

**Kingdom of Saudi Arabia
General Authority of Civil Aviation**

GACA REGULATION

Section 16

Environmental Protection Volume I - Aircraft Noise

Edition 3.0

FOREWORD

The following regulations governing Environmental Protection related to Aircraft Noise and Engine Emissions are based on Articles; 1, 2, 3, 4, 5, 6, and 38 in addition to the Aircraft Airworthiness Articles; 9, 11, 14, 24, 25, 25, 29, 30, 31, 38, 49, 50, 51, 52, 53, 59, 76, 68, 69, 70, 80, 81, 82, 83, 84, 85, 86, 87, 91, 92, 93, 94, 97, 175 and 177 of the Civil Aviation Act that has been approved by the Council of Ministers Resolution No. 185 dated 17/07/1426H and issued by the Royal Decree No. M/44 dated 18/07/1426H. (23/08/2005G).

The promulgation of this regulation is based on the authority granted in Article 179 of the Civil Aviation Act, and is issued under the authority of the President, General Authority of Civil Aviation, as a duly delegated representative of the GACA Board of Directors, in accordance with Order No. T-41, dated 30/12/1429H (28/12/2008G).

The General Authority of Civil Aviation is responsible for the preparation and distribution of all regulations in sufficient quantities so that all service providers and aircraft operators based in the Kingdom of Saudi Arabia are able to obtain an authentic copy prior to the effective date of the Regulation.

APPROVED:

Original Signed

Fahad Bin Abdullah M. Al Saud
President, General Authority of Civil Aviation,

Effective Date: 13 November 2014

CONTENT RULES

1) Organization Structure:

- a) GACA has established an Airworthiness Division (AW) within the Aviation Standards Department (ASD) of the Air Transport Sector (S&AT) with the following responsibilities:
1. Ensure and enforce compliance with the applicable regulations and procedures of GACAR Section 16 Vol I including the identification of conditions and circumstances under which AW are allowed to deal with, and resolve events involving certain deviations internally, within the context of this regulation,
 2. Perform safety oversight functions including audits, inspections, investigations, and data analysis; on pre-established annual audit program and frequent inspections of areas of greater safety concern or need, as identified by the analysis of data, or as instructed by Senior Management,
 3. Certify the airworthiness of aircrafts registered in the Kingdom to include aircraft noise and engine emissions requirements, and maintain current data base for aircraft airworthiness certifications,
 4. Certify major aircrafts alterations and repairs and conduct compliance and conformity inspections to ensure airworthiness,
 5. Review and approve aircraft flight manuals (AFM), structural repair, minimum equipment list (MEL), Configuration Deviation List (CDL), overhaul, fueling/refueling/de-fueling, and ground servicing, manuals
 6. Review and approve registered aircrafts' weight and balance control, reliability, corrosion control, and structural integrity programs,
 7. Ensure the maintenance of registered aircrafts in accordance with all requirements and applicable standards for the particular aircraft design and series through:
 - a) Review and approval of maintenance manuals, programs, and schedules for all registered aircrafts,
 - b) Regular surveillance and inspection of common carriers,
 - c) Inspect and certify in and out of Kingdom stations repairing Saudi-registered aircrafts,
 - d) Inspect and certify mechanics, repairmen and other maintenance personnel working in repair stations handling Saudi-registered aircrafts to ensure their capabilities in maintaining and repairing aircrafts. This includes as well assessing and approving their training program,
 - e) Evaluate application for and appoint Designated Engineering Representatives (DERs),
 8. Participate in incident and accident investigations.

2) Rules of Constructions:

- a) To avoid any misunderstanding within this regulation, certain words are to be interpreted as having specific meanings when they are used, unless the context requires otherwise:
1. Words importing the singular include the plural;
 2. Words importing the plural include the singular; and
 3. Words importing the masculine gender include the feminine
- b) In this regulation, the following protocol is used:
1. The words "**Shall**" and "**must**" indicate that compliance is compulsory.
 2. The word "**should**" indicates a recommendation. It does not mean that compliance is optional but rather that, where insurmountable difficulties exist, the GACA-S&AT may accept an alternative means of compliance, provided that an acceptable safety assurance from the authority shows that the safety requirements will not be reduced below that intended by the requirement.
 3. The word "**Can**" or "**May**" is used in a permissive sense to state authority or permission to do the act prescribed, and the words "no person may * * *" or "a person may not * * *" mean that no person is required, authorized, or permitted to do the act prescribed;
 4. The word "**will**" is used to express the future; and
 5. The word "**Includes**" means "**includes but is not limited to**".

