United Kingdom

Civil Aviation Authority

Official Record Series 9

CAA Decision adopting AMC, GM and CS for UK Regulation (EU) No. 139/2014 (Aerodromes)

DECISION No. 0059

Publication date: 23 January 2026

Background

1. CAA UK-EU Transition Decision No. 1 adopted a form of Acceptable Means of Compliance ("AMC") as means by which the requirements in assimilated law, UK Regulation (EU) No. 139/2014, could be met. That decision also adopted Guidance Material ("GM") as non-binding explanatory and interpretation material on how to achieve the requirements in UK Reg (EU) No. 139/2014. That decision also adopted Certification Specifications ("CS") as non-binding technical standards that may be used to meet the requirements in UK Reg (EU) No. 139/2014.

2. By this decision the Civil Aviation Authority ("the CAA") is amending and adopting the relevant AMC, GM and CS.

3. The changes are being made for the following reasons:

    a) To reflect the ICAO change to the reporting method of pavement bearing strength from Aircraft Classification Number (ACN) and Pavement Classification Number (PCN) to Aircraft Classification Rating (ACR) and Pavement Classification Rating (PCR) which became applicable on 28 November 2024.

    b) To align AMC1 ADR.OR.D.005(b)(11) to AMC1 ADR.AR.B.005(a)(4) for the adjustment of the CAA aerodrome compliance monitoring schedule from 36 months to 48 months.

    c) To align UK Reg (EU) No. 139/2014 to a UK difference which the UK has filed with ICAO relating to the placement of runway edge and stopway lighting.

d) To incorporate changes stemming from Amendment 15 to ICAO Annex 14, 'Aerodromes', Volume I 'Aerodrome Design and Operations' (ICAO State Letter AN 4/1.2.28-20/35 and editorial amendments).

e) Further changes include:

- new text regarding Instrument Runway Visual Range (IRVR) interfaces;
- new text regarding pilot-controlled lighting (PCL);
- new Certification Standard regarding Engineered Materials Arresting Systems (EMAS); and
- an update to the guidance material for the medical assessment criteria for firefighters.

f) Incorporation of text from CAP 1168 in respect of emergency exercises and emergency planning which aligns the regulation to current UK practices.

Note: The CAP 1168 derived text has not been subject to consultation because the practices are already employed, and consultation is deemed not necessary, and industry is expecting the update.

g) To make editorial corrections and standardise the AMC/GM and paragraph numbering.

Decision

4. The CAA, under Article 76(3) of UK Regulation (EU) 2018/1139, has decided to amend and adopt the AMC, GM and CS attached at Schedule 1.

5. This AMC, GM and CS supplements and/or replaces that which was adopted for UK Reg (EU) No. 139/2014 (Aerodromes) by CAA UK-EU Transition Decision No. 1 dated 22 December 2020 and any subsequent decisions.

6. The AMC, GM and CS attached at Schedule 1 to this Decision come into force on 31 January 2026.

7. This Decision will remain in force unless revoked or amended by the CAA.

Definitions

8. All references to Regulations are to assimilated law pursuant to the Retained EU Law (Revocation and Reform) Act 2023.

Rob Bishton
For the Civil Aviation Authority

Date of Decision: 20 January 2026
Date of Decision Coming into force: 31 January 2026

Schedule 1

Includes the Acceptable Means of Compliance (AMC) and Guidance Material (GM) referenced below.

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

(a) ~~Text to be deleted is shown struck through~~;

(b) New text is highlighted in grey;

(c) ~~Text to be deleted is shown struck through~~ followed by the replacement text which is highlighted in grey;

(d) […] Text not shown for brevity.

UK Regulation (EU) No. 139/2014, Aerodromes

GM2 ADR.AR.C.035(a) is amended as follows:

GM2 ADR.AR.C.035(a) Issuance of certificates

NOMINATED PERSONS - INTERVIEW WITH THE APPOINTED ACCOUNTABLE MANAGER, AND NOMINATED PERSONS

(a) Possible cases where an interview/meeting with nominated persons may be necessary are amongst others:

(~~a~~1) start of operations before issuing a first certificate for an aerodrome; and

(~~b~~2) change of nominated persons at an aerodrome already certified.

(b) Purpose of the meeting

(1) The aim of the interview and exchange of information between the intended nominated persons and the CAA is~~,~~ for the latter to acquire information on the intended work areas of the nominated persons and their respective competence level so as to verify their suitability for the posts.

(2) The purpose of the information exchange is to create good contact and understanding between the both parties, and to come to a mutual conclusion on, if necessary, possible solutions for training and personal development over time.

(c) Possible agenda items:

(~~a~~1) information from the CAA on organisation and mission of the CAA, the regulatory framework, and specifically Safety Management System requirements;

(~~b~~2) information from the nominated person concerning the intended work area;

(~~c~~3) enforcement methodology of the CAA;

(~~d~~4) the role and responsibility of the ~~accountable manager/operational services manager/maintenance manager/~~ accountable manager / operational services manager / maintenance manager / safety manager or other nominated persons;

(~~e~~5) expected competence requirement of the nominated person in relation to present personal status and experience presented in a CV or equivalent documentation;

(~~f~~6) interview/discussion concerning depth of knowledge, and understanding of the applicable legislation;

(~~g~~7) the role and responsibility of the CAA and of the nominated person;

(~~h~~8) understanding of aviation in general and for the specific nominated post, how operators/activities at the aerodrome including Air Navigation Service Providers, and other aviation activities can impact aircraft safety; and

(~~i~~9) distribution of delegated powers depending on the organisational situation.

AMC1 ADR.OR.D.005(b)(11) is amended as follows:

AMC1 ADR.OR.D.005(b)(11) Management system

[…]

(e) Compliance monitoring — audit scheduling

[…]

(3) After that, the aerodrome operator should consider the results of its safety (risk) assessments and of its past compliance monitoring activities, in order to adapt the calendar period within which an audit or a series of audits should be conducted, to cover the whole aerodrome, its management system key processes, procedures and its operation in a manner, and at intervals, set out in the aerodrome manual. This calendar period should be consistent with the relevant CAA's oversight planning cycle and may be increased, up to ~~36~~48 months, in coordination with the CAA, provided that there are no level 1 findings, and subject to the aerodrome operator having a good record of rectifying findings in a timely manner.

AMC3 ADR.OR.E.005 is amended as follows:

AMC~~3~~2 ADR.OR.E.005 Aerodrome manual

AERODROME MANUAL

(a) The aerodrome manual should have the following structure, and include, at least, the following information; if an item is not applicable, the indication 'Not applicable' or 'Intentionally blank' should be inserted, along with the relevant reason:

[…]

D. PART D — PARTICULARS OF THE AERODROME REQUIRED TO BE REPORTED TO THE AERONAUTICAL INFORMATION SERVICE

[…]

6. Aerodrome dimensions and related information, inducing the following:

[…]

6.8 pavement surface type and bearing strength using the Aircraft Classification ~~Number~~ Rating— Pavement Classification ~~Number~~ Rating (~~ACN-PCN~~ ACR-PCR) method;

[…]

GM1 ADR.OR.E.005 is amended as follows:

GM1 ADR.OR.E.005 Aerodrome manual

AERODROME MANUAL

(a) Form of the aerodrome manual

(1) The aerodrome manual is a key document both for the aerodrome operator and for the CAA. The manual is the source document describing how the aerodrome infrastructure, facilities, and operational procedures will operate safely.

(2) As well as the operational procedures, the CAA will expect the aerodrome manual to be an accurate reflection of the day-to-day functioning of the aerodrome's safety management system, and its safety culture. It will need to show how the aerodrome intends to measure its performance against safety targets and objectives. The reader of an aerodrome manual should be given a clear statement of how safety is developed, managed, and maintained on the aerodrome. All safety policies, operational procedures and instructions should be contained in detail when relevant or cross-referenced to other controlled, formally accepted or recognised, publications.

(3) At larger aerodromes, the size and complexity of operations, and related procedures may dictate that these procedures could not easily be included in a single document. In such circumstances, it is acceptable to identify and reference within the aerodrome manual the procedures which are not included within it. If this system is to be successful, it is essential that any referenced information, documentation, and procedures are made available as necessary to all operational staff in a similar way as the aerodrome manual itself. For that purpose, a computerised database containing the referenced procedures and information could be suitable. For many small aerodromes, the aerodrome manual can be both simple and brief as long as it covers procedures essential for satisfactory day-to-day operations. Nevertheless, it is possible to adopt a

common format embracing the essential elements that define a safety management system.

(b) Purpose of the aerodrome manual

(1) An efficient management structure and a systematic approach to aerodrome operation is essential. The aerodrome manual should contain all the relevant information to describe this structure satisfactorily. It is one of the means by which all relevant operating staff can be informed as to their duties and responsibilities with regard to safety. It should describe the aerodrome infrastructure, services and facilities, all operating procedures, and any restrictions on aerodrome availability.

(2) Accountability for safety must start at the very top of any organisation. One of the key elements in establishing safe working practices is the 'top down' approach where all staff should understand the safety aims of the organisation, the chain of command, and their own responsibilities and accountabilities. As safety management principles are applied, the aerodrome manual should be expanded to describe clearly how the safety of operations is to be managed. To a reader or user of the aerodrome manual, there should never be any doubt in terms of 'safety accountability' for each domain or activity described. Each section should define who is accountable, who is responsible, who has the authority, who has the expertise, and who actually carries out the tasks described in any section.

(3) The ~~principle~~ principal objective of an aerodrome manual should be to show how management will accomplish its safety responsibilities. The aerodrome manual will set out the policy and expected standards of performance, and the procedures by which they will be achieved.

(4) The aerodrome operator should ensure that:

(~~1~~i) the responsibilities of the aerodrome operator are clearly described;

(~~2~~ii) the tasks and activities that are to be performed by the aerodrome operator or its subcontractors are listed; and

(~~3~~iii) the means and procedures in order to complete these tasks and activities are described or appended, together with the necessary details on their frequencies and operating modes.

(5) Where responsibilities are attributed to other stakeholders, the aerodrome manual should clearly identify them.

GM2 ADR.OR.E.005 is amended as follows:

GM2 ADR.OR.E.005 Aerodrome manual

CONTENTS

The numbering system described in AMC~~3~~2 ADR.OR.E.005 should be maintained even if there are sections that, because of the nature of the aerodrome or the types of operation, are not applicable.

AMC2 ADR.OR.E.005(i)(2) is amended as follows:

AMC~~2~~1 ADR.OR.E.005(i)(2) Aerodrome manual

LANGUAGE OF THE AERODROME MANUAL

[…]

GM1 ADR.OPS.A.005 is amended as follows:

GM1 ADR.OPS.A.005 Aerodrome data

AERODROME REFERENCE POINT

(a) The aerodrome reference point should be located near the initial or planned geometric centre of the aerodrome and normally should remain where first established.

(b) The aerodrome reference point should be measured and reported to the aeronautical information services in degrees, minutes, and seconds.

~~**AERODROME AND RUNWAY ELEVATIONS**~~

~~The following should be measured and reported to the aeronautical information services:~~

~~(a) The aerodrome elevation and geoid undulation at the aerodrome elevation position to the accuracy of one-half metre or foot;~~

~~(b) For non-precision approaches, the elevation and geoid undulation of each threshold, the elevation of the runway end and any significant high and low intermediate points along the runway, to the accuracy of one-half metre or foot;~~

~~(c) For precision approach runway, the elevation and geoid undulation of the threshold, the elevation of the runway end and the highest elevation of the touchdown zone, to the accuracy of one-quarter metre or foot.~~

~~**AERODROME REFERENCE TEMPERATURE**~~

~~(a) The aerodrome reference temperature should be determined in degrees Celsius.~~

~~(b) The aerodrome reference temperature should be the monthly mean of the daily maximum temperatures for the hottest month of the year (the hottest month being~~

that which has the highest monthly mean temperature), averaged over a period of five (5) years.

AERODROME DIMENSIONS AND RELATED INFORMATION

The following data are measured or described, as appropriate, for each facility provided on the aerodrome:

(a) Runway

(1) true bearing to one-hundredth of a degree;

(2) designation number;

(3) length;

(4) width;

(5) displaced threshold location to the nearest metre or foot;

(6) longitudinal slope;

(7) surface type;

(8) type of runway; and

(9) for a precision approach runway category I, the existence of an obstacle free zone when provided.

(b) Strip/Runway End Safety Area/Stopway

(1) Length, width to the nearest metre or foot;

(2) Surface type; and

(3) Arresting system – location (which runway end) and description.

(c) Taxiway

(1) Designation;

(2) Width; and

(3) Surface type.

(d) Apron

(1) Surface type; and

(2) Aircraft stands.

(e) The boundaries of the air traffic control service;

(f) Clearway

(1) length to the nearest metre or foot; and

(2) ground profile.

(g) Visual aids for approach procedures, marking and lighting of runways, taxiways and aprons, other visual guidance and control aids on taxiways and aprons,

including runway holding positions, intermediate holding positions and stopbars, and location and type of visual docking guidance systems;

(h) Location and radio frequency of any VOR aerodrome checkpoint;

(i) Location and designation of standard taxi-routes;

(j) Distances to the nearest metre or foot of localiser and glide path elements comprising an instrument landing system (ILS) or azimuth and elevation antenna of a microwave landing system (MLS) in relation to the associated runway extremities;

(k) The geographical coordinates of:

(1) each threshold;

(2) appropriate taxiway centre line points; and

(3) each aircraft stand;

are measured and reported to the aeronautical information services in degrees, minutes, seconds and hundredths of seconds.

STRENGTH OF PAVEMENTS

(a) The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5 700 kg should be made available using the aircraft classification — pavement classification number (ACN–PCN) method, by reporting all of the following information:

(1) the pavement classification number (PCN);

(2) pavement type for ACN-PCN determination;

(3) subgrade strength category;

(4) maximum allowable tire pressure category or maximum allowable tire pressure value; and

(5) evaluation method.

(b) For the purposes of determining the ACN, the behaviour of a pavement should be classified as equivalent to a rigid or flexible construction;

(c) Information on pavement type for ACN-PCN determination, subgrade strength category, maximum allowable tire pressure category and evaluation method, should be reported using the following codes:

(1) Pavement type for ACN-PCN determination:

(i) Rigid pavement: Code R;

(ii) Flexible pavement: Code F;

(2) Subgrade strength category:

(i) High strength: characterised by K = 150 MN/m^3 and representing all K values above 120 MN/m^3 for rigid pavements, and by CBR = 15 and

representing all CBR values above 13 for flexible pavements — Code A;

(ii) Medium strength: characterised by K = 80 MN/m3 and representing a range in K of 60 to 120 MN/m^3 for rigid pavements, and by CBR = 10 and representing a range in CBR of 8 to 13 for flexible pavements — Code B;

(iii) Low strength: characterised by K = 40 MN/m^3 and representing a range in K of 25 to 60 MN/m^3 for rigid pavements, and by CBR = 6 and representing a range in CBR of 4 to 8 for flexible pavements — Code C;

(iv) Ultra low strength: characterised by K = 20 MN/m^3 and representing all K values below 25 MN/m^3 for rigid pavements, and by CBR = 3 and representing all CBR values below 4 for flexible pavements — Code D;

(3) Maximum allowable tire pressure category:

(i) Unlimited: no pressure limit — Code W;

(ii) High: pressure limited to 1.75 MPa — Code X;

(iii) Medium: pressure limited to 1.25 MPa — Code Y;

(iv) Low: pressure limited to 0.50 MPa — Code Z;

(4) Evaluation method:

(i) Technical evaluation: representing a specific study of the pavement characteristics and application of pavement behaviour technology — Code T;

(ii) Using aircraft experience: representing a knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use — Code U;

(d) The bearing strength of a pavement intended for aircraft of apron (ramp) mass equal to or less than 5 700 kg, should be reported by reporting the following information:

(1) maximum allowable aircraft mass; and

(2) maximum allowable tire pressure.

PRE-FLIGHT ALTIMETER CHECK LOCATION

(a) One or more pre-flight altimeter check locations should be established.

(b) The elevation of a pre-flight altimeter check location should be given as the average elevation, rounded to the nearest metre or foot, of the area on which it is located. The elevation of any portion of a pre-flight altimeter check location should be within 3 m (10 ft) of the average elevation for that location.

(c) Pre-flight check location could be located on an apron. Locating a pre-flight altimeter check location on an apron enables an altimeter check to be made prior to obtaining taxi clearance and eliminates the need for stopping for that purpose

after leaving the apron. Normally an entire apron could serve as a satisfactory altimeter check location.

DECLARED DISTANCES

(a) The following distances should be calculated to the nearest metre or foot for a runway and reported to the aeronautical information services and Air Traffic Services:

(1) Take-off run available (TORA);

(2) Take-off distance available (TODA);

(3) Accelerate stop distance available (ASDA); and

(4) Landing distance available (LDA).

(b) The take-off run available (TORA), take-off distance available (TODA), accelerate stop distance available (ASDA) and landing distance available (LDA) should be calculated according to the following (all declared distances are illustrated for operations from left to right):

(1) Where a runway is not provided with a stopway or a clearway and the threshold is located at the extremity of the runway, the four declared distances should normally be equal to the length of the runway

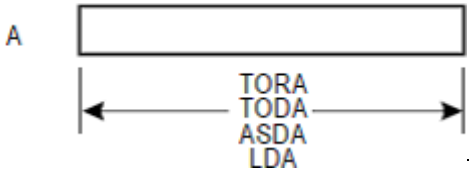


Figure 1

(2) When a runway is provided with a clearway (CWY), then the TODA will include the length of clearway.

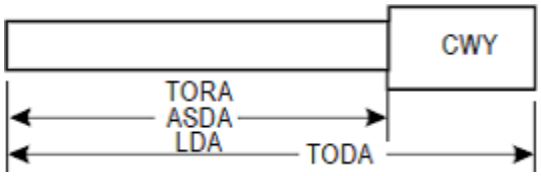


Figure 2

(3) Where a runway is provided with a stopway (SWY), then the ASDA will include the length of stopway.

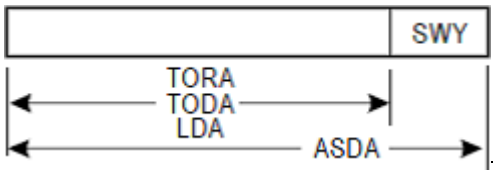
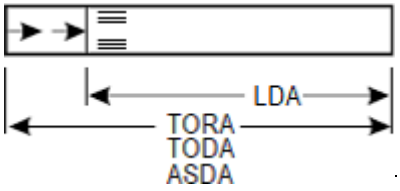


Figure 3

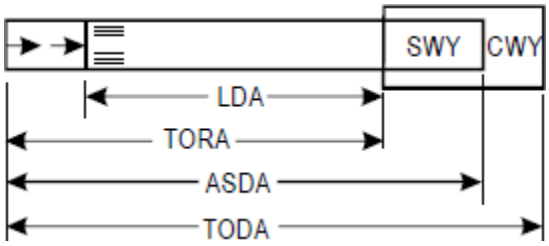
(4) Where a runway has a displaced threshold, then the LDA will be reduced by the distance the threshold is displaced. A displaced threshold affects only the

~~LDA for approaches made to that threshold; all declared distances for operations in the reciprocal direction are unaffected.~~



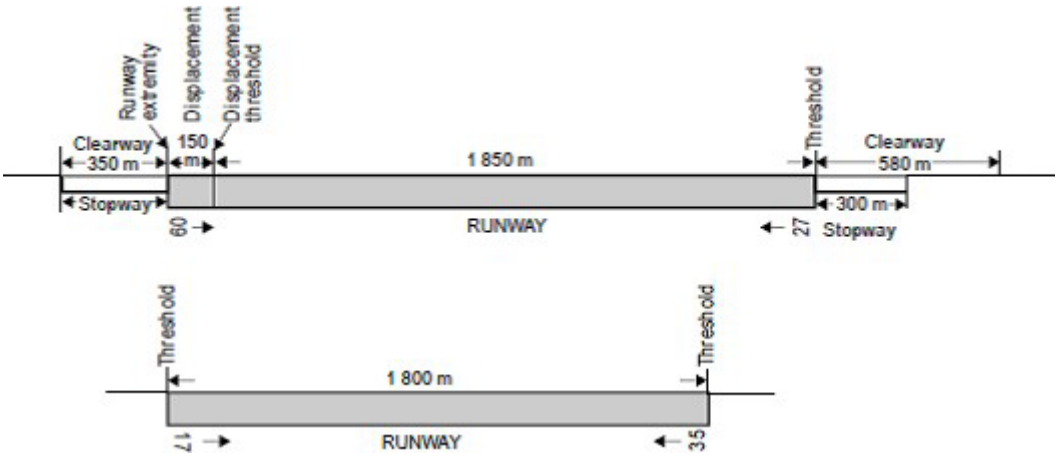
~~Figure 4~~

~~(5) Where a runway is provided with more than one of the clearway, stopway, or having a displaced threshold, then more than one of the declared distances will be modified. The modification will follow the same principle as in (1)–(4)~~



~~Figure 5~~

~~(c) The information on declared distances should be provided according to the following table:~~



~~Figure 6~~

~~RUNWAY~~	~~TORA~~	~~ASDA~~	~~TODA~~	~~LDA~~
	~~m~~	~~m~~	~~m~~	~~m~~
~~09~~	~~2 000~~	~~2 300~~	~~2 580~~	~~1 850~~
~~27~~	~~2 000~~	~~2 350~~	~~2 350~~	~~2 000~~
~~17~~	~~NU~~	~~NU~~	~~NU~~	~~1 800~~
~~35~~	~~1 800~~	~~1 800~~	~~1 800~~	~~NU~~

Table 1

If a runway direction cannot be used for take-off or landing, or both because it is operationally forbidden, then this should be declared and the words 'not usable' or the abbreviation 'NU' entered.

(d) When intersection take-offs are performed, the datum line from which the reduced runway declared distances for take-off are determined, should be defined by the intersection of the downwind edge as shown in the figure below:

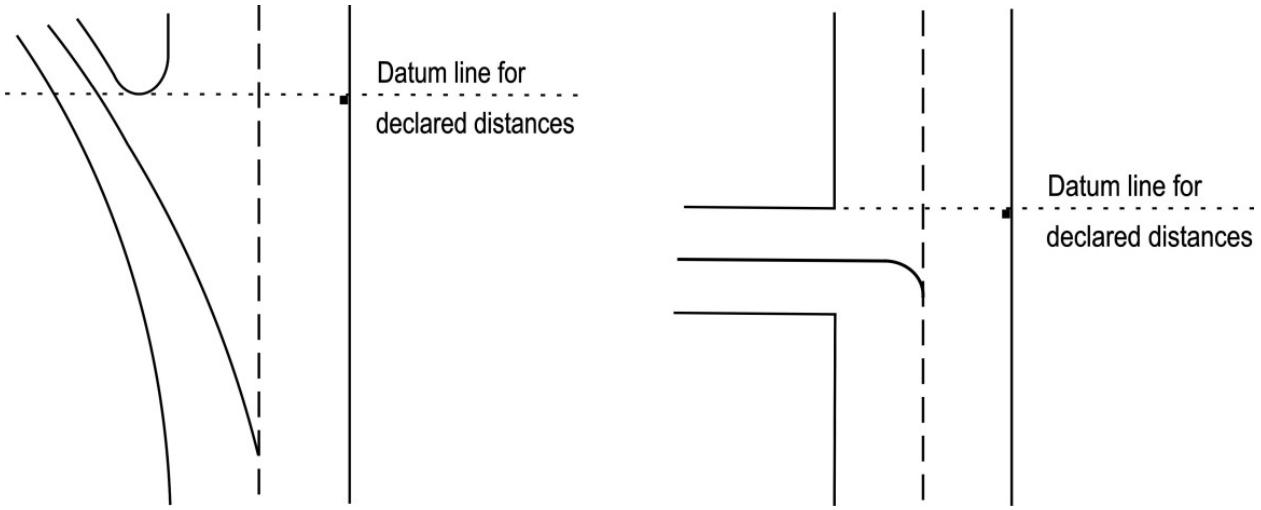


Figure 7

CONDITION OF THE MOVEMENT AREA AND RELATED FACILITIES

The condition of the movement area and the operational status of related facilities needs to be monitored and reported, on matters of operational significance affecting aircraft and aerodrome operations, particularly in respect of the following:

(a) construction or maintenance work;

(b) rough or broken surfaces on a runway, a taxiway or an apron;

(c) other temporary hazards, including parked aircraft;

(d) failure or irregular operation of part or all the aerodrome visual aids; and

(e) failure of the normal or secondary power supply.

DISABLED AIRCRAFT REMOVAL

(a) The contact details (telephone/telex number(s), email address, etc.) of the office of the aerodrome coordinator of operations for the removal of an aircraft disabled on or adjacent to the movement area should be made available on request to aircraft operators.

(b) Information concerning the capability to remove an aircraft disabled on or adjacent to the movement area should be made available.

(c) The capability to remove a disabled aircraft may be expressed in terms of the largest type of aircraft which the aerodrome is equipped to remove.

~~**RESCUE AND FIREFIGHTING**~~

~~(a) Information concerning the level of protection provided at an aerodrome for aircraft rescue and firefighting purposes during the hours of operation should be made available.~~

~~(b) The level of protection normally available at the aerodrome should be expressed in terms of the category of the rescue and firefighting services and in accordance with the types and amounts of extinguishing agents normally available at the aerodrome.~~

~~(c) Changes in the level of protection normally available at the aerodrome for rescue and firefighting should be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units should be advised accordingly.~~

~~(d) Changes in the level of protection from that normally available at the aerodrome could result from a change in the availability of extinguishing agents, equipment to deliver the agents or personnel to operate the equipment, etc.~~

~~(e) A change in the level of protection is expressed in terms of the new category of the rescue and firefighting services available at the aerodrome.~~

~~**VISUAL APPROACH SLOPE INDICATOR SYSTEMS**~~

~~The following information concerning a visual approach indicator system is made available:~~

~~(a) associated runway designation number;~~

~~(b) type of system; for a PAPI or APAPI installation, the side of the runway on which the lights are installed, i.e. left or right, is given;~~

~~(c) 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, is indicated;~~

~~(d) nominal approach slope angle(s); and~~

~~(e) minimum eye height(s) over the threshold of the on-slope signal(s).~~

The following GM2 ADR.OPS.A.005 is inserted:

GM2 ADR.OPS.A.005 Aerodrome data

AERODROME AND RUNWAY ELEVATIONS

The following should be measured and reported to the aeronautical information services:

(a) the aerodrome elevation and geoid undulation at the aerodrome elevation position to the accuracy of one-half metre or foot;

(b) for non-precision approaches, the elevation and geoid undulation of each threshold, the elevation of the runway end and any significant high and low

intermediate points along the runway, to the accuracy of one-half metre or foot; and

(c) for precision approach runway, the elevation and geoid undulation of the threshold, the elevation of the runway end and the highest elevation of the touchdown zone, to the accuracy of one-quarter metre or foot.

