, each airplane may not be identified as complying with more than one stage or configuration simultaneously.

(h) For the purpose of showing compliance with this part, for helicopters in the primary, normal, transport, and restricted categories, the following terms have the specified meanings:

(1) A "Stage 1 noise level" means a takeoff, flyover, or approach noise level greater than the Stage 2 noise limits prescribed in Section H36.305 of Appendix H of this part, or a flyover noise level greater than the Stage 2 noise limits prescribed in section J36.305 of appendix J of this part.

(2) A "Stage 1 helicopter" means a helicopter that has not been shown under this part to comply with the takeoff, flyover, and approach noise levels required for Stage 2 helicopters as prescribed in section H36.305 of appendix H of this part, or a helicopter that has not been shown under this part to comply with the flyover noise level required for Stage 2 helicopters as prescribed in section J36.305 of appendix J of this part.

(3) A "Stage 2 noise level" means a takeoff, flyover, or approach noise level at or below the Stage 2 noise limits prescribed in Section H36.305 of Appendix H of this part, or a flyover noise level at or below the Stage 2 limit prescribed in section J36.305 of appendix J of this part.

(4) A "Stage 2 helicopter" means a helicopter that has been shown under this part to comply with Stage 2 noise limits (including applicable tradeoffs) prescribed in Section H36.305 of Appendix H of this part, or a helicopter that has been shown under this part to comply with the Stage 2 noise limit prescribed in section J36.305 of appendix J of this part.

(5) A “"Stage 3 noise levels” means a takeoff, flyover, or approach noise level at or below the stage 3 noise limits prescribed in section H36.305 of appendix H of this part, or a flyover noise level at or below the Stage 3 noise limit prescribed in section J36.305 of appendix J of this part.

(6) A “Stage 3 helicopter” means a helicopter that has been shown under this part to comply with the Stage 3 noise limits (including applicable tradeoffs) prescribed in section H36.305 of appendix H of this part, or a helicopter that has been shown under this part to comply with the Stage 3 noise limit prescribed in section J36.305 of appendix J of this part.

(7) Maximum normal operating RPM means the highest rotor speed corresponding to

the airworthiness limit imposed by the manufacturer and approved by the DGCA. Where a tolerance on the highest rotor speed is specified, the maximum normal operating rotor speed is the highest rotor speed for which that tolerance is given. If the rotor speed is automatically linked with flight condition, the maximum normal operating rotor speed corresponding with that flight condition must be used during the noise certification procedure. If rotor speed can be changed by pilot action, the highest normal operating rotor speed specified in the flight manual limitation section for power-on conditions must be used during the noise certification procedure.

(i) For the purpose of showing compliance with this part for tiltrotors, the following terms have the specified meanings: Airplane mode means a configuration with nacelles on the down stops (axis aligned horizontally) and rotor speed set to cruise revolutions per minute (RPM).

Airplane mode RPM means the lower range of rotor rotational speed in RPM defined for the airplane mode cruise flight condition.

Fixed operation points mean designated nacelle angle positions selected for airworthiness reference. These are default positions used to refer to normal nacelle positioning operation of the aircraft. The nacelle angle is controlled by a self-centering switch. When the nacelle angle is 0 degrees (airplane mode) and the pilot moves the nacelle switch upwards, the nacelles are

programmed to automatically turn to the first default position (for example, 60 degrees) where they will stop. A second upward move of the switch will tilt the nacelle to the second default position (for example, 75 degrees).

Above the last default position, the nacelle angle can be set to any angle up to approximately 95 degrees by moving the switch in the up or down direction. The number and position of the fixed operation points may vary on different tiltrotor configurations.

Nacelle angle is defined as the angle between the rotor shaft centerline and the longitudinal axis of the aircraft fuselage.

Tiltrotor means a class of aircraft capable of vertical take-off and landing, within the powered-lift category, with rotors mounted at or near the wing tips that vary in pitch from near vertical to near horizontal configuration relative to the wing and fuselage.

Vertical takeoff and landing (VTOL) mode means the aircraft state or configuration having the rotors orientated with the axis of rotation in a vertical manner (i.e. , nacelle angle of approximately 90 degrees) for vertical takeoff and landing operations.