AMENDMENT PROCEDURE

The existing General Authority of Civil Aviation Regulations (GACAR) will be periodically reviewed to reflect the latest updates of International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs); it will be also amended to reflect the latest aviation safety provisions issued by GACA and other regional and international civil aviation organizations. A complete revised edition incorporating all amendments will be published every three years from the original effective date of this regulation. The amendment procedure shall be as follows:

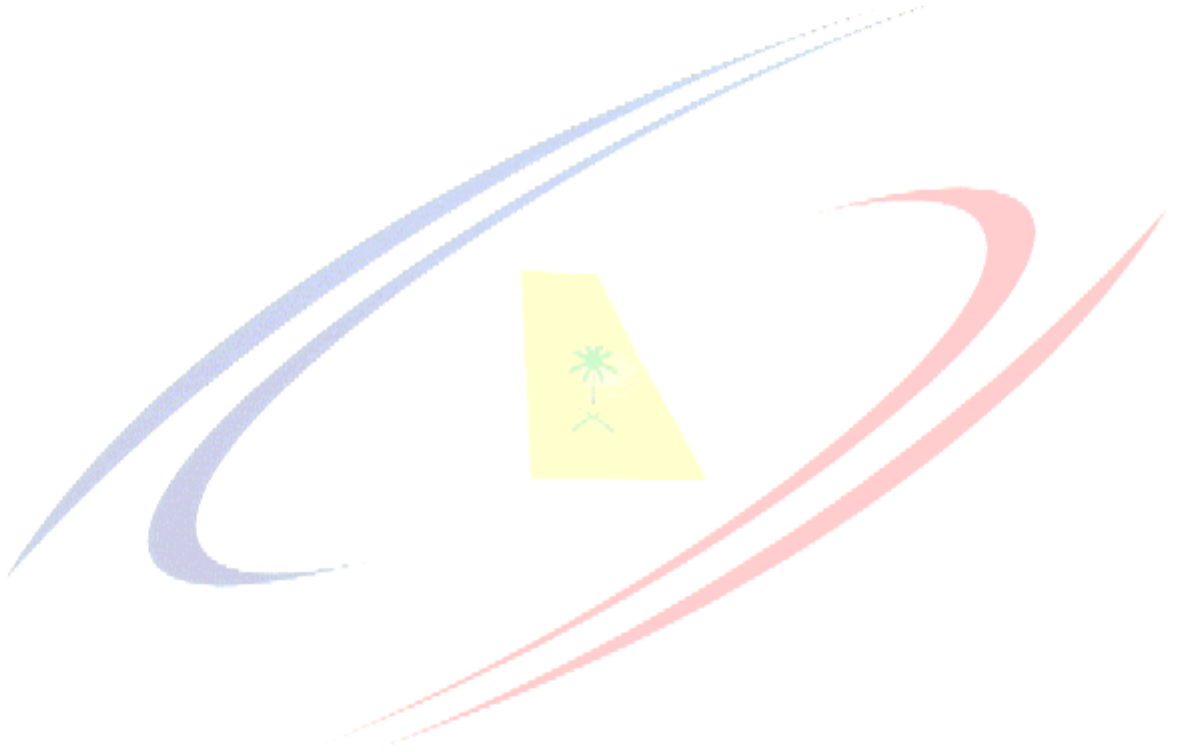
1. When the General Authority of Civil Aviation (GACA) receives an amendment to any of the current ICAO Annexes that can affect the provisions of this regulation, it will be forwarded by the Assistant President of International Cooperation to the Assistant Vice President, Safety and Air Transport (S&AT) who in turn will forward it to Aviation Regulation Department to coordinate with the concerned department to study and comments, taking into account the ICAO deadline for the reply.
2. When any GACA department or stakeholder proposes an amendment to this regulation, it will send a letter with the proposed amendment including a clear justification and argument for such amendment. Following the receipt of an amendment proposal, the S&AT will analyze this proposal and forward its comments and any proposed decision action to the S&AT Assistant Vice President.
3. An accepted amendment proposal will be prepared as draft amendment to the GACAR-Section 16 Vol I and forwarded to the originator of the amendment proposal and concerned GACA department (s) for further review and comment within a specified timeline.
4. All accepted amendments will be drafted in the form of Notices of Proposed Amendments (NPA) and forwarded to all concerned parties including stakeholders for comment within a two-month reply period. The NPA shall indicate the proposed Amendment's effective date.
5. Following the receipt of NPA replies, the S&AT will analyze the comments received and produce a new draft in consultation with the concerned GACA department. The final draft will be submitted to President of the General Authority of Civil Aviation for formal approval prior to publication.
6. The Amendment's effective date will take into account the comments of all the concerned parties and stakeholders.
7. Any differences between the GACAR Section 16 new amendment and ICAO Annex 16 Vol I Standards and Recommended Practices will be forwarded to ICAO as a Difference and published as it is in the Aeronautical Information Publication (AIP).
8. All concerned parties and stakeholders will be provided a copy of the new amendment and will be requested to update their copy of the GACAR Section 16 accordingly.
9. It is the responsibility of all concerned parties to keep their copy of GACAR-Section 16 Vol I and other GACA regulation publication up to date.

