



CAR AGA 3

AERODROME LICENSING & OPERATION

FOREWORD

CONTENTS – SECTION 1

CONTENTS – SECTION 2

REVISION RECORD

LIST of EFFECTIVE PAGES



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FOREWORD

1. The Civil Aviation Authority Bahamas is known in these regulations as the “Authority” and has implemented CAR AGA 3 - Civil Aviation Regulations – Aerodromes and Ground Aids - Aerodrome Licensing and Operation. The regulations are made under the Civil Aviation Authority Act – 2021.
2. CAR AGA 3 contains regulations that prescribe the licensing and operational requirements of those aerodromes within the territory of The Bahamas that do not meet the requirements for certification under CAR AGA 1.

Notes:

- (a) *All aerodromes, regardless of use, must be registered.*
 - (b) *Aerodromes, capable of being certified, are addressed in CAR AGA 1.*
 - (c) *Heliports, capable of being certified or licensed, are addressed in CAR AGA 2.*
3. Unless otherwise stated, applicable CAR DEF definitions and abbreviations are used throughout this document.
4. The editing practices used in this document are as follows:
 - (a) ‘Shall’ or ‘Will’ or ‘Must’ is used to indicate a mandatory requirement.
 - (b) ‘Should’ is used to indicate a recommendation.
 - (c) ‘May’ is used to indicate discretion by the Authority, the industry or the applicant, as appropriate.

Note: The use of the male gender implies all genders.

5. Paragraphs and sub-paragraphs with new, amended and corrected text will be enclosed within square brackets until a subsequent “amendment” is issued.
6. Section 1 regulations are presented in “Times Roman” font and Section 2 guidance material is presented in “Arial” font.
7. Manuals related to the specifications of CAR AGA 3;
 - (a) ICAO Manual on Certification of Aerodromes (Doc 9774)
 - (b) ICAO Procedures for Air Navigation Services – Aerodromes (Doc 9981)



REVISION RECORD

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LIST OF EFFECTIVES PAGES

i	01 Jul 21
ii	01 Jul 21
iii	01 Jul 21
iv	01 Jul 21
v	01 Jul 21
vi	01 Jul 21

Section 1**Chapter 1**

1-1-1	01 Jul 21
1-1-2	01 Jul 21
1-1-3	01 Jul 21
1-1-4	01 Jul 21
1-1-5	01 Jul 21
1-1-6	01 Jul 21
1-1-7	01 Jul 21
1-1-8	01 Jul 21

Chapter 2

1-2-1	25 Mar 21
1-2-2	25 Mar 21
1-2-3	25 Mar 21
1-2-4	25 Mar 21

Chapter 3

1-3-1	25 Mar 21
1-3-2	25 Mar 21
1-3-3	25 Mar 21
1-3-4	25 Mar 21

Chapter 4

1-4-1	25 Mar 21
1-4-2	25 Mar 21
1-4-3	25 Mar 21
1-4-4	25 Mar 21
1-4-5	25 Mar 21
1-4-6	25 Mar 21
1-4-7	25 Mar 21
1-4-8	25 Mar 21
1-4-9	25 Mar 21
1-4-10	25 Mar 21
1-4-11	25 Mar 21

1-4-12	25 Mar 21
1-4-13	25 Mar 21
1-4-14	25 Mar 21
1-4-15	25 Mar 21
1-4-16	25 Mar 21
1-4-17	25 Mar 21
1-4-18	25 Mar 21
1-4-19	25 Mar 21
1-4-20	25 Mar 21
1-4-21	25 Mar 21
1-4-22	25 Mar 21
1-4-23	25 Mar 21
1-4-24	25 Mar 21
1-4-25	25 Mar 21
1-4-26	25 Mar 21
1-4-27	25 Mar 21
1-4-28	25 Mar 21
1-4-29	25 Mar 21
1-4-30	25 Mar 21
1-4-31	25 Mar 21
1-4-32	25 Mar 21
1-4-33	25 Mar 21
1-4-34	25 Mar 21
1-4-35	25 Mar 21
1-4-36	25 Mar 21
1-4-37	25 Mar 21
1-4-38	25 Mar 21

Appendices

APP 1-1	25 Mar 21
APP 1-2	25 Mar 21
APP 1-3	25 Mar 21
APP 1-4	25 Mar 21
APP 1-5	25 Mar 21
APP 1-6	25 Mar 21
APP 1-7	25 Mar 21
APP 1-8	25 Mar 21
APP 1-9	25 Mar 21
APP 1-10	25 Mar 21
APP 1-11	25 Mar 21
APP 1-12	25 Mar 21
APP 2-1	25 Mar 21
APP 2-2	25 Mar 21
APP 3-1	25 Mar 21
APP 3-2	25 Mar 21

Section 2

i	25 Mar 21
ii	25 Mar 21

Chapter 1

2-1-1	25 Mar 21
2-1-2	25 Mar 21
2-1-3	25 Mar 21
2-1-4	25 Mar 21

Chapter 2

2-2-1	25 Mar 21
2-2-2	25 Mar 21

Chapter 3

2-3-1	25 Mar 21
2-3-2	25 Mar 21

Chapter 4

2-4-1	25 Mar 21
2-4-2	25 Mar 21
2-4-3	25 Mar 21
2-4-4	25 Mar 21
2-4-5	25 Mar 21
2-4-6	25 Mar 21
2-4-7	25 Mar 21
2-4-8	25 Mar 21
2-4-9	25 Mar 21
2-4-10	25 Mar 21
2-4-11	25 Mar 21
2-4-12	25 Mar 21

-End-



CONTENTS

Forewordi

Revision Recordii

List of Effective Pages iii

Contentsiv

Advisory Circulars (AC) Contentsvi

SECTION 1 REGULATIONS

CHAPTER 1 GENERAL 1-1-1

1.1 Definitions 1-1-1

1.2 Applicability 1-1-1

1.3 Requirements for an Aerodrome licence 1-1-2

1.4 Abbreviations 1-1-3

1.6 Operational Coordination With Service Providers 1-1-4

1.7 Access to the Aerodrome 1-1-5

1.8 Aeronautical Studies 1-1-6

1.8 Operational Directives 1-1-6

CHAPTER 2 LICENSING PROCESS 1-2-1

2.1 General Requirements for Approval..... 1-2-1

2.2 Grant of an Aerodrome licence 1-2-2

2.3 Duration of an Aerodrome licence 1-2-2

2.4 Transfer of an Aerodrome licence 1-2-2

2.5 Amendment of an Aerodrome licence 1-2-3

2.6 Surrender of an Aerodrome licence 1-2-3

CHAPTER 3 AERODROME OPERATIONS MANUAL 1-3-1

3.1 Requirement of the Aerodrome Operations Manual 1-3-1

3.2 Preparation of the Aerodrome Operations Manual (Aom) 1-3-1

3.3 Contents of the Aerodrome Operations Manual 1-3-2

3.4 Amendment and Location of the Aerodrome Operations Manual 1-3-2

3.5 Aerodrome Operations Manual Review 1-3-2

3.6 Approval of the Aerodrome Operations Manual 1-3-3

CHAPTER 4 OBLIGATIONS OF THE AERODROME OPERATOR 1-4-1

4.1 General 1-4-1

4.2 Records 1-4-1

4.3 Personnel Competence And Requirements 1-4-1

4.4 Specific Procedures for Aerodrome Operations 1-4-2

4.5 Paved Areas 1-4-2

4.6 Unpaved Areas 1-4-4

4.7 Runway Strips and Taxiways 1-4-5

4.8 Visual Aids and Electrical Systems 1-4-5

4.9 Rescue And Fire-Fighting Service (RFFS) 1-4-10

4.10 Emergency Access Roads 1-4-17

4.11 Communication and Alerting Systems 1-4-18

4.12 Aerodrome Emergency Plan 1-4-18



4.13	Handling and Storage of Hazardous Substances	1-4-21
4.14	Aerodrome Safety Management System	1-4-23
4.15	Safety Audits And Inspections	1-4-23
4.16	Vehicles	1-4-24
4.17	Obstacle Control	1-4-25
4.18	Protection of Radio Navigational Aids	1-4-28
4.19	Public Protection	1-4-28
4.20	Wildlife Strike Hazard Reduction	1-4-29
4.21	Notifying and Reporting About Aerodrome Conditions	1-4-31
4.22	Identification and Marking of Construction Areas	1-4-33
4.23	Apron Management Service	1-4-34
4.24	Ground Servicing of Aircraft	1-4-34
4.25	Disabled Aircraft Removal	1-4-35
4.26	Tools and Precision Equipment	1-4-35
4.27	Technical Library	1-4-36
4.28	Aerodrome Incident Reporting and Investigation	1-4-36
4.29	Warning Notices	1-4-36
Appendix 1	Contents of the Aerodrome Operations Manual (AOM)	APP 1 1
Appendix 2	Paved Areas	APP 2-1
Appendix 3	Vehicles	APP 3-1



SECTION 2 - ADVISORY CIRCULARS (AC)

General	i
Presentation	i

CHAPTER 1 GENERAL

AC 1.2 Requirement for an Aerodrome Licence.....	2-1-1
AC 1.7.3(c) Runway Safety Team.....	2-1-1
AC 1.7.4 Service Level Agreements	2-1-1
AC 1.9 Aeronautical Studies	2-1-2

CHAPTER 2 LICENSING PROCESS

AC 2.1 Licensing Process.....	2-2-1
AC 2.1.6 Key Personnel	2-2-1
AC 2.2 Grant of an Aerodrome Licence	2-2-2

CHAPTER 3 AIRPORT OPERATIONS MANUAL (AOM)

AC 3.1 Preparation of the Aerodrome Operations Manual (AOM).....	2-3-1
AC 3.3 Airport Operations Manual (AOM) Compliance Letter	2-3-2

CHAPTER 4 OBLIGATIONS OF THE AERODROME OPERATOR

AC 4.1 General.....	2-4-1
AC 4.3.2 Personnel competence	2-4-1
AC 4.4 Specific procedures for aerodrome operations.....	2-4-2
AC 4.5.1 Paved areas.....	2-4-2
AC 4.5.2(b)(2) Paved areas.....	2-4-3
AC 4.5.2(b)(3) Paved areas – Frequency of friction tests	2-4-3
AC 4.5.2(b)(4) Paved areas - Frequency for airfield rubber removal	2-4-3
AC 4.5.3 Paved areas – Overlaying pavements.....	2-4-4
AC 4.8.1 Visual aids and electrical systems.....	2-4-4
AC 4.9 Rescue and firefighting	2-4-4
AC 4.9.1 Rescue and firefighting: categorising	2-4-4
AC 4.9.2 Rescue and firefighting: Equipment and extinguishing agents	2-4-4
AC 4.9.4 Rescue and firefighting: Response time	2-4-5
AC 4.9.9 Rescue and firefighting: operational requirements	2-4-6
AC 4.12 Aerodrome emergency planning	2-4-6
AC 4.13 Handling and storage of hazardous materials	2-4-6
AC 4.14 Guidance on an aerodrome safety management system	2-4-7
AC 4.15 Safety Audits and Inspections.....	2-4-7
AC 4.16 Vehicles.....	2-4-7
AC 4.17 Control of obstacles	2-4-9
AC 4.19 Public protection	2-4-9
AC 4.20 Protection against wildlife strike hazards.....	2-4-10
AC 4.21.4(c) Notifying and reporting about aerodrome conditions	2-4-10
AC 4.21.9 Notifying and reporting about aerodrome conditions	2-4-10
AC 4.23 Apron management service	2-4-11



CHAPTER 1

GENERAL

1.1 Definitions

Unless otherwise stated, applicable CAR DEF definitions and abbreviations are used throughout this document.

1.2 Applicability

(See AC 1.2)

- 1.2.1 CAR AGA 3 applies to aerodromes located in the territory of The Bahamas that are designed for use by aeroplanes but are temporarily or permanently incapable of being certified under CAR AGA 1.
- 1.2.2 Aerodromes, designated as a point of entry in the AIP, accepting aeroplanes having a passenger seating configuration, excluding any pilot seats, of more than 30, shall not be licenced unless a corrective action plan to become certified is acceptable to the Authority.
- 1.2.3 Unless accepted by the Authority as a condition for future certification, licensed aerodromes shall;
- (a) not be used at night;
 - (b) be used for VFR operations only; and
 - (c) be restricted to non-instrument runways.
- 1.2.4 An aerodrome, other than a certified aerodrome, shall be licenced when used for the following purposes;
- (1) international operations with any type of aeroplane having a passenger seating configuration, excluding any pilot seats, of less than 30;
 - (2) domestic commercial operations with any type of aeroplane having a maximum take-off mass (MTOM) of less than 25,000 kg;
 - (3) domestic general aviation operations from public use aerodromes;
 - (4) aerial work operations with an aeroplane over 5700 kg; or
 - (5) night operations (emergency use only).

Note 1: Aerodromes not for public use must be registered but need not be licensed.

Note 2: An aerodrome, licenced under paragraph 1.2.4, may be certified if it meets CAR AGA 1 requirements.

[Note 3: Aerodrome physical characteristics, signs and markings for licensed aerodromes can be found in the applicable section of CAR AGA 1.]



- 1.2.5 CAR AGA 3 also applies to the aerodrome service providers, rescue and firefighting services, security agencies, technical support companies for aircraft: dispatch, online service, fuelling, food and beverage supply, handling of cargo operation and other organisations which perform or may perform independent activities at the aerodrome.
- 1.2.6 A person shall not operate an aerodrome used for the purposes stated in 1.2.4 unless it is either certified in accordance with CAR AGA 1 or licensed under these regulations
- 1.2.7 A person shall not operate an aeroplane on operations stated in 1.2.4 from any aerodrome unless it is either certified in accordance with CAR AGA 1 or licensed under these regulations.

1.3 Requirements for registration of an aerodrome

All locations within the Bahamas used for the take-off and landing of aircraft shall be registered with the Authority. The aerodrome operator shall formally notify the Authority and provide the following minimum registration requirements:

- (a) The name of the aerodrome.
- (b) The location of the aerodrome including the geographical coordinates of the aerodrome
- (c) The owner and operator of the aerodrome
- (d) The types of aircraft operating
- (e) A description of the main activities carried out at the aerodrome.

1.4 Aerodrome operator responsibilities

The following aerodrome operator responsibilities shall be applicable to all aerodromes that conduct commercial passenger, cargo and mail operations within the Bahamas:

- (a) Movement area maintenance programs and plan for paved areas, un paved areas, visual aids, electrical systems (as applicable), secondary power supply (as applicable.);
- (b) aeronautical studies and risk assessment;
- (c) safety audits and inspections by the Authority;
- (d) apron management and safety;
- (e) handling and storage of hazardous materials;
- (f) vehicle operations (as applicable);
- (g) obstacle control;
- (h) fencing;
- (i) notifying and reporting aerodrome conditions to the pilots;
- (j) safety during construction or maintenance;



- (k) ground servicing of aircraft;
- (l) disabled aircraft removal;
- (m) land use and environmental management;
- (n) aerodrome incident reporting and investigation; and
- (o) any other provision that in the opinion of the Authority is applicable to the aerodrome, commensurate with the aerodrome operations.

1.5 Abbreviations

1.5.1 In this regulation, the terms and expressions listed below have the following meaning:

(a) Abbreviations

AC	Advisory Circular
ACN	Aircraft classification number.
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
AOM	Aerodrome operations manual
APRX	Approximately
ASDA	Accelerate-stop distance available
ARIWS	Autonomous runway incursion warning system
ATS	Air traffic services
AVSEC	Aviation security
C	Degree Celsius
CBR	California bearing ratio
cd	Candela
cm	Centimetre
DME	Distance measuring equipment
Ft	Foot
ILS	Instrument landing system
IMC	Instrument meteorological conditions
K	Degree Kelvin
kg	Kilogram
km	Kilometre
km/h	Kilometre per hour
kt	Knot
L	Litre
LDA	Landing distance available
m	Metre
max	Maximum
min	Minimum
mm	Millimetre
MN	Meganewton
MPa	Megapascal
MTOM	Maximum Take-off Mass
NM	Nautical mile
NU	Not usable
OCA/H	Obstacle clearance altitude/height



OFZ	Obstacle free zone
OLS	Obstacles Limitation Surfaces
OMGWS	Outer main gear wheel span
OPS	Obstacle protection surface
PANS	Procedures of Air navigation service
PCN	Pavement classification number
RCAM	Runway Condition Assessment Matrix
RCR	Runway condition report
RESA	Runway end safety area
RVR	Runway visual range
RWYCC	Runway condition code
TODA	Take-off distance available
TORA	Take-off runway available
TRA	Task Resource Analysis
VMC	Visual meteorological conditions
VOR	Very high frequency omnidirectional radio range

(b) Symbols

°	-	Degree
=	-	Equals
'	-	Minute of arc
μ	-	Friction coefficient
>	-	Greater than
<	-	Less than
%	-	Percentage
±	-	Plus or minus

1.6 Definitions

In these regulations, all definitions are contained in CAR DEF:

1.7 Operational Coordination with Service Providers

(See AC 1.7.3(c) and (d))

- 1.7.1 The aerodrome operator shall coordinate with Air Traffic Services, Meteorological Services, Aeronautical Information Services, Rescue and Firefighting Services, Aviation Security Agencies, Customs, Immigration office and all other relevant services to ensure safety, availability and continuity on the provision of such services.
- 1.7.2 All Service Providers shall actively adhere to the aerodrome Safety Management System (SMS).
- 1.7.3 The aerodrome operator shall chair and lead as a minimum, the following committees:
- The Safety Management Committee.
 - The Security and Facilitation Committee.
 - The Runway Safety Team
 - The Emergency Planning Committee,
 - The Wildlife Hazard Control Committee



- 1.7.4 The aerodrome operator shall Service Level Agreements with the aerodrome users and service providers with the aim of agreeing competences, liabilities or any other aspect needed to ensure aerodrome safety, availability and continuity of service provision. (See AC 1.7.4)
- 1.7.5 The aerodrome operator shall make arrangements with the aeronautical information services provider for immediate notification to ensure that the appropriate parties receive the necessary data to provide updated information prior to the flight and satisfy the need of information during the flight, including;
- (a) information on the aerodrome licensing situation and the aerodrome conditions;
 - (b) serviceability of the facilities, services and navigation aids located within the area of competence;
 - (c) any information that may be relevant to operations.
- 1.7.6 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and aerodrome authorities responsible for aerodrome services to report the following to the responsible aeronautical information services unit, with a minimum of delay.
- (a) Information on the status of certification of aerodromes and aerodrome conditions.
 - (b) the operational status of associated facilities, services and navigation aids within their area of responsibility;
 - (c) any other information considered to be of operational significance.
- 1.7.7 Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by aeronautical information services for the preparation, production and issue of relevant material for promulgation.

Note: To ensure timely provision of the information to aeronautical information services, close coordination between those services concerned is required. Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as specified in CAR AIS, (Regulation and Control of Aeronautical Information)

- 1.7.8 The predetermined, internationally agreed AIRAC effective dates in addition to 14 days postage time shall be observed by the responsible aerodrome services when submitting the raw information/data to aeronautical information services.
- 1.7.9 The aerodrome services responsible for the provision of raw aeronautical information/data to the aeronautical information services shall ensure accuracy and integrity requirements for aeronautical data as specified in CAR AIS.

1.8 Access to the Aerodrome

- 1.8.1 A person authorised by the Authority may verify, audit, inspect and carry out tests on the aerodrome facilities, services and equipment, inspect the aerodrome operator's documents and records and audit the aerodrome operator's SMS before the aerodrome licence is granted or



renewed and subsequently, at any other time, for the purpose of ensuring safety at the aerodrome.

- 1.8.2 An aerodrome operator or applicant shall, at the request of the Authority's authorised person cooperate in the inspection duties and allow access to any part of the aerodrome or any aerodrome facility, including equipment, technical records and documents as well as operator and management personnel.
- 1.8.3 The aerodrome operator shall observe and comply with the annual monitoring programme established by the Authority for safety monitoring purposes at each aerodrome. This shall not affect random unannounced inspections or audits conducted by an authorised person to determine whether approved operation requirements and procedures are met under all circumstances and whether they conform to the activity and comply with CAR AGA 3.
- 1.8.4 The aerodrome operator shall resolve the findings from the Authority's authorised person(s) and once notified by an official report, shall send a corrective action plan within the established period.
- 1.8.5 Failure to resolve the findings may result in the revocation/suspension of the aerodrome licence and/or enforcement consequences.

1.9 Aeronautical Studies

(See AC 1.9)

- 1.9.1 An aeronautical study shall be conducted to assess the impact of deviations from the aerodrome standards specified in these regulations to present alternative means of ensuring the safety of aircraft operations, to estimate the effectiveness of each alternative and to recommend procedures to compensate for the deviation.