VCON is defined as the maximum authorized speed for any nacelle angle in VTOL/Conversion mode.

VTOL/Conversion mode is all approved nacelle positions where the design operating rotor speed is used for hover operations.

VTOL mode RPM means highest range of RPM that occur for takeoff, approach, hover, and conversion conditions.

2. Section 36.6 is added in between section 36.5 and section 36.7 to read as follows:

36.6 Incorporation by reference

(a) General. This part prescribes certain standards and procedures which are not set forth in full text in the rule. Those standards and procedures are contained in published material which is reasonably available to the class of persons affected.

(b) Identification statement. The complete title or description which identifies each published matter incorporated by reference in this part is as follows:

(1) International Electrotechnical Commission (IEC) Publications.

(i) IEC Publication No. 179, entitled "Precision Sound Level Meters," dated 1973.

(ii) IEC Publication No. 225, entitled "Octave, Half-Octave, Third Octave Band Filters Intended for the Analysis of Sounds and Vibrations," dated 1966.

(iii) IEC Publication No. 651, entitled "Sound Level Meters," first edition, dated 1979.

(iv) IEC Publication No. 561, entitled "Electro-acoustical Measuring Equipment for Aircraft Noise Certification," first edition, dated 1976.

(v) IEC Publication No. 804, entitled "Integrating-averaging Sound Level Meters," first edition, dated 1985.

(vi) IEC Publication 61094-3, entitled "Measurement Microphones—Part 3: Primary Method for Free-Field

Calibration of Laboratory Standard Microphones by the Reciprocity Technique", edition 1.0, dated 1995.

(vii) IEC Publication 61094-4, entitled "Measurement Microphones—Part 4: Specifications for Working Standard Microphones", edition 1.0, dated 1995.

(viii) IEC Publication 61260, entitled "Electroacoustics-Octave-Band and Fractional-Octave-Band filters", edition 1.0, dated 1995.

(ix) IEC Publication 61265, entitled "Instruments for Measurement of Aircraft Noise-Performance Requirements for Systems to Measure One-Third-Octave-Band Sound pressure Levels in Noise Certification of Transport-Category Aeroplanes," edition 1.0, dated 1995.

(x) IEC Publication 60942, entitled "Electroacoustics—Sound Calibrators," edition 2.0, dated 1997.

(2) Society of Automotive Engineers (SAE) Publications. (i) SAE ARP 866A, entitled "Standard Values at Atmospheric Absorption as a Function of Temperature and Humidity for Use in Evaluating Aircraft Flyover Noise," dated March 15, 1975.

(3) International Standards and Recommended Practices entitled "Environmental Protection, Annex 16 to the Convention on International Civil

Aviation, Volume I, Aircraft Noise", 7th Edition, Amendment 11-B, effective 1 January 2015.

3. Section 36.9 is amended to read as follows:

36.9 Acoustical Change: Propeller Driven Small Airplanes and Propeller Driven Commuter Category Airplanes

For propeller-driven small airplanes in the primary, normal, utility, acrobatic, transport, and restricted categories and for propeller-driven, commuter category airplanes for which an acoustical change approval is applied for under Sec 21.93(b) of CASR part 21, the following apply:

(a) If the airplane was type certificated under this part prior to a change in type design, it may not subsequently exceed the noise limits specified in Sec 36.501 of this part.

(b) If the airplane was not type certificated under this part prior to a change in type design, it may not exceed the higher of the two following values:

(1) The noise limit specified in Sec 36.501 of this part, or

(2) The noise level created prior to the change in type design, measured and corrected as prescribed in Sec 36.501 of this part.

4. Section 36.13 is added after section 36.11 to read as follows:

36.13 Acoustical Change: Tiltrotor aircraft

The following requirements apply to tiltrotors in any category for which an acoustical change approval is applied for under Sec 21.93(b) of this chapter on or after March 11, 2013:

(a) In showing compliance with Appendix K of this part, noise levels must be measured, evaluated, and calculated in accordance with the applicable procedures and conditions prescribed in Appendix K of this part.

(b) Compliance with the noise limits prescribed in section K4 (Noise Limits) of Appendix K of this part must be shown in accordance with the applicable provisions of sections K2 (Noise Evaluation Measure), K3 (Noise Measurement Reference Points), K6 (Noise Certification Reference Procedures), and K7 (Test Procedures) of Appendix K of this part.