SUPPLEMENTARY REGULATIONS

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From time to time it will be necessary to issue regulations which supplement or augment the GACAR Regulations. The following procedures will apply:

1. Supplementary regulations will be issued in the form of a GACA Regulation Circular (RC).
2. The GACA Regulation Circular will be approved by the President.
3. The process for preparation and publishing of the GACA Regulation Circular will be addressed in the GACA Quality System Manual.



AMENDMENT RECORD

This edition reflects ICAO Annex 16 Volume I up to and including amendment 11

[illegible]

LIST OF CURRENT DIFFERENCES TO ICAO SARPS

GACA Regulation Section 16 (Vol. I) is based on ICAO Annex 16 (Vol. I). The following is a list of differences with the GACA Regulation and the ICAO Standards and Recommended Practices (SARPS). Differences have been notified to ICAO and are also published in the KSA Aeronautical Information Publication (AIP-GEN 1.7).

ICAO Annex 16 Volume I – Environmental Protection – Amendment 11			
SARP Identifier	SARP	Regulation Reference	Level of implementation of SARP's
Chapter 1 Reference Definition	Powered-lift. A heavier-than-air aircraft capable of vertical take-off, vertical landing, and low-speed flight, which depends principally on engine-driven lift devices or engine thrust for the lift during these flight regimes and on non-rotating aerofoil(s) for lift during horizontal flight.	GACAR/FAR1.1	More Exacting or Exceeds
Chapter 1 Reference Definition	Tilt-rotor. A powered-lift capable of vertical take-off, vertical landing, and sustained low-speed flight, which depends principally on engine-driven rotors mounted on tiltable nacelles for the lift during these flight regimes and on non-rotating aerofoil(s) for lift during high-speed flight.	CAGAR/FAR 36.1	More Exacting or Exceeds
Chapter 1 Reference Definition	<i>Associated aircraft systems.</i> Those aircraft systems drawing electrical/pneumatic power from an auxiliary power unit during ground operations.	GACA Regulations Section 8: GACAR/FAR 1.1	Different in character or other means of compliance
Chapter 1 Reference Definition	Auxiliary power unit (APU). A self contained power unit on an aircraft providing electrical/pneumatic power to aircraft systems during ground operations.	GACA Regulations Section 8: GACAR/FAR 1.1	Different in character or other means of compliance
Chapter 1 Reference Definition	Derived version of a helicopter. A helicopter which, from the point of view of airworthiness, is similar to the noise certificated prototype but incorporates changes in type design which may affect its noise characteristics adversely. N1. In applying the Standards of this Annex, a helicopter that is based on an existing prototype but which is considered by the certifying authority to be a new type design for airworthiness purposes shall nevertheless be considered as a derived version if the noise source characteristics are judged by the certifying authority to be the same as the prototype. N2. "Adversely" refers to an increase of more than 0.30 EPNdB in any one of the noise certification levels for helicopters certificated according to Chapter 8 and 0.30 dB(A) in the certification level for helicopters certificated according to Chapter 11.	GACA Regulations Section 8: GACAR/FAR 36.7	Different in character or other means of compliance