1.10 Operational Directives

- 1.10.1 The Authority may issue operational directives to prohibit, limit or subject an operation to certain conditions in the interest of safety.
- 1.10.2 Operational directives shall have:
 - (a) The reason for issuance;
 - (b) The scope and duration; and
 - (c) Action required from aerodrome operators.
- 1.10.3 Anything required by the operational directives shall be considered an additional requirement to those established in CAR AGA 3
- 1.10.4 The Authority may also issue Acceptable Means of Compliance to facilitate compliance and implementation of this regulation.

1.11 Airport design

- 1.11.1 Architectural and infrastructure-related requirements for the optimum implementation of international civil aviation security measures shall be integrated into the design and construction of new facilities and alterations to existing facilities at an aerodrome.



1.11.2 The design of aerodromes shall take into account land-use and environmental control measures.

1.12 Aerodrome reference code

1.12.1 An aerodrome reference code — code number and letter — which is selected for aerodrome planning purposes shall be determined in accordance with the characteristics of the aeroplane for which an aerodrome facility is intended.

1.12.2 The aerodrome reference code numbers and letters shall have the meanings assigned to them and corresponding code numbers determined from Table 1-1 of CAR AGA 1.



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**CHAPTER 2****LICENSING PROCESS****2.1 General requirements for approval**

(See AC 2.1)

- 2.1.1 An aerodrome operator shall apply to the Authority at least 90 days prior to proposed commencement of aircraft operations.
- 2.1.2 The aerodrome operator must satisfy the Authority that;
- (a) its organisation and management are suitable and properly matched to the scale and scope of the operation; and
 - (b) procedures for the supervision of operations have been defined
- 2.1.3 An aerodrome operator shall not provide any aerodrome related service otherwise than under, and in accordance with, the terms and conditions of an aerodrome licence from the Authority.
- 2.1.4 An applicant for an aerodrome licence, or variation of an aerodrome licence, shall allow the Authority to examine all safety aspects of the proposed service.
- 2.1.5 An applicant for an aerodrome licence, or revalidation of the aerodrome licence; shall
- (a) have his principal place of business and, if any, his registered office located in The Bahamas;
 - (b) satisfy the Authority that he is able to conduct safe services.
- 2.1.6 The aerodrome licence shall engage and/or employ the services of;
- (See AC 2.1.6)
- (a) an Accountable Manager who has the authority within the organisation to ensure that each of the ATS units can be financed and properly organised, equipped and trained to meet the requirements of these regulations;
 - (b) Head of each department;
 - (c) A Safety Management Manager responsible for the provision of an effective safety management system acceptable to the Authority
 - (d) A Quality Manager responsible for the provision of a quality management system acceptable to the Authority; and
 - (e) Sufficient personnel to manage, supervise, provide and support the aerodrome and any associated training or assessment processes agreed with and approved by the Authority
- 2.1.7 The persons listed in 2.1.6 shall be shall be responsible to the Accountable Manager and approved by the Authority.
- 2.1.8 An applicant for an aerodrome licence shall establish a safety management system, which is;



- (a) in accordance with the framework elements contained CAR SMS;
- (b) commensurate with the size of the service provided and the complexity of its aviation products or services; and
- (c) be made acceptable to the Authority as the State responsible for the aerodrome's licensing.

2.2 Grant of an Aerodrome licence

(See AC 2.2)

2.2.1 The Authority shall issue the aerodrome licence provided:

- (a) The applicant has satisfactorily completed the technical licensing process;
- (b) The applicant and his staff have demonstrated the necessary competence and experience to operate and maintain the aerodrome safely;
- (c) The aerodrome operating manual submitted by the applicant for approval contains all the relevant information corresponding to the aerodrome site, facilities, services, equipment, operating procedures, organisation and management as stated in this regulation;
- (d) The aerodrome facilities, services and equipment are in accordance with the relevant CAR;
- (e) The aerodrome operating procedures under Chapter 3 make satisfactory provision for the safety of aircraft; and
- (f) The applicant has implemented an acceptable SMS.

2.2.2 Any conditions or limitations stated on the aerodrome licence shall be complied with.

2.3 Duration of an Aerodrome licence

2.3.1 An aerodrome licence issued under CAR AGA 3 shall remain in force from the date of issue until it is suspended, transferred or cancelled by the Authority or, alternatively, until the validity period has expired.

2.3.2 An aerodrome licence shall be valid for a maximum period of 5 years.

2.3.3 Any renewals of the aerodrome licence shall be subject to approval by the Authority.

2.3.4 The Authority may revoke an aerodrome licence if during the surveillance process the aerodrome operator does not demonstrate that it maintains the necessary competencies or if it incurs in recurring failures in the resolution of any non-conformities found.

2.4 Transfer of an Aerodrome licence

2.4.1 The Authority may give its consent to and issue an instrument of transfer of an aerodrome licence to a transferee when:

- (a) The current holder of the aerodrome licence notifies the Authority, in writing, at least three months before ceasing to operate the aerodrome as of the date specified in the notice, including the name of the transferee or aerodrome operator.



- (b) The transferee applies to the Authority, in writing, within two months before the current holder of the aerodrome licence ceases to operate the aerodrome for the aerodrome licence to be transferred to the transferee.

2.4.2 If there are no changes in the original terms of the licence, only the holder transfer shall be recorded and the licence amended. If there are changes, the Authority shall evaluate the situation and communicate, in writing, to the transferee the actions to be taken. These actions may go from a partial re-licensing process or less, up to the application of the full licensing process.

2.4.3 If the Authority does not consent to the transfer of an aerodrome licence, it shall notify the transferee, in writing, of its reasons no later than 15 business days after making that decision.

2.5 Amendment of an Aerodrome licence

2.5.1 The Authority may amend an aerodrome licence when:

- (a) there is a change in the ownership;
- (b) there is a change in the use;
- (c) there is a change in the boundaries of the aerodrome; or
- (d) the holder of the aerodrome licence requests an amendment by requirement of the Authority.

2.6 Surrender of an Aerodrome licence

2.6.1 An aerodrome licence holder must give the Authority not less than 60 days' written notice of the date on which the licence is to be surrendered in order that suitable promulgation action can be taken.

2.6.2 The Authority shall cancel the aerodrome licence after the notice period is closed.



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**CHAPTER 3****AERODROME OPERATIONS MANUAL****3.1 Requirement of the Aerodrome Operations Manual**

(See Appendix 1)

(See AC 3.1)

3.1.1 To be a holder of an aerodrome licence, the applicant shall have an aerodrome operations manual approved by the Authority, containing relevant information for the aerodrome maintenance and operation in accordance with its policies and procedures. This manual is called the Aerodrome Operations Manual – AOM.

3.1.2 An amendment to the AOM shall be approved by the Authority prior to becoming effective.

3.2 Preparation of the Aerodrome Operations Manual (AOM)

(See AC 3.3)

3.2.1 The aerodrome operations manual shall:

- (a) Be typewritten and printed in English;
- (b) Be in a format that is easy to revise and use;
- (c) Have a system for logging revisions;
- (d) Have the initial approval date and the list of effective pages duly signed to support the revision approvals.
- (e) Have a guarantee from the aerodrome operator, that the AOM and its revisions do not infringe any standards of this regulation.
- (f) Include all revisions and amendments required by the Authority, aimed at ensuring aircraft safety.
- (g) Be organised in a manner that will facilitate the preparation, review and acceptance/approval process by the Authority. It may be structured in one or multiple volumes, whichever is more convenient.
- (h) Some regulatory requirements, such as;
 - (1) SMS Manual;
 - (2) Aerodrome Emergency Plan;
 - (3) Rescue and Firefighting Manual,
 - (4) Training Manual;
 - (5) Preventive and Corrective Maintenance Plan; or
 - (6) Wildlife Hazard Management Plan



may be submitted separately but shall be referenced within the AOM and form part of the AOM.

- (7) The AOM shall comprise all policies and procedures including information and instructions necessary for the Accountable Manager to carry out their duties.

3.3 Contents of the Aerodrome Operations Manual

3.3.1 The AOM required by this CAR shall contain all the relevant information concerning the aerodrome site, services, operating procedures, equipment, facilities, organisation and management including the SMS.

3.3.2 If a requirement is not included in the AOM because it is not applicable to the aerodrome, the reason shall be indicated in the manual.

Note: Refer to Appendix 1 for guidance on the content of the AOM.

3.4 Amendment and Location of the Aerodrome Operations Manual

3.4.1 An aerodrome operator shall:

- (a) Ensure that the AOM is amended so that its instructions and information are current.
- (b) Ensure that the administrative personnel, as well as the Operations, Maintenance and SMS personnel and any person or entity responsible for a manual, receive the approved revisions in a timely manner.
- (c) Keep at least one complete and current copy of the AOM at each Operations, Maintenance and SMS Department.
- (d) Provide the applicable parts or portions of the AOM, or a complete copy, to the aerodrome personnel in charge of its implementation.
- (e) Keep master control of all existing manuals.
- (f) Ensure any holder of the AOM, or any of its parts, is responsible for keeping this document up to date with the amendments provided by the aerodrome operator.

3.5 Aerodrome Operations Manual Review

3.5.1 The Authority may review the AOM:

- (a) At the aerodrome operator's request, who may require to include modifications to the conditions initially approved, related to the aerodrome site, services, operating procedures, equipment, facilities, organisation, aerodrome management or the SMS.
- (b) If a revision is determined to be needed in the interest of safety.

3.5.2 An AOM revision request shall be submitted at least 30 business days prior to the date set for entry into force, unless the Authority approves a shorter period upon request of the applicant.



- 3.5.3 In case of revisions originated by the Authority, the aerodrome operator shall be notified of the reasons for revision and the pages with the proposed revisions shall be included. The aerodrome operator has seven business days to submit in writing his/her viewpoints and arguments on the revision. After evaluating the information, the Authority shall decide whether or not to adopt the revision. The revision shall be effective 30 business days after the aerodrome operator receives it.
- 3.5.4 If the Authority determines the presence of an emergency condition requiring immediate safety action that prevents the implementation of the procedures provided in paragraph 3.5.3, a revision shall be carried out and it shall be effective since the aerodrome operator receives it. The Authority shall briefly describe the emergency in the letter of formal amendment notice. Once the emergency is solved, the aerodrome operator may request the Authority a reevaluation of the elements causing the emergency and the revision required.

3.6 Approval of the Aerodrome Operations Manual

- 3.6.1 For the purposes of AOM approval, or the volumes comprising it, the aerodrome operator shall submit two copies of each to the Authority.
- 3.6.2 The Authority shall approve the AOM or the volumes comprising it, and any revision provided that CAR requirements are met.
- 3.6.3 Once the AOM, or the volumes comprising it, are approved, the Authority shall return a copy to the aerodrome operator and keep a copy of each one in the aerodrome licensing file.



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**CHAPTER 4****OBLIGATIONS OF THE AERODROME OPERATOR****4.1 General**

(See AC 4.1)

- 4.1.1 The aerodrome operator shall manage, operate and maintain the aerodrome in accordance with the policies and procedures set out in the AOM.
- 4.1.2 The aerodrome operator shall establish a preventive and corrective maintenance programme that meets the human factors principles to grant that pavement, fencing, drainage systems, buildings and other facilities are kept in such conditions that do not affect safety, regularity or efficiency of air navigation.

4.2 Records

4.2.1 The aerodrome operator shall establish a recording system including at least the following:

- (a) Aerodrome certification records;
- (b) Personnel training records;
- (c) Emergency training records;
- (d) Training records on fuel and hazardous material handling;
- (e) Audit and inspection records;
- (f) People accessing the movement area;
- (g) SMS records;
- (h) Wildlife strike records;
- (i) Records on aerodrome conditions;
- (j) Records on tool and equipment calibration; and
- (k) Incident/accident records.

4.2.2 The records in paragraph 4.2.1 above shall be kept permanently unless the specified regulation establishes a holding period.

4.3 Personnel Competence and Requirements

4.3.1 The aerodrome operator shall employ and maintain an adequate number of qualified and skilled personnel to perform all critical activities for aerodrome management, operations, maintenance, aviation security and safety.



- 4.3.2 The aerodrome operator shall submit to the Authority, for its approval, an initial and recurrent training programme in order to maintain the technical competence of personnel responsible for the management, operation and maintenance of the aerodrome, as provided in paragraph 4.3.1 above. The programme shall be included in the AOM. (See AC 4.3.2)
- 4.3.3 The aerodrome operator shall submit to the Authority, for its approval, key operations and maintenance personnel of the aerodrome.
- 4.3.4 Any change in the approved management personnel shall be submitted to the Authority for approval.

4.4 Specific Procedures for Aerodrome Operations

(See AC 4.4)

- 4.4.1 When the aerodrome is approved to accommodate an aircraft that exceeds the licence conditions of the aerodrome, the compatibility between the operation of the aircraft and aerodrome infrastructure and operations shall be assessed and appropriate measures developed and implemented in order to maintain an acceptable level of safety during operations.
- 4.4.2 Information concerning alternative measures, operational procedures and operating restrictions implemented at an aerodrome arising from paragraph 4.4.1 shall be promulgated in the AIP.

4.5 Paved Areas

(See AC 4.5.1)

4.5.1 General

In the preventive and corrective maintenance programme, the aerodrome operator shall consider the following procedures with regard to paved areas:

- (a) With respect to the pavement edge, the level difference between the pavement and the adjacent area shall not exceed 7.5 cm (3 inches).
- (b) The pavement shall be free from material failures such as cracks, deformations, disintegration, fluting and low skid resistance that may affect aircraft directional control, braking capacity, structural damage or damage caused by flying objects.
- (c) So as to provide good friction characteristics and low rolling resistance, garbage, dust, mud, sand, rubber deposits and other contaminants shall be removed as rapidly and completely as possible to minimise accumulation at runways, taxiways, aprons and other movement areas.
- (d) The pavement of the runway shall be easily drained and be free from depressions or other harmful irregularities to prevent standing water that may affect runway markings or aircraft safe operation due to hydroplaning.
- (e) The surfaces of all movement areas including pavements (runways, taxiways and aprons) and adjacent areas shall be inspected and their conditions monitored regularly as part of an aerodrome preventive and corrective maintenance programme with the objective of avoiding and eliminating any loose objects/debris that might cause damage to aircraft or impair the operation of on-board aircraft systems; as well as avoiding loose stones or other objects that could be ingested or expelled by the aircraft engines.



- (f) The surface of a runway shall be maintained in a condition such as to prevent formation of harmful irregularities.
- (g) Any chemical used to clean any pavement area, as well as rubber deposits, shall be removed as soon as possible in accordance with the manufacturer's instructions for the solvent.
- (h) Chemicals for cleaning or removing rubber deposits which may have harmful effects on aircraft airframe or pavements, or the aerodrome environment, shall not be used by the aerodrome operator.

4.5.2 Surface friction characteristics.

- (a) A paved runway shall be maintained in a condition so as to provide surface friction characteristics at or above the minimum friction levels. Standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed as rapidly and completely as possible to minimise accumulation.
- (b) The aerodrome operator shall include in the AOM or as part of the maintenance programme the following aspects:
 - (1) The measurement procedures of runway surface friction characteristics shall be carried out with a continuous friction measuring device provided with a smooth tread tire or other means approved by the Authority.
 - (2) The procedures for adoption of corrective maintenance action shall be taken to prevent the runway surface friction characteristics for either the entire runway or a portion thereof from falling below the minimum friction level. (See AC 4.5.2(b)(2))
 - (3) The frequency of these measurements shall be sufficient to determine the trend of the surface friction characteristics of the runway. (See AC 4.5.2(b)(3))
 - (4) Frequency and procedures for the removal of rubber deposits. (See AC 4.5.2(b)(4))
 - (5) When runway surface friction measurements are made for maintenance purposes using a self-wetting continuous friction-measuring device, the performance of the device shall meet the standard set or agreed by the Authority.
 - (6) Personnel measuring runway surface friction required for (b) (1) shall be trained to fulfil their duties.
 - (7) The runway surface shall be visually assessed, as necessary, under natural or simulated rain conditions for ponding or poor drainage and where required, corrective maintenance action taken.
 - (8) Chemicals which may have harmful effects on aircraft or pavements, or chemicals which may have toxic effects on the aerodrome environment, shall not be used.
 - (9) Procedures when there is reason to believe that the drainage characteristics of a runway, or portions thereof, are poor due to slopes or depressions, then the runway surface friction characteristics shall be assessed under natural or simulated conditions that are representative of local rain, and corrective maintenance action shall be taken as necessary.



- (10) When turbine-engined aircrafts use a taxiway, the surface of the taxiway shall be maintained so as to be free of any loose stones or other objects that could be ingested by the aircraft engines.
- (11) A taxiway shall be kept clean to the extent necessary to enable aircraft to be taxied to and from an operational runway.
- (12) Aprons shall be kept clean to the extent necessary to enable aircraft to manoeuvre safely or, where appropriate, to be towed or pushed.

4.5.3 Runway pavement overlays. (See AC 4.5.3)

- (a) The following specifications are intended for runway pavement overlay projects when the runway is to be returned temporarily to an operational status before overlay of the entire runway is complete thus normally necessitating a temporary ramp between the new and old runway surfaces.
 - (1) The longitudinal slope of the temporary ramp, measured with reference to the existing runway surface or previous overlay course, shall be;
 - (i) 0.5 to 1.0 per cent for overlays up to and including 5 cm in thickness; and
 - (ii) not more than 0.5 per cent for overlays more than 5 cm in thickness.
 - (2) Overlaying shall proceed from one end of the runway toward the other end so that based on runway utilisation most aircraft operations will experience a down ramp.
 - (3) The entire width of the runway shall be overlaid during each work session.
 - (4) Before a runway being overlaid is returned to a temporary operational status, a runway centreline marking conforming to the aerodrome design specifications shall be provided. Additionally, the location of any temporary threshold shall be identified by a 3.6 m wide transverse stripe.
 - (5) The overlay shall be constructed and maintained above the minimum friction level.

4.6 Unpaved Areas

4.6.1 The aerodrome operator shall include in the maintenance programme, procedures to maintain and repair surfaces with loose stones or grass and every runway, taxiway or unpaved ramp as follows:

- (a) In the event of a slope in the edge of the surface towards the lower part of the ground, it shall have a ratio of two to one (2:1) or lower.
- (b) The surface shall have the necessary slopes to allow sufficient drainage and prevent accumulation of water.
- (c) The surface shall be adequately compacted and sufficiently stable to prevent tire tread/groove patterns and avoid affecting drainage and directional control.
- (d) The surface shall not have holes or depressions exceeding three inches deep since that may cause aircraft damage or affect directional control.



- (e) Foreign objects and other contaminants shall be removed completely from runways, taxiways, movement areas or adjacent areas.

4.6.2 In case of unpaved runways, the green area (grass) of the runway strips shall not exceed 20 cm in height.

4.7 Runway Strips and Taxiways

4.7.1 The aerodrome operator shall include in the maintenance programme, procedures to maintain runway and taxiway strips as follows:

- (a) Clear and graded without channels, warping, depressions, erosion or other surface variations.
- (b) Appropriately drained to prevent water accumulation.
- (c) Built, prepared and maintained so as to reduce to the minimum risks associated with allowable weight differences with respect to the aircraft the runway has been designed to serve, so that it may support the rescue and firefighting vehicles and occasional movement by an aircraft that is off the runway, such that no major damage occurs.
- (d) Free of obstacles, except those needed for air navigation and visual aids whose structures shall be frangible. The height of supporting structures shall not exceed 7.5 cm.

4.7.2 No mobile object shall be allowed in the runway strip while the runway and/or taxiway is in use.

4.7.3 The grass of the runway and taxiway strips shall be kept at a height not exceeding the lower part of the runway or taxiway edge lights or higher than 20 cm.

4.8 Visual Aids and Electrical Systems

(See AC 4.8.1)

4.8.1 The following requirements shall be met;

- (a) The aerodrome operator or the entity responsible for maintenance shall establish the maintenance programmes with the procedures for appropriate maintenance of visual aids and electrical systems to ensure lighting and marking system reliability. In this context, appropriate maintenance includes: cleaning, replacement, calibration, adjustment or repair of any missing or inoperative device/object, so that the user has a precise reference.
- (b) The aerodrome operator shall ensure that all illumination systems, including those of approach lighting systems, vehicle parking areas, roads, fuel tank areas, aprons, the vicinity of buildings and surroundings are properly regulated and protected to prevent in-flight and ground interference or glare to pilots, aerodrome and apron controllers and personnel on the apron.
- (c) A light shall be deemed to be unserviceable when the main beam average intensity is less than 50 per cent of the value specified in the appropriate figure in CAR AGA 1. For light units where the designed main beam average intensity is above the value shown in CAR AGA 1, the 50 per cent value shall be related to that design value. The Authority may accept, under demonstration, the criteria of skilful personnel, who will determine the condition of the intensity level based on their experience.