(c) After a change in type design, tiltrotor noise levels may not exceed the limits specified in Sec 36.1103.

5. Section 36.105 is amended to read as follows:

36.105 Flight Manual Statement Of Chapter 4 Equivalency

For each airplane that meets the requirements for Stage 4 certification, the Airplane Flight Manual or operations manual must include the following statement: “The following noise levels comply with part 36, Appendix B, Stage 4 maximum noise level requirements and were obtained by analysis of approved data from noise tests conducted under the provisions of part 36, Amendment 36 (insert part 36 amendment to which the airplane was certificated). The noise measurement and evaluation procedures used to obtain these noise levels are considered by the DGCA to be equivalent to the Chapter 4 noise level required by the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, 7th Edition, Amendment 11-B, effective 1 January 2015”.

6. Subpart D is added to read as follows:

SUBPART D - NOISE LIMITS FOR SUPERSONIC TRANSPORT CATEGORY AIRPLANES

36.301 Noise limits: Concorde.

(a) General. For the Concorde airplane, compliance with this subpart must be shown with noise levels measured and evaluated as prescribed in Subpart B of this part, and demonstrated at the measuring points prescribed in appendix B of this part.

(b) Noise limits. It must be shown, in accordance with the provisions of this part in effect on October 13, 1977, that the noise levels of the airplane are reduced to the lowest levels that are economically reasonable, technologically practicable, and appropriate for the Concorde type design.

7. Subpart K is added to read as follows:

SUBPART K-TILTROTORS

36.1101 Noise measurement and evaluation

For tiltrotors, the noise generated must be measured and evaluated under Appendix K of this part, or under an approved equivalent procedure.

36.1103 Noise Limit

(a) Compliance with the maximum noise levels prescribed in Appendix K of this part must be shown for a tiltrotor for which the application for the issuance of a type certificate is made on or after March 11, 2013.

(b) To demonstrate compliance with this part, noise levels may not exceed the noise limits listed in Appendix K, Section K4, Noise

Limits of this part. Appendix K of this part (or an approved equivalent procedure) must also be used to evaluate and demonstrate compliance with the approved test procedures, and at the applicable noise measurement points.

8. Section A 36.1 Appendix A is amended to read as follows:

A36.1 Introduction

A36.1.1 This appendix prescribes the conditions under which airplane noise certification tests must be conducted and states the measurement procedures that must be used to measure airplane noise. The procedures that must be used to determine the noise evaluation quantity designated as effective perceived noise level, EPNL, under secs. 36.101 and 36.803 are also stated.

A36.1.2 The instructions and procedures given are intended to ensure uniformity during compliance tests and to permit comparison between tests of various types of airplanes conducted in various geographical locations.

A36.1.3 A complete list of symbols and units, the mathematical formulation of perceived noisiness, a procedure for determining atmospheric attenuation of sound, and detailed procedures for correcting noise levels from non-reference to reference conditions are included in this appendix.

A36.1.4 For Stage 4 airplanes, an acceptable alternate for noise measurement and evaluation is Appendix 2 to the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, 7th

Edition, Amendment 11-B, effective 1 January 2015.

9. Section B36.1 is amended to read as follows:

APPENDIX B - NOISE LEVELS FOR TRANSPORT CATEGORY AND JET AIRPLANES UNDER SEC. 36.103

B36.1 Noise Measurement and Evaluation

(a) The procedures of Appendix A of this part, or approved equivalent procedures, must be used to determine noise levels of an airplane. These noise levels must be used to show compliance with the requirements of this appendix.

(b) For Stage 4 airplanes, an acceptable alternative for noise measurement and evaluation is Appendix 2 to the International Civil Aviation Organization (ICAO) Annex 16, Environmental Protection, Volume I, 7th Edition, Amendment 11-B, effective 1 January 2015.

10. Section B36.5 point (d) is amended so that section B36.5 reads as follows:

B36.5 Maximum Noise Levels

Except as provided in section B36.6 of this appendix, maximum noise levels, when determined in accordance with the noise evaluation methods of appendix A of this part, may not exceed the following:

(a) For acoustical changes to Stage 1 airplanes, regardless of the number of engines, the noise levels prescribed under sec. 36.7(c) of this part.