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VOLUME I - AIRCRAFT NOISE

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Chapter 1 Reference Definition	Recertification. Certification of an aircraft with or without a revision to its certification noise levels, to a Standard different to that to which it was originally certificated.	GACA Regulations Section 8: GACAR/FAR Part 21, subparts D and E.	Different in character or other means of compliance
Reference 1.3 Standard	If noise recertification is requested, it shall be granted or validated by the State of Registry of an aircraft on the basis of satisfactory evidence that the aircraft complies with requirements that are at least equal to the applicable Standards specified in this Annex. The date used by a certifying authority to determine the recertification basis shall be the date of acceptance of the first application for recertification.	GACA Regulations Section 8: GACAR/FAR Part 21, subparts D & E	Different in character or other means of compliance
Reference 14.1.1 Standard	<p>CHAPTER 14</p> <p>1.— SUBSONIC JET AEROPLANES AND PROPELLER DRIVEN AEROPLANES WITH MAXIMUM CERTIFICATED TAKE OFF MASS 55 000 kg AND OVER — Application for Type Certificate submitted on or after 31 December 2017</p> <p>2.— SUBSONIC JET AEROPLANES WITH MAXIMUM CERTIFICATED TAKE OFF MASS LESS THAN 55 000 kg — Application for Type Certificate submitted on or after 31 December 2020</p> <p>3. PROPELLER DRIVEN AEROPLANES WITH MAXIMUM CERTIFICATED TAKE OFF MASS OVER 8 618 kg AND LESS THAN 55 000 kg — Application for Type Certificate submitted on or after 31 December 2020</p> <p>14.1 Applicability Note.— See also Chapter 1, 1.10, 1.11, 1.12 and 1.13.</p> <p>The Standards of this chapter shall, with the exception of those aeroplanes which require a runway length of 610 m or less at maximum certificated mass for airworthiness or propeller driven aeroplanes specifically designed and used for agricultural or firefighting purposes, be applicable to:</p> <p>a) all subsonic jet aeroplanes and propeller driven aeroplanes, including their derived versions, with a maximum certificated take off mass of 55 000 kg and over for which the application for a Type Certificate was submitted on or after 31 December 2017;</p> <p>b) all subsonic jet aeroplanes, including their derived versions, with a maximum certificated take off mass of less than 55 000 kg for which the application for a Type Certificate was submitted on or after 31 December 2020;</p>	GACAR/FAR 36.1	More Exacting or Exceeds

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	<p>c) all propeller driven aeroplanes, including their derived versions, with a maximum certificated take off mass of over 8 618 kg and less than 55 000 kg for which the application for a Type Certificate was submitted on or after 31 December 2020; and</p> <p>d) All subsonic jet aeroplanes and all propeller driven aeroplanes certificated originally as satisfying Annex 16, Volume I, Chapter 3, Chapter 4 or Chapter 5, for which recertification to Chapter 14 is requested. Note.— Guidance material on applications for recertification is provided in the Environmental Technical Manual (Doc 9501), Volume I — Procedures for Noise Certification of Aircraft.</p> <p>—</p> <p>1. With no stopway or clearway.</p>		
Reference 14.1.2 Standard	<p>Notwithstanding 14.1.1, it may be recognized by a Contracting State that the following situations for jet aeroplanes and propeller-driven aeroplanes over 8 618 kg maximum certificated take-off mass on its registry do not require demonstration of compliance with the provisions of the Standards of Annex 16, Volume I:</p> <p>gear down flight with one or more retractable landing gear down during the entire flight;</p> <p>spare engine and nacelle carriage external to the skin of the aeroplane (and return of the pylon or other external mount); and</p> <p>time-limited engine and/or nacelle changes, where the change in type design specifies that the aeroplane may not be operated for a period of more than 90 days unless compliance with the provisions of Annex 16, Volume I, is shown for that change in type design. This applies only to changes resulting from a required maintenance action.</p>	GACAR/FAR 36.1	More Exacting or Exceeds
Reference 14.2.1 Standard	<p>14.2 Noise measurements</p> <p>Noise evaluation measure</p> <p>The noise evaluation measure shall be the effective perceived noise level in EPNdB as described in Appendix 2.</p>	GACAR/FAR36.101	
Reference 14.3.1 Standard	<p>14.3 Reference noise measurement points</p> <p>An aeroplane, when tested in accordance with these Standards, shall not exceed the maximum noise level specified in 14.4 of the noise measured at the points specified in Chapter 3, 3.3.1 a), b) and c).</p>	GACAR/FARSection B36.3	More Exacting or Exceeds
Reference 14.3.2 Standard	<p>Test noise measurement points</p> <p>The provisions of Chapter 3, 3.3.2, relating to test noise measurement points shall apply.</p>	GACAR/FARAppendix B to Part 36 Section B36.3	More Exacting or Exceeds