- (d) The system of preventive maintenance employed for a precision approach runway category II or III shall include at least the following checks:
- (1) visual inspection and in-field measurement of the intensity, beam spread and orientation of lights included in the approach and runway lighting systems;
 - (2) control and measurement of the electrical characteristics of each circuitry included in the approach and runway lighting systems; and
 - (3) control of the correct functioning of light intensity settings used by air traffic control.
- (e) In-field measurement of intensity, beam spread and orientation of lights included in approach and runway lighting systems for a precision approach runway category II or III shall be undertaken by measuring all lights, as far as practicable, to ensure conformance with the applicable specification of CAR AGA 1.
- (f) Measurement of intensity, beam spread and orientation of lights included in approach and runway lighting systems for a precision approach runway category II or III shall be undertaken using a mobile measuring unit of sufficient accuracy to analyse the characteristics of the individual lights.
- (g) The frequency of measurement of lights for a precision approach runway category II or III shall be based on traffic density, the local pollution level, the reliability of the installed lighting equipment and the continuous assessment of the results of the in-field measurements but, in any event, shall not be less than twice a year for in-pavement lights and not less than once a year for other lights.
- (h) The system of preventive maintenance employed for a precision approach runway category II or III shall have as its objective that, during any period of category II or III operations, all approach and runway lights are serviceable and that, in any event, at least:
- (1) 95 per cent of the lights are serviceable in each of the following particular significant elements;
 - (2) precision approach category II and III lighting system, the inner 450 m;
 - (3) runway centre line lights;
 - (4) runway threshold lights;
 - (5) runway edge lights.
 - (6) 90 per cent of the lights are serviceable in the touchdown zone lights;
 - (7) 85 per cent of the lights are serviceable in the approach lighting system beyond 450 m; and
 - (8) 75 per cent of the lights are serviceable in the runway end lights.
- (i) In order to provide continuity of guidance, the allowable percentage of unserviceable lights shall not be permitted in such a way as to alter the basic pattern of the lighting system. Additionally, an unserviceable light shall not be permitted adjacent to another



unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted.

- (j) The preventive maintenance programme employed for a stop bar provided at a runway-holding position used in conjunction with a runway intended for operations in runway visual range conditions less than a value of 350 m shall have the following objectives:
 - (1) No more than two lights will remain unserviceable; and
 - (2) Two adjacent lights will not remain unserviceable unless the light spacing is significantly less than that specified.
- (k) The system of preventive maintenance employed for a taxiway intended for use in runway visual range conditions less than a value of 350 m shall have as its objective that no two adjacent taxiway centre line lights be unserviceable.
- (l) The preventive maintenance programme employed for a precision approach runway category I shall have as its objective that, during any period of category I operations, all approach and runway lights are serviceable and that, in any event, at least 85 per cent of the lights are serviceable in each of the following:
 - (1) precision approach category I lighting system;
 - (2) runway threshold lights;
 - (3) runway edge lights; and
 - (4) runway end lights.
- (m) In order to provide continuity of guidance an unserviceable light shall not be permitted adjacent to another unserviceable light unless the light spacing is significantly less than that specified. The system of preventive maintenance employed for a runway meant for take-off in runway visual range conditions less than a value of 550 m shall have as its objective that, during any period of operations, all runway lights are serviceable and that in any event;
 - (1) at least 95 per cent of the lights are serviceable in the runway centre line lights (where provided) and in the runway edge lights; and
 - (2) at least 75 per cent of the lights are serviceable in the runway end lights.

In order to provide continuity of guidance, an unserviceable light shall not be permitted adjacent to another unserviceable light.

- (n) The system of preventive maintenance employed for a runway meant for take-off in runway visual range conditions of a value of 550 m or greater shall have as its objective that, during any period of operations, all runway lights are serviceable and that, in any event, at least 85 per cent of the lights are serviceable in the runway edge lights and runway end lights. In order to provide continuity of guidance, an unserviceable light shall not be permitted adjacent to another unserviceable light.



- (o) In low visibility conditions, the Authority may impose restrictions on building and maintenance activities carried out in the areas adjacent to the aerodrome electrical system.
- (p) The following aerodrome facilities shall be provided with a secondary power supply capable of supplying power when there is a failure of the primary power supply:
 - (1) the signalling lamp and the minimum lighting necessary to enable air traffic services personnel to carry out their duties, as well as the operating communication and radar equipment;
 - (2) all obstacle lights which, in the opinion of the Authority, are essential to ensure the safe operation of aircraft;
 - (3) approach, runway and taxiway lighting;
 - (4) meteorological equipment;
 - (5) essential security lighting, in accordance with public protection requirements
 - (6) essential equipment and facilities for the aerodrome responding emergency agencies, and other equipment for aerodrome safety and operation;
 - (7) floodlighting on a designated isolated aircraft parking position if provided;
 - (8) radio navigation aids and ground elements of communications systems; and
 - (9) illumination of apron areas over which passengers may walk.
- (q) The time interval between failure of the primary source of power and the complete restoration of the services required by paragraph (p) above, shall be as short as practicable, except that for visual aids associated with non-precision, precision approach or take-off runways the requirements of Table 1 for maximum switch-over times shall apply.
- (r) To achieve the switch-overtime as provided in Table 1, in relation to the maximum switch-overtimes the replacement of an existing secondary power supply before 1 January 2010 is not required. However, for a secondary power supply installed after 4 November 1999, the electric power supply connections to those facilities for which secondary power is required shall be so arranged that the facilities are capable of meeting the requirements of Table 1 for maximum switch-over times as defined in these regulations.
- (s) As part of the audit and inspection plan of the preventive maintenance system, the aerodrome operator shall include:
 - (1) The frequency (no less than twice a year) and procedures for verification of secondary power supply switch-over periods based on the requirements of Table 1, which shall be verified as required by the Authority
 - (2) The frequency and procedures of measurement of light intensity for a precision approach runway category I or II shall be based on traffic density, the local pollution level, the reliability of the installed lighting equipment and the continuous assessment of the results of the in-field measurements but, in any event, shall not be less than twice a year for in-pavement lights and not less than once a year for other lights.



- (t) Requirements for a secondary power supply shall be met by either of the following:
 - (1) independent public power, which is a source of power supplying the aerodrome service from a substation other than the normal substation through a transmission line following a route different from the normal power supply route and such that the possibility of a simultaneous failure of the normal and independent public power supplies is extremely remote; or
 - (2) standby power unit(s), which are engine generators, batteries, etc., from which electric power can be obtained.
- (u) At an aerodrome where the primary runway is a non-instrument runway, a secondary power supply capable of meeting the requirements of sub-paragraph (h) above shall be provided by the aerodrome operator, except that a secondary power supply for visual aids need not be provided when an emergency lighting system in accordance with the specification of sub-paragraph (o) is provided and capable of being deployed in 15 minutes
- (v) At an aerodrome where the primary runway is a non-precision approach runway, a secondary power supply capable of meeting the requirements of Table 1 shall be provided by the aerodrome operator except that a secondary power supply for visual aids need not be provided for more than one non-precision approach runway.
- (w) For a precision approach runway, a secondary power supply capable of meeting the requirements of Table 1 for the appropriate category of precision approach runway shall be provided. Electric power supply connections to those facilities for which secondary power is required shall be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.
- (x) For a runway meant for take-off in runway visual range conditions less than a value of 800 m, a secondary power supply capable of meeting the relevant requirements of Table 1 shall be provided.

Table 1 - Secondary Power Supply Requirements

Runway	Lighting aids requiring power	Maximum switch-over time
Non-instrument	Visual approach slope indicators ^a Runway edge ^b Runway threshold ^b Runway end ^b Obstacle ^a	See (h) and (l)
Non-precision approach	Approach lighting system Visual approach slope indicators ^{a, d} Runway edge ^d Runway threshold ^d Runway end Obstacle	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach Cat I	Approach lighting system Runway edge ^d Visual approach slope indicators ^{a, d} Runway threshold ^d	15 seconds 15 seconds 15 seconds 15 seconds



	Runway end	15 seconds
	Essential taxiway ^a	15 seconds
	Obstacle	15 seconds
Precision approach Cat II/III	Inner 300 m of the approach lighting system	1 seconds
	Other parts of the approach lighting system	15 seconds
	Obstacle ^a	15 seconds
	Runway edge	15 seconds
	Runway threshold	1 seconds
	Runway end	1 seconds
	Runway centre line	1 seconds
	Runway touchdown zone	1 seconds
	All stop bars	1 seconds
	Essential taxiway	15 seconds
Runway meant for take-off in runway visual range conditions less than a value of 800 m	Runway edge	15 seconds ^c
	Runway end	1 seconds
	Runway centre line	1 seconds
	All stop bars	1 seconds
	Essential taxiway ^a	15 seconds
	Obstacle ^a	15 seconds
^{a.} Supplied with secondary power when their operation is essential to the safety of flight operation. ^{b.} See CAR AGA 1, regarding the use of emergency lighting. ^{c.} One second where no runway centre line lights are provided. ^{d.} One second where approaches are over hazardous or precipitous terrain.		

4.8.2 Emergency lighting system.

- (1) At an aerodrome provided with runway lighting and without a secondary power supply, sufficient emergency lights shall be conveniently available for installation on at least the primary runway in the event of failure of the normal lighting system. Emergency lighting may also be useful to mark obstacles or delineate taxiways and apron areas.
- (2) When installed on a runway the emergency lights shall, as a minimum, conform to the configuration required for a non-instrument runway.
- (3) The colour of the emergency lights shall conform to the colour requirements for runway lighting, and all lights may be variable white or as close to variable white as practicable.

4.9 Rescue and Fire-fighting Service (RFFS)

(See AC 4.9)

4.9.1 Determining the RFFS Category

(See AC 4.9.1)

The aerodrome operator shall determine the aerodrome RFFS category using the following principles:

- (a) The aerodrome category shall be determined from Table 2 and shall be based on the longest aircraft normally using the aerodrome and its maximum fuselage width.



- (b) The level of protection provided at an aerodrome for rescue and fire-fighting shall be appropriate to the aerodrome category except that, where the number of movements of aircraft in the highest category normally using the aerodrome is less than 700 in the busiest consecutive three months, the level of protection provided shall be not less than one category below the determined category.

Note: A movement is either a take-off or landing.

- (c) During anticipated periods of reduced activity, the level of RFFS protection available shall be no less than that needed for the highest category of aircraft planned to use the aerodrome during that time irrespective of the number of movements.
- (d) The amount of rescue and firefighting vehicles serving the aerodrome shall not be lower than the number indicated in Column 4 on Table 2.

Table 2 - RFFS Category and Vehicles

Aerodrome Category (1)	Aircraft Overall Length (2)	Maximum Fuselage Width (3)	Number of Vehicles (4)
1	0 m up to but not including 9 m	2m	1
2	9 m up to but not including 12 m	2m	1
3	12 m up to but not including 18 m	3m	1
4	18 m up to but not including 24 m	4m	1
5	24 m up to but not including 28 m	4m	1
6	28 m up to but not including 39 m	5m	2
7	39 m up to but not including 49 m	5m	2
8	49 m up to but not including 61 m	7m	3
9	61 m up to but not including 76 m	7m	3
10	76 m up to but not including 90 m	8m	3

Note: To determine the RFF category for aircraft using the aerodrome;

- (a) *first evaluate the overall aircraft length and secondly, the fuselage width; and*
- (b) *if, after selecting the category appropriate to the longest aircrafts' overall length, that the aircraft fuselage width is greater than the maximum width shown in Table 2, then the category for that aircraft shall actually be one category higher.*

4.9.2 Extinguishing Agents

- (a) The aerodrome operator shall provide a combination of both principal and complementary extinguishing agents at an aerodrome shown in Table 3.



Table 3 - Minimum Extinguishing Agents

Aerodrome Category	Performance Level A Foam		Performance Level B Foam		Performance Level C Foam		Dry Powder (Kg)	Discharge Rate (Kg/Sec)
	Water (Litres)	Discharge Rate Foam Solution - Litres per Minute	Water (Litres)	Discharge Rate Foam Solution - Litres per Minute	Water (Litres)	Discharge Rate Foam Solution - Litres per Minute		
1	350	350	230	230	160	160	45	2.25
2	1,000	800	670	550	460	360	90	2.25
3	1,800	1,300	1200	900	820	630	135	2.25
4	3,600	2,600	2400	1,800	1,700	1,100	135	2.25
5	8,100	4,500	5400	3,000	3,900	2,200	180	2.25
6	11,800	6,000	7900	4,000	5,800	2,900	225	2.25
7	18,200	7,900	12,100	5,300	8,800	3,800	225	2.25
8	27,300	10,800	18,200	7,200	12,800	5,100	450	4.5
9	36,400	13,500	24,300	9,000	17,100	6,300	450	4.5
10	48,200	16,600	32,300	11,200	22,800	7,900	450	4.5

- (b) The principal extinguishing agents shall be:
- (1) a foam meeting the minimum performance level type A; or
 - (2) a foam meeting the minimum performance level type B; or
 - (3) a foam meeting the minimum performance level type C; or
 - (4) a combination of these agents;
- (c) Except that the principal extinguishing agent for aerodromes in categories 1 to 3 shall meet performance level type B or C foam.
- (d) The complementary extinguishing agent shall be a dry chemical powder suitable for extinguishing hydrocarbon fires.
- Note: When selecting dry chemical powders for use with foam, care must be exercised to ensure compatibility.*
- (e) The amounts of water for foam production and the complementary agents to be provided on the rescue and fire-fighting vehicles shall be in accordance with the aerodrome category determined under Table 2 and Table 3, except that for aerodrome of categories 1 and 2 up to 100 per cent of the water may be substituted with complementary agent; or
- (f) For the purpose of agent substitution, 1 kg of complementary agent shall be taken as equivalent to 1.0L

Note 1: The amounts of water specified for foam production are predicated on an application rate of 8.2 L/min/m² for a foam meeting performance level A, 5.5 L/min/m² for a foam meeting performance level B and 3.75L/min/m² for foam meeting performance Level C.

Note 2: When any other complementary agent is used, the substitution ratios need to be checked.



- (g) At aerodromes where operations by aircraft larger than the average size in a given category are planned, the quantities of water shall be recalculated and the amount of water for foam production and the discharge rates for foam solution shall be increased accordingly.
- (h) The quantity of foam concentrates separately provided on vehicles for foam production shall be in proportion to the quantity of water provided and the foam concentrate selected.
- (i) The amount of foam concentrate provided on a vehicle shall be sufficient to produce at least two loads of foam solution.
- (j) Supplementary water supplies, for the expeditious replenishment of rescue and fire-fighting vehicles at the scene of an aircraft accident, shall be provided.
- (k) The discharge rate of the foam solution shall not be less than the rates shown in Table 3.
- (l) The complementary agents shall comply with the appropriate specifications of the International Organisation for Standardisation.
- (m) The discharge rate of complementary agents shall be not less than the value shown in Table 3.
- (n) A reserve supply of foam concentrate, equivalent to 200 per cent of the quantities identified in Table 3, should be maintained on the aerodrome for vehicle replenishment purposes.

Note: Foam concentrate carried on fire vehicles in excess of the quantity identified in Table 3 can contribute to the reserve.

- (o) A reserve supply of complementary agent, equivalent to 100 per cent of the quantity identified in Table 3, should be maintained on the aerodrome for vehicle replenishment purposes. Sufficient propellant gas should be included to utilise this reserve complementary agent.
- (p) Category 1 and 2 aerodromes that have replaced up to 100 per cent of the water with complementary agent should hold a reserve supply of complementary agent of 200 percent.
- (q) Where a major delay in the replenishment of the supplies is anticipated, the amount of reserve supply should be increased as determined by a risk assessment.

4.9.3 Rescue Equipment

Rescue equipment commensurate with the level of aircraft operations shall be provided on the RFFS vehicle(s).

4.9.4 Response Time (See AC 4.9.4)

- (a) The operational objective of the RFFS shall be to achieve response times of two minutes and not exceeding three minutes to the end of each runway, as well as to any other part of the movement area, in optimum conditions of visibility and surface conditions.



Note: Optimum visibility and surface conditions are defined as daytime, good visibility, no precipitation with normal response route free of surface contamination e.g. water.

- (b) Response time is considered to be the time between the initial call to the RFFS and the time when the first responding vehicle(s) is(are) in position to apply foam at a rate of at least 50 percent of the discharge rate specified in Table 3.
- (c) Any other vehicles required to deliver the amounts of extinguishing agents specified in Table 3 should arrive in three minutes and no more than four minutes from the initial call so as to provide continuous agent application.
- (d) Recommendation - To meet the operational objective as nearly as possible in less than optimum conditions of visibility, especially during low visibility operations, suitable guidance, equipment and/or procedures for rescue and fire-fighting services should be provided.
- (e) A system of preventive maintenance of RFFS vehicles shall be employed to ensure effectiveness of the equipment and compliance with the specified response time throughout the life of the vehicle.
- (f) The aerodrome operator shall carry out periodic response time tests to evaluate the response time and effectiveness of the RFFS provided. Records of such tests must be maintained and be available for inspection by the Authority.
- (g) The aerodrome operator is required to take immediate action if the response time capability of the RFFS does not meet the minimum requirements. Such action may include in extreme cases, the closing of the Aerodrome until minimum response time requirements can be achieved, or the repositioning of RFFS vehicles to meet the response time objective.

4.9.5 Rescue and Fire-fighting Vehicles

- (a) The minimum number of rescue and fire-fighting vehicles provided at an aerodrome shall be in accordance with Table 2.

4.9.6 RFFS Personnel

- (a) The aerodrome operator shall appoint a competent person to establish and effectively manage all aspects of Rescue and Fire-Fighting Operations.
- (b) Minimum staffing levels for all RFFS Categories operated by an aerodrome shall be agreed with the Authority and promulgated in the Aerodrome Manual.
- (c) Sufficient competent personnel shall be readily available to respond and operate the RFFS equipment at maximum capacity. These personnel shall be deployed in a way that ensures that response objectives shall be achieved and that continuous agent application at the appropriate rate(s) shall be fully maintained.
- (d) When RFFS personnel designated as part of the operational duty fire crew and they are engaged on extraneous duties (sweeping, bird control, and surface inspections. Etc.) they shall be capable of meeting response times whilst carrying out those duties. No extraneous duty should create conditions likely to affect individual or crew performance or introduce additional hazards.



- (e) At all aerodromes the minimum number of personnel designated shall be assessed by the aerodrome operator. In determining the minimum number of rescue and fire-fighting personnel, a Task Resource Analysis (TRA) shall be conducted and completed for acceptance by the Authority.
- (f) When conducting the TRA the following shall be taken into account:
 - (1) The types of aircraft using the aerodrome;
 - (2) Response times;
 - (3) Type, design, capacity and discharge rate of appliances to be deployed;
 - (4) The need for the rescue of aircraft occupants;
 - (5) The need to operate ladders, breathing apparatus, and rescue equipment;
 - (6) The availability of water supplies;
 - (7) The speed and scale of response of any mutual aid agency;
 - (8) The competency levels of all RFFS staff.
- (g) Consideration shall also be given for personnel to use hand lines, ladders and other rescue and fire-fighting equipment normally associated with aircraft rescue and fire-fighting operations.
- (h) The agreed minimum staffing level shall not be reduced without an assessment being conducted and forwarded, in writing, to the Authority for acceptance.
- (i) The minimum level of staffing of the aerodrome RFFS shall include an adequate number of competent supervisors and managers reflecting the appropriate command structure. In assessing the level of personnel proposed, the aerodrome operator shall take account of the supervisors' and managers' competence in the role(s) and tasks applicable to their position.
- (j) Each operational fire appliance should have a designated supervisor on board when responding.
- (k) If the Authority considers that minimum staffing levels provided are inappropriate for the level of aircraft operation or where an assessment is unacceptable to the Authority, it will assess and set the minimum staffing level based on the criteria set out above. This would include the supervisory grades.

4.9.7 Training of RFFS Personnel

- (a) All RFFS personnel require appropriate training if they are to operate in a safe and effective manner. All personnel engaged on rescue and fire-fighting duties, shall receive initial and recurrent competence-based training relevant to their role. The most important factors bearing on effective rescue in a survivable aircraft accident are the training received, the effectiveness of the equipment, and the speed with which competent personnel and equipment designated for rescue and fire-fighting purposes, can be put to use.