(b) For any Stage 2 airplane regardless of the number of engines:

(1) Flyover: 108 EPNdB for maximum weight of 600,000 pounds or more; for

each halving of maximum weight (from 600,000 pounds), reduce the limit by 5 EPNdB; the limit is 93 EPNdB for a maximum weight of 75,000 pounds or less.

(2) Lateral and approach: 108 EPNdB for maximum weight of 600,000 pounds or more; for each halving of maximum weight (from 600,000 pounds), reduce the limit by 2 EPNdB; the limit is 102 EPNdB for a maximum weight of 75,000 pounds or less.

(c) For any Stage 3 airplane:

(1) Flyover.

(i) For airplanes with more than 3 engines: 106 EPNdB for maximum weight of 850,000 pounds or more; for each halving of maximum weight (from 850,000 pounds), reduce the limit by 4 EPNdB; the limit is 89 EPNdB for a maximum weight of 44,673 pounds or less;

(ii) For airplanes with 3 engines: 104 EPNdB for maximum weight of 850,000 pounds or more; for each halving of maximum weight (from 850,000 pounds), reduce the limit by 4 EPNdB; the limit is 89 EPNdB for a maximum weight of 63,177 pounds or less; and

(iii) For airplanes with fewer than 3 engines: 101 EPNdB for maximum weight of 850,000

pounds or more; for each halving of maximum weight (from 850,000 pounds), reduce the limit by 4 EPNdB; the limit is 89 EPNdB for a maximum weight of 106,250 pounds or less.

(2) Lateral, regardless of the number of engines: 103 EPNdB for maximum weight of 882,000 pounds or more; for each halving of maximum weight (from 882,000 pounds), reduce the limit by 2.56 EPNdB; the limit is 94 EPNdB for a maximum weight of 77,200 pounds or less.

(3) Approach, regardless of the number of engines: 105 EPNdB for maximum weight of 617,300 pounds or more; for each halving of maximum weight (from 617,300 pounds), reduce the limit by 2.33 EPNdB; the limit is 98 EPNdB for a maximum weight of 77,200 pounds or less.

(d) For any Stage 4 airplane, the flyover, lateral, and approach maximum noise levels are prescribed in Chapter 4, Paragraph 4.4, Maximum Noise Levels, and Chapter 3, Paragraph 3.4, Maximum Noise Levels, of the International Civil Aviation Organization (ICAO) Annex 16, Environmental Protection, Volume I, 7th Edition, Amendment 11-B, effective 1 January 2015. [Incorporated by reference, section 36.6].

11. Appendix K is added to read as follows:

APPENDIX K - NOISE REQUIREMENTS FOR TILTROTORS UNDER SUBPART K

K36.1 General

This appendix prescribes noise limits and procedures for measuring noise and adjusting the data to standard conditions for tiltrotors as specified in Sec 36.1 of this part.

K36.2 Noise Evaluation Measure

The noise evaluation measure is the effective perceived noise level in EPNdB, to be calculated in accordance with section A36.4 of Appendix A to this part, except corrections for spectral irregularities must be determined using the 50 Hz sound pressure level found in section H36.201 of Appendix H to this part.

K36.3 Noise Measurement Reference Points

The following noise reference points must be used when demonstrating tiltrotor compliance with section K36.6 (Noise Certification Reference Procedures) and section K36.7 (Test Procedures) of this appendix:

(a) Takeoff reference noise measurement points —

As shown in Figure K1 below:

(1) The centerline noise measurement flight path reference point, designated A, is located on the ground vertically below the reference takeoff flight path. The measurement point is located 1,640 feet (500 m) in the horizontal direction of flight from the point Cr where transition to climbing flight is initiated, as described in section K6.2 of this appendix;

(2) Two sideline noise measurement points, designated as S (starboard) and S (port), are located on the ground perpendicular to and symmetrically stationed at 492 feet (150 m) on each side of the takeoff reference flight path.

The measurement points bisect the centerline flight path reference point A.