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Reference 14.4.1 Standard	14.4 Maximum noise levels The maximum noise levels, when determined in accordance with the noise evaluation method of Appendix 2, shall not exceed the following:	GACAR/FARAppendix B to Part 36 Section B36.5	More Exacting or Exceeds
Reference 14.4.1.1 Standard	At the lateral full power reference noise measurement point 103 EPNdB for aeroplanes with maximum certificated take off mass, at which the noise certification is requested, of 400 000 kg and over, decreasing linearly with the logarithm of the mass down to 94 EPNdB at 35 000 kg, after which the limit is constant to 8 618 kg, where it decreases linearly with the logarithm of the mass down to 88.6 EPNdB at 2 000 kg, after which the limit is constant.	GACAR/FARAppendix B to Part 36 Section B36.5	More Exacting or Exceeds
Reference 14.4.1.2 Standard	At the flyover reference noise measurement point a) Aeroplanes with two engines or less 101 EPNdB for aeroplanes with maximum certificated take off mass, at which the noise certification is requested, of 385 000 kg and over, decreasing linearly with the logarithm of the mass at the rate of 4 EPNdB per halving of mass down to 89 EPNdB, after which the limit is constant to 8 618 kg, where it decreases linearly with the logarithm of the mass at a rate of 4 EPNdB per halving of mass down to 2 000 kg, after which the limit is constant. b) Aeroplanes with three engines As a) but with 104 EPNdB for aeroplanes with maximum certificated take off mass of 385 000 kg and over. c) Aeroplanes with four engines or more As a) but with 106 EPNdB for aeroplanes with maximum certificated take off mass of 385 000 kg and over.	GACAR/FARAppendix B to Part 36 Section B36.5	More Exacting or Exceeds
Reference 14.4.1.3 Standard	At the approach reference noise measurement point 105 EPNdB for aeroplanes with maximum certificated take off mass, at which the noise certification is requested, of 280 000 kg and over, decreasing linearly with the logarithm of the mass down to 98 EPNdB at 35 000 kg, after which the limit is constant to 8 618 kg, where it decreases linearly with the logarithm of the mass down to 93.1 EPNdB at 2 000 kg, after which the limit is constant.	GACAR/FARAppendix B to Part 36 Section B36.5	More Exacting or Exceeds
Reference 14.4.1.4 Standard	The sum of the differences at all three measurement points between the maximum noise levels and the maximum permitted noise levels specified in 14.4.1.1, 14.4.1.2 and 14.4.1.3, shall not be less than 17 EPNdB.	GACAR/FARAppendix B to Part 36 Section B36.5	More Exacting or Exceeds