- (b) The aerodrome operator shall ensure that the RFFS has a comprehensive Training and Assessment Policy which clearly explains how RFFS personnel receive initial and ongoing training to maintain their competence in role.
- (c) The training programme shall cover subjects necessary for initial, on the job and recurrent competency training. The training should cover at least the following;
- (1) Aerodrome Familiarisation
 - (2) Aircraft Familiarisation
 - (3) Emergency Planning
 - (4) Communications
 - (5) Personal Safety
 - (6) Fire Behaviour
 - (7) Extinguishing Agents
 - (8) Foam Monitors/Bumper Turrets
 - (9) Hand Line Use
 - (10) Complementary Agent
 - (11) Tools/Equipment
 - (12) Appliance Replenishment
 - (13) Fire-fighting Operation
 - (14) First Aid
 - (15) Appliance Driving:
 - (16) RFF vehicle deployment
 - (17) Command and Control Training
 - (18) Watchroom Operators
 - (19) Communications
 - (20) Interagency liaison
 - (21) Aerodrome Emergency Procedures
 - (22) Live Fire Training shall be provided to all RFFS personnel as a minimum of every 12 months.
 - (23) Vehicle Monitor and handlines



- (24) Low Visibility Training - At an aerodrome certified for low-visibility operations, the RFFS shall receive initial and recurrent training in driving and operating in low visibility conditions.

4.9.8 Training Records

- (a) A record of individual achievement shall be maintained for all RFFS personnel.
- (b) Records may be either in paper or electronic format, or a combination of both.
- (c) All training records shall be durable and auditable.
- (d) Aerodrome operators shall maintain accurate records of all RFFS training and assessment events, and any other specialist courses attended and that these are made available for inspection by Authority.
- (e) Training records should be maintained for the full period of service and for 5 years after transfer or cessation of employment.

4.9.9 Fire Stations

(See AC 4.9.9)

- (a) All RFFS vehicles shall have the capability to be housed in a fire station.
- (b) Satellite fire stations shall be provided whenever the response time cannot be achieved from a single fire station.
- (c) The fire station shall be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.

4.10 Emergency Access Roads

4.10.1 Emergency access roads should be provided on an aerodrome where terrain conditions permit their construction, so as to facilitate achieving minimum response times. Particular attention should be given to the provision of ready access to approach areas up to 1 000 m from the threshold, or at least within the aerodrome boundary. Where a fence is provided, the need for convenient access to outside areas should be taken into account.

4.10.2 When the surface of the road is indistinguishable from the surrounding area, edge markers should be placed at intervals of about 10 m.

Note: Aerodrome service roads may serve as emergency access roads when they are suitably located and constructed.

4.10.3 Emergency access roads should be capable of supporting the heaviest vehicles which will use them and be usable in all weather conditions.

4.10.4 Roads within 90 m of a runway should be surfaced to prevent surface erosion and the transfer of debris to the runway.

4.10.5 Sufficient vertical clearance should be provided from overhead obstructions for the largest vehicles.



4.11 Communication and Alerting Systems

- 4.11.1 An alerting system (alarms and sirens) for notifying RFFS personnel of aircraft emergencies, capable of being operated from the Air Traffic Control Tower or any Fire Station at the aerodrome, shall be provided.
- 4.11.2 The aerodrome operator shall establish the procedures and include them in the AOM.
- 4.11.3 Each RFFS vehicle required under Table 2 shall have a two-way radio to communicate with the Air Traffic Control Tower, other vehicles attending the emergency and the Fire Stations defined in the Aerodrome Emergency Plan.
- 4.11.4 A discrete communication system shall be provided linking Air Traffic Control tower with all Fire Stations and RFFS vehicles.

4.12 Aerodrome Emergency Plan

(See AC 4.12)

- 4.12.1 The aerodrome operator shall establish an emergency plan commensurate with the aircraft operations and other activities conducted at the aerodrome.
- 4.12.2 The aerodrome emergency plan shall provide for the coordination of the actions to be taken in an emergency occurring at an aerodrome or in its vicinity.
- 4.12.3 The plan shall observe Human Factors principles to ensure optimum response by all existing agencies participating in emergency operations, include and meet at least the following requirements:
 - (a) Organisation and Operations to include at least the following:
 - (1) Procedures that constitute a rapid response to any of the emergencies listed in sub-paragraph (b), in sufficient detail, to provide adequate guidance for each person who requires implementing it.
 - (2) The establishment of a fixed emergency operations centre (EOC) at the aerodrome under the responsibility of the highest aerodrome authority or the nominated person.
 - (3) Responsibility and role of each agency, the EOC and the mobile command post, for each type of emergency.
 - (4) The mobile command post shall be a facility capable of being moved rapidly to the site of an emergency, when required, and shall undertake command and the local coordination of those agencies responding to the emergency. The person assigned to assume control of the command post shall be the competent authority assigned in agreement with the type of emergency as provided in sub-paragraph (b) of this section.
 - (5) A communication system linking the mobile command post and the EOC with each other and with the participating agencies.
 - (6) List of key personnel at the aerodrome, including: names, telephone numbers, position, institution or other means of contact.



- (7) Provisions for medical service, including transportation and medical assistance for the maximum number of people that may be carried on board of the largest aircraft operating at the aerodrome.
 - (8) Name, location, telephone numbers and emergency capacity of each hospital and other medical facilities as well as addresses and telephone numbers of all medical personnel at the aerodrome and the community where the aerodrome is located which agree to provide medical and transport assistance.
 - (9) The name, address and telephone number of each rescue squad, ambulances and government units located at the aerodrome or the community where it is located, which may provide medical assistance or transportation.
 - (10) An inventory of vehicles and aircraft fitted with ramps, facilities, institutions and individuals, included in the plan under sub-paragraphs (2) and (3) of this section, which shall transport dead or injured persons from the aerodrome to hospitals or other sites.
 - (11) Each hangar or other buildings at the aerodrome or in the community which may be used to accommodate uninjured, injured and deceased people.
 - (12) Grid map of the airport and its immediate vicinity.
 - (13) Accommodation, guidance and transport of injured and uninjured people who have survived an accident or incident.
 - (14) Procedures to notify institutions and personnel responsible for the aircraft accident plan of the community about the number of persons involved in the accident and any other information necessary to take on responsibility as soon as they receive the information and become available.
 - (15) The emergency alarm system.
 - (16) Supplies for the rescue of victims of aircraft accidents that may happen on water located near the approach or departure areas of the aerodrome. In that case, the aerodrome emergency plan shall include exercises and reviews at regular intervals on the response time of rescue services.
- (b) Instructions for immediate response in the following emergencies:
- (1) Aviation accidents or incidents.
 - (2) Acts of unlawful interference.
 - (i) Incidents with explosive devices or bomb threats on board an aircraft, whether in-flight, on the ground, at aerodrome facilities or sites within the area of the aerodrome, including the parking position for aircraft involved.
 - (ii) Sabotage
 - (iii) Unlawful seizure of aircraft (hijacking in-flight or on the ground)
 - (iv) Hostage taking.



- (v) Unlawful seizure of facilities serving international civil aviation.
 - (3) Building fires.
 - (4) Fires in fuel farms or storage areas.
 - (5) Natural disasters.
 - (6) Dangerous goods occurrences on board an aircraft or ground facility.
 - (7) Rescue situations on the sea, where appropriate.
 - (8) Public health emergencies, for example: increased risk of spreading a serious communicable disease internationally through air travellers or cargo carried by air transport and severe outbreak of a communicable disease potentially affecting a large proportion of aerodrome staff.
- (c) Coordination. The aerodrome operator shall:
- (1) Coordinate the plan with the;
 - (i) Authority,
 - (ii) law enforcement agencies;
 - (iii) traffic authorities,
 - (iv) rescue institutions,
 - (v) air traffic services (ATS),
 - (vi) the Red Cross,
 - (vii) rescue and firefighting services,
 - (viii) the national entity in charge of emergencies in particular the unit responsible for technical advice in case of aircraft emergencies,
 - (ix) the accident investigation authorities;
 - (x) the security services,
 - (xi) medical personnel, hospitals, clinics and
 - (xii) other liable institutions or personnel in this plan.
 - (2) Encourage and provide for the participation of all parties and specific personnel for the development of this plan.
 - (3) Ensure that all personnel, who have obligations and responsibilities under this plan, are familiar with their assignments and have proper training.



(d) Assessment of the emergency plan.

The aerodrome operator shall ensure:

- (1) The plan contains procedures for periodic testing of the adequacy of the plan and for reviewing the results in order to improve its effectiveness.
 - (2) Planned verification through a full-scale aerodrome emergency exercise at intervals not exceeding two years.
 - (3) A series of modular tests commencing in the first year and concluding in a full-scale aerodrome emergency exercise at intervals not exceeding three years;
 - (i) ensure that all people involved know their responsibilities and that plan information is updated;
 - (ii) ensure that any deficiencies found during the full-scale aerodrome emergency exercise or an actual emergency have been corrected;
 - (iii) ensure the adequacy of the response by individual participating agencies with regard to each one of the components of the plan, such as the communications system;
 - (4) After an actual emergency or an exercise, results shall be reviewed so as to correct any deficiencies found.
- (e) The aerodrome operator providing services to air operators with aircraft for the international transport of passengers shall ensure that instructions on the response to subparagraph (b) (2) in the aerodrome emergency plan, are consistent with the provisions of the Aerodrome Security Programme.
- (f) Emergencies in difficult environments. The plan shall include the availability of, and coordination with, appropriate specialist rescue services to be able to respond to emergencies where an aerodrome is located close to water and/or swampy areas and where a significant portion of approach or departure operations takes place over these areas.
- (g) At those aerodromes located close to water and/or swampy areas, or difficult terrain, the aerodrome emergency plan shall include the establishment, testing and assessment at regular intervals of a predetermined response for the specialist rescue services.
- (h) An assessment of the approach and departure areas within 1,000 m of the runway threshold shall be carried out by the aerodrome operator to determine the options available for intervention.

4.13 Handling and Storage of Hazardous Substances

(See AC 4.13)

4.13.1 The aerodrome operator shall establish and maintain procedures for people and property protection in the aerodrome during handling and storage of any material regulated under CAR DG on air transportation of dangerous goods. These procedures shall include at least the following:

- (a) Assignment of personnel in charge of receiving and handling hazardous materials or substances.



- (b) Consignors or aerodrome operators must ensure that cargo is handled safely including any special procedure required for safety purposes.
 - (c) Arrangements for special areas on the aerodrome to be set up for the storage of hazardous materials while they are in the aerodrome.
 - (d) The method to be followed for temporary location of boxes, packages and containers of dangerous goods with evidence of leakage.
- 4.13.2 The aerodrome operator or fuel supplier, as appropriate, shall establish the procedures and follow the standards, to ensure safety against fire and explosions during storage, refuelling and handling of fuels including:
- (a) Grounding or earthing.
 - (b) Public protection.
 - (c) Access control in storage areas.
 - (d) Safety against fuel fire in storage and refuelling areas.
 - (e) Safety against fire in refuelling vehicles, hydrants and cabinets.
 - (f) Personnel safety training against fire according to paragraph 4.13.5.
 - (g) Applicable RFFS Category as established by the Authority.
- 4.13.3 If the aerodrome provides fuel, it shall require other suppliers to comply with the requirements of paragraph 4.13.2. The aerodrome operator shall conduct inspections and audits to demonstrate compliance with the provisions on paragraph 4.13.2, according to the required standard.
- 4.13.4 The aerodrome operator shall conduct audits/inspections of vehicles and facilities of the aerodrome, and/or other provider or fuel supplier, at least once every four months to comply with the provisions on paragraph 4.13.2 and shall retain the inspection records for a period of 24 months. The aerodrome operator may use a technically qualified and independent organisation to conduct audits/inspections under the approval of the Authority.
- 4.13.5 Instruction required under paragraph 4.13.2(f) shall include at least the following:
- (a) At least each shift supervisor of the supplier shall have completed a specialised course on aviation fuel fire safety every 24 months, approved by the Authority.
 - (b) Personnel receiving and handling fuel or refuelling aircraft shall receive an initial and recurrent on the job training (OJT) every 12 months, conducted by a trained supervisor.
- 4.13.6 The fuel supplier shall keep a record system on the initial and recurrent training of each employee and keep it for a period of 24 months after training completion.
- 4.13.7 The aerodrome operator shall require each fuel supplier to take immediate corrective action when deficiencies in compliance with standards are detected. To ensure compliance, the aerodrome operator shall notify the discrepancies found to the Authority so that they are properly monitored.



4.13.8 Other hazardous substances used or handled in the aerodrome, not covered in the provisions above, such as liquefied petroleum gas (LPG), shall be controlled.

Note: Refer to National Fire Protection Association (NFPA) standards.

4.14 Aerodrome Safety Management System

(See AC 4.14)

4.14.1 The aerodrome operator shall maintain a SMS and as a minimum the SMS shall:

- (a) Identify safety hazards;
- (b) Establish policies and procedures to ensure the implementation of remedial action necessary to maintain agreed safety performance;
- (c) Establish policies and procedures that provide for continuous monitoring and regular assessment of the safety performance through internal and external audits; and
- (d) Aim at a continuous improvement of the overall performance of the SMS.

4.14.2 A SMS shall clearly define lines of safety accountability in the aerodrome operator's organisation, including a direct accountability to ensure that aerodrome operations are safe, monitored and continuously improved.

4.14.3 Aerodrome Service Providers shall be part of the aerodrome SMS in accordance with valid applicable regulations. Aerodrome service providers shall develop and maintain a protocol that ensures they must support audits, inspections and tests that the aerodrome operator or Authority conducts to ensure compliance.

4.14.4 All aerodrome users, Service Providers and other organisations operating independently are required to cooperate with the SMS to promote safety and safe use of the aerodrome; by taking corrective actions to mitigate risks and immediately reporting any incident, accident, defect or flaw that may impact safety or security against acts of unlawful interference.

4.14.5 The SMS shall be part of the Aerodrome Operations Manual.

Note: Further guidance on SMS can be found in CAR SMS

4.15 Safety Audits and Inspections

(See AC 4.15)

4.15.1 The aerodrome operator shall arrange for an audit of the SMS, including an inspection of the aerodrome facilities and equipment. The audit shall cover the aerodrome operator's own functions. The aerodrome operator shall also arrange for an external audit and inspection programme for evaluating other users, including Service Providers, fixed-base operators, and other organisations working at the aerodrome.

4.15.2 The aerodrome operator shall establish within the audit programme the frequency of such audits and inspections referred to in the regulation above.



- 4.15.3 The aerodrome operator shall establish a daily inspection system. These inspections shall be conducted during the day or at night to verify the possible existence of deficiencies or contamination in the movement area, including pavement (runways, taxiways, aprons and adjacent areas). Inspection guides and checklists shall be included in, or referenced, within the Aerodrome Operations Manual.
- 4.15.4 The aerodrome operator shall conduct special inspections as required by circumstances, to ensure aviation safety, at least in the following cases:
- (a) As soon as practicable after any aircraft accident or incident or ground incident;
 - (b) During any period of construction or repair of the aerodrome facilities or equipment;
 - (c) At any other time when there are conditions at the aerodrome that could affect aviation safety;
 - (d) When weather conditions may affect the safe operation of aircraft;
 - (e) As soon as practicable after any natural disaster.
- 4.15.5 The aerodrome operator shall include all relevant information in the Aerodrome Operations Manual and ensure that the audit and inspection reports, including the report on the aerodrome facilities, services and equipment, are prepared by suitably qualified safety experts and signed by the individuals who conducted the audits and inspections.
- 4.15.6 The aerodrome operator shall provide the following:
- (a) Equipment to conduct safety audits and inspections of the aerodrome.
 - (b) Procedures, facilities and equipment for the safe and prompt distribution of information among the aerodrome personnel, airlines and other users.
 - (c) A system of reporting, follow-up and correction of unsafe conditions detected during the inspection.
- 4.15.7 The aerodrome operator shall establish a system to record audits and inspections prescribed in this section, detailing the conditions found and the corrective measures taken. The records shall be kept for at least 24 months after the inspection date or the closing date of each inaccuracy found.
- 4.15.8 The aerodrome operator shall establish a transfer and communication system with the Authority in regards to inaccuracies or findings in audits and inspections conducted involving aerodrome Service Providers and any other organisation that carries out, or may carry out, independent activities at the aerodrome.

4.16 Vehicles

- 4.16.1 Access of vehicles to the movement area shall be limited by the aerodrome operator, in particular to those vehicles that are unnecessary for aerodrome and aircraft operations.
- 4.16.2 The aerodrome operator shall establish and implement traffic rules and procedures for the safe and orderly operation of vehicles on the movement area and identify the consequences of non-compliance.



4.16.3 A vehicle shall be operated;

- (a) on a manoeuvring area only as authorised by the aerodrome control tower; and
- (b) on an apron only when authorised by the aerodrome operator.
- (c) when operation is carried out by escort vehicles, they shall be authorised as provided above.

4.16.4 The driver of a vehicle on the movement area shall comply with all mandatory instructions conveyed by markings and signs unless otherwise authorised by:

- (a) the aerodrome control tower when on the manoeuvring area; or
- (b) the aerodrome operator while on the apron.

4.16.5 The aerodrome operator shall implement a training plan and a record system for drivers who require to be authorised to enter the manoeuvring area, the apron or other portions of the movement area.

4.16.6 It is necessary to maintain and make available to the Authority the records of accidents and incidents on the ground and incursions of aircraft, vehicles, or both, and of people in the movement area.

4.16.7 The aerodrome operator shall establish a system to verify technical review programmes of all vehicles and equipment operating in the movement area.

4.16.8 Markings and lighting of vehicles shall be approved by the Authority.

4.16.9 The driver of a vehicle on the movement area shall comply with all mandatory instructions that the aerodrome control tower conveys by lights.

4.16.10 The driver of a vehicle who requires entering the manoeuvring area shall establish satisfactory two-way radio communication with the aerodrome control tower and with the aerodrome operator before entering the apron. The driver shall maintain a continuous listening watch on the assigned frequency when on the manoeuvring area.

4.17 Obstacle Control

(See AC 4.17)

4.17.1 The aerodrome operator shall monitor any interference with an obstacle limitation surface:

- (a) objects with natural growth;
- (b) temporary or permanent constructions, including equipment and materials used in these structures;
- (c) temporary or permanent alteration of any structure.

4.17.2 These obstacles shall be removed, marked or illuminated, by the owner of the property or by the aerodrome operator as determined by an aeronautical study.

4.17.3 Every four years, the aerodrome operator shall verify and update the Type A Chart for obstacles.



4.17.4 The aerodrome operator shall establish, through an aeronautical study conducted by the Authority, the preventive, corrective or decisive provisions against any circumstance of:

- (a) Evident or imminent presence of a new obstacle.
- (b) Modification or alteration of an existing object.
- (c) Intention or interest of natural or legal persons to place a new object or modify an existing one.

4.17.5 Aeronautical studies may be conducted by the aerodrome operator, the individuals concerned or by the Authority's own initiative.

4.17.6 Removal, marking and lighting.

- (a) These obstacles shall be removed, marked or illuminated, by the owner of the property or by the aerodrome operator, as determined by the aeronautical study.
- (b) The aerodrome operator shall remove or eliminate, from the movement area or any other surface, any vehicle or obstruction whose presence may be dangerous for regular operations.

4.17.7 Shielding principle

- (a) Through an aeronautical study, the Authority may establish, in a reasonable and reliable way, that there is no possibility for an existing object to be removed in the future; regardless of how the configuration, the type or density of air operations may be modified. In that case, the object is considered permanent or immovable.
- (b) When an object is considered or immovable, it creates a shielding plane on the surface surrounding it. That surface and the objects included are shielded by permanent or immovable objects. A permanent object is considered to be dominant with respect to surrounding objects shielded by it.
- (c) An obstacle shielded by an existing or immovable object shall not be considered as such. The Authority may exempt the operator or interested party from the requirement of removing, marking or illuminating it.
- (d) In any case, the shielding principle shall be determined by an aeronautical study. The formula shall be based in the following analysis criteria: Any object which lies beneath any of the following planes shall be considered as shielded:
 - (1) A horizontal plane at the elevation of the top of the obstacle, that extends from the obstacle in the direction away from the runway; and
 - (2) A plane with a negative slope of 10% towards the runway.

4.17.8 Non-instrument runways

- (a) New objects or extensions of existing objects shall not be permitted above an approach or transitional surface except when the new object or extension would be shielded by an existing immovable object.



- (b) New objects or extensions of existing objects shall not be permitted above the conical surface or inner horizontal surface except when the object would be shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.
- (c) Existing objects above the conical surface, inner horizontal surface, approach and transitional surfaces, shall as far as practicable be removed except when the object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.

4.17.9 Non-precision approach runways:

- (a) New objects or extensions of existing objects shall not be permitted above an approach surface within 3,000 m of the inner edge or above a transitional surface except when, the new object or extension would be shielded by an existing immovable object.
- (b) New objects or extensions of existing objects shall not be permitted above the approach surface beyond 3,000 m from the inner edge, or above the conical surface or inner horizontal surface except when, the object would be shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.
- (c) Existing objects above any of the conical surface, inner horizontal surface, approach and transitional surfaces shall as far as practicable be removed except when, the object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.