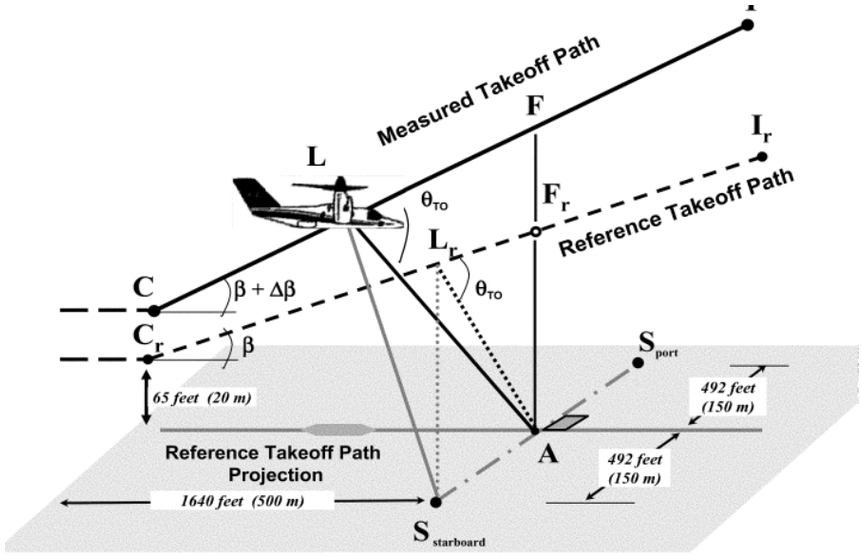

Figure K1.
Comparison of Measured and Reference Takeoff Profiles

(b) Flyover reference noise measurement points —

As shown in Figure K2 below:

(1) The centerline noise measurement flight path reference point, designated A, is located on the ground 492 feet (150 m) vertically below the reference flyover flight path. The measurement point is defined by the flyover reference procedure in section K36.6.3 of this appendix;

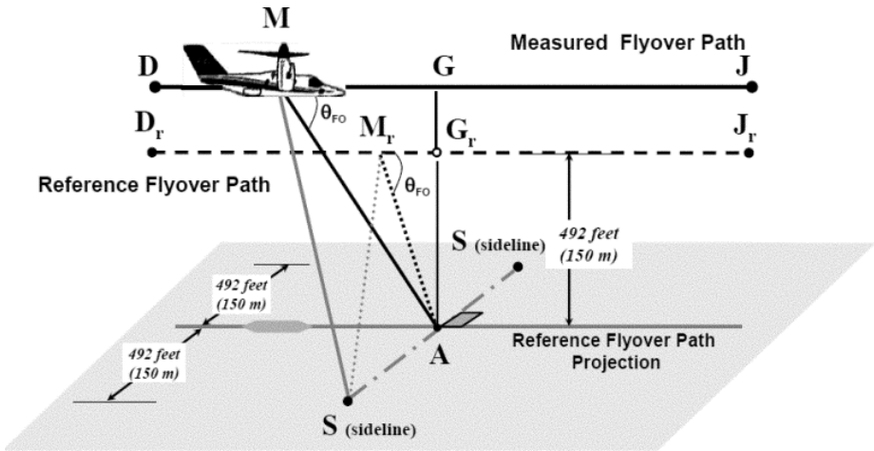

Figure K2.
Comparison of Measured and Reference Flyover Profiles

(2) Two sideline noise measurement points, designated as $S_{(sideline)}$, are located on the ground perpendicular to and symmetrically stationed at 492 feet (150 m) on each side of the flyover

reference flight path. The measurement points bisect the centerline flight path reference point A.

(c) Approach reference noise measurement points

As shown in Figure K3 below:

(1) The centerline noise measurement flight path reference point, designated A, is located on the ground 394 feet (120 m) vertically below the reference approach flight path. The measurement point is defined by the approach reference procedure in section K36.6.4 of this appendix. On level ground, the measurement point corresponds to a position 3,740 feet (1,140 m) from the intersection of the 6.0 degree approach path with the ground plane;

(2) Two sideline noise measurement points, designated as S (starboard) and S(port), are located on the ground perpendicular to and symmetrically stationed at 492 feet (150 m) on each side of the approach reference flight path. The measurement points bisect the centerline flight path reference point A.