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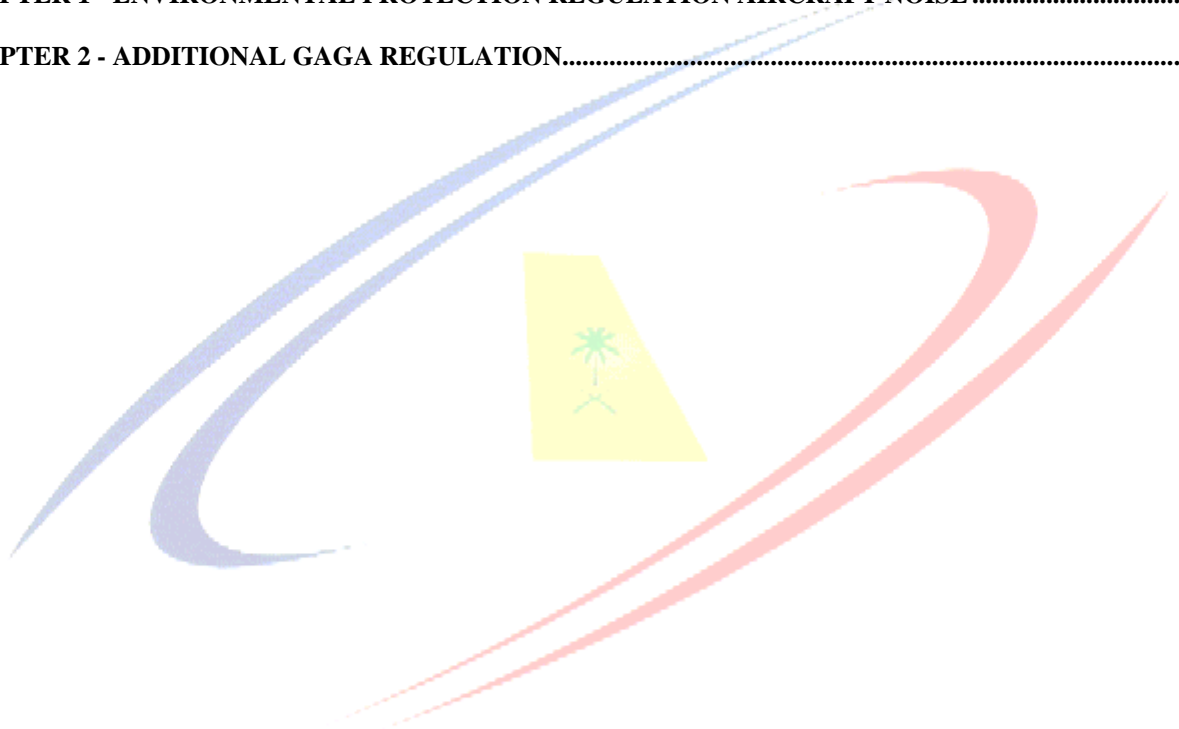
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Reference 14.4.1.5 Standard	The maximum noise level at each of the three measurement points shall not be less than 1 EPNdB below the corresponding maximum permitted noise level specified in 14.4.1.1, 14.4.1.2 and 14.4.1.3. Note.— See Attachment A for equations for the calculation of maximum permitted noise levels as a function of take off mass.	GACAR/FARAppendix B to Part 36 Section B36.5	More Exacting or Exceeds
Reference 14.5 Standard	Noise certification reference procedures The noise certification reference procedures shall be as specified in Chapter 3, 3.6.	GACA/FARAppendix B to Part 36 Section B36.7	More Exacting or Exceeds
Reference 14.6 Standard	Test procedures The test procedures shall be as specified in Chapter 3, 3.7.	GACA/FARAppendix B to Part 36 Section B36.8	More Exacting or Exceeds
Reference 14.7 Standard	Recertification For aeroplanes specified in 14.1.1 d), recertification shall be granted on the basis that the evidence used to determine compliance with Chapter 14 is as satisfactory as the evidence associated with aeroplanes specified in 14.1.1 a), b) and c).	GACA/FAR 36.9	More Exacting or Exceeds