The following GM3 ADR.OPS.A.005 is inserted:

GM3 ADR.OPS.A.005 Aerodrome data

AERODROME REFERENCE TEMPERATURE

(a) The aerodrome reference temperature should be determined in degrees Celsius.

(b) The aerodrome reference temperature should be the monthly mean of the daily maximum temperatures for the hottest month of the year (the hottest month being that which has the highest monthly mean temperature), averaged over a period of five years.

The following GM4 ADR.OPS.A.005 is inserted:

GM4 ADR.OPS.A.005 Aerodrome data

AERODROME DIMENSIONS AND RELATED INFORMATION

The following data are measured or described, as appropriate, for each facility provided on the aerodrome:

(a) Runway

(1) true bearing to one-hundredth of a degree;

(2) designation number;

(3) length;

(4) width;

(5) displaced threshold location to the nearest metre or foot;

(6) longitudinal slope;

(7) surface type;

(8) type of runway; and

(9) for a precision approach runway category I, the existence of an obstacle free zone when provided.

(b) Strip / Runway End Safety Area / Stopway

(1) length, width to the nearest metre or foot;

(2) surface type; and

(3) arresting system – location (which runway end) and description.

(c) Taxiway

(1) designation;

(2) width; and

(3) surface type.

(d) Apron

(1) surface type; and

(2) aircraft stands.

(e) The boundaries of the air traffic control service.

(f) Clearway

(1) length to the nearest metre or foot; and

(2) ground profile.

(g) Visual aids and lights

(1) visual aids for approach procedures;

(2) marking and lighting of runways, taxiways and aprons;

(3) other visual guidance and control aids on taxiways and aprons, including runway holding positions, intermediate holding positions and stopbars; and

(4) location and type of visual docking guidance systems.

(h) Location and radio frequency of any VOR aerodrome checkpoint.

(i) Location and designation of standard taxi-routes.

(j) Distances to the nearest metre or foot of localiser and glide path elements comprising an instrument landing system (ILS) or azimuth and elevation antenna of a microwave landing system (MLS) in relation to the associated runway extremities.

(k) The geographical coordinates of:

(1) each threshold;

(2) appropriate taxiway centre line points; and

(3) each aircraft stand

are measured and reported to the aeronautical information services in degrees, minutes, seconds and hundredths of seconds.

The following GM5 ADR.OPS.A.005 is inserted:

GM5 ADR.OPS.A.005 Aerodrome data

STRENGTH OF PAVEMENTS

(a) **Pavements for Aircraft Greater Than 5 700 kg**

(1) The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5 700 kg should be made available using the aircraft classification rating — pavement classification rating (ACR–PCR) method, by reporting all of the following information:

(i) the pavement classification rating (PCR) and numerical value; and

(ii) pavement type for ACR-PCR determination.

(2) The pavement classification rating (PCR) reported should indicate that an aircraft with an aircraft classification rating (ACR) equal to or less than the reported PCR can operate on the pavement subject to any limitation on the tyre pressure, or aircraft all-up mass for specified aircraft type(s).

(3) The ACR of an aircraft shall be determined in accordance with the standard procedures associated with the ACR-PCR method.

(4) For the purposes of determining the ACR-PCR, the behaviour of a pavement should be classified as equivalent to a rigid or flexible construction.

(5) Information on pavement type for ACR-PCR determination, subgrade strength category, maximum allowable tyre pressure category and evaluation method should be reported using the following codes:

(i) Pavement type for ACN-PCN determination:

Pavement type	**Code**
Rigid pavement	R
Flexible pavement	F

Note: If the actual construction is composite or non-standard, include a note to that effect (see example 2 below).

(ii) Subgrade strength category:

Subgrade	**Code**
High strength; characterised by E = 200 MPa and representing all E values equal to or above 150 MPa, for rigid and flexible pavements.	A
Medium strength; characterised by E = 120 MPa and representing a range in E values equal to or above 100 MPa and strictly less than 150 MPa, for rigid and flexible pavements.	B

Subgrade	Code
Low strength; characterised by E = 80 MPa and representing a range in E values equal to or above 60 MPa and strictly less than 100 MPa, for rigid and flexible pavements.	C
Ultra-low strength; characterised by E = 50 MPa and representing all E values strictly less than 60 MPa, for rigid and flexible pavements.	D

(iii) Maximum allowable tyre pressure category:

Tyre pressure	Code
Unlimited; no pressure limit	W
High; pressure limited to 1.75 MPa	X
Medium; pressure limited to 1.25 MPa	Y
Low; pressure limited to 0.50 MPa	Z

(iv) Evaluation method:

Evaluation method	Code
Technical evaluation; representing a specific study of the pavement characteristics for the types of aircraft which the pavement is intended to serve.	T
Using aircraft experience; representing a knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use.	U

(6) The following examples illustrate how pavement strength data are reported under the ACR-PCR method. Further guidance on this topic is contained in the Aerodrome Design Manual (ICAO Doc 9157), Part 3.

Example 1

If the bearing strength of a rigid pavement, resting on a medium-strength subgrade, has been assessed by technical evaluation to be PCR 760 and there is no tyre pressure limitation, then the reported information would be:

PCR 760 R/B/W/T

Example 2

If the bearing strength of a composite pavement, behaving like a flexible pavement and resting on a high strength subgrade, has been assessed by using aircraft experience to be PCR 550 and the maximum allowable tyre pressure is 1.25 MPa, then the reported information would be:

PCR 550 F/A/Y/U

(b) **Pavements for Aircraft Less Than or Equal to 5 700 kg**

(1) The bearing strength of a pavement intended for aircraft of apron (ramp) mass equal to or less than 5 700 kg should be made available by reporting the following information:

(i) maximum allowable aircraft mass; and

(ii) maximum allowable tyre pressure.

Example 3

4 800 kg/0.60 MPa

(c) **Reporting of Composite or Non-Standard Pavements**

(1) If the actual construction of the pavement is composite or non-standard, this should be noted as required by point (a)(5) of AMC1 ADR.OPS.A.005 Aerodrome Data.

(2) Dedicated software is available on the ICAO website, for computing any aircraft ACRs at any mass on rigid and flexible pavements for the four standard subgrade strength categories.

(d) **Publication of PCR**

(1) If necessary, the PCRs may be published to an accuracy of one-tenth of a whole number. Guidance on reporting and publishing of PCRs is contained in the Aerodrome Design Manual (ICAO Doc 9157).

(2) Different PCRs may be reported if the strength of the pavement is subject to significant seasonal variation.

(e) **Cumulative Damage Factor (CDF)**

(1) The (subgrade) cumulative damage factor (CDF) is the amount of the structural fatigue life of the pavement which has been used up. It is expressed as the ratio applied load repetitions to allowable load repetitions to failure, or, for one aeroplane and constant departures:

$$\text{CDF} = \frac{\text{Applied coverages}}{\text{Coverages to failure}}$$

where a coverage is one application of the maximum strain or stress due to load on a given point in the pavement structure.

(2) CDF Values

(i) When CDF = 1 the pavement subgrade will have used a lot of its fatigue life.

(ii) When CDF < 1 the pavement subgrade will have some remaining life and the value of the CDF will give the fraction of the life used.

(iii) When CDF > 1 all of the fatigue life will have been used and the pavement subgrade will have failed.

(3) To calculate multiple aircraft (Miner's rule):

$CDF = CDF_1 + CDF_2 + \ldots + CDF_N$ (where CDF_i is the CDF of each aeroplane in the traffic mix and N is the number of the aeroplane in the mix).

(4) CDF depends on:

(i) the type of aircraft and their number of annual departures, pavement characteristics; and

(ii) the contribution of each individual aircraft to the max CDF is identified as the critical offset.

(5) If the pavement CDF is lower than or equal to 1.0 (well or overdesigned) no weight restriction should occur for the aircraft in the evaluated traffic.

(6) If the pavement CDF is higher than 1.0 (under designed) at least one aircraft for the elevated traffic will be weight restricted.

(7) According to the studied manoeuvring area, pavement mechanical characteristics can be adjusted with regards to the aircraft speed and the standard deviation (lateral wandering).

(8) Consequences of PCR inaccuracies

(i) Underestimated PCR (overestimated CDF) may result in aircraft weight / annual departure restrictions or operations not granted.

(ii) Overestimate PCR (underestimated CDF) may result in more traffic acceptance (weight/volume) than the pavement is able to withstand over its design life and premature damage, increased maintenance, repairs and costs.

(f) **Pavement Evaluation – Method for Technical Evaluation**

(1) To achieve a comprehensive technical PCR evaluation, aerodrome operators should employ a combination of Unbound Material Sampling (UMS), Dynamic Cone Penetrometer (DCP), Heavy Weight Deflectometer (HWD), and coring surveys to assess and analyse in-service pavements:

(i) Foundation Layer Characterisation:

Unbound Material Sampling (UMS): Utilised to determine the composition and characteristics of the foundation layers.

(ii) Dynamic Cone Penetrometer (DCP):

Employed to evaluate the stiffness of the foundation layers. When conducted in sufficient quantities, the combined data sets from UMS and DCP can provide a reliable estimation of the in-situ California Bearing Ratio (CBR).

(iii) Pavement Layer Evaluation:

Heavy Weight Deflectometer (HWD): HWD is used to determine the E-Modulus of each pavement layer, including the subgrade modulus, and to assess load transfer in rigid pavements. The HWD offers an overall view of pavement condition and, with appropriate calibration during back-analysis, provides reliable layer stiffness measurements.

(iv) Additional Technical Evaluations:

(A) Core Samples:

Used to determine layer thicknesses.

(B) Ground Penetrating Radar (GPR):

Employed to assess interface bonding conditions, such as the presence of water or moisture.

(v) Laboratory Testing:

Conducted to determine the E-Modulus of material.

(g) **PCR Using Aircraft Evaluation**

(1) If an aerodrome operator wishes to assess the PCR of its runway but due to financial constraints a technical evaluation is not feasible, if may undertake a using aircraft evaluation as an interim measure while plans are made to undertake the technical evaluation.

(2) Example of using aircraft calculation:

Historical CBR = 9.

The runway is flexible (**F)**.

The subgrade - modulus can be estimated from the historical CBR of 9:

E = 10 MPa therefore CBR 9 = 90 MPa, subgrade category is **C**.

There is no evidence of pavement distress attributable to high tyre pressures therefore the tyre pressure category is **W**.

The runway has been accommodating the following traffic without any significant damage:

Aircraft type	Operating weight	Annual Departures	ACR at operating weight
A330-300	233.9 t	104	650 F/C
A350-900	268.9 t	52	720 F/C
B777-300ER	352.4 t	6	790 F/C

Aircraft type	Operating weight	Annual Departures	ACR at operating weight
B787-900	254.7 t	52	750 F/C

The most demanding aircraft only are considered, other aircraft can be dismissed as they will not lead to the most critical ACR.

The number of annual departures for the B777-300ER is very low compared to the other aircraft, therefore it is dismissed from the PCR assignment.

The B787-900 is the heaviest most demanding using aircraft (**U**).

Therefore the PCR should be reported as **750 F/C/W/U**.

The 777-300ER would then be accepted based on the ICAO overload allowance (10% of PCR).

For such types of traffic indicated in the table above, a technical evaluation is preferable.

(h) **Pavement Condition and Behaviour**

(1) There must next be a careful examination of what effect the traffic of using aircraft is having on the pavement. The condition of the pavement in relation to any cracking, distortion or wear, and the experience with needed maintenance are of first importance. Age must be considered since overload effects on a new pavement may not yet be evident, while some accumulated indications of distress may normally be evident in a very old pavement. In general, however, a pavement in good condition can be considered to be satisfactorily carrying the using traffic, while indications of advancing distress show the pavement is being overloaded.

(2) The condition examination should take note of relative pavement behaviour in areas of intense versus low usage, such as in and out of wheel paths or most and least used taxiways, zones subject to maximum braking (e.g. taxiway turn-off, etc.). Note should also be taken of behaviour of any known or observable weak or critical areas such as low points of pavement grade, old stream crossings, pipe crossings where initial compaction was poor, structurally weak sections, etc. These will help to predict the rate of deterioration under existing traffic and thereby indicate the degree of overloading or of underloading. The condition examination should also focus on any damage resulting from tyre pressures of using aircraft and the need for tyre pressure limitations.

(i) **Reference Aircraft**

(1) Studying of the types and masses of aircraft will indicate those which must be of concern in establishing a reference aircraft, and the condition survey findings will indicate whether the load of the reference aircraft should be less than that being applied or might be somewhat greater. Since load distribution to the subgrade depends somewhat on pavement type and subgrade strength, the particular reference aircraft and its mass cannot be selected

until those elements of the ACR-PCR method, which are reported in addition to the PCR, have been established.

(j) **Determination of the Pavement Type, Subgrade Strength and Tyre Pressure Categories**

(1) The pavement type must be established as rigid or flexible. If the pavement includes a PCC (Portland Cement Concrete) slab as the primary structural element, it should be classified as rigid even though it may have a bituminous overlay resurfacing.

(2) If the pavement includes no such load-distributing slab, it should be classified as flexible. The subgrade category must be determined as high, medium, low, or ultra-low strength.

(3) If modulus of elasticity test data is available for the subgrade, these can be used directly to select the subgrade category. Such data, however, must represent in situ subgrade conditions. Similar data from any surrounding structures on the same type of soil and in similar topography can also be used.

(4) Soil strength data in almost any other form (such as CBR data) can be used to project an equivalent modulus of elasticity E for use in selecting the subgrade category. Information on subgrade soil strength may be obtainable from local road or highway agencies, or local agricultural agencies.

(5) A direct, though somewhat crude, or approximate, determination of subgrade strength can be made from classification of the subgrade material and reference to any of many published correlations.

(k) **Equivalencies Between CBR or Module of Subgrade Reaction (K) and Modulus of elasticity (E)**

(1) For existing pavements initially designed with the California bearing radio (CBR) design procedure, subgrade modulus values can be determined in a number of ways. The procedure that will be applicable in most cases is to use available CBR values and substitute the relationship:

E = 1 500 × CBR (E in psi) or

E = 10 x CBR (E in MPa).

This method provides designs compatible with the earlier flexible design procedure based on subgrade CBR, but other accepted equivalencies can also be used (Shell method, Airport Pavement Design System Knowledge Base (APSDS) method, etc.).

(2) Subgrade modulus values for PCR determination may also be determined from direct soil testing (e.g. lightweight deflectometer, plate test). Similarly, for rigid pavement design, the foundation modulus can be expressed as the modulus of subgrade reaction K or as the elastic (Young's) modulus E. However, all structural computations are performed using the elastic modulus E.

(3) If the foundation modulus is input as a K value, it can be converted to the equivalent E value using the following equation:

$$ESG=20.15\times k1.284$$

where ESG = Elastic (Young's) modulus of the subgrade, pounds per square inch (psi); and

K = Modulus of subgrade reaction, pounds per cubic inch (pci).

(4) The tyre pressure category must be determined as unlimited, high, medium or low. PCC surfacing and good to excellent quality bituminous surfacing can sustain the tyre pressures commonly encountered and should be classified as unlimited pressure category with no limit on pressure.

(5) Bituminous surfacing of inferior quality and aggregate or earth surfacing will require the limitation of lower categories.

(6) The applicable pressure category of the aircraft using the pavement without producing observable distress should be the basis for determining the tyre pressure category.

(l) **Aerodromes Without CBR or K Data**

(1) If CBR of K data is not available aerodrome operators should undertake pressure plate testing as close to the runway edge as possible in order to determine a CBR or K value which can be converted to calculate the E value of the adjacent runway giving the runway theoretical strength.

(2) The number of test areas should be sufficient in order to provide CBR data for the entire length and width of the surface being surveyed which should consider any differing pavement construction areas.

(m) **Maximum Age of Historical CBR or K Data**

(1) Historical data used for technical evaluation should not be older than 5 years; however, if data greater than 5 years has significant assurance attached to it then the CAA may consider the use of the data.

(2) If data is older than 5 years aerodrome operators may use the using aircraft evaluation method or undertake a new technical survey consisting of a combination of HWD, core samples with DCP and GPR.

(n) **Determining the Critical Offset**

(1) Using the aircraft mix operating at the aerodrome the wheel track of the aircraft types should be calculated in order to ascertain the distance from the centreline of the wheel track which may cause the most damage, this will be the critical offset.

(2) The most used aircraft should be the reference aircraft given the number of passes of the particular aircraft is likely to have the most detrimental impact to the pavement. This distance dependent on the aircraft type is likely to be approximately 1 - 3 m.

The following GM6 ADR.OPS.A.005 is inserted:

GM6 ADR.OPS.A.005 Aerodrome data

PRE-FLIGHT ALTIMETER CHECK LOCATION

(a) One or more pre-flight altimeter check locations should be established.

(b) The elevation of a pre-flight altimeter check location should be given as the average elevation, rounded to the nearest metre or foot, of the area on which it is located. The elevation of any portion of a pre-flight altimeter check location should be within 3 m (10 ft) of the average elevation for that location.

(c) Pre-flight check location could be located on an apron. Locating a pre-flight altimeter check location on an apron enables an altimeter check to be made prior to obtaining taxi clearance and eliminates the need for stopping for that purpose after leaving the apron. Normally an entire apron could serve as a satisfactory altimeter check location.

The following GM7 ADR.OPS.A.005 is inserted:

GM7 ADR.OPS.A.005 Aerodrome data

DECLARED DISTANCES

(a) The following distances should be calculated to the nearest metre or foot for a runway and reported to the aeronautical information services and Air Traffic Services:

(1) Take-off run available (TORA);

(2) Take-off distance available (TODA);

(3) Accelerate stop distance available (ASDA); and

(4) Landing distance available (LDA).

(b) The TORA, TODA, ASDA and LDA should be calculated according to the following (all declared distances are illustrated for operations from left to right):

(1) Where a runway is not provided with a stopway or a clearway and the threshold is located at the extremity of the runway, the four declared distances should normally be equal to the length of the runway.

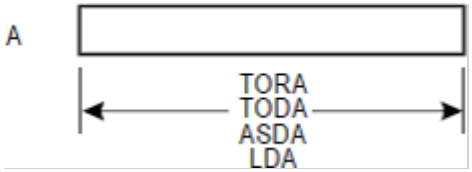


Figure 1

(2) When a runway is provided with a clearway (CWY), then the TODA will include the length of clearway.

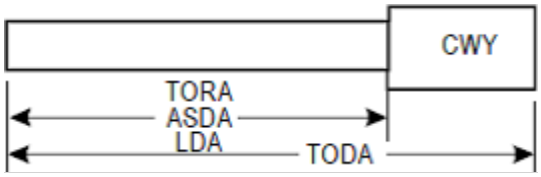


Figure 2

(3) Where a runway is provided with a stopway (SWY), then the ASDA will include the length of stopway.

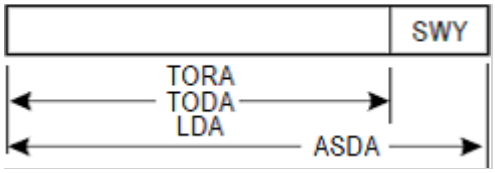


Figure 3

(4) Where a runway has a displaced threshold, then the LDA will be reduced by the distance the threshold is displaced. A displaced threshold affects only the LDA for approaches made to that threshold; all declared distances for operations in the reciprocal direction are unaffected.

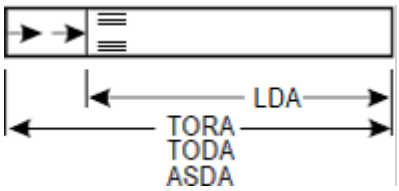


Figure 4

(5) Where a runway is provided with more than one of the clearway, stopway, or having a displaced threshold, then more than one of the declared distances will be modified. The modification will follow the same principle as in (1)–(4)

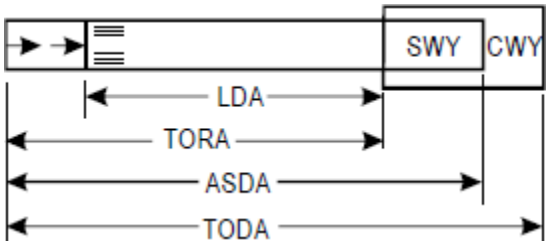


Figure 5

(c) The information on declared distances should be provided according to the following table:

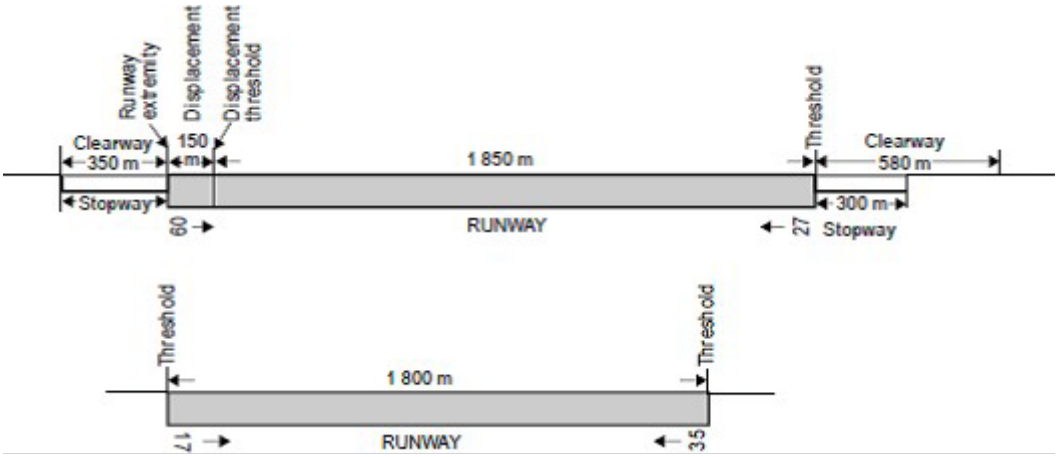


Figure 6

RUNWAY	TORA (m)	ASDA (m)	TODA (m)	LDA (m)
09	2 000	2 300	2 580	1 850
27	2 000	2 350	2 350	2 000
17	NU	NU	NU	1 800
35	1 800	1 800	1 800	NU

Table 1

If a runway direction cannot be used for take-off or landing, or both because it is operationally forbidden, then this should be declared and the words ‘not usable’ or the abbreviation ‘NU’ entered.

(d) When intersection take-offs are performed, the datum line from which the reduced runway declared distances for take-off are determined should be defined by the intersection of the downwind edge as shown in the figure below:

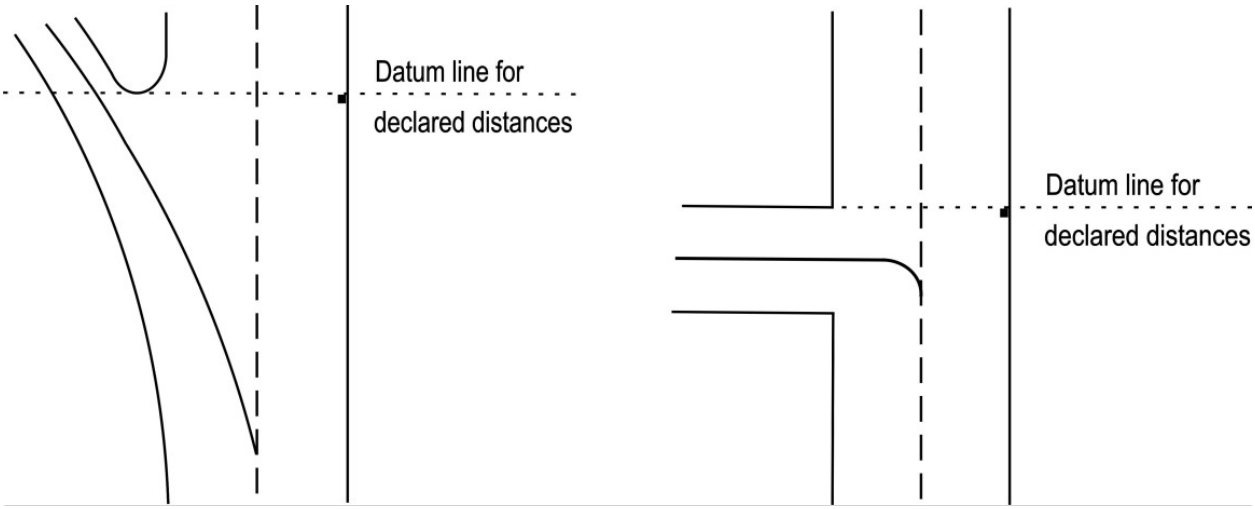


Figure 7

The following GM8 ADR.OPS.A.005 is inserted:

GM8 ADR.OPS.A.005 Aerodrome data

CONDITION OF THE MOVEMENT AREA AND RELATED FACILITIES

The condition of the movement area and the operational status of related facilities needs to be monitored and reported, on matters of operational significance affecting aircraft and aerodrome operations, particularly in respect of the following:

(a) construction or maintenance work;

(b) rough or broken surfaces on a runway, a taxiway or an apron;

(c) other temporary hazards, including parked aircraft;

(d) failure or irregular operation of part or all the aerodrome visual aids; and

(e) failure of the normal or secondary power supply.

The following GM9 ADR.OPS.A.005 is inserted:

GM9 ADR.OPS.A.005 Aerodrome data

DISABLED AIRCRAFT REMOVAL

(a) The contact details (telephone/telex number(s), email address, etc.) of the office of the aerodrome coordinator of operations for the removal of an aircraft disabled on or adjacent to the movement area should be made available on request to aircraft operators.

(b) Information concerning the capability to remove an aircraft disabled on or adjacent to the movement area should be made available.

(c) The capability to remove a disabled aircraft may be expressed in terms of the largest type of aircraft which the aerodrome is equipped to remove.