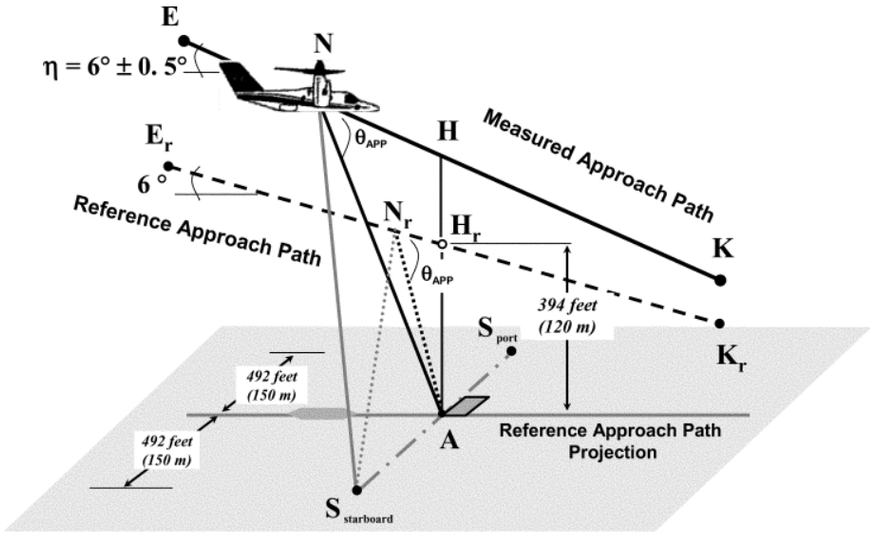

Figure K3.
Comparison of Measured and Reference Approach Profiles

K36.4 Noise Limits

For a tiltrotor, the maximum noise levels, as determined in accordance with the noise evaluation in EPNdB and calculation method

described in section H36.201 of Appendix H of this part, must not exceed the noise limits as follows:

(a) At the takeoff flight path reference point: For a tiltrotor having a maximum certificated takeoff weight (mass) of 176,370 pounds (80,000 kg) or more, in VTOL/Conversion mode, 109 EPNdB, decreasing linearly with the logarithm of the tiltrotor weight (mass) at a rate of 3.0 EPNdB per halving of weight (mass) down to 89 EPNdB, after which the limit is constant. Figure K4 illustrates the takeoff noise limit as a solid line.

(b) At the Flyover path reference point: For a tiltrotor having a maximum certificated takeoff weight (mass) of 176,370 pounds (80,000 kg) or more, in VTOL/Conversion mode, 108 EPNdB, decreasing linearly with the logarithm of the tiltrotor weight (mass) at a rate of 3.0 EPNdB per halving of weight (mass) down to 88 EPNdB, after which the limit is constant. Figure K4 illustrates the flyover noise limit as a dashed line.

(c) At the approach flight path reference point: For a tiltrotor having a maximum certificated takeoff weight (mass) of 176,370 pounds (80,000 kg) or more, in VTOL/Conversion mode, 110 EPNdB, decreasing linearly with the logarithm of the tiltrotors weight (mass) at a rate of 3.0 EPNdB per halving of weight (mass) down to 90 EPNdB, after which the limit is constant. Figure K4 illustrates the approach noise limit as a dash-dot line.