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CHAPTER 1

**ENVIRONMENTAL PROTECTION REGULATION
AIRCRAFT NOISE**

- 1) The General Authority of Civil Aviation (GACA) adopted the United States of America Environmental Protection Regulations related to Aircraft Noise through the 14 CFR, and its supporting handbooks, manuals, Advisory Circulars (ACs), Directives, policy, guidance material, Orders, Notices, and specific GACA requirements as amended, to be GACA Regulation Section 16 - Environmental Protection Volume I - Aircraft Noise.
- 2) The adoption of the United States Environmental Protection Regulations is based on GACA Board of Directors Order No. T- 4-26, dated 28/08/1428H (10/09/2007G). Based on this Order, GACA also adopted the United States Aviation Safety Regulations regarding Personnel Licensing, Operation of Aircraft, and Aircraft Airworthiness to be part of GACA Regulations until GACA develops its own regulations for these areas.
- 3) GACA promulgated civil aviation safety regulations that comprise the following sections:
 - Section 1 - Personnel Licensing (GACAR /FAR)
 - Section 2 - Rules of the Air
 - Section 3 - Meteorological Service for Air Navigation
 - Section 4 - Aeronautical Charts
 - Section 5 - Units of Measurement to be Used in Air and Ground Operations
 - Section 6 - Operation of Aircraft (GACAR /FAR)
 - Section 7 - Aircraft Nationality and Registration Marks
 - Section 8 - Airworthiness of Aircraft (GACAR /FAR)
 - Section 9 - Facilitation (RESERVED)
 - Section 10 - Aeronautical Telecommunications
 - Section 11 - Air Traffic Services
 - Section 12 - Search and Rescue
 - Section 13 - Aircraft Accident and Incident Investigation
 - Section 14 - Aerodromes
 - Section 15 - Aeronautical Information Services
 - Section 16 - Environmental Protection (GACAR /FAR)
 - Section 17 - Aviation Security (RESERVED)
 - Section 18 - The Safe Transportation of Dangerous Goods by Air
 - Section 19 - Safety Management
 - Section 21 - Safety Management System
- 4) Any differences between GACAR Section 16 Vol. I /14 CFR Parts and ICAO Annex 16 Vol. I Standards and Recommended Practices (SARPs) will be reported to ICAO and reflected in Kingdom of Saudi Arabia (KSA) Aeronautical Information Publications (AIP's).
- 5) GACAR Section 16 Vol. I /14 CFR Parts provisions related to Environmental Protection Volume I - Aircraft Noise are addressed in 14 CFR Parts, supported by handbooks, manuals, Advisory Circulars (ACs), Directives, policy, guidance materials, Orders and Notices and more specifically through the following 14 CFR Parts:

- a) Part 21 — Certification Procedures for Products and Parts;
 - b) Part 23 — Airworthiness Standards: Normal, Utility, Acrobatic and Commuter Category Airplanes;
 - c) Part 25 — Airworthiness Standards: Transport Category Airplanes;
 - d) Part 26 — Continued Airworthiness and Safety Improvements for Transport Category Airplanes;
 - e) Part 27 — Airworthiness Standards: Normal Category Rotorcraft;
 - f) Part 29 — Airworthiness Standards: Transport Category Rotorcraft;
 - g) Part 31 — Airworthiness Standards: Manned Free Balloons;
 - h) Part 33 — Airworthiness Standards: Aircraft Engines;
 - i) Part 34 — Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes;
 - j) Part 35 — Airworthiness Standards: Propellers;
 - k) Part 36 — Noise Standards: Aircraft Type and Airworthiness Certification;
 - l) Part 39 — Airworthiness Directives;
 - m) Part 43 — Maintenance, Preventive Maintenance, Rebuilding, and Alteration;
 - n) Part 45 — Identification and Registration Marking;
 - o) Part 47 — Aircraft Registration;
 - p) Part 65 — Certification: Airmen Other than Flight Crewmembers;
 - q) Part 145 — Repair Stations;
 - r) Part 147 — Aviation Maintenance Technician Schools; and
 - s) Part 183 — Representatives of the Administrator (Designees).
- 6) The Presidency of Meteorology and Environment (PME) is the national authority of the Kingdom of Saudi Arabia (KSA) that is responsible for the regulation and the protection of the environment in the Kingdom. GACA will be responsible for the implementation of PME regulations for environmental protection that are not related to aircraft noise and engine emissions which are regulated by GACA Regulation Section 16 Vol. I.

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CHAPTER 2 - ADDITIONAL GAGA REGULATION

Reserve