4.17.10 Precision approach runways:

- (a) Fixed objects shall not be permitted above the inner approach surface, the inner transitional surface or the balked landing surface, except for frangible objects which because of their function must be located on the strip. Mobile objects shall not be permitted above these surfaces during the use of the runway for landing.
- (b) New objects or extensions of existing objects shall not be permitted above an approach surface or a transitional surface except when, the new object or extension would be shielded by an existing immovable object.
- (c) New objects or extensions of existing objects shall not be permitted above the conical surface and the inner horizontal surface except when, an object would be shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.
- (d) Existing objects above an approach surface, a transitional surface, the conical surface and inner horizontal surface shall as far as practicable be removed except when, an object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.



4.17.11 Runways meant for take-off:

- (a) New objects or extensions of existing objects shall not be permitted above a take-off climb surface except when the new object or extension would be shielded by an existing immovable object.
- (b) If no object reaches the 2 per cent (1:50) take-off climb surface, new objects shall be limited to preserve the existing obstacle free surface or a surface down to a slope of 1.6 per cent (1:62.5).
- (c) Existing objects that extend above a take-off climb surface shall as far as practicable be removed, except when an object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.
- (d) The aerodrome operator shall coordinate with the local authority to remove or prevent the installation of signs or other structures, which penetrate the obstacle limitation surfaces of the aerodrome within its jurisdictions, or the installation of lighting systems or luminous elements that the Authority, through a risk analysis, determines that affect safety.
- (e) The entities in charge of controlling and providing electrical power or communication services shall remove or prevent the installation of electricity pylons, towers, transmission or supply lines or other structures or buildings, which penetrate the aerodrome obstacle limitation surfaces, or the installation of lighting systems or luminous elements that the Authority, through a risk analysis, determines that affect safety.

4.18 Protection of Radio Navigational Aids

4.18.1 The aerodrome operator shall:

- (a) Prevent that the construction of facilities at the aerodrome that may interfere, void or reduce the operation of a visual or electronic aid;
- (b) When necessary, protect the navigational aids from vandalism or theft;
- (c) When necessary, monitor and prevent signal interruption of navigational aids;
- (d) Ensure the protection of these systems during the maintenance of the unpaved areas in the vicinity of these equipment (grass cutting, wildlife management and other inspections) The aerodrome operator shall demarcate these areas in such a way that they are defined as restricted areas to both person and equipment.

4.19 Public Protection

(See AC 4.19)

4.19.1 The aerodrome operator shall:

- (a) Provide a fence or other suitable barrier to prevent the inadvertent or premeditated access of an unauthorised person onto a non-public area of the aerodrome. This is intended to include barring of sewers, tunnels or other similar ducts. The fence or barrier shall be located such that it does not represent an obstacle separates the movement area and other facilities or zones on the aerodrome vital to the safe operation of aircraft and prevents acts of unlawful interference.



- (b) Provide illumination at a minimum essential level for a fence or other barrier provided for the protection of civil aviation and its facilities, through lights illuminating both sides of the fence or barrier, particularly at access points.
- (c) A cleared area shall be provided on both sides of the fence or barrier to facilitate the work of patrols and prevent unauthorised access. Consideration shall be given to the provision of a perimeter road inside the aerodrome fencing for the use of both maintenance personnel and security patrols.
- (d) Make all necessary arrangements and provide a fence or other suitable barrier to prevent the entrance to the movement area of an unauthorised person or vehicle, or animals large enough to be a hazard to aircraft.
- (e) Establish, within the monitoring programme, daily inspections during the day and night.
- (f) Reasonably protect persons and property to prevent damage from aircraft engine jet blast.

4.20 Wildlife Strike Hazard Reduction

(See AC 4.20)

4.20.1 The wildlife strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:

- (a) the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;
- (b) the collection of information from aircraft operators, aerodrome personnel and other sources on the presence of wildlife on or around the aerodrome constituting a potential hazard to aircraft operations; and
- (c) an ongoing evaluation of the wildlife hazard by competent personnel.

Note.— See ICAO Annex 15, Chapter 5.

4.20.2 Wildlife strike reports shall be collected and forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database.

4.20.3 Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft; including

- (a) published procedures on the management of wildlife hazards on and within the vicinity of aerodromes, including the establishment of a wildlife hazard management programme (WHMP), wildlife risk assessment, land-use management and personnel training; and
- (b) published procedures to follow in the event of conflicting interests between land use and aviation authorities, to ensure that aircraft safety is not compromised.

4.20.4 The Authority, in cooperation with the aerodrome operating authority, shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicates that they are unlikely to create conditions conducive to a wildlife hazard problem. Where the elimination of existing sites is not possible, the Authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.



4.20.5 The Authority shall give due consideration to aviation safety concerns related to land developments in the vicinity of the aerodrome that may attract wildlife.

4.20.6 The aerodrome operator shall:

- (a) Provide or facilitate a wildlife study in order to take appropriate action to minimise the risks related to birds and other animals:
- (b) The study required in sub-paragraph (a) shall be conducted by professionals with expertise in aerodrome management and shall include at least the following:
 - (1) Identification of species, numbers, daily and seasonal local movements and information on the presence of animals.
 - (2) Identification and location of characteristics of the aerodrome, or its vicinity, which may attract birds or wild animals.
 - (3) Description of any wildlife hazard to air operations.
 - (4) Periodical update mechanism.
 - (5) Criteria of public and private entities affected.
- (c) The study required in sub-paragraph (a) shall be submitted to the Authority, who shall determine if it is necessary to establish an ongoing plan on wildlife hazard conducted by competent personnel. To determine this, the Authority shall take into consideration:
 - (1) The wildlife studies.
 - (2) Actions recommended in the study.
 - (3) The aviation activities at the aerodrome, including the number of movements.
 - (4) The opinion of the aerodrome operator.
 - (5) The opinion of aerodrome users.
 - (6) Information from aircraft operators.
- (d) When the Authority determines that the wildlife management plan is required, the aerodrome operator, in coordination with the wildlife committee, shall prepare this plan and include at least the following:
 - (1) Persons with authority and responsible for the implementation of each element of the plan.
 - (2) Priorities for changes of habitat and land use identified in the wildlife study and proposed deadlines to comply with the plan.
 - (3) Information to be sent to public entities to issue permits for wildlife control.
 - (4) Identification of the resources to be provided by the aerodrome operator for the plan to be implemented.



- (5) Procedures to be followed during aircraft operation, including at least:
 - (i) The assignment of personnel responsible for implementing the procedure.
 - (ii) Conduction of physical inspections in the movement area and other critical areas for possible wildlife hazards.
 - (iii) Animal control measures.
 - (iv) Effective means of communication among personnel of the aerodrome operator in charge of wildlife management and Air Traffic Control Services.
 - (6) Procedures for the assessment and periodical review, at least every 12 months, of the wildlife management plan, including:
 - (i) The plan effectiveness to handle wildlife hazards at the aerodrome or its vicinity.
 - (ii) Aspects of the plan that require re-evaluation.
 - (7) A training programme taught by experts, which provide personnel with appropriate knowledge and skills for the successful conduct of the wildlife management plan at the aerodrome.
 - (8) A recording system for wildlife hazard control.
 - (9) Creation of a bird and wildlife hazard committee for the aerodrome.
- (e) The aerodrome operator shall maintain surveillance up to a radius of no less than 13 km in any direction from the aerodrome, or the radius established by the Authority containing waste disposal dumps or any other source which may attract birds or animals, unless an appropriate aeronautical study indicates that they are unlikely to create conditions conducive to a wildlife hazard problem. If the aerodrome operator knows about the existence of garbage disposal dumps or other facilities non-compatible with aviation, it shall coordinate with health authorities and entities with the authority to eliminate and prevent the installation through the wildlife hazard committee of the aerodrome.
- (f) The Authority is responsible for reporting bird strikes to the International Civil Aviation Authority.
- (g) The Authority, through control plans, shall take into account aviation safety concerns related to developments near the aerodrome, which may attract birds and other animals.

4.21 Notifying and reporting about Aerodrome Conditions

(See AC 4.21.4(c))

4.21.1. An aerodrome operator shall adhere to the requirement to notify and report to the Authority and air traffic control, within time limits specified in this section, any condition that may affect aircraft safety and operations.

4.21.2 An aerodrome operator shall review all aeronautical information publications (AIP), AIP Supplements, AIP Amendments, Notices to Airmen (NOTAM), Pre-flight Information Bulletins and Aeronautical Information Circulars issued by AIS on receipt thereof and immediately after such reviews shall notify AIS of any inaccurate information contained therein that pertains to the



aerodrome.

4.21.3 The aerodrome operator shall notify AIS, in writing, at least 56 days before effecting any planned major change to the aerodrome facility or equipment or level of service at the aerodrome which may affect accuracy of the information contained in any AIS publication.

4.21.4 The aerodrome operator shall immediately report to AIS and shall arrange for Air Traffic Control and the flight operations unit to receive immediate notice detailing any of the following circumstances of which the operator has knowledge:

- (a) Obstacles, obstructions and hazards.
 - (1) Any penetration by an object into an obstacle limitation surface related to the aerodrome.
 - (2) The existence of any obstruction or hazardous condition affecting aviation safety at or near the aerodrome.
 - (3) Objects in the movement area or runway strips.
- (b) Level of service: reduction in the level of service or absence of rescue and firefighting services at the aerodrome.
- (c) The condition of the movement area and the operational status of related facilities shall be monitored and reported to the appropriate AIS units, and the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be maintained up to date, any change shall be notified on time and cover relevant aspects on operational safety or on matters affecting performance, particularly in respect of the following:
 - (1) construction or maintenance work;
 - (2) irregular or deteriorated surfaces on a runway, a taxiway or a platform;
 - (3) Whenever water is present on a runway, a description of the runway surface conditions shall be made available using the following terms:
DAMP — the surface shows a change of colour due to moisture.

WET — the surface is soaked but there is no standing water.

STANDING WATER — for aircraft performance purposes, a runway where more than 25 per cent of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by water more than 3 mm deep.

Including the possible assessment of water depth, location with respect to the runway centre line, and where applicable, wet runway, water patches and flooding on the runway; and indicate in case of water on a taxiway or an apron.

- (4) liquid chemicals or other contaminants on a runway, taxiway or apron.
- (5) other temporary hazards, including parked aircraft;
- (6) failure or irregular operation of part or all of the aerodrome visual aids; and



(7) failure of the normal or secondary power supply or malfunction of any lighting system.

(d) Wildlife hazards

(e) Information that a runway or portion thereof may be slippery when wet shall be made available. A runway or portion thereof shall be determined as being slippery, when the runway surface friction characteristics are below the minimum friction level or when it is suspected that a runway may become slippery under unusual conditions and additional measurements have been made.

(f) Any other condition that may affect aviation safety at the aerodrome and against which precautions shall be warranted.

4.21.5 Immediate notification to pilots. When it is not feasible for an aerodrome operator to arrange for the air traffic control to receive notice of a circumstance referred to in sub-paragraph (d) above, the aerodrome operator must give immediate notice direct to the pilots who may be affected by that circumstance.

4.21.6 The aerodrome operator shall provide information on the minimum friction level for reporting slippery runway conditions and the type of friction measuring device.

4.21.7 The aerodrome operator shall give due consideration regarding accuracy and integrity requirements for the provision of aeronautical information/data to the AIS for the issue of NOTAMs, AICs and changes to the AIP.

4.21.8 Personnel assessing and reporting runway surface conditions required shall be trained and competent to meet criteria set by the Authority.

4.21.9 Runway surface condition(s) for use in the runway condition report. (See AC 4.21.9)

4.22 Identification and Marking of Construction Areas

4.22.1 The aerodrome operator shall guarantee:

(a) Markings, lighting and installation of fences or barriers in:

(1) All construction areas and out of service areas near the movement area or any other area of the aerodrome where aircraft operate.

(2) Each element of the construction equipment and any road under construction that may affect the safe movement of aircraft at the aerodrome.

(3) Any area adjacent to a navigation aid that may interrupt the signal or cause failure of the radio navigation aids when crossed.

(b) Verification of existing plans or information before construction to prevent damages to wires, lighting, ducts, cables and other underground utilities.

4.22.2 The aerodrome operator shall establish a safety plan for construction, comprising both operational and public safety (AVSEC) aspects and which shall be submitted to the Authority to verify that the minimum elements to ensure safety during construction work have been considered.



4.23 Apron Management Service

(See AC 4.23)

4.23.1 When warranted by the volume of traffic and operating conditions, an appropriate apron management service shall be provided on an apron by an aerodrome ATS unit, by the aerodrome operator, or by a cooperative combination of these, in order to:

- (a) Regulate movement with the objective of preventing collisions between aircraft, and between aircraft and obstacles;
- (b) Regulate entry of aircraft into, and coordinate exit of aircraft from the apron with the aerodrome control tower; and
- (c) Ensure a safe and expeditious movement of vehicles and appropriate regulation of other activities.

4.23.2 When the aerodrome control tower does not participate in the apron management service, procedures shall be established to facilitate the orderly transition of aircraft between the apron management unit and the aerodrome control tower.

4.23.3 An apron management service shall be provided with radiotelephony communications facilities.

4.23.4 Where low visibility procedures are in effect, persons and vehicles operating on an apron shall be restricted to the essential minimum.

4.23.5 An emergency vehicle responding to an emergency shall be given priority over all other surface movement traffic and air traffic services shall suspend any manoeuvre in the movement area.

4.23.6 The aerodrome operator shall monitor that vehicles operating on an apron:

- (a) Give way to:
 - (1) An emergency vehicle;
 - (2) An aircraft taxiing;
 - (3) An aircraft taxiing or about to taxi;
 - (4) An aircraft being pushed back, towed or about to be pushed or towed.
- (b) Give way to fuelling and rescue and firefighting vehicles and tow tractors.

4.23.7 An aircraft stand shall be visually monitored by the aerodrome operator to ensure that the recommended clearance distances are provided to an aircraft using the stand.

4.24 Ground Servicing of Aircraft

4.24.1 Fire extinguishing equipment suitable for at least initial intervention in the event of a fuel fire and personnel trained in its use shall be readily available during the ground servicing of an aircraft, and there shall be a means of quickly summoning the RFFS in the event of a fire or major fuel spill. In case of a fuel spill, the aircraft operator or the fuel supplier shall have solvent material to remove spilled fuel.



4.24.2 When aircraft refuelling operations take place while passengers are embarking, on board or disembarking, ground equipment shall be positioned so as to allow:

- (a) The use of a sufficient number of exits for expeditious evacuation; and
- (b) A ready escape route from each of the exits to be used in an emergency.

4.24.3 The aerodrome operator shall designate appropriate areas for aircraft engine and system tests and keep noise pollution under control.

4.24.3 Any person or organisation which provides, or seeks to provide, ground handling services, or fixed-base operators (FBO), shall comply with the requirements laid down by the aerodrome operator with regard to safety and an insurance policy which covers adequately liabilities for risks inherent to the services provided.

4.24.4 Aerodrome users that regularly operate vehicles on apron also require an insurance policy to cover damage to third parties.

4.25 Disabled Aircraft Removal

4.25.1 A plan for the removal of an aircraft disabled on, or adjacent to, the movement area shall be established for an aerodrome, and a coordinator designated to implement the plan, when necessary.

4.25.2 The disabled aircraft removal plan shall be based on the characteristics of the aircraft that may normally be expected to operate at the aerodrome, and include among other things:

- (a) list of equipment and personnel on, or in the vicinity of, the aerodrome which would be available for such purpose; and
- (b) Arrangements for the rapid receipt of aircraft recovery equipment kits available from other aerodromes.
- (c) Designate an area for the safekeeping of a disabled aircraft, in order to protect the remains for investigation by the relevant Authorities.

4.26 Tools and Precision Equipment

4.26.1 The aerodrome operator or providers AOG technical support service shall ensure the precision and accuracy of tools and precision equipment. This is achieved through a calibration by an entity authorised by the National Measurement Office or any other local or international entity that keeps measures and standards.

4.26.2 The period between calibrations shall be:

- (a) Specified by the manufacturer;
- (b) one year, if there is no period set by the manufacturer; or
- (c) The period established by the Authority when doubts on the reliability of tools and equipment arise.



4.26.3 The aerodrome operator or providers of AOG technical support service shall establish a system recording tools and precision equipment to be calibrated.

4.27 Technical Library

4.27.1 The aerodrome operator shall provide and keep the following information updated:

- (a) Obstacle charts;
- (b) Instrument approach charts;
- (c) Grid map of the aerodrome;
- (d) National and international regulations;
- (e) International standards of design, quality and inspection of:
 - (1) Fuel;
 - (2) Vehicles and ground equipment of the aerodrome;
 - (3) Equipment, clothing and rescue and firefighting material;
 - (4) Navigation aids; and
 - (5) Any other rule or standard applicable to aerodrome safety.

4.28 Aerodrome Incident Reporting and Investigation

4.28.1 The aerodrome operator shall establish procedures to report aircraft incidents and surface incidents, taking into account the responsibilities described below:

- (1) The aerodrome operator shall immediately notify the Authority, verbally, by phone, by electronic mail or any other means on the occurrence of an incident.
- (2) Written reports shall be forwarded to the Authority within 5 days from the time the incident is identified unless exceptional circumstances prevent it.

4.28.2 The aerodrome operator shall establish procedures for the investigation of;

- (a) any surface incident to identify causal factors and take corrective measures necessary to minimise risks as provided in the SMS Manual. The investigation shall be assessed by the Authority.
- (b) the investigation of air incidents may be initiated or conducted as agreed with the entity responsible for accident investigations (Memorandum of understanding).

4.28.3 The aerodrome operator shall permanently retain a copy of the incident investigation reports and create a logbook to record them.

4.29 Warning Notices

4.29.1 When low flying aircraft, at or near an aerodrome, or taxiing aircraft are likely to be hazardous to



people or vehicular traffic, the aerodrome operator shall:

- (a) Post hazard warning notices on any public way that is adjacent to the manoeuvring area; or
- (b) If such a public way is not controlled by the aerodrome operator, inform the authority responsible for posting the notices on the public way that it is a hazard.

4.30 Insurance

4.30.1 The aerodrome operator shall have insurance covering liabilities according to the risk levels of the aerodrome.



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APPENDIX 1

CONTENTS OF THE AERODROME OPERATIONS MANUAL (AOM)

The AOM shall include the following information applicable to the size, category and complexity of its operations shall be included.

Part 1: General Information

- (a) Purpose and scope of the AOM;
- (b) Legal requirement stating that the AOM and the airport operator comply with all applicable regulations as prescribed in the provisions and conditions of the aerodrome licence;
- (c) A statement that the AOM includes operating instructions to be met by relevant personnel;
- (d) A statement to indicate that the aerodrome shall at all times, when it is available for the take-off and landing of aircraft, be so available to all persons on equal terms and conditions;
- (e) The system for recording aircraft movement; and
- (f) The available aeronautical information system and procedures for its promulgation and/or notification to the Aeronautical Information Service (AIS);

1.2 Explanations and definitions of terms and words needed to use the AOM.

1.3 Amendment and review system

- (a) A statement of who is responsible for the issuance and disclosure of amendments and revisions.
- (b) A record of amendments and revisions with their corresponding entry and effective dates.
- (c) A statement that no handwritten amendments or revisions are allowed except in situations requiring an immediate amendment or revision in the interest of operational safety.
- (d) A list of effective pages.
- (e) A description of the distribution system of the AOM, amendments and revisions.

Part 2: Organisation

- 2.1 An aerodrome organisational chart showing the names and positions of management personnel.
- 2.2 Functions and responsibilities of management personnel.
- 2.3 Airport committees, including Safety and Facilitation, Fauna, Emergency, and any other committee established by the aerodrome operator to ensure aerodrome safety and operation.

Part 3: Particulars of the Aerodrome Site

General information, including the following:



- (a) A plan of the aerodrome showing the main aerodrome facilities for the operation of the aerodrome including, particularly, the location of each wind direction indicator; lights, markings, signs, access to the aerodrome, perimeter roads, fuel storage, rescue and firefighting installations, ATC facilities and location or road-holding position for rescue and firefighting vehicles in case of emergency and an isolated parking position for an aircraft which is believed to be the subject of unlawful interference.
- (b) A plan of the aerodrome showing the aerodrome boundaries;
- (c) A plan showing the distance of the aerodrome from the nearest city, town or other populous area, and the location of any aerodrome facilities and equipment outside the boundaries of the aerodrome covering a diameter of at least 8 km ;
- (d) Particulars of the title (cadastral plan) of the aerodrome site. If the boundaries of the aerodrome are not defined in the document particulars of the title to, or interest in, the property on which the aerodrome is located and a plan showing the boundaries and position of the aerodrome.