The following GM10 ADR.OPS.A.005 is inserted:

GM10 ADR.OPS.A.005 Aerodrome data

RESCUE AND FIREFIGHTING

(a) Information concerning the level of protection provided at an aerodrome for aircraft rescue and firefighting purposes during the hours of operation should be made available.

(b) The level of protection normally available at the aerodrome should be expressed in terms of the category of the rescue and firefighting services and in accordance with the types and amounts of extinguishing agents normally available at the aerodrome.

(c) Changes in the level of protection normally available at the aerodrome for rescue and firefighting should be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units should be advised accordingly.

(d) Changes in the level of protection from that normally available at the aerodrome could result from a change in the availability of extinguishing agents, equipment to deliver the agents or personnel to operate the equipment, etc.

(e) A change in the level of protection is expressed in terms of the new category of the rescue and firefighting services available at the aerodrome.

The following GM11 ADR.OPS.A.005 is inserted:

GM11 ADR.OPS.A.005 Aerodrome data

VISUAL APPROACH SLOPE INDICATOR SYSTEMS

The following information concerning a visual approach indicator system is made available:

(a) associated runway designation number;

(b) type of system; for a PAPI or APAPI installation, the side of the runway on which the lights are installed, i.e. left or right, is given;

(c) 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, is indicated;

(d) nominal approach slope angle(s); and

(e) minimum eye height(s) over the threshold of the on-slope signal(s).

GM2 ADR.OPS.A.005(a) is amended as follows:

GM21 ADR.OPS.A.005(a) Aerodrome data

[…]

GM3 ADR.OPS.A.005(a) is amended as follows:

GM32 ADR.OPS.A.005(a) Aerodrome data

[…]

GM4 ADR.OPS.A.005(a) is amended as follows:

GM43 ADR.OPS.A.005(a) Aerodrome data

[…]

GM1 ADR.OPS.A.057(b) is amended as follows:

GM1 ADR.OPS.A.057(b) Origination of NOTAM

NON-ORIGINATION OF NOTAM

(a) Promulgation of information through NOTAM is required under certain circumstances. In such cases, the responsible organisation (e.g. Competent Authority, aerodrome operator, air traffic services provider, etc.) originates a NOTAM, which is finally issued by the AIS provider. ADR.OPS.A.057 defines the responsibilities of the aerodrome operator with respect to the NOTAM origination process, while its point (b) requires the origination of a NOTAM by the aerodrome operator in the cases prescribed in it.

(b) On the other hand, for a variety of reasons (e.g. prevention of information overflow), not all kinds of information are eligible for promulgation through NOTAM. To this end UK Reg (EU) 2017/373, which applies to AIS providers, prescribes in AIS.TR.330 the cases where the AIS provider shall (or shall not) issue a NOTAM.

(c) This means that there are cases in which, even if an aerodrome operator originates a NOTAM to promulgate information, the NOTAM will not be finally issued by the AIS provider if this information is not allowed to be promulgated by NOTAM as per AIS.TR.330. To avoid such situations, the aerodrome operator needs to:

(~~a~~1) ensure that the relevant aerodrome operator's personnel are adequately trained in the relevant regulatory framework regarding both the origination and issuance of NOTAM;

(~~b~~2) develop robust procedures regarding NOTAM origination by its personnel; and

(~~c~~3) maintain close cooperation with the relevant AIS provider.

(d) The following are example cases where the aerodrome operator will not originate a NOTAM:

(~~a~~1) routine maintenance work on aprons and taxiways that does not affect the safe movement of aircraft;

(~~b~~2) temporary obstructions in the vicinity of aerodromes/heliports that do not affect the safe operation of aircraft;

(~~c~~3) partial failure of aerodrome/heliport lighting facilities where such a failure does not directly affect aircraft operations;

(~~d~~4) partial temporary failure of air-ground communications when suitable alternative frequencies are available and are operative;

(~~e~~5) lack of apron marshalling services, road traffic closures, limitations and control;

(~~f~~6) unserviceability of location, destination or other instruction signs on the aerodrome movement area;

(~~g~~7) training activities performed by ground units;

(~~h~~8) unavailability of backup and secondary systems if these systems do not have an operational impact;

(~~i~~9) limitations to aerodrome facilities or general services with no operational impact;

(~~j~~10) announcements or warnings about possible/potential limitations with no operational impact;

(~~k~~11) general reminders on already published information;

(~~l~~12) availability of equipment for ground units, without information on the operational impact on airspace and facility users;

(~~m~~13) information about laser emissions with no operational impact and about fireworks below the minimum flying heights;

(~~n~~14) closure of parts of the movement area in connection with locally coordinated, planned work of duration of less than 1 hour;

(~~o~~15) closure, changes, unavailability in the operation of aerodrome(s)/heliport(s) other than in the aerodrome(s)/heliport(s) operation hours; and

(~~p~~16) other non-operational information of a similar temporary nature.

(e) Information which relates to an aerodrome and its vicinity and which does not affect its operational status may be distributed locally during pre-flight or in-flight briefing or other local contact with flight crews. Thus, in case of need, the aerodrome operator may disseminate such type of information through the AIS provider it has arrangements with.

GM1 ADR.OPS.A.057(d)(4) is amended as follows:

GM1 ADR.OPS.A.057(d)(4) Origination of NOTAM

SNOWTAM FORMAT

SNOWTAM Proposals are to be submitted by AMHS/AFTN to the UK NOTAM Office (UK NOF) address EUECYIYP.

If the incorrect SNOWTAM Format is used, an automatic rejection will be sent to the originating AFTN address, stating the reason for non-compliance.

The way to complete correctly a SNOWTAM format when initiating a SNOWTAM is indicated below.

~~1.~~(a) General

(~~a~~1) When reporting on more than one runway, repeat Items B to H (aeroplane performance calculation section).

(~~b~~2) The letters used to indicate items are only used for reference purposes and should not be included in the messages. The letters M (mandatory), C (conditional) and O (optional) mark the usage and information and should be included as explained below.

(~~c~~3) Metric units should be used, and the unit of measurement shall not be reported.

(~~d~~4) The maximum validity of SNOWTAM is 8 hours. A new SNOWTAM should be issued whenever a new RCR is received.

(~~e~~5) A SNOWTAM cancels the previous SNOWTAM.

(~~f~~6) The abbreviated heading ‘TTAAiiii CCCC MMYYGGgg (BBB)’ is included to facilitate the automatic processing of SNOWTAM messages in computer databanks. The explanation of these symbols is:

[…]

(~~g~~7) The text ‘SNOWTAM’ in the SNOWTAM Format and the SNOWTAM serial number in a four-digit group is separated by a space, e.g. SNOWTAM 0124.

(~~h~~8) For readability purposes for the SNOWTAM message, a linefeed would be included after the SNOWTAM serial number, after Item A, and after the aeroplane performance calculation section.

(~~i~~9) When reporting on more than one runway, repeat the information in the aeroplane performance calculation section from the date and time of assessment for each runway before the information in the situational awareness section.

(~~j~~10) Mandatory information is:

(~~1~~i) AERODROME LOCATION INDICATOR;

(~~2~~ii) DATE AND TIME OF ASSESSMENT;

(3iii) LOWER RUNWAY DESIGNATOR NUMBER;

(4iv) RUNWAY CONDITION CODE FOR EACH RUNWAY THIRD; and

(5v) CONDITION DESCRIPTION FOR EACH RUNWAY THIRD (when RWYCC is reported 1- 5)

2.(b) Aeroplane performance calculation section

[…]

5.(c) Situational awareness section

[…]

GM2 ADR.OPS.A.057(d)(4) is amended as follows:

GM2 ADR.OPS.A.057(d)(4) Origination of NOTAM

SNOWTAM FORMAT

Below are four examples of completed SNOWTAMs.

Example SNOWTAM 1

GG EADBZQZX EADNZQZX EADSZQZX 170100 EADDYNYX

SWEA0149 EADD 02170055 (SNOWTAM 0149

EADD

02170055 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/WET SNOW)

Example SNOWTAM 2

GG EADBZQZX EADNZQZX EADSZQZX 170140 EADDYNYX

SWEA0150 EADD 02170135 (SNOWTAM 0150

EADD

02170055 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/WET SNOW

02170135 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH)

Example SNOWTAM 3

GG EADBZQZX EADNZQZX EADSZQZX 170229 EADYNYX

SWEA0151 EADD 02170225 (SNOWTAM 0151

EADD

02170055 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/WET SNOW

02170135 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH

02170225 09C 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW

RWY 09L SNOWBANK R20 FM CL. RWY 09R ADJ SNOWBANKS. TWY B POOR. APRON NORTH POOR)

~~Example SNOWTAM 4~~

~~GG EADBZQZX EADNZQZX EADSZQZX 170350 EADDYNYX~~

~~SWEA0152 EADD 02170345 (SNOWTAM 0152~~

~~EADD~~

~~02170345 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/SLUSH~~

~~02170134 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH~~

~~02170225 09C 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW~~

~~DRIFTING SNOW. RWY 09L LOOSE SAND. RWY 09R CHEMICALLY TREATED. RWY 09C CHEMICALLY TREATED.)~~

Example 1

SNOWTAM proposal issued by London Heathrow Tower which includes situational awareness and Plain Text remarks.

GG EUECYIYP

311842 EGLLZTZX

(SNOWTAM PROPOSAL EGGN 0351

EGLL

10311800 09L 2/2/2 100/100/100 04/04/04 SLUSH/SLUSH/SLUSH

10311730 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH

RWY 09L SNOWBANK R20 FM CL. RWY 09R ADJ SNOWBANKS. TWY B POOR. APRON NORTH POOR. RMK/ APN STANDS CONTAIN GRIT / STAND 12 CLOSED DUE ICE.)

Example 2

SNOWTAM proposal issued by London Heathrow Tower with no situational awareness or plain text remarks.

GG EUECYIYP

311855 EGLLZTZX

(SNOWTAM PROPOSAL EGGN

EGLL

10311800 09L 5/5/5 100/100/100 NR/NR/NR WET/WET/WET

10311730 09R 5/5/5 100/100/100 NR/NR/NR WET/WET/WET)

Example 3

SNOWTAM Proposal issued by London Heathrow Tower with situational awareness but no plain text remarks.

GG EUECYIYP

311855 EGLLZTZX

(SNOWTAM PROPOSAL EGGN

EGLL

10311800 09L 5/5/5 100/100/100 NR/NR/NR WET/WET/WET

10311730 09R 5/5/5 100/100/100 NR/NR/NR WET/WET/WET

RWY 09L CHEMICALLY TREATED. RWY 09R CHEMICALLY TREATED.)

GM2 ADR.OPS.A.065(a) is amended as follows:

GM2 ADR.OPS.A.065(a) Reporting of the runway surface condition

RUNWAY CONDITION REPORT

AEROPLANE PERFORMANCE CALCULATION SECTION

[…]

(b) The information to be included in this section consists of the following:

[…]

(6) Depth of loose contaminant: dry snow, wet snow, slush or standing water for each runway third: a two- or three-digit number representing the assessed depth (mm) of the contaminant for each runway third. The depth is reported in a six- to nine-character group separated by a '/' for each runway third as defined in ~~CAP2173~~ Table 2 ~~of AMC1 ADR.OPS.A.065(b);(c)~~. The assessment is based upon an even distribution within the runway thirds ~~following an assessment~~ as assessed by trained personnel. If measurements are included as part of the assessment process, the reported values are still reported as assessed depths, as the trained personnel have placed their judgment upon the measured depths to be representative for the runway third.
Format: [n]nn/[n]nn/[n]nn

Examples:

04/06/12 [STANDING WATER]

03/04/09 [SLUSH]

03/05/10 [WET SNOW or WET SNOW ON TOP OF ...]

03/20/100 [DRY SNOW or DRY SNOW ON TOP OF]

NR/NR/100 [DRY SNOW in the last third only]

This information is conditional. It is reported only for DRY SNOW, WET SNOW, SLUSH and STANDING WATER.

~~Format: [n]nn/[n]nn/[n]nn~~

Whenever a contaminant not in this list is reported for a given third, the depth value for that third is replaced by “NR” (not reported).

Note: When the assessed depth is below the minimum reportable depth, the reported depth should be equal to the minimum valid value, e.g. 03 for an assessed depth of 2 mm of SLUSH.

(7) Condition description for each runway third: to be reported in capital letters using the terms specified in ADR.OPS.A.065 point (a). The condition types are separated by an oblique stroke ‘/’.

[…]

GM3 ADR.OPS.A.065(a) is amended as follows:

GM3 ADR.OPS.A.065(a) Reporting of the runway surface condition

COMPLETE INFORMATION STRING

(a) An example of a complete information string prepared for dissemination is as follows:

[…]

[Situational awareness section]

RWY 09L SNOWBANK R20 FM CL. RWY 09R ADJ SNOWBANKS. TWY B POOR. APRON NORTH POOR.

SNOWTAM ISSUANCE

(b) On receipt of a correctly constructed proposal the UK NOTAM OFFICE will issue a SNOWTAM message. In cases where the SNOWTAM proposal is incorrectly addressed, formatted, or constructed, it will be rejected either systematically or manually by EAD or the UK NOTAM OFFICE to the originating AFTN address.

(c) It is the responsibility of the Sponsor to monitor for rejection messages and take appropriate action. Sponsors are also responsible for reviewing the SNOWTAM back copies and raising any potential issues directly with the UK NOF.

GM1 ADR.OPS.B.005(a) is amended as follows:

GM1 ADR.OPS.B.005(a) Aerodrome emergency planning

PURPOSE OF THE AERODROME EMERGENCY PLAN

[…]

(b) Irrespective of whose responsibility is the establishment and implementation of an emergency plan covering emergencies at or in the surroundings of an aerodrome, the emergency plan should ensure that there are provisions for:

[…]

(6) safe continuation of aircraft operations or return to normal operations as soon as possible.

(c) The aerodrome operator should be able to demonstrate that the aerodrome's emergency arrangements are effective, and that appropriate use can be made of all available resources, in particular external emergency services, if an aircraft accident or other incident were to occur.

(d) Civil Contingencies Act (As amended)

The Civil Contingencies Act 2004 (CCA) and supporting regulations and statutory guidance establish a clear set of roles and responsibilities for those involved in emergency preparation and response at the local level. In developing the aerodrome emergency plan operators should take into account the requirements of the CCA. Detailed guidance regarding emergency preparedness and the Civil Contingencies legislation can be found on the UK Government website – www.gov.uk.

(e) Emergency Planning Objectives

The objective of aerodrome emergency planning is to anticipate the effects an emergency might have on life, property, and aerodrome operations, and to prepare a course, or courses, of action to minimise those effects, particularly in respect of saving lives.

(f) Emergency Planning Arrangements

(1) The list below is intended to assist an aerodrome operator in choosing those organisations that should be represented on the Aerodrome's Emergency Planning Committee (EPC). However, the list is not comprehensive, and some aerodromes may need expertise from organisations not shown, while others may find some of the organisations shown to be inappropriate. On- and off-aerodrome services from which EPC Members could be selected:

Aerodrome Services

- RFFS
- Air Navigation Service Provider
- Security

- Operations
- Airlines
- Ground and Passenger Handling
- Border Force
- Occupational Medicine
- Telecommunications
- Works Facilities

Local Authority or Other Services

- Ambulance Trust
- Fire and Rescue Service
- Police
- Maritime Coastguard Agency
- Hospital Trust(s)
- Public Health Authority
- Environment Agency
- Council Services
- First Aid Organisations
- Voluntary Organisations
- Religious Leaders

(2) The tasks that the EPC may consider are:

(i) terms of reference of the Planning Committee;

(ii) development of an emergency plan and orders;

(iii) tactics;

(iv) liaison;

(v) co-operative training;

(vi) exercise planning;

(vii) post accident/incident and post exercise reviews;

(viii) review and monitoring; and

(ix) recording.

(3) A senior member of the aerodrome management team with the direct support of the operator should chair any meetings. Records of the meetings should be taken and retained and the person accountable for the emergency planning arrangements should be identified within the Aerodrome Manual.

GM2 ADR.OPS.B.005(a) is amended as follows:

GM2 ADR.OPS.B.005(a) Aerodrome emergency planning

AERODROME EMERGENCY PLAN DOCUMENT

(a) The aerodrome emergency plan of the aerodrome operator should observe human factors principles to ensure optimum response in emergency operations. The principles should include:

(1) the effects of human performance on the plan, for example workload, capabilities, functions, decision aids, environmental constraints, team versus individual performance;

(2) training effectiveness;

(3) staffing including numbers, skills levels and organisational structure;

(4) personnel selection; and

(5) safety and health aspects, for example hazardous materials, safety systems and protective equipment.

(b) Aerodrome Operators may choose to review their existing emergency plans/orders to ensure that they meet the requirements The emergency planning document is intended to:

(1) be confined exclusively to actions to deal with emergencies or incidents;

(2) provide details to individuals, or to departments, of the actions required to initiate the emergency plan;

(3) clearly translate the emergency plan into a course or courses of action to be followed for a given emergency or incident, that will ensure the achievement of the emergency planning objectives;

(4) detail the lines of communication that will ensure all the agencies (or services) appropriate to the emergency are notified and alerted; and

(5) include procedures for leading passengers evacuated from aircraft to secure areas away from the scene of an incident.

(~~b~~c) In order to ensure that the aerodrome emergency plan document fully serves its purpose, it should include the following:

[…]

(2) details of tests for aerodrome facilities and equipment to be used in emergencies such as emergency operations centre, mobile command post, ~~fire fighting~~ firefighting vehicles and equipment, communication means, first aid medical supplies, etc., including the frequency of those tests;

[…]

(4) a list of organisations, agencies, and persons of authority, both on- and off-aerodrome, for site roles; ~~their telephone and fax numbers, e-mail and SITA addresses, and the radio frequencies of their offices~~ and their contact details to be used in an emergency;

[…]

(6) the appointment of an on-the-scene commander for the overall emergency operation; ~~and~~

(7) ~~Details~~ details of the ~~off aerodrome~~ off-aerodrome areas for which the aerodrome RFFS will provide a response, and the size and nature of the response~~.~~; and

(8) details of the document control arrangements including version control, process of amendment, and means by which the aerodrome operator is assured that all circulated copies (hard copy and electronic) are kept up to date.

GM4 ADR.OPS.B.005(a) is amended as follows:

GM4 ADR.OPS.B.005(a) Aerodrome emergency planning

TYPES OF EMERGENCIES

(a) At least the following types of emergencies may be included in the aerodrome emergency plan:

(1) a~~A~~ircraft emergencies;

(2) a~~A~~ircraft ground incidents, where an aircraft on the ground is known to have an emergency situation other than an accident, requiring the attendance of emergency services;

(3) s~~S~~abotage, including bomb threats;

(4) u~~U~~nlawfully seized aircraft;

(5) d~~D~~angerous goods occurrences; and

~~(6) Building fires;~~

~~(7) Natural disasters; and~~

~~(8) Public health emergencies.~~

(6) aerodrome operator emergencies which could include:

(i) weather standby, when weather conditions are such as to render a landing difficult, or difficult to observe; and

(ii) unlawful acts – actions to be taken in the case of any unlawful act may be drawn up in conjunction with local Police using Department for Transport (DfT) guidance and contained in the emergency plan.

(b) The aircraft emergencies for which services may be required are generally classified as:

(1) ‘aircraft accident’: an aircraft accident which has occurred on or in the aerodrome surroundings;

(2) ‘full emergency’: an aircraft approaching the aerodrome is, or is suspected to be, in such trouble that there is imminent danger of an accident; and

(3) ‘local standby’: an aircraft approaching the aerodrome is known, or is suspected, to have developed some defect, but the trouble is not such as would normally involve any serious difficulty in effecting a safe landing.

(c) Non-Aircraft Emergencies

(1) Aerodrome Emergency Plans are generally focused on an aircraft accident or incident. Equipment and techniques recommended are generally directed towards this goal.

(2) If the operator decides to include other emergencies the plan should include the action to be taken by aerodrome-based responders and, where appropriate, external emergency services, in the event of such calls being received.

(d) The classification ‘domestic’ is given to any incident:

(1) on the aerodrome (not including aircraft emergencies);

(2) outside the aerodrome boundary (other than aircraft accidents) which is liable to constitute a danger to flying or aerodrome property;

(3) which the aerodrome rescue and firefighting service might attend where the response is according to an agreement with the local emergency services; or

(4) which is in response to calls from the public or police on humanitarian grounds.

GM1 ADR.OPS.B.005(b) is amended as follows:

GM1 ADR.OPS.B.005(b) Aerodrome emergency planning

COORDINATION WITH OTHER AGENCIES AND ORGANISATIONS

[…]

(f) The aerodrome operator should assess the level of medical supplies to be held on the aerodrome for emergency purposes.

(g) The aerodrome operator should liaise with local emergency responders and establish responsibilities for incident command, particularly for the scene immediately adjacent to the aircraft. Any agreements may be recorded in (or be referenced from) the aerodrome manual.

(h) The importance of an agreed framework for command and co-ordination should not be underestimated. This enables each agency to tailor its own response and interface with the plans of other agencies without disrupting its own procedures.

(i) There is an agreed national framework for managing the local multi-agency response to, and recovery from, emergencies. This national framework can be found on the Government website – www.gov.uk. This framework describes the three management tiers that comprise the framework and briefly mentions the arrangements for managing an incident site.

(j) Whether it should be fully implemented at an aircraft accident should be determined by the severity and numbers of casualties. At the start of any incident for which there has been no warning, the Operational level should be activated first, with the other levels coming into being with the escalation of the incident, or a greater awareness of the situation.

(k) An aerodrome should have a clear and coherent policy that sets out the approach for delivering effective aircraft incident command and liaison with external emergency services.

(l) Management Structures

The management of incidents should be in line with JESIP principles (see https://www.jesip.org.uk/).

(m) Control of the Incident Site

(1) RFFS personnel should be identified by markings in accordance with the national Incident Command System.

(2) RFFS personnel should wear conspicuous tabards (or similar) in order to become distinguishable from the local authority fire officer. Design characteristics of such markings and tabards should be agreed through the emergency planning committee.

(3) The UK government has issued guidance on how an incident site should be managed including the use of cordons. This guidance can be found on the Government website:

https://www.gov.uk/government/publications/the-central-government-s-concept-of-operations

https://www.gov.uk/government/publications/emergency-preparedness

http://www.readyscotland.org/ready-government/preparing-scotland/

(n) Medical Equipment

(1) The objective is to ensure that sufficient medical services are provided. This objective should have regard to the type and configuration of aircraft, and the facilities should be based on a formal assessment. The assessment should ensure that the available emergency medical services provided are adequate and take into account the largest aircraft using the aerodrome.

(2) Aerodrome Operators should:

(i) assess the level of medical supplies to be held on the aerodrome for emergency purposes;

(ii) seek the advice and co-operation of the local NHS Trust and responding ambulance services;

(iii) consider whether additional supplies should be made available to cater for an accident involving more than one aircraft;

(iv) consider portable casualty shelters and blankets for use during inclement weather conditions, taking into account the numbers of casualties that could reasonably be expected;

(v) provide portable lighting for illuminating an accident scene, particularly triage and casualty handling areas; and

(vi) ensure that records appertaining to the medical facilities, covering specification, tests and inspection, and maintenance, are retained and can be made available for CAA inspection if requested. The records should:

(A) include details of consequential action where an inspection has revealed defect or deficiency; and

(B) be retained for a minimum period of five years.

(3) Additional guidance on the provision of medical equipment and services can be found in the ICAO Airport Services Manual Part 7 Airport Emergency Planning, Appendix 3 (Airport Medical Services).

(o) Where the journey time for the first Local Authority ambulance could exceed 15 minutes the provision of an on-site ambulance should be considered or alternative arrangements agreed with the NHS.

(p) Supporting services, operating companies, or agencies

(1) It is important that full details of the aircraft are available, i.e. number of persons aboard, details of any dangerous goods or unusual freight (radioactive materials, livestock, etc.) and in this respect the aircraft operating company or its agents should be responsible for providing any documents, passenger lists and manifests concerning the aircraft involved.

(2) The post-accident arrangements for any survivors who are not injured, as well as for passengers' relatives and friends who may be at the aerodrome waiting for the aircraft to land and may be unaware that an accident has occurred, is a joint responsibility between the aerodrome, the airline and/or its agents, and category 1 responders and should be set out in the emergency plan.

(3) Following an aircraft accident, specialist equipment (e.g. additional lighting or heavy lifting gear) may be required that may not normally be readily available. The emergency committee should consider the potential need for

this equipment and arrange for it to be available should circumstances require it. Care should be taken to ensure that the type and use of this equipment does not introduce the risk of fire in areas which may have become contaminated by fuel spillage.

(4) Incidents involving aircraft will attract the attention of the press and media. Aerodrome Operators may wish to appoint a member of staff to liaise with members of the local and national press.

(q) Assembly of Assisting Services

An aerodrome emergency plan must consider that category 1 responders are not likely to be familiar with the aerodrome layout, or the incident may occur in weather conditions that could hamper the ability of emergency services to find the accident site. A system may be devised whereby emergency services, familiar or unfamiliar with the aerodrome, can be easily guided to the accident or incident. One such system is to distribute a plan of the aerodrome overlaid with a grid, such that each square has an individual identifier.

(r) Consideration should be given to escort arrangements. Suitable assembly or rendezvous points (RVP) should be established, to which incoming vehicles should report, and from which they can be escorted to the accident or incident site with the minimum of delay. A person should be posted at the aerodrome main gate and the rendezvous point, and a telephone should be made available at both locations.

(s) Use of GPS technology should be used to ensure that external responders arrive at the correct RVP.

(t) Signs may be considered but any that are placed on a public highway will need to conform to the dimensions and colour scheme as defined by the Department for Transport (DfT) 'Working drawings for traffic signs'; details are available on the www.gov.uk website.

AMC1 ADR.OPS.B.005(c) is amended as follows:

AMC1 ADR.OPS.B.005(c) Aerodrome emergency planning

AERODROME EMERGENCY EXERCISE

(a) The aerodrome operator should ensure that the emergency plan is tested ~~with:~~.