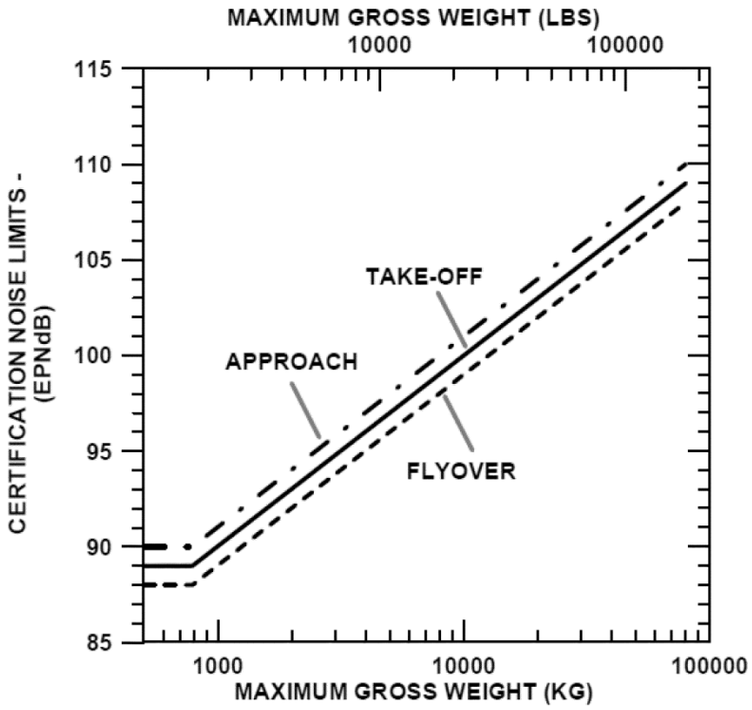

FIGURE K4.
TILTROTOR NOISE LIMITS

K36.5 Trade-Offs

If the noise evaluation measurement exceeds the noise limits described in K36.4 of this appendix at one or two measurement points:

(a) The sum of excesses must not be greater than 4 EPNdB;

(b) The excess at any single point must not be greater than 3 EPNdB; and

(c) Any excess must be offset by the remaining noise margin at the other point or points.

K36.6 Noise Certification Reference Procedures

K36.6.1 General Conditions

(a)-(b) [Reserved]

(c) The takeoff, flyover and approach reference procedures must be established in accordance with sections K36.6.2, K36.6.3 and K36.6.4 of this appendix, except as specified in section K36.6.1(d) of this appendix.

(d) If the design characteristics of the tiltrotor prevent test flights from being conducted in accordance with section K36.6.2, K36.6.3 or K36.6.4 of this appendix, the applicant must revise the test procedures and resubmit the procedures for approval.

(e) The following reference atmospheric conditions must be used to establish the reference procedures:

(1) Sea level atmospheric pressure of 2,116 pounds per square foot (1,013.25 hPa);

(2) Ambient air temperature of 77°Fahrenheit (25 °Celsius, i.e. ISA + 10 °C);

(3) Relative humidity of 70 percent; and

(4) Zero wind.

(f) For tests conducted in accordance with sections K36.6.2, K36.6.3, and K36.6.4 of this appendix, use the maximum normal operating RPM corresponding to the airworthiness limit imposed by the manufacturer. For configurations for which the rotor speed automatically links with the flight condition, use the maximum normal operating rotor speed corresponding with the reference flight condition. For

configurations for which the rotor speed can change by pilot action, use the highest normal rotor speed specified in the flight manual limitation section for the reference conditions.

K36.6.2 Takeoff Reference Procedure.

The takeoff reference flight procedure is as follows:

(a) A constant takeoff configuration must be maintained, including the nacelle angle selected by the applicant;

(b) The tiltrotor power must be stabilized at the maximum takeoff power corresponding to the minimum installed engine(s) specification power available for the reference ambient conditions or gearbox torque limit, whichever is lower. The tiltrotor power must also be stabilized along a path starting from a point located 1,640 feet (500 m) before the flight path reference point, at 65 ft (20 m) above ground level;

(c) The nacelle angle and the corresponding best rate of climb speed, or the lowest approved speed for the climb after takeoff, whichever is the greater, must be maintained throughout the takeoff reference procedure;

(d) The rotor speed must be stabilized at the maximum normal operating RPM certificated for takeoff;

(e) The weight (mass) of the tiltrotors must be the maximum takeoff weight (mass) as requested for noise certification; and

(f) The reference takeoff flight profile is a straight line segment inclined from the

starting point 1,640 feet (500 m) before to the center noise measurement point and 65 ft (20 m) above ground level at an angle defined by best rate of climb and the speed corresponding to the selected nacelle angle and for minimum specification engine performance.

K36.6.3 Flyover Reference Procedure.

The flyover reference flight procedure is as follows:

(a) The tiltrotor must be stabilized for level flight along the centerline flyover flight path and over the noise measurement reference point at an altitude of 492 ft (150 m) above ground level;

(b) A constant flyover configuration selected by the applicant must be maintained;

(c) The weight (mass) of the tiltrotor must be the maximum takeoff weight (mass) as requested for noise certification;

(d) In the VTOL/Conversion mode:

(1) The nacelle angle must be at the authorized fixed operation point that is closest to the shallow nacelle angle certificated for zero airspeed;

(2) The airspeed must be $0.9V_{CON}$ and

(3) The rotor speed must be stabilized at the maximum normal operating RPM certificated for level flight.