Part 4: Particulars of the aerodrome required to be reported to the Aeronautical Information Service (AIS)

4.1 General information

- (a) The name of the aerodrome;
- (b) The location of the aerodrome;
- (c) The geographical coordinates of the aerodrome reference point determined in terms of the World Geodetic System (WGS-84). The aerodrome reference point shall be located near the initial or planned geometric centre and shall be measured in degrees, minutes and seconds.
- (d) The aerodrome elevation and geoid undulation, with an accuracy rounded to the nearest one-half metre;
- (e) The elevation of each threshold and geoid undulation, the elevation of the runway end and any significant high and low points along the runway, and the highest elevation of the touchdown zone of a precision approach runway shall be measured to the accuracy of one-quarter metre and one-half metre for non-precision approaches.
- (f) The aerodrome reference temperature in degrees Celsius, which shall correspond to the monthly mean of the daily maximum temperatures for the hottest month of the year.
- (g) The details of the aerodrome beacon; and
- (h) The name of the aerodrome operator, address, telephone numbers and e-mail address at which the aerodrome operator may be contacted at all times.

4.2 Aerodrome dimensions and related information.

General information, including the following:

- (a) Runway – true bearing rounded to the nearest hundredth of a degree, designation number, length, width and displaced threshold location to the nearest metre, slope, surface type, type of runway and, for a precision approach runway Category I, the existence of an obstacle free zone:



- (b) Length, width rounded to the nearest metre and surface type of strip, runway end safety areas, stopways;
- (c) Length, width and surface type of taxiways;
- (d) Apron surface type and aircraft stands;
- (e) Clearway length and ground profile;
- (f) Visual aids for approach procedures, marking and lighting of runways, taxiways, and aprons; other visual guidance and control aids on taxiways (including runway holding positions, intermediate holding positions and stop bars) and aprons, location and type of visual docking guidance system; availability of standby power for lighting;
- (g) The location and radio frequency of VOR aerodrome checkpoints;
- (h) The location and designation of standard taxi routes;
- (i) The geographical coordinates of each threshold in degrees, minutes, seconds and hundredths of a second.
- (j) The geographical coordinates of appropriate taxiway centre line points in degrees, minutes, seconds and hundredths of a second.
- (k) The geographical coordinates of each aircraft stand in degrees, minutes, seconds and hundredths of a second.
- (l) The geographical coordinates in degrees, minutes, seconds and hundredths of a second and the top elevation of significant obstacles in the approach and take-off areas, in the circling area and in the vicinity of the aerodrome.

Note: This information may be best shown in the form of charts such as those required for the preparation of aeronautical information publications,

- (m) The pavement surface type and bearing strength in accordance with the standardised procedures of the Aircraft Classification Number – Pavement Classification Number (ACN-PCN) method, noting the following information:
 - (1) the Pavement Classification Number (PCN);
 - (2) pavement type for ACN-PCN determination;
 - (3) subgrade strength category;
 - (4) maximum allowable tyre pressure category or maximum allowable tire pressure value; and
 - (5) evaluation method.
- (n) One or more pre-flight altimeter check locations established on an apron and their average elevation rounded to the nearest metre or foot.
- (o) The following declared distances rounded to the nearest metre:



- (1) take-off run available (TORA);
 - (2) take-off distance available (TODA);
 - (3) accelerate-stop distance available (ASDA); and
 - (4) landing distance available (LDA)
- (p) The condition of the movement area and the operational status of related facilities shall be monitored and reports on matters of operational significance or affecting aircraft performance given, particularly in respect of the following:
- (1) construction or maintenance work;
 - (2) rough or broken surfaces on a runway, a taxiway or an apron;
 - (3) water on a runway, a taxiway or an apron;
 - (4) chemicals or other contaminants on a runway, taxiway or apron;
 - (5) other temporary hazards, including parked aircraft;
 - (6) failure or irregular operation of part or all of the aerodrome visual aids; and
 - (7) failure of the normal or secondary power supply.
- (q) The disabled aircraft removal plan: the telephone/ telex/facsimile numbers and e-mail address of the aerodrome operator for the removal of a disabled aircraft on or adjacent to the movement area, information on the capability to remove a disabled aircraft, expressed in terms of the largest type of aircraft which the aerodrome is equipped to remove;
- (r) The Rescue and firefighting: the level of protection provided, expressed in terms of the category, which shall be in accordance with the type and amounts of extinguishing agents normally available at the aerodrome. Moreover, significant changes to the level of protection, level restoration and in terms of a new category, resulting from variations in availability of extinguishing agents, vehicles, personnel or any other requirement affecting the level of protection.
- (s) The following information concerning a visual approach slope indicator system installation shall be made available:
- (1) associated runway designation number;
 - (2) type of system and, for an AT-VASIS, PAPI or APAPI installation, the side of the runway on which the lights are installed, i.e. left or right, shall be given;
 - (3) where the axis of the system is not parallel to the runway centre line, the angle of displacement and the direction of displacement, i.e. left or right, shall be indicated;
 - (4) nominal approach slope angle(s). For a T-VASIS or an AT-VASIS this shall be angle Θ according to the formula in Figure 5-18 and for a PAPI and an APAPI this shall be angle $(B + C) \div 2$ and $(A + B) \div 2$, respectively as in Figure 5-20; and



- (5) minimum eye height(s) over the threshold of the on-slope signal(s). For a T-VASIS or an AT-VASIS this shall be the lowest height at which only the wing bar(s) are visible; however, the additional heights at which the wing bar(s) plus one, two or three fly-down light units come into view may also be reported if such information would be of benefit to aircraft using the approach. For a PAPI this shall be the setting angle of the third unit from the runway minus 2', i.e. angle B minus 2', and for an APAPI this shall be the setting angle of the unit farther from the runway minus 2', i.e. angle A minus 2'.
- (t) Limitations, by aircraft type, in terms of resistance, runways, taxiways and turns.

Note: The accuracy of the information previously indicated is critical to aircraft safety. Information requiring engineering survey and assessment shall be gathered or verified by qualified technical persons.

Part 5: Particulars of the Aerodrome Operating Procedures and Safety Measures.

5.1 Aerodrome reporting

Particulars of the procedures for reporting any changes to the aerodrome information set out in the AIP and procedures for requesting the issue of NOTAMs, including the following:

- (a) Arrangements for reporting any changes to the Authority and recording the reporting of changes during and outside the normal hours of aerodrome operations;
- (b) The names and roles of persons responsible for notifying the changes, and their telephone numbers during and outside the normal hours of aerodrome operations; and
- (c) The address and telephone numbers, as provided by the Authority, of the place where changes are to be reported to the AIS base stations.

5.2 Access to the aerodrome movement area

Particulars of the procedures that have been developed and are to be followed in coordination with the competent authorities for preventing unauthorised entry of persons, vehicles, equipment, animals or other things into the movement area, including the following:

- (a) The role of the aerodrome operator, the aircraft operator, aerodrome fixed-based operators, the aerodrome security entity, the Authority and other government departments, as applicable;
- (b) The names and roles of the personnel responsible for controlling access to the aerodrome, and the telephone numbers for contacting them during and after working hours;
- (c) Procedures to access the movement area, including: Issue and format of identification cards as well as the training plan, evaluation and consequences of non-compliance.
- (d) Responsibilities, procedures and means for communicating emerging problems of the pilot and the aircraft carrier.

5.3 Aerodrome Emergency Plan.

Particulars of the Aerodrome Emergency Plan, including the following:



- (a) Plans for dealing with emergencies occurring at the aerodrome or in its vicinity, including the malfunction of aircraft in flight or on the ground; structural fires, sabotage, including bomb threats (aircraft or structure); unlawful seizure of aircraft or facilities; and accidents or incidents on the airport covering “during the emergency” and “after the emergency” considerations;
- (b) Details of tests for aerodrome facilities and equipment to be used in emergencies, including the frequency of those tests; it shall not exceed two years.
- (c) Details of exercises to test emergency plans, including the frequency of those exercises; it shall not exceed two years.
- (d) A list of organisations, agencies and persons of authority, both on- and off airport, for site roles; their telephone and facsimile numbers, e-mail and SITA addresses and the radio frequencies of their offices as well as any other communication system;
- (e) The establishment of an aerodrome emergency planning committee or similar agreement to organise training and other preparations for dealing with emergencies; and
- (f) The appointment of an on-scene commander to supervise the overall emergency operations.

5.4 Rescue and Firefighting Service

Facilities, equipment, personnel and procedures data to meet the rescue and firefighting requirements; including the names and roles of the persons responsible for dealing with the rescue and firefighting services at the aerodrome, training, exercises and response time demonstration.

Note: This subject shall also be covered in appropriate detail in the aerodrome emergency plan.

5.5 Inspection of the aerodrome movement area and obstacle limitation surface by the aerodrome operator

Particulars of the procedures for the inspection of the aerodrome movement area and obstacle limitation surfaces, including the following:

- (a) Arrangements for carrying out inspections, including runway friction and water-depth measurements on runways and taxiways, during and outside the normal hours of aerodrome operations;
- (b) Arrangements and means of communicating with air traffic control during an inspection;
- (c) Arrangements for keeping an inspection logbook, and the location of the logbook;
- (d) Details of inspection intervals and times;
- (e) Inspection guides and checklists;
- (f) Arrangements for recording and reporting the results of inspections and for taking prompt follow-up actions to ensure correction of unsafe conditions; and
- (g) The names and roles of persons responsible for carrying out inspections, and their telephone numbers during and after working hours.



5.6 Visual aids and aerodrome electrical systems

Particulars of the procedures for the inspection and maintenance of aeronautical lights (including obstacle lighting), signs, markers and aerodrome electrical systems, including the following:

- (a) Arrangements for carrying out inspections during and outside the normal hours of aerodrome operation, and the checklist for such inspections;
- (b) Arrangements for recording the result of inspections and for taking follow-up action to correct deficiencies;
- (c) Arrangements for carrying out routine maintenance and emergency maintenance;
- (d) Arrangements for secondary power supplies, if any, and, if applicable, the particulars or any other method of dealing with partial or total system failure; and
- (e) The names and roles of the persons responsible for the inspection and maintenance of the lighting, and the telephone numbers for contacting those persons during and after working hours.
- (f) Monthly verification of PAPI/VASI light angles and photo cell operation, by the responsible unit.

5.7 Maintenance of the movement area

Particulars of the facilities and procedures for the maintenance of the movement area, including;

- (a) Arrangements for maintaining the paved areas;
- (b) Arrangements for maintaining the unpaved runways and taxiways;
- (c) Arrangements for maintaining the runway and taxiway strips; and
- (d) Arrangements for the maintenance of aerodrome drainage.

5.8 Aerodrome works – Safety

Particulars of the procedures for planning and carrying out construction and maintenance work safely (including work that may have to be carried out at short notice) on or in the vicinity of the movement area which may extend above an obstacle limitation surface, including the following:

- (a) Arrangements for communicating with air traffic control during the progress of such work;
- (b) The names, telephone numbers and role of persons or organisations responsible for planning and carrying out the work, and arrangements for contacting those persons and organisations at all times;
- (c) The names, telephone numbers, during and after working hours, of the aerodrome fixed-base operators, ground handling agents and aircraft operators who are to be notified of the work;
- (d) A distribution list for work plans, if required; and
- (e) Arrangements, procedures and recovery time of major damage to the runway pavement.



5.9 Apron management

Particulars of the apron management procedures, including the following:

- (a) Arrangements between air traffic control and the apron management unit;
- (b) Arrangements for allocating aircraft parking positions;
- (c) Arrangements for initiating engine start and ensuring clearance of aircraft push-back;
- (d) Marshalling service; and
- (e) Leader (van) service.
- (f) Arrangements and procedures on movement/non movement areas, to determine when the control is to be taken by ATS, the aerodrome operator or the aircraft operator in push back operation and taxiing and when it corresponds to the air operator in push back operations and taxiing.

5.10 Apron safety management.

Procedures to ensure apron safety, including:

- (a) Protection from jet blasts;
- (b) Enforcement of safety precautions during aircraft refuelling operations;
- (c) Apron sweeping;
- (d) Apron cleaning;
- (e) Arrangements for reporting incidents and accidents of an apron; and
- (f) Arrangements for auditing the safety compliance of all personnel working on the apron.

5.11 Airside vehicle control

Particulars of the procedures for the control of surface vehicles operating on or in the vicinity of the movement area, including:

- (a) Details of the applicable traffic rules (including speed limits and the means of enforcing the rules);
- (b) The method of issuing driving permits for operating vehicles in the movement area;
- (c) Identification (signalling) procedures and safety equipment; and
- (d) Compliance with the procedures for the total annual vehicle technical inspection and when in doubt, with the operating conditions of vehicles.

5.12 Wildlife hazard management

Particulars of the procedures to deal with the danger posed to aircraft operations by the presence of bird or other animals in the aerodrome flight pattern or movement area, including the following:



- (a) Arrangements for assessing wildlife hazards;
- (b) Arrangements for implementing wildlife control programmes; and
- (c) The names and roles of the persons responsible for dealing with wildlife hazards, and their telephone numbers during and after working hours.

5.13 Obstacle control

Particulars setting out the procedures for:

- (a) Monitoring the obstacle limitation surfaces and Type A Chart for obstacles in the take-off surface;
- (b) Controlling obstacles within the authority of the aerodrome operator;
- (c) Monitoring the height of buildings or structures within the boundaries of the obstacle limitation surfaces;
- (d) Controlling new developments in the vicinity of aerodromes;
- (e) Notifying the Authority of the nature and the location of obstacles and any subsequent addition or removal of obstacles for action as necessary, including amendment of the AIS publication; and
- (f) Evaluating and updating the obstacle letter.

5.14 Removal of disabled aircraft

Particular of the procedures for removing a disabled aircraft on or adjacent to the movement area, including the following:

- (a) The roles of the aerodrome operator and the holder of the aircraft certificate of registration;
- (b) Arrangements for notifying the holder of the certificate of registration;
- (c) Arrangements for liaising with the air traffic control unit;
- (d) Arrangements for obtaining equipment and personnel to remove the disabled aircraft; and
- (e) The names, role and telephone numbers of persons responsible for arranging for the removal of disabled aircraft.

5.15 Handling of hazardous materials

Particulars of the procedures for the safe handling and storage of hazardous materials on the aerodrome, including the following:

- (a) arrangements for special areas on the aerodrome to be set up for the storage of inflammable liquids (including aviation fuels) and any other hazardous materials; and
- (b) the method to be followed for the delivery, storage, dispensing and handling of hazardous materials, including areas for temporary storage of containers and packing with spills.



Note: Hazardous materials include inflammable liquids and solids, explosives, solvents, corrosive liquids, compressed gases and magnetised or radioactive materials. Arrangements for dealing with the accidental spillage of hazardous materials shall be included in the aerodrome emergency plan.

5.16 Reduced-visibility operations

Particulars of procedures to be introduced for low-visibility operations, including the measurement and reporting of runway visual range as and when required, and the names and telephone numbers, during and after working hours, of the persons responsible for measuring the runway visual range.

5.17 Protection of sites for radar and navigational aids

Particulars of the procedures for the protection of sites for radar and radio navigational aids located on the aerodrome to ensure that their performance will not be degraded, including the following:

- (a) arrangements for the control of activities in the vicinity of radar and navigational aids installations;
- (b) arrangements for ground maintenance in the vicinity of these installations; and
- (c) arrangements for the supply and installation of signs, warnings of hazardous microwave radiation.

Note 1: In writing the procedures for each category, clear and precise information shall be included on:

- *When, or in what circumstances, an operating procedure is to be activated;*
- *how an operating procedure is to be activated;*
- *actions to be taken;*
- *the persons who are to carry out the actions; and*
- *the equipment necessary for carrying out the actions, and access to such equipment.*

Note 2: If any of the procedures specified above are not relevant or applicable, the reason shall be given.

Part 6: Aerodrome Safety Management System

- (a) General description of the SMS established for ensuring compliance with all safety requirements provided in CAR SMS;
- (b) The safety policy, insofar as applicable, on the safety management process and its relation to the operational and maintenance process;
- (c) the structure or organisation of the SMS, including staffing and the assignment of individual and group responsibilities for safety issues;
- (d) SMS strategy and planning, such as setting safety performance targets, allocating priorities for implementing safety initiatives and providing a framework for controlling the risks to as low a level as is reasonably practicable keeping always in view the requirements of CAR's, as well as the applicable local regulations, standards, rules or technical guides;



- (e) SMS implementation, including facilities, methods and procedures for the effective communication of safety messages and the enforcement of safety requirements;
- (f) a system for the implementation of, and action on, critical safety areas which require a higher level of safety management integrity (safety measures programme);
- (g) measures for safety promotion and accident prevention and a system for risk control involving analysis and handling of accidents, incidents, complaints, defects, faults, discrepancies and failures, and continuing safety monitoring;
- (h) A system of voluntary notification of events, events or hazards that affect or may affect aeronautical safety
- (i) the internal safety audit and review system detailing the systems and programmes for quality control of safety;
- (j) the system for documenting all safety-related airport facilities as well as airport operational and maintenance records, including information on the design and construction of aircraft pavements and aerodrome lighting. The system shall enable easy retrieval of records including charts;
- (k) staff training and competency, including the review and evaluation of the adequacy of training provided to staff on safety-related duties and of the licensing system for testing their competency; and
- (l) The incorporation and enforcement of safety-related clauses in the contracts for construction work at the aerodrome.



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APPENDIX 2

PAVED AREAS

Table 4 establishes the minimum friction levels and their correlation with different friction measuring devices.

Table 4 - Friction level classification

	65 kph			95 kph		
	Minimum	Maintenance Planning	New Pavement	Minimum	Maintenance Planning	New Pavement
Mu Meter	.42	.52	.72	.26	.38	.66
Dynatest Consulting, Inc. Runway Friction Tester	.50	.60	.82	.41	.54	.72
Airport Equipment Co. Skiddometer	.50	.60	.82	.34	.47	.74
Airport Surface Friction Tester	.50	.60	.82	.34	.47	.74
Airport Technology USA Safe gate Friction Tester	.50	.60	.82	.34	.47	.74
Findlay, Irvine, Ltd. Griptester Friction Meter	.43	.53	.74	.24	.36	.64
Tatra Friction Tester	.48	.57	.76	.42	.52	.67
Norse meter RUNAR (operated at fixed 16% slip)	.45	.52	.69	.32	.42	.63



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**APPENDIX 3****VEHICLES**

Minimum training and assessment requirements for people who apply for a credential or permit to operate vehicles at the aerodrome.

(a) Plan contents. The authorities responsible for the operation of vehicles on the movement area shall ensure that the operators are properly qualified. This may include, as appropriate to the driver's function, knowledge of:

- (1) Identification of runways, taxiways, parking areas and NAVAIDs.
- (2) Distinction between movement areas and non-movement areas.
- (3) Airport rules and procedures.
- (4) Identification of aerodrome signs and markings.
- (5) Identification of lights.
- (6) Description and location of NAVAIDs critical areas.
- (7) CAR ATS – Air Traffic Services in regards to ground operations and authorisations.
- (8) Identification and sources of rules governing the operation of vehicles.
- (9) Basic communication system.
- (10) Aeronautical terms and phrases.
- (11) Communication procedures (radiotelephony).
- (12) Use of ICAO spelling alphabet.
- (13) Description of communication procedures when radio fails.
- (14) Description of consequences for non-compliance with operational requirements.

(b) Practical assessment for applicants:

The operator shall be able to demonstrate competency, as appropriate, in:

- (1) the operation or use of vehicle transmit/receive equipment;
- (2) understanding and complying with air traffic control;
- (3) vehicle navigation on the aerodrome;
- (4) special skills required for the particular function; and

(c) As required for any specialist function, the operator shall be the holder of a Bahamas driving licence.



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SECTION 2

ADVISORY CIRCULARS (AC)

1. General

This section 2 contains Advisory Circulars (AC), which is additional text related to the CAR requirements to clarify and provide guidance for its application. It contains explanations, interpretations and/or acceptable means of compliance.

Where a particular paragraph does not have AC, it means that such paragraph does not require it.

2. Presentation

The numbering proceeded by the acronym AC indicates the paragraph number of CAR AGA 3 they refer to.



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CHAPTER 1

GENERAL

AC 1.2 Requirement for an Aerodrome Licence

(See AGA 3 para 1.2)

When a Licence is granted to an aerodrome, for aircraft operators and other organisations operating on it, it means that at the time of licensing the aerodrome complied with the standards relating to the facilities and their operation and the operator has in agreement with the Authority, the ability to continue to meet those specifications during the validity of the licence.

The licensing process also establishes the benchmark for continuous monitoring of compliance with specifications.

It is necessary to provide to the aeronautical information services, relevant information on the status of licensing of aerodromes to be promulgated in the Aeronautical Information Publication (AIP). See CAR AIS.