~~(a) a full-scale aerodrome emergency exercise at intervals not exceeding two years; and~~

~~(b) partial emergency exercises in the intervening year to ensure that any deficiencies found during the full-scale aerodrome emergency exercise have been corrected and reviewed thereafter, or after an actual emergency, so as to correct any deficiency found during such exercises or actual emergency.~~

(b) An aerodrome operator should test its emergency plan by following either Option 1 or Option 2. The chosen Option should be clearly documented in the Aerodrome Manual (see AMC3 ADR.OR.E.005 point (a), paragraph 19.3).

Option 1

(1) A full-scale aerodrome emergency exercise at intervals not exceeding two years; and

(2) partial emergency exercises in the intervening year to ensure that any deficiencies found during the full-scale aerodrome emergency exercise have been corrected and reviewed thereafter, or after an actual emergency, so as to correct any deficiency found during such exercises or actual emergency.

Option 2

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 and reviewed thereafter.

(c) Where an aircraft accident occurs at, or in the vicinity of, the aerodrome to which the response has adequately tested all or part of the plan, the aerodrome operator may use that experience as part of the above exercise process.

GM2 ADR.OPS.B.005(c) is amended as follows:

GM2 ADR.OPS.B.005(c) Aerodrome emergency planning

AERODROME EMERGENCY EXERCISES

(a) Full-scale exercises (Option 1)

(1) The purpose of a full-scale exercise is to ensure the adequacy of the plan to cope with different types of emergencies.

[…]

(4) Involved departments and agencies should be thoroughly familiar with the aerodrome emergency plan~~,~~ and develop individual plans in coordination with the general plan.

(5) The emergency exercises should be held in locations which will provide maximum realism while ensuring minimum disruption of the aerodrome operations. Different scenarios, as described in the aerodrome emergency plan document, should be used. The exercise could be held either during the day or at night on the aerodrome, and at different times of the year when seasonal changes may present additional challenges. Exercises may take place both on and near the aerodrome to test different scenarios.

(6) In order to obtain the maximum benefit from a full-scale emergency exercise, the entire proceedings should be reviewed. An observer critique team should

be organised, comprised of members who are familiar with mass casualty accident proceedings. Each member of the critique team should observe the entire exercise~~,~~ and complete the appropriate emergency drill critique forms. As soon as convenient after the exercise, a critique meeting should be held so members of the team can present their observations and recommendations for improvement of the aerodrome emergency plan procedures and associated aerodrome emergency plan document.

[…]

(c) Tabletop exercises Tabletop exercises should be held at regular intervals. The aim of these exercises should be to verify that roles and procedures are clear and understood. These exercises offer a good opportunity to test new or revised procedures, before implementation, or preparation for a ~~full- scale~~ full-scale emergency exercise.

The following GM3 ADR.OPS.B.005(c) is inserted:

GM3 ADR.OPS.B.005(c) Aerodrome emergency planning

MODULAR EXERCISES (OPTION 2)

(a) The following are examples of the high-level enabling objectives to be achieved during each of the modules which, once complete, should ensure the main objective is achieved. Aerodrome Operators may consider other modules to test the emergency plans for specific aerodrome features/risks.

(1) Module 1: Raising the Alarm

This module focuses on the call out systems; it covers the period from commencement of the incident until all relevant agencies have been informed. It is envisaged that this module would be run using the actual procedures, resources and equipment required as if it were in a live time incident.

The exercise could be conducted on numerous occasions over a given time period to ensure competence by all those expected to become involved; evidence may be recorded from actual incidents.

Objective: Test Call Out System	**Consider, but not limited to**
1.1 Initiating the call	Instigated by ATC. Alerting method and communications. Test Omni crash / direct line. Communications with AFS, on and off airport response include each LAES
1.2 Differing levels/types of emergencies	Description of Aircraft accident, Ground incident, Full emergency, Local Standby etc.

Objective: Test Call Out System	Consider, but not limited to
1.3 Terminology/abbreviations	AGI. A/C accident imminent on/off AD.
1.4 Normal methods / contingencies	Power failure, loss of communication.
1.5 Communications exercise	Airport switch board / PBX / ATC etc.
1.6 Organisations involved	ATC, AFS, OPS, PBX, LAES, Security.
1.7 EPC and LA Emergency Planners	Policy, procedures, planning, preparing, training. Civil Contingencies and Risk Register.
1.8 Training	Assess adequacy of prior training given to those expected to become involved.
1.9 Assessment and feedback	Assessed locally on each occasion the module is tested, or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward or repeat module.
1.10 Recording outcomes	Accurate records maintained.

(2) Module 2: Rendezvous Point (RVP)

This module deals with the RVP, it focuses on the incident from the period that the call has been received, until all those services from both on and off the airport are in position at the RVP and ready to move forward. This module will include practical demonstration of escorting members of the LAES from the RVP to an incident site. It is envisaged that this module would be run using the actual procedures, equipment and resources from all of the organisations required as if it were in a live time incident.

Objective: Test RVP	Consider, but not limited to
2.1 Determine which RVP is to be used	(Appropriate only where there are multiple RVPs provided). The test should be planned so that each RVP is practised on a rotational basis over varying times of day and night.
2.2 RVP directional signage	Ensure they are Visible, Adequate, and Appropriate to responding services that may not necessarily be familiar with the airport.

Objective: Test RVP	Consider, but not limited to
2.3 Opening/security of RVP	Adequate staffing at RVP, training/procedures, physical barriers, locks, chains etc.
2.4 Fit for purpose	Marshalling/manoeuvring area, parking, lighting, communications, information, maps etc.
2.5 Escorts	Adequate amounts of trained staff/vehicles, procedures.
2.6 Traffic management	Police, security, Ops, procedures.
2.7 EPC and LA Emergency Planners	Policy, procedures, planning, preparing, training, liaison. Civil Contingencies and Risk Register.
2.8 Training	Assess adequacy of prior training given to those expected to become involved including training records.
2.9 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward or repeat module.
2.10 Recording outcomes	Accurate records maintained.

(3) Module 3: Operational Command (Bronze)

This module deals with the operational command at the incident. It focuses on the Operations at the incident, more specifically at command. It is envisaged that this module could be run using simulation, possibly tabletop. It should involve organisations from on and off the airport together with members from all LAES who may attend the incident. Using modern virtual reality (VR) technology, it could be run on airport or at a remote site.

Objective: Test Operational Command	Consider, but not limited to
3.1 Liaison	Inter service on/off airport liaison visits/training days, interoperability procedures and operational practices.
3.2 Organisational structure	Identification of commanders.

Objective: Test Operational Command	Consider, but not limited to
3.3 Decision making	Staff training, procedures. Decisions taken are appropriate to Operational Commanders. Support available if required.
3.4 Communications	Effective communications between services/departments both on and off airport?
3.5 Forward control	Is there a dedicated forward control point vehicle and is it effective?
3.6 Cordons	Adequate resources, trained staff, procedures.
3.7 EPG and LA Emergency Planners	Policy, procedures, planning, preparing, training, liaison. Civil Contingencies and Risk Register.
3.8 Training	Assess adequacy of prior training given to those expected to become involved including training records.
3.9 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward or repeat module.
3.10 Recording outcomes	Accurate records maintained.

(4) Module 4: Medical Services

This module deals with the medical services at the incident. It focuses on the practical aspects of medical care and evacuation of any casualties. It may be conducted on or off airport, and should involve organisations from both on and off the airport together with members from the Local Health Authority, Primary Care Trust or Hospital Authority who may attend the incident. It could be run as a tabletop or using simulation and modern virtual reality (VR) technology.

Objective: Test Medical Response	Consider, but not limited to
4.1 Liaison	Inter service on/off airport liaison visits.
4.2 Organisational structure	Identification of commanders.

Objective: Test Medical Response	Consider, but not limited to
4.3 Triage	Worst first walking wounded etc. Staff training, procedures.
4.4 Communications	Is there effective communications between AFS, LAES / departments both on and off airport?
4.5 Emergency shelters	Are adequate facilities to provide emergency shelter available, from on or off airport? Resources; training, testing/inspecting.
4.6 Transport	Removal of casualties. Adequate resources.
4.7 Evacuation routes	Consider one-way routes. Contingency if access is blocked.
4.8 NHS / local hospitals	Contingency for possible large number of casualties.
4.9 EPG and LA Emergency Planners	Policy, procedures, planning, preparing, training, liaison. Civil Contingencies and Risk Register.
4.10 Training	Assess adequacy of prior training given to those expected to become involved including training records.
4.11 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
4.12 Recording outcomes	Accurate records maintained.

(5) Module 5: Tactical Command (Silver)

This module deals with tactical command at the incident. It focuses on the tactical aspects of the incident from a point in the incident when sufficient resource has arrived to instigate Tactical Command. It should involve organisations from both on and off the airport together with members from all LAES who may attend the incident. It could be run as a tabletop exercise or using simulation and modern virtual reality (VR) technology; it could be run on airport or at a remote site.

Objective: Test Tactical Command	Consider, but not limited to
5.1 Liaison	Inter service on/off airport liaison visits.
5.2 Organisational structure	Identification of commanders.
5.3 Decision making	Staff training, procedures. Decisions taken are appropriate to Tactical Commanders. Support available if required.
5.4 Location	Consider best location to set up Tactical Command. Is there a dedicated on-airport facility?
5.5 Communications	Effective communications between services/departments both on and off airport. Sufficient telephone, fax, computers.
5.6 Resources	Are adequate resources made available? White boards, flip charts maps, and writing aids. Training, procedures.
5.7 Training	Assess adequacy of prior training given to those expected to become involved including training records.
5.8 EPG, LA Emergency Planners and Crisis Management Team	Policy, procedures, planning, preparing, training, liaison. Civil Contingencies, Risk Register appropriate to Silver Command.
5.9 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
5.10 Recording outcomes	Accurate records maintained.

(6) Module 6: Strategic Command (Gold)

This module deals with strategic command at the incident. It focuses on the strategic aspects of the incident from a point in the incident when sufficient resource has arrived to instigate Strategic Command. It should involve senior

managers from both on and off the airport, senior local council officers together with senior members from all LAES who may attend the incident. It could be run as a tabletop exercise or using simulation and modern virtual reality (VR) technology; it could be run on airport or at a remote site.

Objective: Test Strategic Command	**Consider, but not limited to**
6.1 Organisational structure	Identification of commanders.
6.2 Location	Consider the Emergency Plan and identify pre-determined location for Strategic Command.
6.3 Communications	Effective communications between services/departments both on and off airport.
6.4 EPG, LA Emergency Planners and Crisis Management Team	Identify link into Strategic Command Centre. Policy, procedures, planning, preparing, training, liaison. Civil Contingencies and Risk Register.
6.5 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
6.6 Recording outcomes	Accurate records maintained.

(7) Module 7: Airport Reception Centres / Non-Emengency Services Response

This module deals with the assistance provided by agencies other than AFS and LAES. It focuses on the incident from a point when survivors/casualties are being removed from the scene of operations and efforts are being made to reunite them with their friends and families. It should involve organisations from both on and off the airport who might be expected to participate. It is envisaged that this would be conducted as a practical exercise on airport in the actual building/location that has been set aside for the purpose.

Objective: Test FRC /SRC / Voluntary Agencies	**Consider, but not limited to**
7.1 Liaison	Planning, training, liaison.
7.2 Roles and responsibilities	Procedures, roles and responsibilities of Airport, Airline and Handling Agent. Staff training/familiarisation.

Objective: Test FRC /SRC / Voluntary Agencies	**Consider, but not limited to**
7.3 Friends and Relatives Reception Centre (FRC)	Assess the building; room, shelter, screens etc. are they adequate for the expected numbers of casualties commensurate to the scale of operation? Procedures, staff training/familiarisation. The reunion process.
7.4 Survivors Reception Centre (SRC)	Assess the building; room, shelter, screens etc. are they adequate for the expected numbers of casualties commensurate to the scale of operation? Resources, procedures, staff training/familiarisation.
7.5 Media area	Is there a suitable area set aside for the media, away from the scene of operations and those attending FRC/SRC?
7.6 Voluntary organisations	WRVS, Ministers of religion, social services etc. Liaison visits and training including procedures for gaining access onto the airport.
7.7 Information Centres	The role of British Airways Emergency Planning Coordination Unit (EPIC) or Casualty Bureau or other information service providers.
7.8 EPG and LA Emergency Planners	Policy, procedures, planning, preparing, training.
7.9 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
7.10 Recording outcomes	Accurate records maintained.

(8) Module 8: Post-Disaster Management

This module deals with post-disaster management. It focuses on the latter stages of the incident from a point when all survivors/casualties have been removed and the work of body recovery, Police investigators and the Air Accidents Investigation Branch (AAIB) begins. Primarily it will involve the Police, the airport operator and the AAIB. Training could be via a tabletop exercise, or as a simulation on or off airport.

Objective: Test Post-Disaster Management Procedures	**Consider, but not limited to**
8.1 Air Accidents Investigation Branch	The role of the AAIB.
8.2 Body recovery	Specialist Police unit.
8.3 Temporary mortuary	Identify if there is any appropriate local facility near the airport as agreed with the Coroner and EPC.
8.4 Body holding area	Local facility appropriate to the airport.
8.5 Body identification	Specialist Police unit, Coroner, casualty bureau.
8.6 Undertakers	Specialist agencies e.g. Kenyons.
8.7 Family liaison / assistance centres	Local authorities, social services.
8.8 EPG and LA Emergency Planners	Policy, procedures, planning, preparing, training.
8.9 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
8.10 Recording outcomes	Accurate records maintained.

(9) Module 9: Business Recovery

This module deals with business recovery. It focuses on the end of the incident from a point when all survivors/casualties and the deceased have been removed, the investigators have concluded their investigation, and the airport is working towards returning to business as usual. It will involve the Police liaising closely with the airport operator, the NAA, the AAIB and the EPG. It is envisaged that this would be conducted as a tabletop or simulated exercise on or off airport.

Objective: Test Business Continuity/Recovery	**Consider, but not limited to**
9.1 Short/long-term closure	Local decision on airport closure.
9.2 Evacuation	Local procedures.
9.3 Aircraft recovery	RAF or local procedure.
9.4 Accommodation	Local facility appropriate to the airport where food and shelter may be provided.
9.5 Contingency plans	Robust contingency plans covering all eventualities, local to each airport.
9.6 EPG and LA Emergency Planners	Policy, procedures, planning, preparing, training.
9.7 Assessment and feedback	Assessed locally on each occasion the module is tested or externally by CAA Inspectors during their visits. Feedback sought/provided and acted upon.
9.8 Recording outcomes	Accurate records maintained.

(10) Module 10: Live Full-Scale Exercise

This module deals with the practical firefighting, search and rescue operation of the incident. It focuses on the point from when the aircraft has recently crashed up to the point when all survivors are released. It will involve the Rescue and Fire Fighting Service (RFFS), members from each of the LAES who may be expected to attend the airport, Airport Operations, Airport Security and senior airport managers. It may be held on or off the airport and should closely simulate an actual aircraft accident commensurate to the size of aircraft operating from the aerodrome. It may be possible to preassemble all those playing an active role in the exercise at a suitable location close to the scene.

Objective: Test Practical Fire-Fighting, Search and Rescue	**Consider, but not limited to**
10.1 Aim and objectives	Specific aim & objectives to be tested
10.2 AFS attendance	AFS tactics/techniques. AFS Objectives.
10.3 LAES attendance	Specific objectives for each of the LAES. Fire, Police and Ambulance, consider other agencies where appropriate,

Objective: Test Practical Fire-Fighting, Search and Rescue	Consider, but not limited to
	e.g. Coast Guard, RNLI, Military.
10.4 AAIB	Scene preservation.
10.5 Liaison	Interoperability, prior liaison and training days involving each service.
10.6 incident Command (Bronze)	Joint Operational Command involving the AFS and each responding emergency service.
10.7 Sectorisation	Cordons, specific areas of operations.
10.8 Debriefing	Hot debrief at the end of exercise followed by full formal debrief where learning is identified, notes are taken, and actions are cleared.

(b) Records should be maintained to show when/how each module is achieved, any lessons learned, and actions arising.

(c) Aerodrome operators that select option 2 should prepare a rolling plan highlighting precise details of how and when each module is to be tested. CAA Inspectors may attend tests of the modules as appropriate.

(d) Guidance on exercises is available from the following sources:

(1) ICAO Airport Services Manual Part 7, Airport Emergency Planning Chapter 13; and

(2) under 'Preparation and Planning for Emergencies' at www.gov.uk.

The following GM4 ADR.OPS.B.005(c) is inserted:

GM4 ADR.OPS.B.005(c) Aerodrome emergency planning

AERODROME EMERGENCY EXERCISES

(a) CAA Inspectors will require to be assured of the suitability of the Aerodrome Operator's emergency plan. Consequently, inspectors will wish to review documentary evidence relating to the arrangements put in place by the Aerodrome Operator.

(b) Inspectors may attend an exercise pre-briefing, testing, or debriefing, or may choose to attend emergency exercises conducted by the aerodrome.

(c) Notification of a proposed full-scale exercise must be given to the CAA inspector at least six months in advance.

AMC4 ADR.OPS.B.010(a)(2) is amended as follows:

AMC4 ADR.OPS.B.010(a)(2) Rescue and firefighting services

EXTINGUISHING AGENTS

(a) The aerodrome operator should ensure that:

(~~a~~1) both principal and complementary extinguishing agents are provided at the aerodrome;

(~~b~~2) principal extinguishing agent includes:

(~~1~~i) a foam meeting the minimum performance level A; or

(~~2~~ii) a foam meeting the minimum performance level B; or

(~~3~~iii) a foam meeting the minimum performance level C; or

(4iv) a combination of these agents;

except for aerodromes in categories 1 to 3, where it should preferably meet a performance level B or C foam~~;~~.

Note: When purchasing and using firefighting foam aerodrome operators should consider the environmental impact of their foam concentrates and follow guidance published by the Environment Agency and UK REACH - HSE (22_03_22_doc (External comms on PFOA foams) V3 FINAL.pdf & UK REACH – HSE);

(~~c~~3) the complementary extinguishing agent is a dry chemical powder suitable for extinguishing hydrocarbon fires, or any other alternate agent having equivalent firefighting capability;

(~~d~~4) the amounts of water for foam production, and of the complementary agents provided on the rescue and firefighting vehicles, are in accordance with the determined aerodrome category and Table 1~~,~~:

[Table 1 unchanged]

except that for aerodrome categories 1 and 2, up to 100 % of the water may be substituted with complementary agent. For the purpose of agent substitution, 1 kg of complementary agent is equivalent to 1 L of water for production of a foam meeting performance level A.

Note 1: The amounts of water specified for foam production are predicated on an application rate of 8.2 L/min/~~m2~~m^2 for a foam meeting performance level A, 5.5 L/min/~~m2~~m^2 for a foam meeting performance level B and 3.75 L/min/~~m2~~m^2 for a foam meeting performance level C.

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

Note 3: If a ‘high performance’ dry powder is used it may be permissible to reduce the amount provided. If an aerodrome operator wishes to

reduce the quantity of dry powder provided, they must apply for an Alternative Means of Compliance to the CAA. The application must be supported by an assessment that shows how the aerodrome operator is assured that the lower quantity of dry powder can provide an equivalent level of fire extinguishing performance for the types of fires where the agent is expected to be used;

(~~da~~5) the quantity of foam concentrates separately provided on vehicles for foam production is in proportion to the quantity of water provided and the foam concentrate selected;

~~(e) the amount of foam concentrate provided on a vehicle should be sufficient to produce, at least, two loads of foam solution;~~

~~(f) when a combination of different performance level foams are provided at the aerodrome, the total amount of water to be provided for foam production should be calculated for each foam type and the distribution of these quantities should be documented for each vehicle and applied to the overall rescue and firefighting requirement;~~

(~~g~~6) the discharge rate of the foam solution is not less than the rates shown in Table 1;

(~~h~~7) the complementary agents comply with the appropriate specifications of the International Organisation for Standardisation (ISO);

(~~i~~8) the discharge rate of complementary agents is not less than the values shown in Table 1;

(~~j~~9) a reserve supply of foam concentrate equivalent to 200 % of the quantities identified in Table 1 is maintained on the aerodrome for vehicle replenishment purposes. Foam concentrate carried on fire vehicles in excess of the quantity identified in Table 1 can contribute to the reserve;

(~~k~~10) a reserve supply of complementary agent equivalent to 100% of the quantity identified in Table 1 is maintained on the aerodrome for vehicle replenishment purposes and sufficient propellant gas is included to ~~utilize~~ utilise this reserve complementary agent. Complementary agent(s) carried on fire vehicles in excess of the quantity identified in Table 1 may contribute to the reserve;

(~~l~~11) for Category 1 and 2 aerodromes that have replaced up to 100% of the water with complementary agent a reserve supply of complementary agent of 200% is maintained;

(~~m~~12) where a major delay in the replenishment of the supplies is anticipated, the amount of reserve supply is increased as determined by a risk assessment;

(~~n~~13) a water need analysis is conducted to determine the availability of sufficient quantities of water for firefighting;

(~~o~~14) quantities of water and foam concentrate are recalculated, and the amount of water and foam concentrate for foam production and the discharge rates for foam solution are increased accordingly, where operations by aeroplanes larger than the average size in a given category are planned; and

~~(oa) Where the level of protection is reduced in accordance with AMC2 ADR.OPS.B.010 (a)(2), a recalculation of quantities of extinguishing agents should be computed based on the largest aeroplane in the reduced category;~~

~~(ob) For all-cargo, mail, training, test, positioning and end-of-life aeroplane operations, including those carrying dangerous goods, the recalculation of quantities of extinguishing agents should be based on the largest aeroplane in the category specified in Table 2 of AMC2 ADR.OPS.B.010(a)(2);and~~

(~~p~~15) arrangements are in place to manage extinguishing agents in terms of selection, storage, maintenance, and testing.

(b) The aerodrome operator should consider the following recommendations and meet their intent:

(1) the amount of foam concentrate provided on a vehicle should be sufficient to produce, at least, two loads of foam solution;

(2) when a combination of different performance level foams is provided at the aerodrome, the total amount of water to be provided for foam production should be calculated for each foam type and the distribution of these quantities should be documented for each vehicle and applied to the overall rescue and firefighting requirement;

(3) where the level of protection is reduced in accordance with AMC2 ADR.OPS.B.010(a)(2), a recalculation of quantities of extinguishing agents should be computed based on the largest aeroplane in the reduced category; and

(4) for all-cargo, mail, training, test, positioning and end-of-life aeroplane operations, including those carrying dangerous goods, the recalculation of quantities of extinguishing agents should be based on the largest aeroplane in the category specified in Table 2 of AMC2 ADR.OPS.B.010(a)(2).

AMC5 ADR.OPS.B.010(a)(2) is amended as follows:

AMC5 ADR.OPS.B.010(a)(2) Rescue and firefighting services

RESPONSE TIME

The aerodrome operator should ensure that:

(a) rescue and firefighting service achieves a response time not exceeding three minutes with an operational objective of not exceeding two minutes from the time of the initial call to the rescue and firefighting services, to any point of each operational runway, in optimum visibility and surface conditions, and be in a

position to apply foam at a rate of, at least, 50 % of the discharge rate specified in AMC4 ADR.OPS.B.010(a)(2) Table 1;

(b) response times to any other part of the movement area, in optimum visibility and surface conditions, are calculated and included in the Aerodrome Emergency Plan;

(c) any vehicle, other than the first responding vehicle(s), required to achieve continuous agent application of the amount of extinguishing agents specified in Table 1 of AMC4 ADR.OPS.B.010(a)(2) arrives no more than one minute after the first responding vehicle(s); and

[…]

GM1 ADR.OPS.B.010(a)(2) is amended as follows:

GM1 ADR.OPS.B.010(a)(2) Rescue and firefighting services

COMMUNICATION AND ALERTING SYSTEMS

(a) The aerodrome operator should examine the possibility of ~~utilizing~~ utilising means allowing the direct communication between the rescue and ~~fire fighting~~ firefighting service and the flight crew of an aircraft in emergency. The decision could be based on the ability of the rescue and ~~fire fighting~~ firefighting personnel to communicate effectively with the flight crew either verbally or using hand signals. Two-way radio communication system may be used as well as the hand signals described in Appendix 1 of the Annex to UK Regulation (EU) No. 923/2012 Standardised Rules of the Air - Signals ~~Commission Implementing Regulation (EU) No 923/2012~~.

(b) A method of monitoring the movement area for the purpose of alerting and deploying the RFFS without delay should be considered as a means to achieve point (d) of AMC1 ADR.OPS.B.010(a)(2).

(c) Communications equipment provided should ensure effective two-way communication between parties with an effective range that ensures reception within all areas that the RFFS may be required to operate in.

(d) Radio equipment to enable Incident Commanders to maintain communications when not in their vehicles should be provided.

(e) Radio telecommunications (RTF) equipment should be provided to enable the airport fire officer(s) to communicate with the aircraft flight deck. An aeronautical radio frequency, 121.605 MHz, may be used for this purpose. All RTF communications on this frequency should be recorded on suitable equipment that has the capability to identify the time the communication took place. Procedures should be in place to store recordings on archival media for a minimum period of 30 days from the date of the last recorded message. The CAA and Air Accidents Investigation Branch (AAIB) may require access to the recordings.

(f) To use 121.605 MHz, the RFFS must obtain prior approval to install and operate radio equipment from the relevant licensing authority. The use of 121.605 MHz is

limited to direct communications between the fire officer and pilot when the aircraft is on the ground and only within the period of a declared emergency.

GM2 ADR.OPS.B.010(a)(2) is amended as follows:

GM2 ADR.OPS.B.010(a)(2) Rescue and firefighting services

NUMBER OF RFFS PERSONNEL

(a) In determining the minimum number of personnel and supervisory levels required to provide ~~for~~ rescue and firefighting, a Task and Resource Analysis (TRA) should be ~~performed,~~ completed and the level of crewing and qualification promulgated in, or referenced to, the aerodrome manual. The TRA should take ~~taking~~ into consideration the types of aircraft operating at the aerodrome, the available rescue and firefighting vehicles and equipment, any other duties required from RFFS personnel, etc.

(b) The objective of providing an adequate level of competent personnel is to have available sufficient personnel at all responsibility levels to ensure that:

(1) the RFFS is capable of achieving the Principal Objective;

(2) all vehicles and equipment can be operated effectively and safely;

(3) continuous agent application at the appropriate rate(s) can be fully maintained;

(4) sufficient supervisory grades can implement an Incident Command System; and

(5) the RFFS elements of the aerodrome emergency plan can be effectively achieved.