K36.6.4 Approach Reference Procedure.

The approach reference procedure is as follows:

(a) The tiltrotor must be stabilized to follow a 6.0 degree approach path;

(b) An approved airworthiness configuration in which maximum noise occurs must be maintained;

(1) An airspeed equal to the best rate of climb speed corresponding to the nacelle angle, or the lowest approved airspeed for the approach, whichever is greater, must be stabilized and maintained; and

(2) The tiltrotor power during the approach must be stabilized over the flight path reference point, and continue as if landing;

(c) The rotor speed must be stabilized at the maximum normal operating RPM certificated for approach;

(d) The constant approach configuration used in airworthiness certification tests, with the landing gear extended, must be maintained; and

(e) The weight (mass) of the tiltrotor at landing must be the maximum landing weight (mass) as requested for noise certification.

K36.7 Test Procedures

K36.7.1 [Reserved]

K36.7.2 The test procedures and noise measurements must be conducted and processed to yield the noise evaluation measure designated in section K36.2 of this appendix.

K36.7.3 If either the test conditions or test procedures do not comply to the applicable noise certification reference conditions or procedures prescribed by this part, the applicant must apply the correction methods described in section H36.205 of Appendix H of this part to the acoustic test data measured.

K36.7.4 Adjustments for differences between test and reference flight procedures must not exceed:

(a) For takeoff: 4.0 EPNdB, of which the arithmetic sum of delta 1 and the term −7.5 log (QK/QrKr) from delta 2 must not in total exceed 2.0 EPNdB;

(b) For flyover or approach: 2.0 EPNdB.

K36.7.5 The average rotor RPM must not vary from the normal maximum operating RPM by more than ±1.0 percent throughout the 10 dB-down time interval.

K36.7.6 The tiltrotor airspeed must not vary from the reference airspeed appropriate to the flight demonstration by more than ±5 kts (±9 km/h) throughout the 10 dB-down time interval.

K36.7.7 The number of level flyovers made with a head wind component must be equal to the number of level flyovers made with a tail wind component.

K36.7.8 The tiltrotor must operate between ±10 degrees from the vertical or between ±65 feet (±20 m) lateral deviation tolerance, whichever is greater, above the reference track and throughout the 10 dB-down time interval.

K36.7.9 The tiltrotor altitude must not vary during each flyover by more than ±30 ft (±9 m) from the reference altitude throughout the 10 dB-down time interval.

K36.7.10 During the approach procedure, the tiltrotor must establish a stabilized constant speed approach and fly between approach angles of 5.5 degrees and 6.5 degrees throughout the 10 dB-down time interval.

K36.7.11 During all test procedures, the tiltrotor weight (mass) must not be less than 90 percent and not more than 105 percent of the maximum certificated weight (mass). For each of the test procedures, complete at least one test at or above this maximum certificated weight (mass).

K36.7.12 A tiltrotor capable of carrying external loads or external equipment must be noise certificated without such loads or equipment fitted

K36.7.13 The value of V_{CON} used for noise certification must be included in the approved Flight Manual.

Article II

This Ministerial Regulation comes into force on the date of promulgation.

In order that every person may know hereof, it is ordered to promulgate this State Bulletin by its placement in the State Bulletin of the Republic of Indonesia.

Issued in Jakarta
on 4 August 2017

MINISTER OF TRANSPORTATION
THE REPUBLIC OF INDONESIA,

signed

BUDI KARYA SUMADI

Promulgated in Jakarta
on 8 August 2017

DIRECTOR OF GENERAL
OF LEGISLATION MINISTRY OF JUSTICE AND HUMAN RIGHTS OF
THE REPUBLIC OF INDONESIA,

signed

WIDODO EKATJAHJANA

STATE BULLETIN OF THE REPUBLIC OF INDONESIA OF 2017 NUMBER 1094

Jakarta, 16 August 2017
Has been translated as an Official Translation
on behalf of Minister of Law and Human Rights
of the Republic of Indonesia,
DIRECTOR GENERAL OF LEGISLATION,

WIDODO EKATJAHJANA