AC 1.7.3(c) Runway Safety Team

(See AGA 3 para 1.7.3(c))

Runway Safety Programme

The aerodrome operator shall establish a safety plan on the runway for the prevention of incursions, excursions and any other safety related event. Through this programme a Runway Safety Team (RST) must be established at each of the international airports. The programme must take into account the following participants:

- a) The Airport Operator
- b) Air traffic services
- c) Aircraft Operators SMS representative
- d) State SSP representative
- e) Pilots
- f) Any other group involved in the operations of the aerodrome

Functions of the Runway Safety Team

The main functions of the RST shall be:

- Develop action plans for runway safety
- Identify the potential hazards of runway incursions and excursions
- Recommend strategies to eliminate hazards and mitigate individual risks
- Any other safety hazards considered to be hazardous.

Frequency of RST meetings

The work team shall meet regularly at least every three months

AC 1.7.4 Service Level Agreements

(See AGA 3 para 1.7.4)

This AC is an alternative means of compliance on how Service Level Agreements may be established.

Memorandum of Understanding between the Airport Operator ----- and -----.



APPLICABILITY

An aeronautical study may be conducted when the aerodrome standards may not be complied with, as a result of development or expansion. Such study is often conducted during the planning process of a new aerodrome or during the licensing of an existing one.

Note: Aeronautical studies may not be conducted in case of deviations with respect to the standards if there are reasonably practicable solutions.

DEFINITION

An aeronautical study is an investigation of an aviation problem aimed at identifying possible solutions and selecting the most acceptable one so that it does not affect flight safety.

TECHNICAL ANALYSIS

The technical analysis shall provide justification for a deviation on the basis that an equivalent level of safety may be achieved by other means. It is generally applied in situations where the cost of correcting a problem that infringes standard results excessive, but where the unsafe effects of the problem may be overcome by any procedural means offering practical and reasonable solutions.

In technical analysis, inspectors shall apply their field experience and expertise. They may also consult other specialists in relevant areas. When considering alternative procedures in the deviation approval process, it is essential to take into account the safety purpose of the aerodrome licensing regulations and the applicable standards so that the purpose of the regulations is maintained.

DEVIATION ACCEPTANCE

In some cases, the only reasonable means of providing an equivalent level of safety is to adopt adequate procedures and demand, as a condition for licensing, that caution notices be published in appropriate AIS publications.

The decision of demanding caution notices shall depend mainly on two considerations:

- a) The pilots' need of being aware of the possible dangerous conditions; and
- b) The responsibility of the Authority to publish deviations with respect to the standards, which otherwise are assumed to be met under the aerodrome licensing.

STRUCTURE OF THE AERONAUTICAL STUDY

The minimum contents required in an aeronautical study shall be the following:

Section 1. General

- a) Title page of the study
- b) Name and signature of the person in charge of the study
- c) General index
- d) Objective
- e) Scope

Section 2. Risk analysis

- a) Description of the deviation by indicating the difference with respect to the standards specified in the CAR AGA 1.



Section 3. Identification of unwanted events

a) Estimate the probability of an incident or an accident related to deviations similar to those under analysis. The probability shall be classified as:	b) Description of the consequences magnitude of incidents or accidents occurrence. The magnitude of the consequences is classified as:
•Frequent	•Catastrophic
•Occasional	•Dangerous
•Remote	•Major
•Unlikely	•Minor
•Extremely unlikely	•Insignificant

Section 4. Mitigation measures

- a) Description of the mitigation measures applied to eliminate or reduce as much as possible the detected risks.

Section 5. Results

- a) Description of the results derived from the implementation of mitigation measures, including the necessary documentation to support such results.
- b) Comparison of results obtained with respect to standards specified in CAR AGA 1.
- c) Conclusions.

Section 6. Annexes

All documents (procedures, analysis, reports, records, photographs, maps, tables, graphics, etc.) and any supporting information needed for the aeronautical study shall be included.



CHAPTER 2

LICENSING PROCESS

AC 2.1 Licensing Process

(See AGA 3 para 2.1)

To obtain an aerodrome licence, the applicant must undergo a licensing process, which is formally recorded in an aerodrome licensing file by the Authority. This process consists of the following stages:

Stage 1 - Pre-application

This is the process where the applicant expresses an interest in obtaining an aerodrome licence and obtains the information required relating to the granting of an aerodrome licence. During this stage, the first meeting between the applicant and the Authority takes place, where there is an information exchange on service and guidance in regards to the regulations, standards, procedures, responsibilities and privileges of the service that the applicant intends to provide, and the technical documentation to be submitted.

Stage 2 - Formal Application

The applicant shall submit the a formal application to the Authority attaching the schedule of events for the licensing process, the Aerodrome Operations Manual (AOM) required by CAR AGA 3, the Aerodrome Security Programme required by CAR SEC and the SMS of the aerodrome required by CAR SMS.

Stage 3 – Evaluation

The Authority conducts a thorough review of the documentation submitted and informs the applicant of any discrepancies found; otherwise, provisional approval/acceptance is issued.

Stage 4 - Technical Evaluation

The applicant is subjected to a technical demonstration and evaluation to determine compliance with the facilities with respect to signals, lighting, markings, pavements, obstacles, rescue and firefighting services, equipment, personnel, procedures, SMS, apron management, wildlife strike hazard and training.

Stage 5 – Licensing

Once stages 1 to 4 have been successfully completed, the Authority shall grant the aerodrome licence with any conditions established for promulgation in the Bahamas AIP.

AC 2.1.6 Key Personnel

(See AGA 3 para 2.1.6)

The aerodrome operator must submit to the Authority, for its approval, key operations and maintenance personnel of the aerodrome-

a) Operations:

- 1) Higher education in engineering or aerodrome administration, or an aviation technician license or any other career related to aerodrome operations.
- 2) A minimum of five years of experience in aerodrome management.

b) Maintenance:

- 1) Higher education in civil, mechanical, or electric engineering, construction or architecture or a qualified technician with proven experience subjected to Authority approval.
- 2) Aerodrome specialised courses.
- 3) Three years of proven experience in positions related to supervision and inspection of the movement area or two years subject to a training plan proposed by the aerodrome operator and approved by the Authority.



- c) Safety Management
 - 1) Qualified technician with proven knowledge and experience in SMS.
 - 2) A minimum of three years of proven experience in quality systems or aerodrome SMS.

Any change in the authorised key personnel payroll, must be submitted to the Authority for approval.

AC 2.2 Grant of an aerodrome Licence

(See AGA 3 Para 2.2)

Contents of an aerodrome manual, including procedures for its submission and approval/acceptance, verification of compliance and granting of an aerodrome licence, are available in the PANS-Aerodromes (Doc 9981).

The intent of a safety management system is to have in place an organised and orderly approach in the management of aerodrome safety by the aerodrome operator. CAR SMS Safety Management Systems contains the safety management provisions applicable to certified aerodromes.

Guidance on a harmonized safety management system is given in the Safety Management Manual (SMM) (Doc 9859) and in the Manual on Licensing of Aerodromes (Doc 9774). Procedures on the management of change, conduct of safety assessment, reporting and analyses of safety occurrences at aerodromes and continuous monitoring to enforce compliance with applicable specifications so that identified risks are mitigated can be found in the PANS-Aerodromes (Doc 9981).



CHAPTER 3

AIRPORT OPERATIONS MANUAL (AOM)

AC 3.1 Preparation of the Aerodrome Operations Manual (AOM)

(See AGA 3 para 3.1)

One of the most important reasons for the existence of the AOM is that it serves as an extension of the regulations. CAR AGA 3 provides information in broad terms to cover all aerodromes and it may not appear in a specific level for each airport. The AOM becomes a bridge between the requirements and the individual application for an aerodrome taking into account size, activities and configuration.

In the development of the AOM, two fundamental principles shall be observed:

- a) **Be comprehensive.** It shall include all requirements applicable to the aerodrome, so that personnel operating in the aerodrome have the necessary information to comply with the regulations. Even quotes or references to regulations, may be included.
- b) **Be moderate.** It shall be created with the level of detail necessary to show how to achieve compliance with regulations in the aerodrome. Excessive details that may restrict the flexibility to meet unforeseen circumstances or the creation of commitments not stated in regulations in terms of responsibility, authority and procedures shall be avoided.

There are two relevant levels of approval in the regulations: the approval or compliance statement by the aerodrome operator or the applicant of an Aerodrome Licence before submitting it to the Authority, and Authority's approval.

The highest authority within the structure of the Airport Operator, on behalf of the company it represents, shall establish a statement or approval that the manual complies and that the operator shall meet all applicable rules as well as the provisions and conditions of the Aerodrome Licence in a note or letter. The note or representation letter shall identify the aerodrome, the person signing the document and the date. This approval may be issued in the front page or the first page of the manual.

Once the AOM is approved, it becomes an authorised document. Therefore, the Authority shall issue an initial approval note of the Airport Operations Manual (AOM) and also Licence its approval with the full name, date and signature of the designated inspector, at the end of each sheet of the effective pages of the manual.

To comply with regulatory requirements, the airport operator shall foresee that the policies and procedures of the AOM respond to these questions. A realistic and objective AOM is the one that provides guidelines and instructions necessary for another person to develop its activities while the airport operator is absent. When the person is reading the instructions, these shall indicate who is performing the tasks, what they consist of, how they shall be conducted and the schedules or periods to perform them.

Two aspects require debate. There is a person who normally operates far away under a relative autonomy, not beyond the authority, but with some physical or functional distance. This is called *independent* person for convenience. The key element is that this person can make decisions to deal with abrupt changes in situations without direct supervision, even if the airport operator is located anywhere in the aerodrome. The other person is the *substitute*, who intervenes and performs certain tasks to meet the regulations when the usual chain of authority and responsibility has been temporarily interrupted. This person is essentially an aid and may or may not be completely familiarised with the normal routine. The AOM shall provide enough guidance to perform functions as well as the course and instructions to request support when problems arise.

As it was previously indicated, this person is not entirely independent on authority or action, but certain relevant actions may be carried out without the participation of the airport operator or the normal procedure of application and approval. Therefore, the airport operator must be sure that the person knows what is required from the regulation point of view, how to apply his/her knowledge in adverse situations as well as to conduct routine work, which may be accomplished by firm and clear instructions in the AOM. Rescue and firefighting services represent a good example. In the rescue and firefighting station, events requiring immediate attention may arise and they may have consequences somewhere else or for other people. For example, if a piece of equipment is not working, administrative action must be taken to restrict air operations or, at least, notify the airport operators. In case of an emergency, it is necessary to decide whether to activate the emergency plan or just part of it. Do the rescue and firefighting personnel know how to make these decisions? Do they have clear and concise information for the correct approach? Of course, it must be clear who the person in charge of giving instructions is.



It is important to keep in mind who may take action if the airport operator or the nominated person is absent. Taking daily inspections as an example, if a person knows the airport operations, but he/she does not know the specific regulations, it may be unnecessary to give instructions from scratch. However, the person usually does not perform those functions. Therefore, the AOM shall be specific enough on critical aspects of the operation, so that the aerodrome takes its normal course.

Nevertheless, if the airport operator is not in the facilities, there shall be another person to perform the tasks instead of the appointed person. If the person in charge of checking the lighting system is off, the substitute must know how to check the system and where the switches are. In other words, an instruction in the AOM stating, "The lighting system must be checked to meet the requirements" is not enough.

The instructions in the AOM shall detail what tasks must be conducted and how they shall be carried out by people responsible for its compliance. Unless every person designated for a task is completely familiar with the regulation requirements, the AOM must be structured so that it provides the appropriate guidance. For example, it may be confusing if the AOM states, "*The security areas must be kept according to the regulations*". Unless the personnel knows the regulations, a better description shall provide details identifying the physical limits, the revision periods and how to keep the surfaces of the safety and security areas.

The best instructions will not produce satisfactory results if they do not indicate when they shall be put into practice. Is the instruction "*The personnel shall conduct refuelling inspections every day*" specific enough? Can a person take action if the AOM indicates "*When the weather conditions allow it*"? Closely related questions like who, what, how and when may arise from these indications and the AOM instructions shall provide enough information to answer them.

AC 3.3 Airport Operations Manual (AOM) Compliance Letter (See AGA 3 para 3.3)

The Airport Operator shows that it fully complies with the standards established in these regulations through a compliance letter. There shall be a policy or procedure for each standard in the Manual system taking into account the complexity and size of the operations.



CHAPTER 4

OBLIGATIONS OF THE AERODROME OPERATOR

AC 4.1 General

(See AGA 3 para 4.1)

- a) Preventive maintenance is programmed maintenance work done in order to prevent a failure or degradation of facilities.
- b) "Facilities" are intended to include such items as pavements, visual aids, fencing, drainage systems, electrical systems and buildings.
- c) Guidance material on Human Factors principles can be found in the Human Factors Training Manual (Doc 9683) and in the Airport Services Manual (Doc 9137), Part 8.

AC 4.3.2 Personnel competence

(See AGA 3 para 4.3.2)

Personnel responsible of the administration, operations and maintenance of the aerodrome shall be trained to a level according to the tasks to be performed; therefore, the programme contents of the initial and recurring training of the airport operator shall be based on the policy and procedures stated and approved by the Authority in the Airport Operations Manual (AOM). These shall include at least the following:

a) Initial training

- (1) Training in airport operations.
- (2) Training in standards and security of fuel storage and handling in the aerodrome.
- (3) Training in the inspection system including familiarisation with the aerodrome, emergency plan, NOTAMs, vehicle operation and discrepancy report system.
- (4) Rescue and firefighting training
- (5) Training in regulations, standards and AOM
- (6) Introduction to the investigation of aviation accidents and incidents
- (7) Maintenance of visual and electronic aids and pavements
- (8) Human factors in civil aviation (ICAO Doc. 9683)
- (9) Dangerous goods training, based on CAR DG
- (10) Bird and other animals control (ICAO IBIS Doc 9332)
- (11) Operational Security Management System
- (12) Quality System

b) Recurring training

- 1) Every two years, (a) (2), (4), (5) and (9) courses shall be given to the appropriate personnel.
- 2) Every year, the training indicated in (a) (3) shall be conducted for the inspection personnel.
- 3) Instruction not indicated in the previous paragraphs shall be given in periods not exceeding 5 years.

c) Training files

Training files of the Airport Operator shall indicate the amount of formal training, on the job training (OJT) and the experience that each employee has accumulated over the years.



d) **Planning and design**

The planning and design stage establishes the basis to define the instruction specifications such as the intermediate and final objectives, expected results, group to be trained, training course contents and specifications, which allow the further development of a training programme.

This stage includes:

- planning and design actions that require to be executed to fill the gap between the current competence and the required competence, and
- definition of the criteria to establish the job performance standards and the performance requirements as well as the evaluation criteria of the instruction process and the subsequent objectives for each course.

The training programme shall be created taking into account the human factors for its implementation. Moreover, it shall consider the depth of each course or subject depending on the responsibilities of the personnel to be trained.

Usually, human resources management is in charge of the administration of resources needed for the correct compliance with the different instruction methods, required teaching materials, activity design, hiring of external instructors, training for internal instructors and their availability, transport to contracted training centres/factories or providers of the different products and services.

However, the highest authority within the Airport Operator is responsible for the approval of any method used for instruction (regardless of whether the instruction is contracted from a third party), as well as for the contents of the training programmes. This may require that contents and evaluation systems of the different courses are audited.

This audit or revision of the training programme by the operator shall be conducted in order to detect non-compliance problems, and eventually, corrective actions.

Data collection shall be performed continuously to provide the basis for the instructional process validation and offer the necessary recommendations to improve it.

AC 4.4 Specific procedures for aerodrome operations

(See AGA 3 para 4.4)

- a) **Introductory Note.** — This section introduces PANS-Aerodromes (Doc 9981) for use by an aerodrome undertaking an assessment of its compatibility with the type of traffic or operation it is intending to accommodate. The material in the PANS- Aerodromes addresses operational issues faced by existing aerodromes and provides the necessary procedures to ensure the continued safety of operations. Where alternative measures, operational procedures and operating restrictions have been developed, these are detailed in the aerodrome manual and reviewed periodically to assess their continued validity. The PANS-Aerodromes does not substitute nor circumvent the provisions contained in this Annex. It is expected that infrastructure on an existing aerodrome or a new aerodrome will fully comply with the requirements of these regulations. See CAR AIS and Annex 15, 4.1.2 (c) on a State's responsibilities for the listing of its differences to the related ICAO Procedures in its Aeronautical Information Publication.
- b) Procedures to assess the compatibility of the operation of a new aeroplane with an existing aerodrome can be found in the PANS-Aerodromes (Doc 9981).
- c) See CAR AIS and ICAO Annex 15, Appendix 1, AD 2.20, on the provision of a detailed description of local traffic regulations.
- d) See PANS-Aerodromes (Doc 9981), Chapter 3, section 3.6, on promulgation of safety information.

AC 4.5.1 Paved areas

(See AGA 3 para 4.5.1)

- a) See AGA 3 para 4.15 for inspection of movement areas.



- b) Procedures on carrying out daily inspections of the movement area and control of FOD are given in the PANS-Aerodromes (Doc 9981), the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476) and the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual (Doc 9830).
- c) The *Airport Services Manual* (Doc 9137), Part 9, provides more information on sweeping and cleaning of surfaces.
- d) The *Aerodrome Design Manual* (Doc 9157), Part 2, offers guidance on precautions to be taken in regard to the surface.
- e) Where the pavement is used by large aircraft or aircraft with tire pressures in the upper categories, particular attention shall be given to the integrity of light fittings in the pavement and pavement joints.
- f) The *Airport Services Manual* (Doc 9137), Part 2, contains further information on this subject, on improving surface friction characteristics of runways.
- g) The objective is to ensure that the surface friction characteristics for the entire runway remain at or above a minimum friction level specified by the State.
- h) Guidance for the determination of the required frequency is provided in Appendix 2 and in the *Airport Services Manual* (Doc 9137), Part 2, Appendix 5.

AC 4.5.2(b)(2) Paved areas
(See AGA 3 para 4.5.2(b)(2))

The following documents provide guidance to establish the procedures on gathering and dissemination of information related to the surface conditions and corrective maintenance when the friction levels are low: *Airport Services Manual* (Doc 9137), Part 2; Annex 14, Attachment A, Section 7 and FAA AC 150/5320-12C.

A portion of runway in the order of 100 m long may be considered significant for maintenance or reporting action.

AC 4.5.2(b)(3) Paved areas – Frequency of friction tests
(See AGA 3 para 4.5.2(b)(3))

The purpose of friction tests or measurement of the friction level of a runway surface is to detect deterioration of the skid resistance. Such deterioration is caused by factors as wear of micro- and macro- textures of pavement by the action of running and braking and the accumulation of pollutants. Rubber, dust, water, mud, sand and oil, are among them, but rubber deposits from aircraft tyres in the touchdown zone are the most representative. Skid resistance is also affected by the type of materials used in the original construction, any subsequent surface treatment and maintenance practices.

Minimum number of daily landings per active runway	Suggested frequency
Less than 15	2 years
16 to 30	1 year
31 to 90	9 months
91 to 150	6 months
151 to 210	3 months
More than 210	1 month

AC 4.5.2(b) (4) Paved areas - Frequency for airfield rubber removal
(See AGA 3 para 4.5.2(b)(4))

When the friction coefficient is near or below the minimum level of maintenance planning on Appendix 1, Table 1, it is recommended to use the following information for budgeting and accumulated rubber removal programming.

Minimum number of daily landings per active runway	Suggested frequency
Less than 15	2 years
16 to 30	1 year
31 to 90	9 months
91 to 150	6 months
151 to 210	3 months
More than 210	1 month



AC 4.5.3 Paved areas – Overlaying pavements
(See AGA 3 para 4.5.3)

ICAO *Aerodrome Design Manual* (Doc 9157), Part 3, offers guidance on overlaying pavements and assessing their operational status.

AC 4.8.1 Visual aids and electrical systems
(See AGA 3 para 4.8.1)

- a) These specifications are intended to define the maintenance performance level objectives. They are not intended to define whether the lighting system is operationally out of service.
- b) The energy savings of light emitting diodes (LEDs) are due in large part to the fact that they do not produce the infra-red heat signature of incandescent lamps.
- c) Enhanced vision systems (EVS) technology relies on the infra-red heat signature provided by incandescent lighting. Annex 15 protocols provide an appropriate means of notifying aerodrome users of EVS when lighting systems are converted to LED.

Guidance on preventive maintenance of visual aids is given in the *Airports Service Manual*, Doc. 9137, part 9, and documents FAA AC-150/5340-24 (Runway and Taxiway Edge Lighting System) and FAA AC-150/5340-26 (Maintenance of Airport Visual Aid Facilities).

With respect to barrettes, crossbars and runway edge lights, lights are considered to be adjacent if located consecutively and:

- Laterally: in the same barrette or crossbar; or
- Longitudinally: in the same row of edge lights or barrettes.

In barrettes and crossbars, having two adjacent unserviceable lights does not lose guidance.