Note: CAP 1150 may be referred to for additional guidance.

(c) It is recognised that RFFS personnel may be engaged in duties other than those directly associated with the RFFS role. Extraneous duties should be the subject of an impact assessment and should be organised so as not to create conditions likely to compromise individual or crew performance or introduce additional hazards.

(d) RFFS personnel designated as part of the minimum level for response, and who are engaged on extraneous duties, should be able to disengage safely, so as to be capable of meeting the response time objective.

GM3 ADR.OPS.B.010(a)(2) is amended as follows:

GM3 ADR.OPS.B.010(a)(2) Rescue and firefighting services

NUMBER OF RFFS VEHICLES AND RESCUE EQUIPMENT

(a) Special ~~fire fighting~~ firefighting equipment may 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 should be 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.

(b) The level of rescue equipment provided should take into consideration:

(1) the level of aircraft operations;

(2) the task and resource analysis;

(3) relevant Health and Safety legislation, e.g. Provision and Use of Work Equipment Regulations (PUWER), Personal Protective Equipment at Work Regulations (PPE); and

(4) a suitable test and inspection regime for which appropriate records should be maintained (for a minimum period of 5 years). Records should include details of consequential action where an inspection has revealed a defect or deficiency.

GM4 ADR.OPS.B.010(a)(2) is amended as follows:

GM4 ADR.OPS.B.010(a)(2) Rescue and firefighting services

REDUCTION OF RFFS LEVEL OF PROTECTION

(a) Contingency arrangements to limit the need for changes to the promulgated rescue and firefighting level of protection should be developed. This may involve, for example, a maintenance plan to ensure the mechanical efficiency of equipment and vehicles for rescue and firefighting, and arrangements to cover unplanned absence of the minimum level of personnel including supervisory levels.

(b) The following may be considered as unforeseen circumstances leading to temporary reduction of the level of protection of the aerodrome rescue and firefighting:

(~~a~~1) breakdown of RFFS vehicles;

(~~b~~2) staff shortage;

(~~c~~3) unavailability of extinguishing agents; and

(~~c~~4) RFFS response to an accident.

(c) Such changes, including estimated time of the reduction, should be notified without delay to the appropriate air traffic services (ATS) units and aeronautical information services (AIS) units (see GM10 ADR.OPS.A.005 Aerodrome data) to enable those units to provide the necessary information to arriving and departing aircraft.

The following GM7 ADR.OPS.B.010(a)(2) is inserted:

GM7 ADR.OPS.B.010(a)(2) Rescue and firefighting services

EXTINGUISHING AGENTS

(a) Details of foam specification should be sought from the foam manufacturer/supplier and/or reference to the relevant product data sheets.

(b) The objective of an extinguishing agent is to extinguish/suppress a fire on which it is applied. Principal agents are provided for permanent control, i.e. for a period of several minutes or longer. Complementary agents may provide rapid fire suppression but generally only offer a transient control, which is available during application. The ICAO Critical Area Concept is not intended to ensure extinguishment of the entire fire, it seeks to control only the area of fire adjacent to the fuselage. The objective is to safeguard the integrity of the fuselage and maintain tolerable conditions for its occupants.

(c) The required quantities of extinguishing agents should be in accordance with the aerodrome category and should be available for immediate discharge from RFFS appliances.

(d) For RFFS Categories 3-10, the discharge rates for foam, as detailed in AMC4 ADR.OPS.B.010(a)(2) Table 1, should be achievable using vehicle monitor(s).

(e) Supplementary water supplies, for the expeditious replenishment of rescue and fire fighting vehicles at the scene of an aircraft accident, should be considered.

(f) Additional water to replenish vehicles may be required in as little as five minutes after an accident; therefore, licence holders should conduct an analysis to determine the extent to which it, and its associated storage and delivery facilities, should be provided. The following factors should be considered:

(1) sizes and types of aircraft using the aerodrome;

(2) the capacities and discharge rates of aerodrome fire vehicles;

(3) the provision of strategically located hydrants;

(4) the provision of strategically located static water supplies;

(5) utilisation of existing natural water supplies;

(6) vehicle response times;

(7) historical data of water used during aircraft accidents;

(8) the need and availability of supplementary pumping capacity;

(9) the provision of additional vehicle-borne supplies;

(10) the level of support provided by local authority emergency services;

(11) the pre-determined response of local authority emergency services;

(12) fixed pumps where these may provide a rapid and less resource-intensive method of replenishment;

(13) additional water supplies adjacent to airport fire service training areas;

(14) overhead static water supplies; and

(15) foam concentrate compatibility.

(g) A quantity of gaseous agent or CO_2 should be provided for use on small or hidden fires. A minimum extinguisher size is 5 kg for major and 2 kg for smaller vehicles.

(h) Training foams do not comply with any recognised national or international standards; however, they will be quality assured by the manufacturer. They may be formulated to mimic the operational foams for induction, drainage and expansion properties; however, their firefighting properties may be reduced. Personnel must understand this feature of training foams before they are used.

(i) Care should be taken to prevent confusion between the storage and use of training foams with their operational counterparts. Where the manufacturer can demonstrate that the training foam produces identical test results to those expected to be obtained by the operational firefighting foam, it may be used to conduct the foam production performance and in-service tests.

Note Training foam should be managed in the same manner as operational foam.

The following GM8 ADR.OPS.B.010(a)(2) is inserted:

GM8 ADR.OPS.B.010(a)(2) Rescue and firefighting services

RESPONSE TIME

(a) When calculating response time, the aerodrome operators should consider the following:

(1) providing direct access to the operational runway(s);

(2) runway incursion prevention measures;

(3) designating access routes to the response area;

(4) the maintenance of roads and access routes;

(5) eliminating the possibility of any vehicle blocking the progress of responding emergency vehicles;

(6) taking account of the gross weight and maximum dimensions of the RFFS vehicle(s) expected to use the roads and access routes and the vehicle handling characteristics;

(7) that roads are capable of being traversed in all conditions;

(8) exit gates or frangible sections in the security fence;

(9) exit points will need to be clearly identified. Retro-reflective tape or markers will be of assistance where the aerodrome may need to be accessible during the hours of darkness or conditions of low visibility;

(10) any delethalisation requirements; and

(11) providing sufficient vertical clearance from overhead obstructions for the largest vehicle.

(b) 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 in a position to apply foam as described in AMC5 ADR.OPS.B.10(a)(2).

(c) Optimum visibility and surface conditions are defined as daytime, good visibility, no precipitation with normal response route free of surface contamination, e.g. water, ice or snow.

(d) RFFS vehicles should approach any aircraft accident by the quickest route commensurate with safety, although this might not necessarily be the shortest distance to the scene.

(e) Traversing through unimproved areas can take longer than travelling a greater distance on paved surfaces, therefore a thorough knowledge by RFFS personnel of the topography of the aerodrome and its immediate vicinity is fundamental. The use of grid maps and careful selection of routes is essential for success in meeting the response objective.

(f) RFFS vehicles should be equipped with an airfield chart clearly showing all taxiways, runways, holding points and vehicle routes marked with their appropriate designation. The chart(s) should be accompanied by written instructions clearly detailing the action that the driver should take in the event that the vehicle should break down or that the driver should become unsure of the vehicle’s position on the aerodrome.

(g) A response safe system of work includes a number of elements that must come together to deliver an effective and safe response. A comprehensive hazard and risk analysis should be conducted over the optimum response routes within the aerodrome boundary that RFFS vehicles are likely to use to achieve the operational objective. The analysis and system of work should consider:

(1) standard operating procedures.

(2) call handling;

(3) alerting system;

(4) position of the fire station or standby area;

(5) position of training area where a response may be made from;

(6) suitable access roads and routes;

(7) visibility and surface conditions;

(8) a clear route;

(9) vehicle performance;

(10) vehicle maintenance;

(11) effective equipment;

(12) competent staff.

(13) communications;

(14) an effective safety culture;

(15) effective leadership and incident command;

(16) human factors; and

(17) monitoring and review including records.

(h) In assessing an effective response all of these areas should be considered and reviewed. Aerodrome Operators should not focus on any one aspect in isolation when measuring effectiveness.

(i) Where RFFS vehicles respond to incidents using the public highway, an assessment of the implications of such a response should be carried out. The following should be considered:

(1) the legal requirements for vehicles and drivers;

(2) that suitable policies and procedures are in place;

(3) competence and training requirements for drivers;

(4) pre-planning of routes for suitability; and

(5) the monitoring and review of such responses.

GM2 ADR.OPS.B.010(a)(4) is amended as follows:

GM2 ADR.OPS.B.010(a)(4) Rescue and firefighting services

MEDICAL CRITERIA FOR RFFS PERSONNEL

~~1.~~(a) **CARDIOVASCULAR SYSTEM**

(~~a~~1) General

(~~1~~i) ~~Rescue and firefighting~~ RFFS personnel with any of the following conditions are assessed as unfit:

(~~i~~A) aneurysm of the thoracic or supra-renal abdominal aorta, before or after a surgery;

(~~ii~~B) significant functional abnormality of any of the heart valves;

(~~iii~~C) heart or heart/lung transplantation;

(~~iv~~D) symptomatic sinoatrial disease;

(~~v~~E) complete atrioventricular block;

(~~vi~~F) a sub-endocardial pacemaker;

(~~vii~~G) symptomatic channelopathies including QT prolongation and Brugada syndrome;

(~~viii~~H) an automatic implantable defibrillating system;

(~~ix~~I) a ventricular anti-tachycardia pacemaker; and

(~~x~~J) pulmonary hypertension.

(~~2~~ii) ~~Rescue and firefighting~~ RFFS personnel with a suspected or ~~e~~established diagnosis of any of the following conditions are assessed as unfit. Following satisfactory treatment and specialist review, a fit assessment can be considered.

(~~i~~A) ~~C~~coronary arterial disease before or after intervention;

(~~ii~~B) ~~P~~peripheral arterial disease before or after a surgery;

(~~iii~~C) ~~A~~aneurysm of the infra-renal abdominal aorta, before or after a surgery;

(~~iv~~D) ~~F~~functionally insignificant cardiac valvular abnormalities;

(~~v~~E) ~~A~~after a cardiac valve surgery;

(~~vi~~F) ~~S~~significant disorder of cardiac rhythm, including pacemakers and ablation therapy;

(~~vii~~G) ~~A~~abnormality of the pericardium, myocardium or endocardium;

(~~viii~~H) ~~C~~congenital abnormality of the heart, before or after a corrective surgery;

(~~ix~~I) ~~R~~recurrent vasovagal syncope;

(~~x~~J) ~~A~~arterial or venous thrombosis;

(~~xi~~K) ~~P~~pulmonary embolism; and

(~~xii~~L) ~~C~~cardiovascular condition that requires systemic anticoagulant therapy.

(~~b~~2) Peripheral arterial disease

~~Rescue and firefighting~~ RFFS personnel with peripheral arterial disease, before or after a surgery, undergo a satisfactory cardiological evaluation including an exercise ECG. Further tests may be required which should show no evidence of myocardial ischaemia or significant coronary artery stenosis. A fit assessment may be considered provided that:

(~~1~~i) a Doppler echocardiography of the affected area is satisfactory; and

(~~2~~ii) there is no sign of significant coronary artery disease or evidence of significant atheroma elsewhere, and no functional impairment of the end organ supplied.

(~~c~~3) Aortic aneurysm

~~Rescue and firefighting~~ RFFS personnel:

(~~1~~i) with an aneurysm of the infra-renal abdominal aorta are assessed as unfit; and

(~~2~~ii) may be assessed as fit after a surgery for an infra-renal aortic aneurysm without complications and subject to being free of disease of the carotid and coronary circulation.

(~~d~~4) Cardiac valvular abnormalities

~~Rescue and firefighting~~ RFFS personnel:

(~~1~~i) with previously unrecognised cardiac murmurs will undergo a cardiological evaluation. If considered significant, further investigation may be required subject to the recommendation of the cardiologist;

(~~2~~ii) with minor cardiac valvular abnormalities may be assessed as fit. Regular cardiological follow-up, including at least a 2D Doppler echocardiography, as determined by the cardiologist is required;

(~~3~~iii) with significant abnormality of any of the heart valves are assessed as unfit~~.~~;

(4iv) with bicuspid aortic valve may be assessed as fit if no other cardiac or aortic abnormality is demonstrated and if their effort capacity is not adversely affected. Regular cardiological follow-up, including a 2D Doppler echocardiography, is required;

(~~5~~v) with mild aortic stenosis may be assessed as fit if their effort capacity is not adversely affected. Annual cardiological follow-up is required which includes a 2D Doppler echocardiography;

(~~6~~vi) with aortic regurgitation may be assessed as fit only if regurgitation is minor and there is no evidence of volume overload. There will be no demonstrable abnormality of the ascending aorta on a 2D Doppler echocardiography. Cardiological follow-up including a 2D Doppler echocardiography is required;

(~~7~~vii) with rheumatic mitral stenosis may only be assessed as fit in favourable cases after a cardiological evaluation including a 2D Doppler echocardiography;

(~~8~~viii) with uncomplicated minor mitral valve regurgitation may be assessed as fit if their effort capacity is not adversely affected. Regular cardiological follow-up including a 2D Doppler echocardiography is required;

(~~9~~ix) with mitral valve prolapse and mild mitral regurgitation may be assessed as fit if their effort capacity is not adversely affected;

(~~10~~x) with evidence of volume overloading of the left ventricle demonstrated by increased left ventricular end-diastolic diameter are assessed as unfit;

(~~11~~xi) with cardiac valve replacement/repair are assessed as unfit. After a satisfactory cardiological evaluation, a fit assessment may be considered; ~~and~~

(~~12~~xii) after a valvular surgery without any symptom may be assessed as fit after 6 months subject to:

(~~i~~A) normal valvular and ventricular function as judged by a 2D Doppler echocardiography;

(~~ii~~B) satisfactory symptom-limited exercise ECG or equivalent;

(~~iii~~C) demonstrated absence of coronary artery disease unless this has been satisfactorily treated by re-vascularisation;

(~~iv~~D) no cardioactive medication being required; and

(~~v~~E) annual cardiological follow-up to include an exercise ECG and a 2D Doppler echocardiography. Longer periods may be acceptable once a stable condition has been confirmed by cardiological evaluations; and

(~~13~~xiii) with implanted mechanical valves are assessed as unfit. Persons with implanted biological valves may be assessed as fit subject to documented exemplary compliance with their anti-platelet therapy. Age factors are part of the risk assessment.

(~~e~~5) Thromboembolic disorders

~~Rescue and firefighting~~ RFFS personnel with arterial or venous thrombosis or pulmonary embolism are assessed as unfit during anticoagulation. ~~Rescue and firefighting~~ RFFS personnel with pulmonary embolism will also be evaluated by a cardiologist. Following cessation of anticoagulant therapy, for any indication, they need to undergo a re-assessment before returning to duty.

(~~f~~6) Other cardiac disorders

~~Rescue and firefighting~~ RFFS personnel:

(~~1~~i) with an abnormality of the pericardium, myocardium or endocardium are assessed as unfit. A fit assessment may be considered following a complete resolution and a satisfactory cardiological evaluation which may include a 2D Doppler echocardiography, an exercise ECG, a 24-hour ambulatory ECG, and/or a myocardial perfusion scan or an equivalent test. Coronary angiography or an equivalent test may be indicated. Regular cardiological follow-up may be required; and

(~~2~~ii) with a congenital abnormality of the heart, including those who have undergone surgical correction, are assessed as unfit. ~~Rescue and~~

~~firefighting~~ RFFS personnel with minor abnormalities that are functionally relevant and do not adversely affect their effort capacity may be assessed as fit following a cardiological assessment. No cardioactive medication is acceptable. Investigations may include a 2D Doppler echocardiography, an exercise ECG and a 24-hour ambulatory ECG. Regular cardiological follow-up may be required.

(~~g~~7) Syncope

(~~1~~i) ~~Rescue and firefighting~~ RFFS personnel with a history of recurrent episodes of syncope are assessed as unfit. A fit assessment may be considered after a sufficient period of time without recurrence provided that a cardiological evaluation is satisfactory.

(~~2~~ii) A cardiological evaluation following a single episode of syncope includes at least:

(~~i~~A) a satisfactory symptom-limited exercise ECG. If the exercise ECG is abnormal, a myocardial perfusion scan or an equivalent test is required;

(~~ii~~B) a 2D Doppler echocardiogram showing neither significant selective chamber enlargement nor structural or functional abnormality of the heart, valves or myocardium;

(~~iii~~C) a 24-hour ambulatory ECG recording showing no conduction disturbance, complex or sustained rhythm disturbance or evidence of myocardial ischaemia; and

(~~iv~~D) a tilt test carried out to a standard protocol showing no evidence of vasomotor instability.

(~~3~~iii) Neurological review may be required.

(~~h~~8) Blood pressure

(~~1~~i) Blood pressure will be within normal limits.

(~~2~~ii) Rescue and firefighting personnel:

(~~i~~A) with symptomatic hypotension; or

(~~ii~~B) whose blood pressure at examination consistently exceeds 140 mmHg systolic and/or 90 mmHg diastolic, with or without treatment; or

(~~iii~~C) who have initiated a medication for the control of blood pressure,

will require a period of suspension from the duties in order to assess the severity of the condition, impose or change the treatment and/or to establish the absence of significant side effects.

(~~3~~iii) The investigation of possible hypertension and confirmation of adequate control on medication includes a 24-hour blood pressure monitoring.

(4~~i~~v) Anti-hypertensive medication may include:

(~~i~~A) non-loop diuretic agents;

(~~ii~~B) angiotensin converting enzyme (ACE) inhibitors;

(~~iii~~C) angiotensin II receptor blocking agents;

(~~iv~~D) long-acting slow channel calcium blocking agents; and

(~~v~~E) certain (generally hydrophilic) beta-blocking agents.

(~~5~~v) Following initiation of medication for the control of blood pressure, ~~rescue and firefighting~~ RFFS personnel are re-assessed to verify that the treatment is compatible with the safe exercise of their duties.

(~~i~~9) Coronary artery disease

(~~1~~i) ~~Rescue and firefighting~~ RFFS personnel with chest pain will undergo a full investigation before a fit assessment may be considered. ~~Rescue and firefighting~~ RFFS personnel with angina pectoris are assessed as unfit, whether or not it is abolished by medication.

(~~2~~ii) ~~Rescue and firefighting~~ RFFS personnel with suspected asymptomatic coronary artery disease undergo a cardiological evaluation including an exercise ECG. Further tests (myocardial perfusion scanning, stress echocardiography, coronary angiography or equivalent) may be required, which should show no evidence of myocardial ischaemia or significant coronary artery stenosis.

(~~3~~iii) After an ischaemic cardiac event, including revascularisation (PTCI/stent and CABG), ~~rescue and firefighting~~ RFFS personnel without symptoms need to have reduced any vascular risk factors to an appropriate level. Medication, when used to control cardiac symptoms, is not acceptable. All ~~rescue and firefighting~~ RFFS personnel will be on acceptable secondary prevention treatment.

(~~i~~A) A coronary angiogram or equivalent obtained around the time of, or during, the ischaemic myocardial event, and a complete, detailed clinical report of the ischaemic event and of any operative procedures is available.

(~~A~~I) There is no stenosis more than 50 % in any major untreated vessel, in any vein or artery graft or at the site of an angioplasty/stent, except in a vessel subtending a myocardial infarction. More than two stenoses between 30 % and 50 % within the vascular tree are not acceptable.

(~~B~~II) The whole coronary vascular tree is assessed as satisfactory by a cardiologist, and particular attention is paid to multiple stenoses and/or multiple revascularisations.

(~~C~~III) An untreated stenosis greater than 30 % in the left main or proximal left anterior descending coronary artery is not acceptable.

(~~ii~~B) At least 6 months from the ischaemic myocardial event, including revascularisation, the following investigations need to be completed:

(~~A~~I) an exercise ECG showing neither evidence of myocardial ischaemia nor rhythm or conduction disturbance;

(~~B~~II) an echocardiogram or an equivalent test showing satisfactory left ventricular function with no important abnormality of wall motion (such as dyskinesia or akinesia) and a left ventricular ejection fraction of 50 % or more;

(~~C~~III) in cases of angioplasty/stenting, a myocardial perfusion scan or equivalent test, which shows no evidence of reversible myocardial ischaemia. If there is any doubt about myocardial perfusion, in other cases (infarction or bypass grafting), a perfusion scan is also required; and

(~~D~~IV) further investigations, such as a 24-hour ECG, may be necessary to assess the risk of any significant rhythm disturbance.

(~~iii~~C) Follow-up is conducted annually (or more frequently, if necessary) to ensure that there is no deterioration of the cardiovascular status. It includes a cardiological evaluation, an exercise ECG and a cardiovascular risk assessment. Additional investigations may be required.

(~~iv~~D) After coronary artery vein bypass grafting, a myocardial perfusion scan or an equivalent test is performed on clinical indication, and in all cases within 5 years from the procedure.

(~~v~~E) In all cases, coronary angiography, or an equivalent test, is considered at any time if symptoms, signs or non-invasive tests indicate myocardial ischaemia.

(~~vi~~F) ~~Rescue and firefighting~~ RFFS personnel may be assessed as fit to undergo the physical fitness tests after successful completion of the 6-month or later review.

(~~j~~10) Rhythm and conduction disturbances

(~~1~~i) ~~Rescue and firefighting~~ RFFS personnel with any significant rhythm or conduction disturbance may be assessed as fit after a cardiological

evaluation and with appropriate follow-up. Such an evaluation includes:

(~~i~~A) an exercise ECG to show no significant abnormality of rhythm or conduction, and no evidence of myocardial ischaemia. Withdrawal of cardioactive medication prior to the test is required;

(~~ii~~B) a 24-hour ambulatory ECG to demonstrate no significant rhythm or conduction disturbance; and

(~~iii~~C) a 2D Doppler echocardiogram to show no significant selective chamber enlargement or significant structural or functional abnormality, and a left ventricular ejection fraction of at least 50 %.

Further evaluation may include:

(~~iv~~D) 24-hour ECG recording repeated as necessary;

(~~v~~E) electrophysiological study (EPS);

(~~vi~~F) myocardial perfusion imaging or equivalent test;

(~~vii~~G) cardiac magnetic resonance imaging (MRI) or equivalent test; and

(~~viii~~H) coronary angiogram or equivalent test.

(~~2~~ii) ~~Rescue and firefighting~~ RFFS personnel with supraventricular or ventricular ectopic complexes on a resting ECG may require no further evaluation, provided that the frequency can be shown to be no greater than one per minute; for example, on an extended ECG strip. ~~Rescue and firefighting~~ RFFS personnel with asymptomatic isolated uniform ventricular ectopic complexes may be assessed as fit but frequent or complex forms require a full cardiological evaluation.

(~~3~~iii) Ablation

(~~i~~A) ~~Rescue and firefighting~~ RFFS personnel who have undergone ablation therapy are assessed as unfit for a minimum period of 2 months.

(~~ii~~B) A fit assessment may be considered following successful catheter ablation provided that an EPS demonstrates satisfactory control has been achieved.

(~~iii~~C) Where EPS is not performed, longer periods of unfitness and cardiological follow-up needs to be considered.

(~~iv~~D) Follow-up includes a cardiological assessment.

(4iv) Supraventricular arrhythmias

~~Rescue and firefighting~~ RFFS personnel with significant disturbance of supraventricular rhythm, including sinoatrial dysfunction, whether

intermittent or established, are assessed as unfit. A fit assessment may be considered if a cardiological evaluation, including the prospective risk of stroke, is satisfactory. Anticoagulation therapy is disqualifying.

(~~i~~A) For pre-employment assessments, for ~~rescue and firefighting~~ RFFS personnel with atrial fibrillation/flutter, a fit assessment is limited to those with a single episode of arrhythmia which is considered to be unlikely to recur.

(~~ii~~B) ~~Rescue and firefighting~~ RFFS personnel with asymptomatic sinus pauses up to 2.5 seconds on a resting ECG may be assessed as fit following a satisfactory cardiological evaluation. The cardiological evaluation includes at least the following: an exercise ECG, a 2D Doppler echocardiography and a 24-hour ambulatory ECG.

(~~iii~~C) ~~Rescue and firefighting~~ RFFS personnel with symptomatic ~~sino-atrial~~ sinoatrial disease are assessed as unfit.

(~~5~~v) Mobitz type 2 atrio-ventricular block

~~Rescue and firefighting~~ RFFS personnel with Mobitz type 2 AV block may be assessed as fit after a full cardiological evaluation confirms the absence of distal conducting tissue disease.

(~~6~~vi) Complete right bundle branch block

~~Rescue and firefighting~~ RFFS personnel with complete right bundle branch block undergo a cardiological evaluation on first presentation.

(~~7~~vii) Complete left bundle branch block

A fit assessment may be considered, as follows:

(~~i~~A) At first assessment, rescue and firefighting personnel may be assessed as fit after a full cardiological evaluation showing no pathology. Depending on the clinical situation, a period of stability may be required.

(~~ii~~B) ~~Rescue and firefighting~~ RFFS personnel, during a periodic assessment of their medical fitness, with a de-novo left bundle branch block may be assessed as fit after a cardiological evaluation showing no pathology. A period of stability may be required.

(~~iii~~C) A cardiological evaluation is recommended after 12 months in all cases.

(~~8~~viii) Ventricular pre-excitation

~~Rescue and firefighting~~ RFFS personnel with pre-excitation may be assessed as fit if they are asymptomatic, and an electrophysiological study, including an adequate drug-induced autonomic stimulation

protocol, reveals no inducible re-entry tachycardia and the existence of multiple pathways is excluded. Cardiological follow-up will be required including a 24-hour ambulatory ECG recording showing no tendency to symptomatic or asymptomatic tachy-arrhythmia.

(~~9~~ix) QT prolongation

~~Rescue and firefighting~~ RFFS personnel with QT prolongation need to have a cardiological evaluation. A fit assessment may be considered in asymptomatic persons.

(b) **RESPIRATORY SYSTEM**

(1) RFFS personnel with significant impairment of pulmonary function are assessed as unfit. A fit assessment could be considered once pulmonary function has recovered and is satisfactory.

(2) RFFS personnel with any sequelae of disease or surgical intervention in any part of the respiratory tract likely to cause incapacitation are assessed as unfit. A fit assessment could be considered after a specialist evaluation.