AC 4.9 Rescue and firefighting
(See AGA 3 para 4.9)

The principal objective of a RFFS is to save lives at an aircraft accident/incident. For this reason, the provision of means of dealing with an aircraft accident or incident occurring at, or in the immediate vicinity of, an aerodrome assumes primary importance because it is within this area that there are the greatest opportunities of saving lives. This must assume at all times the possibility of, and need for, extinguishing a fire which may occur either immediately following an aircraft accident or incident, or at any time during rescue operations.

The most important factors bearing on effective rescue in a survivable aircraft accident are: the training received, the effectiveness of the equipment and the speed with which personnel and equipment designated for rescue and firefighting purposes can be put into use. Requirements to combat building and fuel farm fires are not covered in these regulations.

AC 4.9.1 Rescue and firefighting: categorising
(See AGA 3 para 4.9.1)

See guidance in the *Airport Services Manual* (Doc 9137), Part 1, for categorising aerodromes, including those for all-cargo aircraft operations, for rescue and firefighting purposes.

Guidance on training of personnel, rescue equipment for difficult environments and other facilities and services for rescue and firefighting purposes is given in the *Airport Services Manual* (Doc 9137), Part 1.

AC 4.9.2 Rescue and firefighting: Equipment and extinguishing agents
(See AGA 3 para 4.9.2)

The amounts of water specified for foam production are predicated on an application rate of 8.2 L/min/m² for a foam meeting performance level A, 5.5 L/min/m² for a foam meeting performance level B and 3.75 L/min/m² for a foam meeting performance level C.

When any other complementary agent is used, the substitution ratios need to be checked.



Descriptions of the agents may be found in the Airport Services Manual (Doc 9137), Part 1.

Information on the required physical properties and fire extinguishing performance criteria needed for a foam to achieve an acceptable performance level A, B or C rating is given in the Airport Services Manual (Doc 9137), Part 1.

In addition to the provisions the *Airport Services Manual* (Doc 9137), Part I, on rescue and firefighting equipment and extinguishing agents, this AC states some acceptable standards from National Fire Protection Association (NFPA) and the Federal Aviation Administration (FAA), both from the United States of America.

NFPA 412 Standard for Evaluating Aircraft Rescue and Fire Foam Equipment

NFPA 414 Aircraft Rescue and Firefighting Vehicles

FAA-AC150/521B0-14 (Airport Fire and Rescue Personal Protective Clothing)

Foam concentrate carried on fire vehicles in excess of the quantity identified in Table 4 can contribute to the reserve.

See the Airport Services Manual (Doc 9137), Part 1 for guidance on the conduct of a risk analysis to determine the quantities of reserve extinguishing agents.

Guidance regarding to the rescue and firefighting equipment to be provided at the aerodromes is provided in Airport Services Manual (Doc 9137, Part 1)

Guidance on the determination of quantities of water and discharge rates based on the largest theoretical aeroplane in a given category is available in Chapter 2 of the Airport Services Manual (Doc 9137), Part 1.

AC 4.9.4 Rescue and firefighting: Response time

(See AGA 3 para 4.9.4)

- a) Response time is considered to be the time between the initial call to the rescue and firefighting service, and the time when the first responding vehicle(s) is (are) in position to apply foam at a rate of at least 50 per cent of the discharge rate specified in Table 4.
- b) Optimum visibility and surface conditions are defined as daytime, good visibility, no precipitation with normal response route free of surface contamination, e.g. water, fog, ash, sand, mud.

Additional guidance is available in the Airport Services Manual (Doc 9137), Part 1.

In addition to the provisions of the *Airport Services Manual* (Doc 9137), Part I, on rescue and firefighting training, this AC states some acceptable standards for the compliance of the 21B.319 (j) norm, originally from National Fire Protection Association (NFPA) and the Federal Aviation Administration (FAA), both from the United States of America.

NFPA 402 Guide for Aircraft Rescue and Firefighting Operations

NFPA 405 Proficiency Training of Aircraft Rescue Firefighting Personnel

FAA-AC 150/521B0-7 Aircraft Rescue and Fire Communications

FAA-AC 150/521B0-17 Programme for Training of Aircraft Rescue and Firefighting Personnel

FAA-AC 150/5220-17 Design Standards for an Aircraft Rescue and Firefighting Training Facility

Fires associated with fuel discharged under very high pressure from a ruptured fuel tank are known as “pressure-fed fuel fires”.

Guidance material to design training programmes on human performance and team coordination can be found in the Human Factors Training Manual (Doc 9683).

Guidance on the use of a task resource analysis can be found in the Airport Services Manual (Doc 9137), Part 1.

Aerodrome service roads may serve as emergency access roads when they are suitably located and constructed.



Special firefighting equipment need not be provided for water areas; this does not prevent the provision of such equipment if it would be of practical use, such as when the areas concerned include reefs or islands.

The objective is to plan and deploy the necessary life-saving flotation equipment as expeditiously as possible in a number commensurate with the largest aeroplane normally using the aerodrome.

Additional guidance is available in Chapter 13 of the Airport Services Manual (Doc 9137), Part 1.

AC 4.9.9 Rescue and firefighting: operational requirements

(See AGA 3 para 4.9.9)

Besides of the ICAO provisions in the *Airport Services Manual* (Doc 9137), Part 1, on the location and specifications on the rescue and firefighting station, this AC states some acceptable standards originally from the National Fire Protection Association (NFPA) and the Federal Aviation Administration (FAA), both from the United States of America.

NFPA 403 Aircraft Rescue and Firefighting Services at Airports

FAA-AC 150/521B0-15 Airport Rescue and Firefighting Station Building Design

AC 4.12 Aerodrome emergency planning

(See AGA 3 para 4.12)

Aerodrome emergency planning is the process of preparing an aerodrome to cope with an emergency occurring at the aerodrome or in its vicinity. The objective of aerodrome emergency planning is to minimize the effects of an emergency, particularly in respect of saving lives and maintaining aircraft operations. The aerodrome emergency plan sets forth the procedures for coordinating the response of different aerodrome agencies (or services) and of those agencies in the surrounding community that could be of assistance in responding to the emergency.

Guidance material and standard procedures for the development of the aerodrome emergency plan are given in the ICAO *Airport Services Manual* (Doc 9137), part 7 and the advisory circular joint FAA AE 150/5200-31 A.

Examples of emergencies are: aircraft emergencies, sabotage including bomb threats, unlawfully seized aircraft, dangerous goods occurrences, building fires, natural disaster and public health emergencies.

Examples of public health emergencies are increased risk of travellers or cargo spreading a serious communicable disease internationally through air transport and severe outbreak of a communicable disease potentially affecting a large proportion of aerodrome staff.

Guidance material on Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).

The plan includes all participating agencies and associated equipment.

The purpose of a full-scale exercise is to ensure the adequacy of the plan to cope with different types of emergencies. The purpose of a partial exercise is to ensure the adequacy of the response to individual participating agencies and components of the plan, such as the communications system. The purpose of modular tests is to enable concentrated effort on specific components of established emergency plans.

Guidance material on airport emergency planning is available in the Airport Services Manual (Doc 9137), Part 7.

Guidance material on assessing approach and departure areas within 1 000 m of runway thresholds can be found in Chapter 13 of the Airport Services Manual (Doc 9137), Part 1.

AC 4.13 Handling and storage of hazardous materials

(See AGA 3 para 4.13)

Besides of the ICAO provisions in the *Airport Services Manual* (Doc 9137), Part 1, Chapter 16, this AC states some acceptable standards for the compliance of standards on the facilities design, equipment and storage systems, fuel handling and dispensing, originally from the National Fire Protection Association (NFPA) and the Federal Aviation Administration (FAA), both from the United States of America.

NFPA 10 Standards for Portable Fire Extinguishers

NFPA 30 Flammable and Combustible Liquid Code



NFPA 385	Tank Vehicles for Flammable and Combustible Liquids
NFPA 408	Aircraft Hand Portable Fire Extinguishers
NFPA 407	Aircraft Fuel Servicing
NFPA 415	Standard on Airport Terminal Buildings, Fuelling Ramp Drainage, and Loading Walkways
FAA-150/5230-4	Aircraft Fuel Storage, Handling and Dispensing on Airports

AC 4.14 Guidance on an aerodrome safety management system

(See AGA 3 para 4.14)

The intent of a safety management system is to have in place an organised and orderly approach in the management of aerodrome safety by the aerodrome operator. CAR SMS - Safety Management Systems contains the safety management provisions applicable to certified aerodromes. Guidance on a harmonized safety management system is given in the Safety Management Manual (SMM) (Doc 9859) and in the Manual on Licensing of Aerodromes (Doc 9774). Procedures on the management of change, conduct of safety assessment, reporting and analyses of safety occurrences at aerodromes and continuous monitoring to enforce compliance with applicable specifications so that identified risks are mitigated can be found in the PANS-Aerodromes (Doc 9981).

The aerodrome operator shall also identify the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the SMS. Safety responsibilities, accountabilities and authorities shall be documented and communicated throughout the organisation, and shall include a definition of the levels of management with authority to make decisions regarding safety risk tolerability.

The Aerodrome Emergency Plan, shall be part of the structure of the Aerodrome *Safety Management System Manual* (SMSM) and it establishes, in writing, the actions to be adopted after an accident and designates the accountable individuals. The aim of an Aerodrome Emergency Plan is to ensure an efficient and organised transition from normal to emergency operations including delegating emergency authorities and responsibilities. The authorisation for the measures to be taken by key personnel is also part of the plan; as well as the activity coordination with the emergency response. The general objective is continuing the operations under safe conditions or returning to normal operations as soon as possible.

AC 4.15 Safety Audits and Inspections

(See AGA 3 para 4.15)

Guidance on carrying out daily inspections of the movement area is given in the Airport Services Manual (Doc 9137), Part 8 and in the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476).

Examples of agencies are:

- on the aerodrome: air traffic control units, rescue and firefighting services, aerodrome administration, medical and ambulance services, aircraft operators, security services, and police;
- off the aerodrome: fire departments, police, health authorities (including medical, ambulance, hospital and public health services), military, and harbour patrol or coast guard.

Public health services include planning to minimize adverse effects to the community from health-related events and deal with population health issues rather than provision of health services to individuals.

AC 4.16 Vehicles

(See AGA 3 para 4.16)

Ground Vehicle Operations on Airports (Doc AC 150/521B0-20) offers acceptable standards.

a) Objective.

This AC offers guidance for standard identification of vehicles used on the airside of the aerodrome.

b) Definitions.

- 1) Vehicles: Any means of transport used for transportation or assistance for people, cargo, equipping, maintenance, construction, services or security related tasks.



- 2) Airport (airfield) service vehicles: Those vehicles routinely used for service, maintenance or construction of the aerodrome such as runway sweepers, tractors or any other vehicle of the same category.
- 3) Aircraft support vehicles: Those vehicles commonly used to support aircraft operations such as: towing tractors, baggage tow tractors, air conditioning units, road tankers and any other transport of the same category.
- 4) Other vehicles: Those vehicles not commonly used in the aerodrome operations such as ambulances, rescue and firefighting vehicles and security vehicles.

c) Colours

- 1) Ambulances: They shall be coloured according to the dispositions of the corresponding authority (Red Cross).
- 2) Rescue and firefighting vehicles: Yellowish green is the standard colour for aerodromes. This colour provides optimal visibility in different luminance levels throughout the 24 hours of the day.
- 3) Airport Service vehicles: Chrome yellow is the standard colour for vehicles. If they have a bar type bumper of 20 cm or more, they shall be coloured with black and yellow alternating contrasting bands and they shall have 10 cm in width with 45° inclination.
- 4) Security and aircraft support vehicles: Any colour combination except yellowish green or chrome yellow. The recommendation related to bumpers in the previous paragraph is also applicable.
- 5) Other vehicles: Any colour or combination

d) Markings

- 1) Ambulances: They shall be marked according to the dispositions of the corresponding authority (Red Cross).
- 2) Rescue and firefighting, service, aircraft support and security vehicles: They shall have an identification number contrasting with the colour of the vehicle on the sides and top (the cabin is considered the top of the vehicle). The side numbers shall be appropriately located and at a minimum height of 40 cm. Numbers on the top shall be at least 60 cm high facing forward the vehicle. To improve night recognition, a horizontal reflective band of 20 cm in width shall be painted or added across the vehicle. Additionally, it shall have the name of the aerodrome, the company or logo.
- 3) Other vehicles: Vehicles which usually do not access the manoeuvring area or which are not in contact with ATS, shall be provided with an easily visible flag attached to the vehicle. The flag shall be at least 90 cm², with a chequered pattern of 30 cm in orange and white. Moreover, they shall be equipped with two-way radios to communicate with ATS. At aerodromes without ATS, the flag shall be provided on the vehicle.

d) Lighting

The standard light to identify vehicles operating in the airfield, either at night or when visibility is low, shall be the rotating beacon or flashing light, on top of the highest part of the vehicle and visible from any direction, even from the air. Vehicles, which not operate normally in the airfield, shall be identified with a light during low visibility periods or be escorted by a properly identified vehicle.

Characteristics:

- 1) Headlamp or flashing lights shall have low luminous intensity, with a boundary of 400 cd to avoid interference of night vision. The minimum interference intensity at horizontal plane shall be 40 cd.
- 2) Azimuthal horizontal coverage of 360°
- 3) For flashing lights, the flash range shall be between 75 ± 15 per minute.



Colour:

- 1) Ambulances: as provided by the corresponding authority (Red Cross).
- 2) Rescue and firefighting vehicles: Flashing-red lights, red and white flashing combination or rotating beacon if the station is close to the apron.
- 3) Service vehicles: Flashing-yellow lights.
- 4) Aircraft support vehicles: Yellow or red rotating beacons.
- 5) Security vehicles: Flashing-blue lights or a red and blue flashing combination.
- 6) Other vehicles: Flashing-yellow lights.
- 7) Other requirements:
 - I) Permission or security seal issued by the aerodrome operator
 - II) Technical review approval by the airport operator
 - III) Copy of the vehicle insurance policy

AC 4.17 Control of obstacles

(See AGA 3 para 4.17)

The *Airport Services Manual* (Doc 9137), Part 6: obstacle limitation surfaces, and ICAO's Doc PANS-OPS establish the implementation criteria on obstacle limitation surfaces, particularly for operating aerodromes.

AC 4.19 Public protection

(See AGA 3 para 4.19)

- a) The perimeter of the airside as well as the restricted security area shall be outlined and protected with physical barriers. However, as the perimeter of a restricted security area is adjacent to open areas, including the airside, these perimeter sections shall be patrolled or be kept under surveillance to ensure that any non-authorized access is detected and intruders may be promptly arrested before they have access to aircraft or other essential facilities.
- b) All airside shall be protected, whether they are part of the restricted security areas or not, by separating them from adjacent landside through fences or other effective security means.
- c) Fencing shall be at least 2.44 meters high. Supporting pipes shall have an angle of 45° to prevent possible access. In addition, fencing shall have at least 4 barbed wires or razor wire type.
- d) In some places, where a fence or barrier may become an obstacle for safety, it may not be possible to build fences or barriers that fully meet safety conditions; for example, near navigation systems and approach or take-off areas. In such cases, special non-metallic fencing materials or construction methods such as frangible fences including plants or thorny bushes combined with intrusion detection equipment and surveillance may be required.
- e) Each building located in the perimeter of the security restricted area, or which leads to that area, shall be protected enough to ensure that no one may access it through, or over, that building without authorisation. This requires that all open areas, such as windows or vents which may allow access to security restricted areas, shall be protected with locks and provided with barriers, grilles and wire mesh. The roof of the building may be a possible route for unauthorised access and shall be protected in a similar manner, especially when building cables are attached to the perimeter fence of the security restricted area.
- f) Places where there are land characteristics such as water areas, barriers, etc. in the airfield or the perimeter of the security restricted area shall be as protected as the fencing. It is necessary to take care of transitional areas, from fences to natural barriers, to ensure the integrity of the perimeter. In case of navigable watercourses, they shall be patrolled by boats, in addition to regular patrols along the shore.



AC 4.20 Protection against wildlife strike hazards
(See AGA 3 para 4.20)

The presence of wildlife (birds and animals) on and in the aerodrome vicinity poses a serious threat to aircraft operational safety.

- a) Appropriate guidance on wildlife strike hazard is given in ICAO *Airport Services Manual*, Part 3. DOC 4332-1815 contains the *Bird Strike Information System* (IBIS) to notify ICAO.
- b) The IBIS is designed to collect and disseminate information on wildlife strikes to aircrafts. Information on the system is included in the Manual on the ICAO *Bird Strike Information System* (IBIS) (Doc 9332).

AC 4.21.4(c) Notifying and reporting about aerodrome conditions
(See AGA 3 para 4.21.4(c))

Nature, format and conditions of the information to be provided are specified in CAR AIS and PANS-ATM (Doc 4444).

Other contaminants may include mud, dust, sand, volcanic ash, oil and rubber. Procedures for monitoring and reporting the conditions of the movement area are included in the PANS-Aerodromes (Doc 9981).

The determination that a runway or portion thereof may be slippery when wet is not based solely on the friction measurement obtained using a continuous friction measuring device. Supplementary tools to undertake this assessment are described in the *Airport Services Manual* (Doc 9137), Part 2.

The surface friction characteristics of a runway or a portion thereof can be degraded due to rubber deposits, surface polishing, poor drainage or other factors. The determination that a runway or portion thereof is slippery wet stems from various methods used solely or in combination. These methods may be functional friction measurements, using a continuous friction measuring device, that fall below a minimum standard as defined by the State, observations by aerodrome maintenance personnel, repeated reports by pilots and aircraft operators based on flight crew experience, or through analysis of aeroplane stopping performance that indicates a substandard surface. Supplementary tools to undertake this assessment are described in the PANS-Aerodromes (Doc 9981).

Guidance on training criteria is included in the *Airport Services Manual* (Doc 9137), Part 8, Chapter 7.

The *Aeroplane Performance Manual* (Doc 10064) provides guidance on aircraft performance calculation requirements regarding the description of runway surface conditions.

Origin and evolution of data, assessment process and the procedures are prescribed in the PANS-Aerodromes (Doc 9981). These procedures are intended to fulfil the requirements to achieve the desired level of safety for aeroplane operations prescribed by CAR OPS 1 and to provide the information fulfilling the syntax requirements for dissemination specified in Annex 15 and the PANS-ATM (Doc 4444).

AC 4.21.9 Notifying and reporting about aerodrome conditions
(See AGA 3 para 4.21.9)

- a) The runway surface conditions are those conditions for which, by means of the methods described in the PANS-Aerodromes (Doc 9981), the flight crew can derive appropriate aeroplane performance.
- b) The conditions, either singly or in combination with other observations, are criteria for which the effect on aeroplane performance is sufficiently deterministic to allow assignment of a specific runway condition code.
- c) The terms CHEMICALLY TREATED and LOOSE SAND do not appear in the aeroplane performance section but are used in the situational awareness section of the runway condition report.
- d) Procedures on depth and coverage reporting are found in the PANS-Aerodromes (Doc 9981).
- e) Surface friction characteristics of a runway or a portion thereof can be degraded due to rubber deposits, surface polishing, poor drainage or other factors. The determination that a runway or portion thereof is slippery wet stems from various methods used solely or in combination. These methods may be functional friction measurements, using a continuous friction measuring device, that fall below a minimum standard as defined by the State, observations by aerodrome maintenance personnel, repeated reports by pilots and aircraft operators based on flight crew experience, or through analysis of aeroplane stopping performance that indicates a substandard surface. Supplementary tools to undertake this assessment are described in



the PANS-Aerodromes (Doc 9981).

- f) Guidance on determining and expressing the minimum friction level is provided in the ICAO Circular 329 – Assessment, Measurement and Reporting of Runway Surface Conditions.
- g) Procedures on conducting a runway surface friction characteristics evaluation programme are provided in the PANS-Aerodromes (Doc 9981).
- h) Information to be promulgated in a NOTAM includes specifying which portion of the runway is below the minimum friction level and its location on the runway.

AC 4.23 Apron management service

(See AGA 3 para 4.23)

ICAO *Airport Services Manual*, Part 8, and the *Manual of Surface Movement Guidance and Control Systems* (SMGCS), offer guidance on apron management service.

Guidance on related special procedures is given in the *Manual of Surface Movement Guidance and Control Systems* (SMGCS) (Doc 9476).

See the *Airport Services Manual* (Doc 9137), Part 5: It provides guidance and standardised procedures on the development of the disabled aircraft movement and removal plan.

The Director General, in exercise of the powers conferred by Section 17(1) of the Civil Aviation Authority Bahamas Act, 2021 (*No. 2 of 2021*) hereby issues the foregoing amended regulation.

Issued the 1st day of July 2021

An electronic signature in black ink is written over a semi-transparent watermark of the CAAB logo. Below the signature, the text 'Electronic Signature for Alexander B. Ferguson' is printed.

Electronic Signature
for
Alexander B. Ferguson

**(for) DIRECTOR GENERAL
CIVIL AVIATION AUTHORITY BAHAMAS**



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