(3) Following significant respiratory illness, physical fitness tests will be performed prior to a return to operational duty.

(4) Examination

(i) A spirometry is required for initial examination. An FEV1/FVC ratio less than 75 % requires an evaluation by a specialist in respiratory disease before a fit assessment can be considered.

(ii) Posterior/anterior chest radiography may be required at initial, revalidation or renewal examinations when indicated on clinical or epidemiological grounds.

(5) Chronic obstructive airways disease

RFFS personnel with chronic obstructive airways disease are assessed as unfit. Rescue and firefighting personnel with only minor impairment of their pulmonary function may be assessed as fit after a specialist respiratory evaluation. Limitation of duties may be required. RFFS personnel with pulmonary emphysema may be assessed as fit for limited duties excluding use of breathing apparatus following a specialist evaluation showing that the condition is stable and not causing significant symptoms.

(6) Asthma

RFFS personnel with asthma that requires medication may be assessed as fit if the asthma is considered stable with satisfactory pulmonary function tests and medication is compatible with the safe execution of the duties. Operational limitations may be appropriate.

(7) Inflammatory disease

(i) For RFFS personnel with active inflammatory disease of the respiratory system, a fit assessment may be considered following a

specialist evaluation when the condition has resolved without sequelae and no medication is required.

(ii) RFFS personnel with chronic inflammatory diseases may be assessed as fit following a specialist evaluation that shows mild disease with no risk of acute worsening with acceptable pulmonary function test, including bronchial challenge test, and medication compatible with the safe execution of duties. Operational limitations may be required.

(8) Sarcoidosis

(i) RFFS personnel with active sarcoidosis are assessed as unfit. A specialist evaluation is undertaken with respect to the possibility of systemic, particularly cardiac, involvement. A fit assessment may be considered if minimal medication is required, and the disease is limited to hilar lymphadenopathy and inactive.

(ii) RFFS personnel with cardiac or neurological sarcoid are assessed as unfit.

(9) Pneumothorax

RFFS personnel with a spontaneous pneumothorax are assessed as unfit. A fit assessment may be considered:

(i) six weeks after the event provided full recovery from a single event has been confirmed in a full respiratory evaluation including a CT scan or equivalent; and

(ii) following surgical intervention in the case of a recurrent pneumothorax provided that there is satisfactory recovery.

(10) Thoracic surgery

(i) RFFS personnel that require a thoracic surgery are assessed as unfit until such time as the effects of the operation are no longer likely to interfere with the safe exercise of their duties.

(ii) A fit assessment may only be considered after satisfactory recovery and a full respiratory evaluation including a CT scan or equivalent. The underlying pathology which necessitated the surgery is considered in the assessment process.

(11) Sleep apnoea syndrome / sleep disorder

(i) RFFS personnel with unsatisfactorily treated sleep apnoea syndrome and suffering from excessive daytime sleepiness are assessed as unfit.

(ii) RFFS personnel with obstructive sleep apnoea undergo a cardiological and pneumological evaluation.

(iii) A fit assessment may be considered subject to the extent of symptoms, and satisfactory treatment.

(c) DIGESTIVE SYSTEM

(1) RFFS personnel with any sequelae of disease or surgical intervention in any part of the digestive tract or its adnexa likely to cause incapacitation are assessed as unfit. A fit assessment may be considered after a specialist evaluation.

(2) Oesophageal varices

RFFS personnel with oesophageal varices are assessed as unfit.

(3) Pancreatitis

(i) RFFS personnel with pancreatitis are assessed as unfit pending an assessment. A fit assessment may be considered if the cause (e.g. gallstone, other obstruction, medication) is removed.

(ii) Alcohol may be a cause of dyspepsia and pancreatitis. A full evaluation of its use/abuse is required.

(4) Gallstones

RFFS personnel:

(i) with a single large gallstone may be assessed as fit after an evaluation; and

(ii) with multiple gallstones may be assessed as fit while awaiting assessment or treatment provided that the symptoms are unlikely to interfere with duties.

(5) Inflammatory bowel disease

RFFS personnel with an established diagnosis or history of chronic inflammatory bowel disease may be assessed as fit if the disease is in established stable remission, and only minimal, if any, medication is being taken. Regular follow-up is required.

(6) Hernia

RFFS personnel will be free of hernia. A fit assessment may be considered subject to the extent of symptoms, satisfactory treatment and after a specialist evaluation. The risk of secondary complications or worsening should be minimal and the rescue and firefighter will be subject to regular follow-up.

(7) Dyspepsia

RFFS personnel with recurrent dyspepsia that requires medication needs to be investigated by internal examination including radiologic or endoscopic examination. Laboratory testing includes a haemoglobin assessment. Any demonstrated ulceration or significant inflammation requires evidence of recovery before a fit assessment may be considered.

(8) Abdominal surgery

RFFS personnel who have undergone a surgical operation on the digestive tract or its adnexa, including a total or partial excision or a diversion of any of these organs, are assessed as unfit. A fit assessment may be considered after full recovery, the applicant is asymptomatic, and the risk of secondary complications or recurrence is minimal.

(d) **METABOLIC AND ENDOCRINE SYSTEMS**

(1) RFFS personnel with metabolic, nutritional or endocrine dysfunction may be assessed as fit if the condition is asymptomatic, clinically compensated and stable with or without replacement therapy, and regularly reviewed by an appropriate specialist.

(2) Obesity

(i) Obese RFFS personnel (e.g. with a body mass index (BMI) ≥ 35) may be assessed as fit only if the excess weight is not likely to interfere with the safe exercise of duties. A cardiovascular risk factor review and a pneumological examination by a specialist needs to be considered. The presence of sleep apnoea syndrome needs to be ruled out.

(ii) Functional testing in the working environment may be necessary before a fit assessment may be considered.

(3) Thyroid dysfunction

RFFS personnel with hyperthyroidism or hypothyroidism attain a stable euthyroid state before a fit assessment may be considered. Follow-up includes periodic thyroid function blood tests.

(4) Abnormal glucose metabolism

Glycosuria and abnormal blood glucose levels needs to be investigated. A fit assessment may be considered if normal glucose tolerance is demonstrated (low renal threshold) or impaired glucose tolerance without diabetic pathology is fully controlled by diet and regularly reviewed.

(5) Diabetes mellitus

Subject to an at least annual specialist endocrinological assessment, absence of complications likely to interfere with performance of duties, and evidence of control of blood sugar with no significant hypoglycaemic episodes, RFFS personnel with diabetes mellitus:

(i) that do not require medication or require non-hypoglycaemic antidiabetic medications may be assessed as fit;

(ii) that require the use of potentially hypoglycaemic medication(s), including sulphonyl ureas and insulin, may be assessed as fit with an operational limitation (or limitations), including documented testing whilst performing duties. For RFFS personnel treated with insulin, a

review to include the results of operational blood sugar testing will be undertaken every six months;

(iii) and other cardiovascular risk factors including cholesterol will require cardiovascular risk factor management. An exercise ECG will be performed when diagnosed, every five years under 40 years of age, and annually thereafter;

(iv) undergo HbA1c measurement every three months, with the exception of the RFFS personnel that do not require sulphonyl urea or insulin treatment where an extension of the testing to six months is acceptable; and

(v) require annual follow-up by a specialist including demonstrating the absence of diabetic complications such as neuropathy, retinopathy, arteriopathy or nephropathy.

(e) **HAEMATOLOGY**

(1) RFFS personnel with any significant haematological condition are assessed as unfit. Following a specialist evaluation, a fit assessment can be considered.

(2) Anaemia

(i) Anaemia demonstrated by a reduced haemoglobin level needs to be investigated. A fit assessment may be considered in cases where the primary cause has been treated (e.g. iron or B12 deficiency) and the haemoglobin or haematocrit has stabilised at a satisfactory level, for the required duties.

(ii) Anaemia which is unamenable to treatment is disqualifying.

(3) Haemoglobinopathy and red cell enzyme defects

RFFS personnel with a haemoglobinopathy and red cell enzyme defects are assessed as unfit. A fit assessment may be considered where minor thalassaemia, sickle cell disease or other conditions are diagnosed without a history of crises and where full functional capability is demonstrated.

(4) Coagulation disorders

(i) RFFS personnel with significant coagulation disorders are assessed as unfit. A fit assessment may be considered if there is no history of significant bleeding or clotting episodes, and the haematological data indicates that there is no interference with the safe performance of duties.

(ii) RFFS personnel that require anticoagulants are assessed as unfit.

(5) Disorders of the lymphatic system

Lymphatic enlargement requires investigation. A fit assessment may be considered in cases of an acute infectious process which is fully recovered,

or Hodgkin's lymphoma, or other lymphoid malignancy which has been treated and is in full remission. Regular follow-up needs to be performed.

(6) Leukaemia

(i) RFFS personnel that require anticoagulants are assessed as unfit.

(ii) RFFS personnel with chronic leukaemia are assessed as unfit. A fit assessment may be considered after remission and a period of demonstrated stability.

(iii) RFFS personnel with a history of leukaemia will have no history of central nervous system involvement and no continuing side effects from treatment likely to interfere with the safe performance of duties. Haemoglobin and platelet levels need to be satisfactory.

(iv) Regular follow-up is recommended in all cases of leukaemia.

(7) Splenomegaly

Splenomegaly needs to be investigated. A fit assessment may be considered if the enlargement is minimal, stable and no associated pathology is demonstrated, or if the enlargement is minimal and associated with another acceptable condition.

(8) Splenectomy

Following splenectomy, a fit assessment may be considered if there is full recovery and the platelet level is acceptable.

(f) **GENITOURINARY SYSTEM**

(1) The urine will not contain any abnormal element considered to be of pathological significance.

(2) RFFS personnel with any sequelae of disease or surgical procedures on the genitourinary system or its adnexa likely to cause incapacitation, in particular any obstruction due to stricture or compression, are assessed as unfit. A fit assessment may be considered following a specialist evaluation.

(3) Abnormal urinalysis

Any abnormal finding including proteinuria, haematuria and glycosuria on urinalysis needs to be investigated.

(4) Renal disease

(i) RFFS personnel presenting with any signs of renal disease are assessed as unfit. A fit assessment may be considered if blood pressure is satisfactory and renal function is acceptable and there are no significant lesions.

(ii) RFFS personnel that require dialysis are assessed as unfit.

(5) Urinary calculi

(i) RFFS personnel with an asymptomatic calculus or a history of renal colic need to be investigated. A fit assessment may be considered after successful treatment for a calculus and with appropriate follow-up.

(ii) Residual calculi are disqualifying unless they are in a location where they are unlikely to move and give rise to symptoms.

(6) Renal and urological surgery

(i) RFFS personnel who have undergone a major surgical operation on the genitourinary system or its adnexa involving a total or partial excision or a diversion of any of its organs are assessed as unfit until recovery is complete, the person is asymptomatic and the risk of secondary complications is minimal.

(ii) RFFS personnel with compensated nephrectomy without hypertension or uraemia may be assessed as fit.

(iii) RFFS personnel who have undergone renal transplantation may be considered for a fit assessment after full recovery with evidence that it is fully compensated and tolerated with only minimal immune-suppressive therapy. Limitation(s) to duties will be considered.

(iv) RFFS personnel who have undergone total cystectomy may be considered for a fit assessment if there is satisfactory urinary function, no infection and no recurrence of primary pathology.

(g) **INFECTIOUS DISEASES**

(1) RFFS personnel diagnosed with or presenting symptoms of an infectious disease will undergo specialist evaluation and may be considered fit when they are asymptomatic and providing that the therapy does not compromise the safe performance of their duties.

(2) In cases of an infectious disease, consideration is given to a history of, or clinical signs indicating, underlying impairment of the immune system.

(3) Tuberculosis

(i) RFFS personnel with active tuberculosis are assessed as unfit. A fit assessment may be considered following completion of therapy.

(ii) RFFS personnel with quiescent or healed lesions may be assessed as fit. A specialist evaluation needs to consider the extent of the disease, the treatment required and possible side effects of medication.

(4) HIV positivity

(i) RFFS personnel who are HIV positive may be assessed as fit if a full investigation provides no evidence of HIV-associated diseases that might give rise to incapacitating symptoms. Frequent review of the immunological status and a neurological evaluation by an appropriate

specialist needs to be carried out. A cardiological review may also be required depending on medication.

(ii) RFFS personnel with an AIDS-defining condition are assessed as unfit except in individual cases for limited duties after complete recovery and dependent on the review.

(iii) The assessment of cases under (i) and (ii) is dependent on the absence of symptoms or signs of the disease and the acceptability of serological markers. Treatment will be evaluated by a specialist on an individual basis for its appropriateness and any side effects.

(5) Syphilis

RFFS personnel with acute syphilis are assessed as unfit. A fit assessment may be considered in the case of those fully treated and recovered from the primary and secondary stages.

(6) Infectious hepatitis

RFFS personnel with infectious hepatitis are assessed as unfit. A fit assessment may be considered once the person has become asymptomatic after treatment and a specialist evaluation. Regular review of the liver function needs to be carried out.

(h) OBSTETRICS AND GYNAECOLOGY

(1) Gynaecological surgery

RFFS personnel who have undergone a major gynaecological surgery undergo a specialist assessment. A fit assessment can be considered subject to a satisfactory gynaecological evaluation after successful treatment and/or full recovery after a surgery.

(2) Pregnancy

In the case of pregnancy, RFFS personnel are assessed as unfit. A fit assessment may be considered after the 12th week of gestation provided that obstetric evaluation continuously indicates a normal pregnancy. Such a fit assessment is valid until the 30th week of gestation. Additional operational limitations may be imposed. A fit assessment may be considered following a specialist assessment after full recovery following the end of the pregnancy.

(i) MUSKULOSKELETAL SYSTEM

(1) RFFS personnel will have satisfactory functional use of the musculoskeletal system to enable them to safely perform their duties.

(2) RFFS personnel with static or progressive musculoskeletal or rheumatologic conditions or a surgery likely to interfere with the safe performance of their duties will undergo further assessment. A fit assessment can be considered subject to a satisfactory workplace assessment after successful treatment or full recovery after a surgery.

(3) RFFS personnel with a limb prosthesis should have satisfactory functional use as demonstrated by a workplace assessment.

(4) RFFS personnel with any significant sequelae from disease, injury or congenital abnormality affecting the bones, joints, muscles or tendons with or without a surgery need to have a full evaluation prior to a fit assessment.

(5) Abnormal physique, including obesity, or muscular weakness may require a medical assessment and particular attention needs to be paid to workplace assessment.

(6) Locomotor dysfunction, amputations, malformations, loss of function and progressive osteoarthritic disorders are assessed on an individual basis in conjunction with the appropriate operational expert with a knowledge of the complexity of the tasks of that need to be performed.

(7) RFFS personnel with inflammatory, infiltrative, or degenerative disease of the musculoskeletal system may be assessed as fit provided that the condition is in remission and the medication is acceptable and does not adversely affect the discharge of their duties.

(8) For RFFS personnel who have undergone a reconstructive surgery or joint replacement procedures, particular attention will be paid to the risks associated with the particular implant or prosthesis and its functional operational range.

(9) Where there is doubt about the operational fitness, RFFS personnel undergo the operational physical fitness assessment prior to a return to full duties. A limitation (or limitations) may be required.

(j) **PSYCHIATRY**

(1) RFFS personnel with a mental or behavioural disorder due to alcohol or other use or misuse of psychoactive substances, including recreational substances with or without dependency, are assessed as unfit until after a period of documented sobriety or freedom from psychoactive substance use or misuse and subject to a satisfactory psychiatric evaluation after successful treatment.

(2) RFFS personnel with a psychiatric condition such as:

(i) mood disorder;

(ii) neurotic disorder, e.g. claustrophobic or acrophobic symptoms;

(iii) personality disorder;

(iv) mental or behavioural disorder;

(v) post-traumatic stress disorder;

(vi) significant stress-related symptoms; or

(vii) single or repeated acts of deliberate self-harm

will undergo treatment, as necessary, and a satisfactory psychiatric assessment before a fit assessment can be considered. A psychological

evaluation may be required as part of, or complementary to, a specialist psychiatric or neurological assessment.

(3) Disorders due to alcohol or other substance use

(i) A fit assessment may be considered after successful treatment, a period of documented sobriety or freedom from substance use, and review by a psychiatric specialist. The OHMP, with the advice of the psychiatric specialist, will determine the duration of the period to be observed before a fit assessment can be made.

(ii) Depending on the individual case, treatment may include inpatient treatment of variable duration.

(iii) Continuous follow-up, including blood testing and peer reports, may be required indefinitely.

(4) Mood disorder

RFFS personnel with an established mood disorder are assessed as unfit. After full recovery and after full consideration of an individual case, a fit assessment may be considered, depending on the characteristics and gravity of the mood disorder. If stability on maintenance psychotropic medication is confirmed, a fit assessment may be considered. In some cases, an operational limitation may be required. If the dosage of the medication is changed, a further period of unfit assessment is required. Regular specialist supervision needs to be considered. Any use of medication needs to be evaluated further by a specialist.

(5) Psychotic disorder

RFFS personnel with a history, or the occurrence, of a functional psychotic disorder are assessed as unfit unless it can be confirmed that the original diagnosis was inappropriate or inaccurate or was a result of a single toxic episode.

(6) Deliberate self-harm

A single self-destructive action or repeated overt acts entail unfitness. A fit assessment may be considered after full consideration of an individual case and requires psychiatric or psychological review.

(k) **NEUROLOGY**

(1) RFFS personnel with an established history or clinical diagnosis of:

(i) epilepsy except in the cases in (2)(i) and (ii) below;

(ii) recurring episodes of disturbance of consciousness of uncertain cause; and

(iii) conditions with a high propensity for cerebral dysfunction

are assessed as unfit.

(2) RFFS personnel with an established history or clinical diagnosis of:

(i) epilepsy without recurrence after the age of five;

(ii) epilepsy without recurrence and off all treatment for more than five years;

(iii) epileptiform EEG abnormalities and focal slow waves;

(iv) progressive or non-progressive disease of the nervous system;

(v) a single episode of disturbances or loss of consciousness;

(vi) brain injury, affliction or inflammation;

(vii) spinal or peripheral nerve injury, affliction or inflammation;

(viii) disorders of the nervous system due to vascular deficiencies including haemorrhagic and ischaemic events; or

(ix) vertigo

need to undergo a specialist evaluation before a fit assessment may be considered.

(3) Electroencephalography (EEG)

EEG will be carried out based on the person's history or on clinical grounds.

(4) Epilepsy

(i) RFFS personnel who have experienced one or more convulsive episodes after the age of five are assessed as unfit.

(ii) A fit assessment may be considered if:

(A) the RFFS personnel are seizure free and off medication for at least five years; and

(B) a full neurological evaluation shows that a seizure was caused by a specific non-recurrent cause, such as trauma or toxin.

(iii) RFFS personnel who have experienced an episode of benign Rolandic seizure may be assessed as fit provided that the seizure has been clearly diagnosed including a properly documented history and typical EEG result and the RFFS personnel have been free of symptoms and off treatment for at least five years.

(5) Neurological disease

RFFS personnel with any stationary or progressive disease of the nervous system which has caused or is likely to cause a significant disability are assessed as unfit. A fit assessment may be considered in cases of minor functional losses associated with stationary disease after a full neurological evaluation and a workplace assessment. An operational limitation may be required.

(6) Disturbance of consciousness

RFFS personnel with a history of one or more episodes of disturbed consciousness may be assessed as fit if the condition can be satisfactorily explained by a non-recurrent cause. Operational limitations may be imposed. A full neurological evaluation is necessary.

(7) Head injury

RFFS personnel with a head injury which was severe enough to cause loss of consciousness will be evaluated by a consultant neurologist. A fit assessment may be considered if there has been a full recovery, and the risk of post-traumatic epilepsy has fallen to a sufficiently low level. Behavioural and cognitive aspects will be taken into account where there is evidence of significant penetrating brain trauma or contusion.

(l) **VISUAL SYSTEM**

(1) Distant and near visual acuity, with or without optimal correction, will be 6/9 (0.7) or better in each eye separately, and visual acuity with both eyes will be 6/6 (1) or better.

(2) RFFS personnel need to have fields of vision and binocular function appropriate to the operational tasks.

(3) RFFS personnel at the initial assessment having monocular or functional monocular vision, including eye muscle balance problems, may be assessed as fit provided that an ophthalmological examination and an operational evaluation are satisfactory. Operational limitations may be necessary.

(4) RFFS personnel who have undergone an eye surgery are assessed as unfit until full recovery of the visual function. A fit assessment may be considered subject to a satisfactory ophthalmologic evaluation.

(5) RFFS personnel with a clinical diagnosis of keratoconus may be assessed as fit subject to a satisfactory examination by an ophthalmologist.

(6) RFFS personnel with diplopia are assessed as unfit.

(7) Corrective lenses

If satisfactory visual function for the RFF duties is achieved only with the use of correction, the spectacles, inserts or contact lenses must provide optimal visual function, be well tolerated, and suitable for RFF duties, including the wearing of breathing apparatus.

(8) Eye examination - standard tests for vision

(i) At each medical examination, an assessment of vision will be undertaken and the eyes are examined with regard to possible pathology.

(ii) The routine eye examination includes:

(A) history;

(B) visual acuities — near and distant vision; uncorrected and with best optical correction if needed;

(C) morphology by ophthalmoscopy; and

(D) further examination on clinical indication.

(iii) Visual acuity is tested using Snellen charts, or equivalent, under appropriate illumination. Where clinical evidence suggests that Snellen may not be appropriate, Landolt ‘C’ may be used.

(iv) All abnormal and doubtful cases are referred to an ophthalmologist. Conditions which indicate a comprehensive ophthalmological examination include, but are not limited to, a substantial decrease in the uncorrected visual acuity, any decrease in best corrected visual acuity, and/or the occurrence of eye disease, eye injury, or eye surgery.

(v) In case of multiple pathological conditions of the eye, their effect is evaluated by an ophthalmologist with regard to possible cumulative effects. Functional testing in the working environment may be necessary to consider a fit assessment.

(9) Refractive error

RFFS personnel without symptoms with high refractive error in excess of +5.0/-6.0 dioptres, high anisometropia >3D, or high astigmatism >3D may be assessed as fit provided that the visual standards are met in both eyes, optimal correction has been considered and no significant pathology is demonstrated. Risk of visual incapacitation arising from the refractive error or shape of the eye may be acceptable.

(10) Substandard vision

RFFS personnel with reduced central vision in one eye may be assessed as fit if the binocular visual field is normal and the underlying pathology is acceptable according to an ophthalmological evaluation. Testing includes functional testing in the appropriate working environment.

(11) Heterophoria

RFFS personnel with heterophoria (imbalance of the ocular muscles) will undergo further ophthalmological evaluation before a fit assessment is considered.

(12) Eye surgery

(i) Refractive surgery

After a refractive surgery or a surgery of the cornea including cross linking, a fit assessment may be considered, provided that:

(A) the pre-operative refraction was less than +5 dioptres;

(B) satisfactory stability of refraction has been achieved (less than 0.75 dioptres variation diurnally);

(C) the examination of the eye shows no post-operative complications;

(D) the glare sensitivity is normal;

(E) the mesopic contrast sensitivity is not impaired; and

(F) the specialist evaluation is undertaken by an ophthalmologist.

(ii) Cataract surgery

RFFS personnel who have undergone a cataract surgery may be assessed as fit after six weeks provided that the visual requirements are met either with corrective lenses, or with intraocular lenses which are non-tinted.

(iii) Retinal surgery / retinal laser therapy

(A) After a retinal surgery, RFFS personnel may be assessed fit six months after a successful surgery. Annual ophthalmological follow-up may be necessary. Longer periods may be acceptable after two years on recommendation of the ophthalmologist

(B) After successful retinal laser therapy, RFFS personnel may be assessed as fit provided that an ophthalmological evaluation shows stability.

(iv) Glaucoma surgery

After a glaucoma surgery, RFFS personnel may be assessed as fit six months after a successful surgery. Ophthalmological examinations undertaken every six months to follow-up secondary complications caused by the glaucoma may be necessary.

(v) Extraocular muscle surgery

A fit assessment may be considered not less than six months after a surgery and after a satisfactory ophthalmological evaluation.

(vi) Visual correction

Spectacles, contact lenses and mask inserts should permit the RFFS personnel to meet the visual requirements at all distances.

(13) Colour vision

(i) RFFS personnel who fail to correctly identify nine or more of the first 15 plates of the 24-plate edition of Ishihara pseudoisochromatic plates undergo further specialist evaluation. A fit assessment may be considered if the results of the evaluation and/or operational testing demonstrate that the duties can be performed safely.

(ii) Advanced or fictional colour vision testing is assessed using means able to demonstrate acceptable colour vision.

(m) OTORHINOLARYNGOLOGY

(1) RFFS personnel do not have a hearing loss of more than 35 dB at any of the frequencies 500, 1 000 or 2 000 Hz, and 50 dB at 3 000 Hz, in either ear separately.

(2) RFFS personnel who do not meet the hearing criteria above will undergo a specialist assessment before a fit assessment may be considered. In these cases, the rescue and firefighting personnel undergo a functional hearing test in the operational environment. Initial candidates who do not meet the hearing criteria above will undergo a speech discrimination test.

(3) Hearing aids

A fit assessment may be considered if the use of a hearing aid (or aids) or of an appropriate prosthetic aid improves the hearing to achieve a normal standard as assessed by fully functional testing in the operational environment

(4) RFFS personnel with:

(i) an active chronic pathological process of the internal or middle ear;

(ii) unhealed perforation or dysfunction of the tympanic membrane(s);

(iii) disturbance of vestibular function;

(iv) significant malformation or significant chronic infection of the oral cavity or upper respiratory tract; or

(v) significant disorder of speech or voice reducing intelligibility

will undergo further specialist examination and assessment to establish that the condition does not interfere with the safe performance of their duties

(5) Examination

(i) An otorhinolaryngological examination includes:

(A) history;

(B) clinical examination including otoscopy, rhinoscopy, and examination of the mouth and throat; and

(C) clinical assessment of the vestibular system.

(ii) ENT specialists involved in the assessment of RFFS personnel should have an understanding of the functionality required.

(iii) Where a full assessment and functional check is needed, due regard is paid to the operating environment in which the operational functions are undertaken.

(6) Hearing

(i) The follow-up of a RFFS personnel with hypoacusis is decided by the medical staff. If at the next annual test there is no indication of further deterioration, the normal frequency of testing may be resumed.

(ii) Full functional and environmental assessments are carried out with the chosen prosthetic equipment in use.

(7) Ear conditions

RFFS personnel with perforation is considered unfit. A fit assessment can be made following a specialist evaluation, treatment and full recovery.

(8) Vestibular disturbance

The presence of vestibular disturbance with vertigo (e.g. Meniere's disease) and spontaneous or positional nystagmus requires a complete vestibular evaluation by a specialist and entails unfitness until successful treatment and/or full recovery.

(9) Speech disorder

RFFS personnel with a speech disorder are assessed with due regard to the operational environment in which the operational functions are undertaken. Rescue and firefighting personnel with significant disorder of speech or voice are assessed as unfit.

(n) **DERMATOLOGY**

(1) RFFS personnel will not have any established dermatological condition likely to interfere with the safe performance of their duties and the wearing of protective equipment. A fit assessment could be considered following a specialist dermatological assessment.

(2) Systemic effects of radiation or pharmacological treatment for a dermatological condition will be evaluated before a fit assessment can be considered.

(3) RFFS personnel with a skin condition that causes pain, discomfort, irritation or itching may only be assessed as fit if the condition can be controlled and does not interfere with the safe performance of the duties and with wearing of personal protective equipment.

(4) In cases where a dermatological condition is associated with a systemic illness, full consideration will be given to the underlying illness before a fit assessment may be considered.

(o) **ONCOLOGY**

(1) After diagnosis of primary or secondary malignant disease, RFFS personnel are assessed as unfit.

(2) After completion of primary treatment and full recovery, the RFFS personnel will undergo a specialist evaluation before a fit assessment could be considered.

(3) RFFS personnel with an established history or clinical diagnosis of a malignant intracerebral or pulmonary tumour are assessed as unfit.

(4) RFFS personnel who have been diagnosed with malignant disease may be assessed as fit provided that:

(i) after primary treatment, there is no evidence of residual malignant disease likely to interfere with the performance of duties;

(ii) time appropriate to the type of tumour has elapsed since the end of the primary treatment;

(iii) the risk of incapacitation from a recurrence or metastasis is sufficiently low;

(iv) there is no evidence of short- or long-term sequelae from treatment. Special attention should be paid to cardiac risk in persons who have received anthracycline chemotherapy; and

(v) satisfactory oncology follow-up reports are provided to the medical staff.

(5) RFFS personnel receiving ongoing chemotherapy (other than adjuvant preventative therapy) or radiation treatment are assessed as unfit.

(6) RFFS personnel with a benign intracerebral tumour may be assessed as fit after a satisfactory specialist and neurological evaluation and provided that the condition does not compromise the safe performance of duties.

(7) RFFS personnel with pre-malignant conditions may be assessed as fit if treated or excised as necessary and there is a regular follow-up.

AMC1 ADR.OPS.B.090 is amended as follows:

AMC1 ADR.OPS.B.090 Use of the aerodrome by higher code letter aircraft

ELEMENTS TO BE ASSESSED

(a) When assessing the possibility of operation of aircraft whose code letter is higher than the code letter of the aerodrome reference code, the aerodrome operator should, amongst other issues, assess the impact of the characteristics of the aircraft ~~on the aerodrome, its facilities, equipment and its operation, and vice versa~~ that exceed the code letter and/or outer main gear wheel span and their related impact as follows.

(b) Aircraft characteristics to be assessed include, but are not limited to:

(~~a~~1) fuselage length;

(~~b~~2) fuselage width;

(~~c~~3) fuselage height;

(~~d~~4) tail height;

(~~e~~5) wingspan;

(~~f~~6) wing tip vertical clearance;

(g7) cockpit view;

(h8) distance from the pilot's eye position to the nose landing gear and to the main landing gear;

(i9) outer main gear wheel span;

(j10) wheelbase;

(k11) main gear steering system;

(l12) landing gear geometry;

(m13) engine datacharacteristics;

(n14) flight performance; and

(o15) technology evolution.; and

(16) maximum passenger and fuel carrying capacity.

GM1 ADR.OPS.B.090 is amended as follows:

GM1 ADR.OPS.B.090 Use of the aerodrome by higher code letter aircraft

ELEMENTS TO BE ASSESSED

(a) Further guidance on this issue is contained in ICAO Circular 305-AN/177 and ICAO Circular 301-AN/174.

(b) In any case, the elements that have to be taken into account for the safety assessment are, without prejudice to other assessments that may have to be conducted, in accordance with other applicable requirements contained in Part-ADR.OPS.

(c) Such assessments should include, but are not limited to:

(a1) the aircraft mass, tire pressure and ACNACR values — with regard to overload operations; and

(b2) maximum passenger and fuel carrying capacity — with regard to level of RFFS protection to be provided and the aerodrome emergency planning.; and

(3) the aircraft characteristics elements to be assessed in relation to:

(i) wingspan:

(A) wake turbulence;

(B) gate selection;

(C) aerodrome maintenance services around the aeroplane;

(D) equipment for disabled aeroplane removal; and

(E) de-icing;

(ii) wheelbase:

(A) in terminal areas;

(iii) fuselage length:

(A) passenger gates and terminal areas;

(iv) fuselage height, in particular door sill height:

(A) the operational limits of the air bridges;

(B) mobile steps;

(C) catering trucks;

(D) persons with reduced mobility; and

(E) dimensions of the apron;

(v) tail height:

(A) the dimensions of aerodrome maintenance services;

(vi) engine characteristics:

(A) design of air bridges; and

(B) location of refuelling pits on the aircraft stand;

Note: the engine characteristics include engine geometry and engine airflow characteristics, which may affect the aerodrome infrastructure as well as ground handling of the aeroplane and operations in adjacent areas which are likely to become affected by jet blast;

(vii) maximum passenger and fuel carrying capacity:

(A) terminal facilities;

(B) fuel storage and distribution; and

(C) air bridge loading configuration; and

(viii) flight performance:

(A) wake turbulence; and

(B) noise.

(4) Additional elements to be assessed - aircraft ground servicing requirements

The following non-exhaustive list of aircraft ground servicing characteristics and requirements may affect the available aerodrome infrastructure:

(i) ground power;

(ii) passengers embarking and disembarking;

(iii) cargo loading and unloading;

(iv) fuelling;

(v) pushback and towing;

(vi) de-icing;

(vii) taxiing and marshalling;

(viii) aeroplane maintenance;

(ix) RFF;

(x) equipment areas;

(xi) stand allocation; and

(xii) disabled aircraft removal.

(d) Each assessment is specific to a particular type of aircraft and to a particular operational context. The assessment may require a review of the obstacle limitation surfaces at an aerodrome.

(e) At aerodromes where low visibility operations are implemented, additional procedures may be implemented to safeguard the operation of aircraft. Additional processes that ensure suitable measures are in place to protect the signal produced by the ground-based radio navigation equipment may be necessary at aerodromes with precision instrument approaches.

AMC1 ADR.OPS.C.010 is amended as follows:

AMC1 ADR.OPS.C.010 Pavements, other ground surfaces, and drainage

GENERAL

[…]

(e) The aerodrome operator should take corrective maintenance action to prevent the runway surface friction characteristics, for either the entire runway~~,~~ or a portion thereof, from falling below the minimum friction level specified by the ~~State~~CAA.

[…]

GM2 ADR.OPS.C.010(b)(1) is amended as follows:

GM2 ADR.OPS.C.010(b)(1) Pavements, other ground surfaces, and drainage

CRITERIA FOR OVERLOAD OPERATIONS

(a) Overloading of pavements can result either from loads too large, or from a substantially increased application rate, or both. Loads larger than the defined (design or evaluation) load shorten the design life, whilst smaller loads extend it. With the exception of massive overloading, pavements in their structural behaviour are not subject to a particular limiting load above which they suddenly or catastrophically fail. Behaviour is such that a pavement can sustain a definable load for an expected number of repetitions during its design life. As a result,

occasional minor overloading is acceptable, when expedient, with only limited loss in pavement life expectancy, and relatively small acceleration of pavement deterioration. For those operations in which magnitude of overload and/or the frequency of use do not justify a detailed analysis, the following criteria are suggested:

(1) for flexible and rigid pavements, occasional movements by aircraft with ~~ACN~~ ACR not exceeding 10 % above the reported ~~PCN~~ PCR should not adversely affect the pavement;

(2) ~~for rigid or composite pavements, in which a rigid pavement layer provides a primary element of the structure, occasional movements by aircraft with ACN not exceeding 5 % above the reported PCN should not adversely affect the pavement~~ overloads in excess of 10 % should be considered on a case-by-case basis if supported by technical analysis;

~~(3) if the pavement structure is unknown, the 5 % limitation should apply; and~~

(43) the annual number of overload movements should not exceed approximately 5 % of the total annual aircraft movements~~.~~, excluding light aircraft;

(4) overload movements should not be permitted on pavement exhibiting signs of distress or failure;

(5) overloading should be avoided during any periods of thaw following frost penetration, or when the strength of the pavement or its subgrade could be weakened by water; and

(6) where overload operations are conducted, the aerodrome operator should review the relevant pavement condition regularly and should also review the criteria for overload operations periodically since excessive repetition of overloads can cause severe shortening of pavement life or require major rehabilitation of pavement.

~~(b) Such overload movements should not normally be permitted on pavements exhibiting signs of distress or failure. Furthermore, overloading should be avoided during any periods of thaw following frost penetration, or when the strength of the pavement or its subgrade could be weakened by water. Where overload operations are conducted, the aerodrome operator should review the relevant pavement condition regularly, and should also review the criteria for overload operations periodically since excessive repetition of overloads can cause severe shortening of pavement life, or require major rehabilitation of pavement.~~

(b) The ACR, when exceeding the reported PCR, cannot predict accurately how the overload will affect the pavement damage (hence pavement life) since it is strongly dependent on its offset location of the maximum pavement damage.

(c) Technical analysis should determine how the overload operations contribute to the maximum pavement damage (maximum CDF) when mixed with other traffic. The inputs required to perform such analysis are the same as the PCR technical evaluation:

(1) pavement structure;

(2) aircraft traffic (including overload operations); and

(3) damage model (consistent with the PCR calculation and pavement design).

(d) With the exception of massive overloading, pavements in their structural behaviour are not subject to a particular limiting load above which they fail.

(e) The ultimate decision to grant overload operations belongs to the aerodrome operator, depending on the impact of such operations on pavement life and its management policy. A cost benefit analysis (loss of pavement life vs additional revenues) can support such a decision.

The List of Abbreviations in CS-ADR-DSN is amended as follows:

List of Abbreviations

(used in CS-ADR-DSN)

~~ACN~~ACR	Aircraft classification ~~number~~rating
AGL	Above ground level
[…]	
PAPI	Precision approach path indicator
~~PCN~~	~~Pavement classification number~~
PBN	Performance based navigation
PCR	Pavement classification rating
PSV	Polished stone values
[…]	

CS ADR-DSN.A.002 is amended as follows:

CS ADR-DSN.A.002 Definitions

For the purposes of Books 1 and 2, the following definitions should apply:

[…]

‘Aeroplane reference field length’ means the minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certificating authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.

~~‘Arresting system’ means a system designed to decelerate an aeroplane overrunning the runway.~~

~~‘Autonomous runway incursion warning system (ARIWS)’ means a system which provides autonomous detection of a potential incursion or of the occupancy of an active runway and a direct warning to a flight crew or a vehicle operator.~~

‘Aircraft’ means a machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface.

‘Aircraft classification ~~number~~ rating (~~ACN~~ACR)’ means the number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.

‘Aircraft stand’ means a designated area on an apron intended to be used for parking an aircraft.

[…]

‘Apron taxiway’ means a portion of a taxiway system located on an apron and intended to provide a through taxi-route across the apron.

‘Arresting system’ means a system designed to decelerate an aeroplane overrunning the runway.

‘Autonomous runway incursion warning system (ARIWS)’ means a system which provides autonomous detection of a potential incursion or of the occupancy of an active runway and a direct warning to a flight crew or a vehicle operator.

‘Balked landing’ means a landing manoeuvre that is unexpectedly discontinued at any point below the obstacle clearance altitude/height (OCA/H).

[…]

‘Pavement classification ~~number~~ rating (~~PCN~~PCR)’ means a number expressing the bearing strength of a pavement ~~for unrestricted operations~~.

[…]

CS ADR-DSN.A.005 is amended as follows:

CS ADR-DSN.A.005 Aerodrome reference code (ARC)

[…]

(d) The code letter for element 2 should be determined from Table A-1, by selecting the code letter which corresponds to the greatest wingspan of the aeroplanes for which the facility is intended.

Code element 1	
Code number	**Aeroplane reference field length**
1	Less than 800 m
2	800 m up to but not including 1 200 m
3	1 200 m up to but not including 1 800 m
4	1 800 m and over
Code element 2	
Code letter	**Wingspan**
A	Up to but not including 15 m

B	15 m up to but not including 24 m
C	24 m up to but not including 36 m
D	36 m up to but not including 52 m
E	52 m up to but not including 65 m
F	55 m up to but not including 80 m

Table A-1 Aerodrome reference code

(e) In the case of an aeroplane equipped with folding wing tips, its reference code letter may change as a result of the folding/extending of the wing tips. Consideration will be given to the wingspan configuration and resultant operations of the aeroplane at an aerodrome.

(f) Procedures on conducting an aerodrome compatibility study to accommodate aeroplanes with folding wing tips spanning two code letters are given in the Procedures for Air Navigation Services Aerodromes (PANS-Aerodromes, Doc 9981). Further guidance can be found in the manufacturer's aircraft characteristics for airport planning manual.

GM1 ADR-DSN.B.070 is amended as follows:

GM1 ADR-DSN.B.070 Sight distance for slopes of runways

(a) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him/her to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action.

(b) Consideration will have to be given to providing an unobstructed line of sight over the entire length of a single runway where a full-length parallel taxiway is not available. Where an aerodrome has intersecting runways, additional criteria on the line of sight of the intersection area needs to be considered for operational safety. Additional guidance is given in ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways.

GM1 ADR-DSN.B.085 is amended as follows:

GM1 ADR-DSN.B.085 Runway strength

(a) Pavement forming part of the movement area needs to be of sufficient strength to allow aircraft to operate without risk of damage either to the pavement or to the aircraft. Pavements subject to overload conditions should deteriorate at an increasing rate depending upon the degree of overload. To control this, it is necessary to classify both pavement and aircraft under a system whereby the load-bearing capacity of the pavement and the loads imposed by the aircraft can be compared. The method used is the Aircraft Classification ~~Number~~ Rating - Pavement Classification ~~Number~~ Rating (~~ACN/PCN~~ ACR/PCR) method. The

~~ACN/PCN~~ ACR/PCR method has been developed by ICAO as an international method of reporting the bearing strength of pavements.

[…]

(c) Reporting pavement bearing strength:

(1) The ~~ACN/PCN~~ ACR/PCR method of classifying the bearing strength of pavements considers the load imposed on the pavement by the aircraft. In this respect, the load rating of the aircraft is most significantly affected by the subgrade support strength of the pavement. ~~ACNs~~ ACRs are, therefore, numbers giving a relative load rating of the aircraft on pavements for certain specified subgrade strengths. ~~ACN~~ ACR values for most aeroplanes have been calculated by ICAO and are published in Aeronautical Information Publications. The ~~PCN~~ PCR is also a number which represents the load-bearing strength of the pavement in terms of the highest ~~ACN~~ ACR which can be accepted on the pavement for unrestricted use.

(2) A ~~PCN~~ PCR can also be identified and reported without a technical evaluation of the pavement by means of an assessment of the results of aircraft using the pavement. Providing the type and subgrade support strength of the pavement are known, the ~~ACN~~ ACR of the most demanding aircraft successfully using the pavement can be reported as the ~~PCN~~ PCR.

(3) A ~~PCN~~ PCR is reported in a five-part format. Apart from the numerical value, notification is also required of the pavement type (rigid or flexible) and the subgrade support category. Additionally, provision is made for the aerodrome operator to limit the maximum allowable ~~tire~~ tyre pressure. A final indication is whether the assessment has been made by a technical evaluation or from past experience of aircraft using the pavement.

(d) The method for reporting the bearing strength of the pavement is available in Subpart A of Part-ADR.OPS of UK Reg (EU) No 139/2014, AMC1 ADR.OPS.A.005.

(e) Additional information on the bearing strength, the design and evaluation of pavements is given in ICAO Doc 9157, Aerodrome Design Manual, Part 3, Pavements.

GM1 ADR-DSN.B.095 is amended as follows:

GM1 ADR-DSN.B.095 Runway turn pads

(a) Where severe weather conditions and resultant lowering of surface friction characteristics prevail, a larger wheel-to-edge clearance should be provided.

(~~a~~b) A typical runway turn pad layout is presented in Figure GM-B-3 below:

[Figure GM-B-3 unchanged]

(c) Such areas, if provided along a runway, may also be useful to reduce taxiing time and distance for aeroplanes which may not require the full length of the runway.

(~~b~~d) Additional guidance on the design of runway turn pads is given in ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways.

CS ADR-DSN.B.115 is amended as follows:

CS ADR-DSN.B.115 Width of shoulders for runway turn pads

The runway turn pads should be provided with shoulders of such width as is necessary to prevent surface erosion by the jet blast of the most demanding ~~aircraft~~ aeroplane for which the turn pad is intended and any possible foreign object damage to the aeroplane engines.

GM1 ADR-DSN.B.115 is amended as follows:

GM1 ADR-DSN.B.115 Width of shoulders for runway turn pads

As a minimum, the width of the shoulders would need to cover the outer engine of the most demanding ~~aircraft~~ aeroplane and thus may be wider than the associated runway shoulders.

CS ADR-DSN.B.125 is amended as follows:

CS ADR-DSN.B.125 Runway shoulders

(a) The safety objective of a runway shoulder is that it should be so constructed as to mitigate any hazard to an aircraft running off the runway or stopway or to avoid the ingestion of loose stones or other objects by turbine engines.

(b) Runway shoulders should be provided for a runway where the code letter is D, E or F, for aeroplanes with an OMGWS from 9 m up to but not including 15 m.

(c) Runway shoulders need not be provided where the runway width is 60 m, for aeroplanes with an OMGWS from 9 m up to but not including 15 m and code letter:

(1) D, E; or

(2) F with two or three engines.

(d) Where the runway width is 60 m, for aeroplanes with an OMGWS from 9 m up to but not including 15 m and code letter F with four (or more) engines, only the portion of runway shoulders between the runway edge up to a distance as prescribed in paragraph (c) of CS ADR-DSN.B.135 should be provided.

GM1 ADR-DSN.B.150 is amended as follows:

GM1 ADR-DSN.B.150 Runway strip to be provided

(a) A runway strip extends laterally to a specified distance from the runway centre line, longitudinally before the threshold, and beyond the runway end. It provides an

area clear of objects that may endanger aeroplanes. Any equipment or installation required for air navigation or for aircraft safety purposes and ~~is~~ located in this object-free area should be frangible and mounted as low as possible. The term 'aircraft safety purposes' refers to the installation of arresting systems which are frangible and intended to enhance safety in the event of an aircraft overrun.

[…]

CS ADR-DSN.B.160 is amended as follows:

CS ADR-DSN.B.160 Width of runway strip

[…]

(c) A strip including a non-instrument runway should extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 75 m where the code number is ~~3 or~~ 4;

(2) 55 m where the code number is 3;

(~~2~~3) 40 m where the code number is 2; and

(~~3~~4) 30 m where the code number is 1.

(d) For Code 3 non-instrument runways with RNP aerodrome operators are required to provide a runway strip and graded area of 75 m. Any consideration to reduce this to 55 m requires a safety assessment and prior approval from the CAA.

CS ADR-DSN.B.165 is amended as follows:

CS ADR-DSN.B.165 Objects on runway strips

[…]

(b) No fixed object, other than visual aids required for air navigation or those required for aircraft safety purposes and which must be sited on the runway strip, and satisfying the relevant frangibility requirement in Chapter T, should be permitted on any part of a runway strip of a precision approach runway delineated by the lower edges of the inner transitional surfaces defined in Chapter H and Chapter J.~~:~~

~~(1) within 77.5 m of the runway centre line of a precision approach runway Category I, II or III where the code number is 4 and the code letter is F; or~~

~~(2) within 60 m of the runway centre line of a precision approach runway Category I, II or III where the code number is 3 or 4; or~~

~~(3) within 45 m of the runway centre line of a precision approach runway Category I where the code number is 1 or 2.~~

No mobile object should be permitted on ~~this~~ any part of the runway strip during the use of the runway for landing or take-off.

(c) To eliminate a buried vertical surface on objects situated on a graded portion of the runway strip, a slope should be provided to minimise hazards to aeroplanes running off the runway.

GM1 ADR-DSN.B.165 is amended as follows:

GM1 ADR-DSN.B.165 Objects on runway strips

[…]

(f) The term 'aircraft safety purposes' refers to the installation of arresting systems which are frangible and intended to enhance safety in the event of an aircraft overrun.

CS ADR-DSN.B.175 is amended as follows:

CS ADR-DSN.B.175 Grading of runway strips

[…]

(b) That portion of a strip of a non-instrument runway within a distance of at least:

(1) 75 m where the code number is ~~3 or~~ 4;

(2) 55 m where the code number is 3;

(~~2~~3) 40 m where the code number is 2; and

(~~3~~4) 30 m where the code number is 1;

from the centre line of the runway and its extended centre line should provide a graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

Note: See CS ADR-DSN.B.160(d).

[…]

GM1 ADR-DSN.B.175 is amended as follows:

GM1 ADR-DSN.B.175 Grading of runway strips

[…]

(b) Where the areas in paragraph (a) above have paved surface, they should be able to withstand the occasional passage of the critical aeroplane for runway pavement design.

~~(c) The area adjacent to the end of a runway may be referred to as a blast pad.~~

(~~d~~c) Additional guidance on grading is given in ICAO Doc 9157, Aerodrome Design Manual Part 1, Runways.

(~~e~~d) The area adjacent to the end of a runway provided to reduce the erosive effects of jet blast and propeller wash may be referred to as a blast pad.

(~~f~~e) Guidance on protection against aeroplane engine blast is given in ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays.

CS ADR-DSN.B.190 is amended as follows:

CS ADR-DSN.B.190 Strength of runway strips

[…]

(b) That portion of a strip containing a non-instrument runway within a distance of at least:

(1) 75 m where the code number is ~~3 or~~ 4;

(2) 55 m where the code number is 3;

(~~2~~3) 40 m where the code number is 2; and

(~~3~~4) 30 m where the code number is 1;

from the centre line of the runway and its extended centre line should be prepared or constructed so as to minimise hazards arising from differences in load-bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

Note: See CS ADR-DSN.B.160(d).

CS ADR-DSN.B.200 is amended as follows:

CS ADR-DSN.B.200 Stopways

[…]

(c) Slopes on stopways:

Slopes and changes in slope on a stopway, and the transition from a runway to a stopway, should comply with the specifications in CS ADR-DSN.B.060 to CS ADR-DSN.B.080 for the runway with which the stopway is associated except that:

(1) the limitation in CS ADR-DSN.B.060(~~b~~c) of a 0.8 % ~~per cent~~ slope for the first and last quarter of the length of a runway need not be applied to the stopway; and

(2) at the junction of the stopway and runway and along the stopway the maximum rate of slope change may be 0.3 % ~~per cent~~ per 30 m (minimum radius of curvature of 10 000 m) for a runway where the code number is 3 or 4.

[…]

GM1 ADR-DSN.B.200 is amended as follows:

GM1 ADR-DSN.B.200 Stopways

[…]

(c) The economy of a stopway can be entirely lost if, after each usage, it should be regraded and compacted. Therefore, it should be designed to withstand at least a certain number of loadings of the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane.

(d) Notwithstanding that a stopway may have a paved surface, it is not intended that ~~PCN Figures~~ bearing strength data need to be developed for a stopway (see Subpart A of Part-ADR.OPS of UK Reg (EU) No 139/2014 for the method on reporting the bearing strength of the pavement). ~~Further guidance is given in ICAO Doc 4444, PANS-OPS.~~

GM1 ADR-DSN.C.210 is amended as follows:

GM1 ADR-DSN.C.210 Runway end safety areas (RESA)

[…]

(b) Assessment of runway end safety areas

[…]

(2) Combined with this, measures may be considered that would reduce the severity of the consequences should an event occur. Wherever practicable, aerodrome operators should seek to optimise the RESA. This may be achieved through a combination of:

[…]

(v) installing suitably positioned and designed arresting systems according to CS ADR-DSN.C.236 (EMAS), or another suitably positioned and designed type of an arresting system, to supplement or as an alternative to a RESA where an equivalent level of safety is demonstrated;

[…]

(c) Arresting systems on runway end safety areas

(1) In recent years, recognising the difficulties associated with achieving a standard runway end safety area (RESA) at all aerodromes, research programmes have been undertaken on the use of various materials for arresting systems. Furthermore, research programmes have been undertaken to evaluate and develop arrestor systems using engineered materials. This research was driven by the recognition that there were many

runways where natural obstacles, local development, and/or environmental constraints inhibit the provision of RESA and lead to limited dimension of RESA. Additionally, there had been accidents at some aerodromes where the ability to stop an overrunning aeroplane within the RESA would have prevented major damage to aeroplane and/or injuries to passengers.

[…]

(3) Arresting system designs should be supported by a validated design method that can predict the performance of the system. The design method should be derived from field or laboratory tests. Testing may be based either on passage of an actual aircraft or an equivalent single wheel load through a test bed. The design should consider multiple aircraft parameters, including but not limited to:

(i) allowable aircraft gear loads~~,~~;

(ii) gear configuration~~,~~;

(iii) ~~tire~~tyre contact pressure~~,~~;

(iv) aircraft centre of gravity~~,~~; and

(v) aircraft speed.

The model should calculate:

- imposed aircraft gear loads~~,~~;
- g-forces on aircraft occupants~~,~~;
- deceleration rates~~,~~; and
- stopping distances within the arresting system.

Any rebound of the crushed material that may lessen its effectiveness~~,~~ should also be considered.

(4) Demonstrated performance of an arresting system can be achieved by a validated design method which can predict the performance of the system. The design and performance should be based on the type of aeroplane anticipated to use the associated runway that imposes the greatest demand upon the arresting system. The design of an arresting system should be based on a critical (or design) aircraft which is defined as aircraft using the associated runway that imposes the greatest demand upon the arresting system. This is usually, but not always, the heaviest/largest aircraft that regularly uses the runway. Arresting system performance is dependent not only on aircraft weight but also on:

(i) allowable aeroplane gear loads~~,~~;

(ii) gear configuration~~,~~;

(iii) ~~tire~~tyre contact pressure~~,~~;

(iv) aeroplane centre of gravity; and

(v) aeroplane speed.

Accommodating undershoots should also be addressed. All configurations should be considered in optimising the arresting system design. The aerodrome operator and arresting system manufacturer should consult regarding the selection of the design aeroplane that should optimise the arresting system for a particular aerodrome. Additionally, the design should allow the safe operation of fully loaded rescue and fire fighting vehicles, including their ingress and egress.

(5) Additional information is given in ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways.

[Figure GM-C-1 retained]

The following CS ADR-DSN.C.236 is inserted:

CS ADR-DSN.C.236 Engineered Materials Arresting System (EMAS)

(a) An EMAS, provided in accordance with paragraph (b) of CS ADR-DSN.C.215, is a type of arresting system consisting of high energy absorbing materials of specific strength, which will reliably and predictably crush under the weight of an aircraft.

(b) Location:

An EMAS should be located beyond the end of the runway or stopway, if provided, at enough setback distance to avoid damage due to jet blast.

(c) General:

An EMAS should:

(1) be supported by a design method that can predict the performance of the system that is validated through laboratory or field tests;

(2) decelerate an aircraft overrunning the runway by exerting predictable forces on the landing gear without causing major structural damage to the aircraft and avoiding injuries to its occupants;

(3) be a passive system that requires no external means to initiate/trigger its operation to arrest an aircraft;

(4) be constructed not to be damaged by jet blast or projected debris during normal aircraft operations;

(5) use materials which do not generate nor worsen fire hazards to an incoming aircraft. The materials should be non-sparking, non-flammable, not promote combustion, and not emit toxic or malodorous fumes in a fire environment after installation;

(6) be compatible with the installation of approach lighting systems, the radio altimeter operating area and with the meteorological conditions and aerodrome environment;

(7) together with its surroundings, allow ice and snow removal and prevent water accumulation;

(8) have enough mechanical property to avoid damage resulting from personnel walking on it for routine maintenance;

(9) enable the access, movement, and egress of the RFFS vehicles without impeding their activities during an emergency;

(10) be designed for repair to a usable condition (conforming to the original specifications) after an overrun or other type of physical damage, and have an established maintenance programme;

(11) not increase the potential for damage and not cause control capabilities to an aircraft in case of an undershoot more than the risk associated with an undershoot in a RESA;

(12) be frangible and mounted as low as possible: the front ramp facing the runway should not present a vertical face. Ramps on the side of the EMAS are not required;

(13) not impede crew and passenger evacuation nor hinder disabled aircraft removal procedures;

(14) not cause visual or electromagnetic interference with any air navigation aids nor have reflecting surfaces that could cause dazzling;

(15) not increase wildlife hazard; and

(16) not be considered to meet the definition of a stopway as provided in CS ADR-DSN.A.002.

(d) Dimensions:

(1) The length of an EMAS should be designed based on the operating conditions of the associated runway with its centre line coincidental with the extended centre line of the runway.

(2) The width of an EMAS should not be less than the runway width.

(e) Arresting performance:

(1) An EMAS should be designed to decelerate the design aircraft at an entry speed of 70 knots at both maximum take-off weight (MTOW) and 80 % maximum landing weight (MLW) without imposing loads that exceed the aircraft’s design limits, causing major structural damage to the aircraft or imposing excessive forces on its occupants.

(2) When there is insufficient RESA available for a standard EMAS, the EMAS must be designed to achieve the maximum deceleration of the design aircraft within the available runway safety end area.

(3) The design method for EMAS should factor in no reverse thrust of the aeroplane, using a 0.25 braking friction coefficient for the runway and length of pavement prior to the arrestor bed (setback).

(4) The design method for the EMAS assumes no braking friction coefficient (0.25) within the EMAS arrestor bed itself, unless the minimum actual braking friction coefficient that can be achieved as an aeroplane passes through the EMAS arrestor bed material can be demonstrated.

(f) Access:

(1) Slopes or steps should be provided to allow the entrance of the RFFS vehicles from the front and sides and to facilitate crew and passenger evacuation.

(2) On both sides of an EMAS, the requirements for RESA according CS ADR-DSN.C.210 to CS ADR-DSN.C.235 should be applied.

(3) Service roads should be set up for maintenance and emergency access. The width of the service roads should allow access and egress of RFFS vehicles. Service roads should be graded to avoid water accumulation. The strength of the service roads pavement should be capable of supporting the passage of fully loaded RFFS vehicles.

(g) Marking:

(1) An EMAS should be provided with yellow chevrons in accordance with CS ADR-DSN.R.865.

The following GM1 ADR-DSN.C.236 is inserted:

GM1 ADR.OPS.C.236 Engineered Materials Arresting System (EMAS)

(a) Engineered materials:

If an EMAS is installed it should be promulgated to operators and included in the AIP. The materials in an EMAS should have the following properties:

(1) The materials are tailored to specific mechanical properties and are referred to as engineered materials.

(2) The engineered materials have to meet a force-deformation profile within limits which have been shown to assure uniform characteristics and, therefore, predictable response to an aircraft entering the EMAS.

(3) The engineered materials will crush under the landing gears of the aeroplane when it engages the EMAS. The crushing is an irreversible or partly irreversible process, and the arresting performance of the system is proportional to the amount of energy that is dissipated.

(b) The compatibility of the EMAS with the specific meteorological and aerodrome conditions is ensured by using materials which:

(1) are water-resistant to the extent that the presence of water does not affect system performance;

(2) do not attract or are physically vulnerable to wildlife to the greatest extent possible;

(3) does not support unintended plant growth with proper application of herbicides;

(4) exhibit constant strength and density characteristics during all climatic conditions within a temperature range that is appropriate for the local conditions; and

(5) are resistant to deterioration as a result of:

(i) salt;

(ii) aircraft and runway de-icing and anti-icing fluids and solids;

(iii) aircraft fuels, hydraulic fluids, and lubricating oils;

(iv) ultraviolet;

(v) water;

(vi) freezing/thawing;

(vii) blowing sand and snow;

(viii) hail;

(ix) paint; and

(x) herbicides.

(c) Undershoot:

(1) An EMAS is not intended to reduce the risk of damage to an aeroplane undershooting the runway. However, the presence of an EMAS cannot increase the potential for damage in case of undershoot more than the risk that is associated with an undershoot in a RESA.

(2) Compliance with CS ADR-DSN.C.236 point (c)(1) could be justified through experience of real cases of undershoot in an EMAS, flight simulator tests, other type of studies, or a combination of the three.

(d) An EMAS is a passive system which does not require any specific action or procedures by the flight crew. However, a basic knowledge of the systems by the crew is considered advantageous to prevent undesired evasive manoeuvres that could cause the aircraft to avoid entering the bed or system. The EMAS is designed to be entered preferably straight ahead with the unrestricted use of wheel brakes and/or thrust reversers. Additionally, the availability of an EMAS cannot be used for flight planning purposes, i.e. it cannot be included in the declared distances.

(e) Mechanical property:

(1) An EMAS is not intended to support vehicular traffic for maintenance or normal operating purposes.

(2) The EMAS needs to be capable of supporting personnel walking on it for the purposes of its own maintenance and co-located air navigation aids without causing any damage to its surface.

(3) Precaution needs to be taken during snow and ice removal to prevent damage to the EMAS bed.

(4) Light equipment for snow removal may be used in accordance with the manufacturer´s specification to avoid any damage to the surface.

(f) Setback distance:

(1) The setback distance is defined as the distance between the runway end or stopway, if provided, and the beginning of the EMAS.

(2) The setback distance will vary depending on the available area and the EMAS design.

(3) The calculation of the setback distance balances the risk objectives of:

(i) providing enough area for arresting purposes;

(ii) providing enough separation to protect the bed from jet blast;

(iii) providing separation from the threshold to reduce the probability of undershoot in the EMAS; and

(iv) decreasing the probability of aircraft overruns passing by one side of the EMAS due to lateral dispersion.

The safety assessment determines the relevance of each risk objective, taking into account the operating particularities of the associated runway, including usage of the runway, types of approach, weather conditions, fleet, incidents and accidents, and any other particularity related with runway safety.

(4) To reduce the probability of an aircraft travelling into the EMAS, aerodrome operators might consider setting the EMAS back from the end of the runway.

(g) An EMAS normally includes steps and/or slopes at its end and both sides, but they are not considered functional for arresting purposes. Where possible, the functional width of the EMAS is to be maintained the same throughout the whole length of the system.

(h) Entry speed is defined as the speed of the nose gear of the aeroplane as it passes the runway end or stopway, if provided.

(i) The critical aircraft is defined as the aircraft that regularly uses the associated runway that imposes the greatest demand upon the EMAS.

(j) Design aircraft list refers to the combination of aircraft types which are / will be operating regularly on the runway. The critical aircraft is usually, but not always, the heaviest/largest aircraft that regularly uses the runway. The performance of an EMAS is dependent not only on aeroplane weight, but also on the landing gear configuration, tyre pressure, and centre of gravity. In general, the operational maximum take-off weight (operational MTOW) is used for the critical aircraft.

However, there may be instances where less than the MTOW will require a longer EMAS. All parameters are to be considered in optimising the EMAS design. However, to the extent practicable, the EMAS design may consider both the aeroplane that imposes the greatest demand upon the EMAS and the range of aircraft expected to operate regularly on the runway. In some instances, a composite of design aircraft may be preferable to optimising the EMAS for a specific runway than a single critical aircraft. Other factors that are unique to a particular aerodrome, such as available RESA and air cargo operations, should also be considered in the final design.

(k) Testing:

Testing is to be based either on passage of an actual aircraft, or on a single wheel bearing an equivalent load through a test bed. The design will need to consider multiple aircraft parameters, including but not limited to allowable aircraft gear loads, gear configuration, tyre contact pressure, weight, centre of gravity, and speed.

GM1 ADR-DSN.D.240 is amended as follows:

GM1 ADR-DSN.D.240 Taxiways general

[…]

(e) A perimeter taxiway is ideally designed according to the following criteria:

[…]

(3) The requirement for RESA, as well as possible interference with the ILS or other navigation aids, is also taken into account: the perimeter taxiway is located behind the localiser antenna, not between the localiser antenna and the runway, due to the potential for severe ILS disturbance, noting that this is harder to achieve as the distance between the localiser and the runway increases. Likewise, perimeter roads are provided where possible.

[…]

(h) The main design principles for entry and exit taxiways are:

[…]

(2) The taxiway angle should be such that the crew of an aircraft at a taxiway holding position (if any) should be able to see an aircraft using or approaching the runway. Where the taxiway angle is such that this clear view, in both directions, is not possible, consideration is given to provide a perpendicular portion of the taxiway immediately adjacent to the runway to allow for a full visual scan prior to entering (or crossing).

(3) Rapid exit taxiways are designed to be runway exits. Whilst it may be an operational practice at some airports to allow smaller aircraft the option of departing at a mid-point on the runway from one of these rapid exit taxiways, the geometry of the taxiway/runway intersection does not allow the crew to

properly scan the runway in both directions to confirm that there is no conflicting traffic. This practice should thus be eliminated and, from the design point of view, all signage and markings should deter any aircraft from using these rapid exit taxiways for any purpose other than what they are designed for (exiting the runway after landing). However, this may be mitigated by the addition of a fillet so that aircraft can manoeuvre to see down the approach. Note that aircraft on an angled taxiway may have a greater likelihood of causing ILS interference.

[…]

(10) Surface colour should not create confusion:

(i) Have different colours for runway and taxiways.

(ii) Avoid a mix of concrete ~~&~~and asphalt.

[…]

(j) Multi-taxiway entrances to a runway should be parallel to each other and should be distinctly separated by an unpaved area. This design principle allows each runway holding location an earthen area for the proper placement of accompanying sign, marking, and lighting visual cues at each runway holding position. Moreover, the design principle eliminates the construction of unusable pavement ~~and~~ as well as the painting of taxiway edge markings to indicate such unusable pavement. In general, excess paved areas at runway holding positions reduce the effectiveness of sign, marking, and lighting visual cues.

(k) CS ADR-DSN.N.785 provides the certification specifications for a standardised scheme for the nomenclature of taxiways to improve situational awareness and as a part of an effective runway incursion prevention measure.

(~~k~~l) Additional g~~G~~uidance on layout and standardised nomenclature of taxiways is given in ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays.

CS ADR-DSN.D.260 is amended as follows:

CS ADR-DSN.D.260 Taxiway minimum separation distance

[…]

	Distance between taxiway centreline and runway centre line (metres)									Taxiway centre line to taxiway centre line (metres)	Taxiway, other than aircraft stand taxilane, centre line to object (metres)	Aircraft stand taxilane centre line to aircraft stand taxilane centre line (metres)	Aircraft stand taxilane centre line to object (metres)
	Instrument runways Code Number					Non-instrument runways code number							
Code letter	1	2	3	4		1	2	3	4				
(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
A	77.5	77.5	-	-		37.5	47.5	-	-	23	15.5	19.5	12
B	82	82	152	-		42	52	~~87~~ 67	-	32	20	28.5	16.5
C	88	88	158	158		48	58	~~93~~ 73	93	44	26	40.5	22.5
D	-	-	166	166		-	-	~~101~~ 81	101	63	37	59.5	33.5
E	-	-	172.5	172.5		-	-	~~107.5~~ 87.5	107.5	76	43.5	72.5	40
F	-	-	180	180		-	-	~~115~~ 95	115	91	51	87.5	47.5

Note 1: The separation distances shown in columns (2) to (9) represent ordinary combinations of runways and taxiways.

Note 2: The distances in columns (2) to (9) do not guarantee sufficient clearance behind a holding aeroplane to permit the passing of another aeroplane on a parallel taxiway.

Table D-1. Taxiway minimum separation distances

GM1 ADR-DSN.D.285 is amended as follows:

GM1 ADR-DSN.D.285 Strength of taxiways

(a) Information regarding pavement bearing strength, including the ~~ACN/PCN~~ ACR/PCR classification system, may be found in GM1 ADR-DSN.B.085.

(b) Due consideration ~~being~~ is to be given to the fact that a taxiway ~~should be~~ is subjected to a greater density of traffic and, as a result of slow moving and stationary aeroplanes, to higher stresses than the runway it serves.

(c) The method for reporting the bearing strength of the pavement is available in Subpart A of Part-ADR.OPS of Regulation UK Reg (EU) No 139/2014.

(d) Additional information on the bearing strength, the design, and evaluation of pavements is given in ICAO Doc 9157, Aerodrome Design Manual, Part 3, Pavements.

CS ADR-DSN.D.325 is amended as follows:

CS ADR-DSN.D.325 Grading of taxiway strips

[…]

(b) The centre portion of a taxiway strip should provide a graded area to a distance from the centre line of the taxiway of not less than that given by the following tabulation:

(1) 10.25 m where the OMGWS is up to but not including 4.5 m;

(2) 11 m where the OMGWS is 4.5 m up to but not including 6 m;

(3) 12.5~~0~~ m where the OMGWS is 6 m up to but not including 9 m;

(4) ~~18.50~~17 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is D;

(5) 19 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is E; and

(6) 22 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is F.

CS ADR-DSN.D.335 is amended as follows:

CS ADR-DSN.D.335 Holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

(a) Holding bay(s) or other bypasses of sufficient size and adequate construction should be provided where necessary, to make deviations in the departure sequence possible.

(b) A runway-holding position or positions should be established:

Applicable until 20 November 2030:

(1) on the taxiway, if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or ILS/MLS critical/sensitive area or interfere with the operation of radio navigation aids;

(2) on the taxiway, at the intersection of a taxiway and a runway; and

(3) at an intersection of a runway with another runway when the former runway is part of a standard taxi-route.

Applicable from 21 November 2030:

the location of a runway-holding position shall be such that a holding aircraft or vehicle will not infringe the inner approach surface, inner transitional surfaces, balked landing surface, approach surface, take-off climb surface or ILS/MLS critical/sensitive area or interfere with the operation of radio navigation aids.

(c) An intermediate holding position should be established on a taxiway at any point other than a runway-holding position where it is desirable to define a specific holding limit.

(d) An emergency access road should be equipped with road-holding positions at all intersections with runways and taxiways.

(e) A road-holding position should be established at each intersection of a road with a runway.

CS ADR-DSN.D.340 is amended as follows:

CS ADR-DSN.D.340 Location of holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

(a) The distance between a holding bay, runway-holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway should be in accordance with Table D-2 and such that a holding aircraft or vehicle should not interfere with the operation of radio navigation aids.

[…]

Type of runway	**Code number** ~~d~~c			
	1	2	3	4
Non-instrument	30 m	40 m	~~75~~ 55 m	75 m
Non-precision approach	40 m	40 m	75 m	75 m
Precision approach Category I	60 m [b]	60 m [b]	90 m [a,b]	90 m [a,b,~~c~~]
Precision approach Categories II and III	-	-	90 m [a,b]	90 m [a,b,~~c~~]

Take-off runway	30 m	40 m	~~75~~ 55 m	75 m

a. If a holding bay, runway-holding position, or road-holding position is at a lower elevation compared to the threshold, the distance may be decreased 5 m for every metre the bay or holding position is lower than the threshold, contingent upon not infringing the inner transitional surface.

b. This distance may need to be increased to avoid interference with radio navigation aids, particularly the glide path and localiser facilities (see CS ADR-DSN.D.340).

Note 1: The distance of 90 m for code number 3 or 4 is based on an aircraft with a tail height of 20 m, a distance from the nose to the highest part of the tail of 52.7 m and a nose height of 10 m holding at an angle of 45° or more with respect to the runway centre line, being clear of the obstacle-free zone and not accountable for the calculation of OCA/H.

Note 2: The distance of 60 m for code number 2 is based on an aircraft with a tail height of 8 m, a distance from the nose to the highest part of the tail of 24.6 m and a nose height of 5.2 m holding at an angle of 45° or more with respect to the runway centre line, being clear of the obstacle-free zone.

~~c.Where the code letter is F, this distance should be 107.5 m~~

Note 3: For code number 4 where the width of the inner edge of the inner approach surface is more than 120 m, a distance greater than 90 m may be necessary to ensure that a holding aircraft is clear of the obstacle free zone. For example, t~~T~~he distance of 100 ~~107.5~~ m ~~for code number 4 where the code letter is F~~ is based on an aircraft with a tail height of 24 m, a distance from the nose to the highest part of the tail of 62.2 m and a nose height of 10 m holding at an angle of 45° or more with respect to the runway centre line, being clear of the obstacle-free zone.

c~~d~~. Elevation of taxiway should be taken into account for possible increase of the distances indicated in this table

Table D-2. Minimum distance from the runway centre line to a holding bay, runway-holding position, or road-holding position

GM1 ADR-DSN.D.340 is amended as follows:

GM1 ADR-DSN.D.340 Location of holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

[…]

(c) An aircraft taxiing could endanger aircraft operations when the aircraft is too close to the runway during take-off and landings. It is so advised to check if the aircraft taking off or landing could be hindered. […]

[…]

(f) If a holding bay, runway-holding position or road-holding position for a precision approach runway code number 4 is at a greater elevation compared to the threshold, the distance ~~of 90 m or 107.5 m, as appropriate,~~ specified in Table D-2 could be further increased 5 m for every metre the bay or position is higher than the threshold.

[…]

CS ADR-DSN.E.345 is amended as follows:

CS ADR-DSN.E.345 General

(a) Aprons should be provided to permit the safe loading and off-loading of passengers, cargo, or mail as well as the servicing of aircraft without interfering with the aerodrome traffic.

(b) The design of aprons should take into consideration criteria for safe ground handling, including:

(1) sufficient space between aircraft stands to enable personnel and equipment to move safely and efficiently;

(2) adequate apron markings, apron signs and apron floodlighting;

(3) adequate staging and storage areas for ground support equipment (GSE);

(4) positioning of fixed ground services;

(5) storage areas for unit load devices (ULD);

(6) adequate access and egress routes for fuel, GSE and emergency vehicles;

(7) clearly delineated and visible access and egress routes for passengers;

(8) new technologies (electric charging points, autonomous vehicles, etc.);

(9) avoidance of rear of aircraft stand service roads wherever practicable; and

(10) appropriate protection from jet blast and propeller wash.

GM1 ADR-DSN.E.345 is amended as follows:

GM1 ADR-DSN.E.345 General

~~Intentionally left blank~~ Further guidance on apron design and markings is given in the Aerodrome Design Manual (ICAO Doc 9157), Part 4 — Visual Aids, and the Airport Planning Manual (ICAO Doc 9184), Part 1 — Master Planning.

GM1 ADR-DSN.E.360 is amended as follows:

GM1 ADR-DSN.E.360 Slopes on aprons

[…]

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing ~~airplane~~aircraft stands, should specifically take into account the impact of the slopes on the ~~airplane~~aircraft during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an ~~airplane~~aircraft passes its stop point and goes on the apron service road or to the closest building and, on the other hand, to save fuel and optimise the manoeuvrability of the ~~airplane~~aircraft or of the push-back device.

[…]

CS ADR-DSN.E.365 is amended as follows:

CS ADR-DSN.E.365 Clearance distances on aircraft stands

[…]

(c) When special circumstances so warrant, these ~~The minimum~~ clearances ~~distance~~ for code letters D, E and F ~~can~~ may be reduced at a nose-in aircraft stand:

(1) for height limited objects~~,~~;

(2) if the stand is restricted for aircraft with specific characteristics~~,~~; and

(3) in the following locations (for aircraft using a taxi-in, push-back procedure only):

(i) between the terminal (including passenger ~~loading~~ boarding bridges) and the nose of an aircraft; and

(ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system.

CS ADR-DSN.G.380 is amended as follows:

CS ADR-DSN.G.380 Location

(a) De-icing/anti-icing facilities should be provided either at aircraft stands or at specified remote areas.

(b) The remote de-icing/anti-icing facilities should be located to:

(1) be clear of the obstacle limitation surfaces;

(2) ~~to~~ not cause interference to the radio navigation aids; and

(3) be clearly visible from the air traffic control tower responsible for clearing the treated aeroplane.

GM1 ADR-DSN.G.380 is amended as follows:

GM1 ADR-DSN.G.380 Location

[…]

(e) The remote de-icing/anti-icing facilities should be so located as to provide for an expeditious traffic flow, perhaps with a bypass configuration, and not require unusual taxiing manoeuvre into and out of the pads.

[…]

GM1 ADR-DSN.G.400 is amended as follows:

GM1 ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

(a) The separation criteria should take into account the need for individual de-icing/anti-icing pads to provide sufficient manoeuvring area around the ~~airplane~~aircraft to allow simultaneous treatment by two or more mobile de-icing/anti-icing vehicles and sufficient non-overlapping space for a vehicle safety zone between adjacent de-icing pads and for other de-icing/anti-icing pads.

[…]

GM1 ADR-DSN.J.465 is amended as follows:

GM1 ADR-DSN.J.465 General

Applicable until 20 November 2030

The requirements for obstacle limitation surfaces are specified on the basis of the intended use of a runway, i.e. take-off or landing, and type of approach, and are intended to be applied when such use of the runway is made. In cases where operations are conducted to or from both directions of a runway, the function of certain surfaces may be nullified because of more stringent requirements of another lower surface.

Applicable from 21 November 2030

The objectives of the specifications are to define the airspace around aerodromes to be maintained free from obstacles so as to permit the intended aeroplane operations at the aerodromes to be conducted safely and to prevent the aerodromes from becoming unusable by the growth of obstacles around the aerodromes. This is achieved by establishing a series of obstacle limitation surfaces that define the limits to which objects may project into the airspace.

CS ADR-DSN.J.480 is amended as follows:

CS ADR-DSN.J.480 Precision approach runways

[…]

(g) New objects or extensions of existing objects should 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 if, after a safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

(h) Existing objects above an approach surface, a transitional surface, the conical surface and inner horizontal surface should, as far as practicable, be removed except when an object would be shielded by an existing immovable object, or if, after a safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

Approach Runways										
Runway Classification										
Surface and dimension [a]	**Non-instrument Code number**				**Non-precision approach Code number**			**Precision approach category I, II or III Code Number**		
								~~I Code Number~~		**~~II or III Code Number~~**
	1	**2**	**3**	**4**	**1,2**	**3**	**4**	**1,2**	**3,4**	**~~3,4~~**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**~~(11)~~**
CONICAL										
Slope	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	~~5 %~~

Approach Runways										
Runway Classification										
Surface and dimension [a]	**Non-instrument Code number**				**Non-precision approach Code number**			**Precision approach category I, II or III Code Number**		
								~~I Code Number~~		**~~II or III Code Number~~**
	1	**2**	**3**	**4**	**1,2**	**3**	**4**	**1,2**	**3,4**	**~~3,4~~**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**~~(11)~~**
Height	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	~~100 m~~
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	~~45 m~~
Radius	2 000 m	2 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m	3 500 m	4 000 m	~~4 000 m~~
INNER APPROACH										
Width	-	-	-	-	-	-	-	90 m	120 m[eb]	~~120 m~~[e]
Distance from threshold	-	-	-	-	-	-	-	60 m	60 m	~~60 m~~
Length	-	-	-	-	-	-	-	900 m	900 m	~~900 m~~

Approach Runways										
Runway Classification										
Surface and dimension [a]	**Non-instrument Code number**				**Non-precision approach Code number**			**Precision approach category I, II or III Code Number**		
								I Code Number		**II or III Code Number**
	1	**2**	**3**	**4**	**1,2**	**3**	**4**	**1,2**	**3,4**	**3,4**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Slope	-	-	-	-	-	-	-	2.5 %	2 %	2 %
APPROACH										
Length of inner edge	60 m	80 m	150 110 m	150 m	140 m	280 m	280 m	140 m	280 m	280 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10 %	10 %	10 %	10 %	15 %	15 %	15 %	15 %	15 %	15 %
First section										
Length	1 600 m	2 500 m	3 000 m	3 000 m	2 500 m	3 000 m	3 000 m	3 000 m	3 000 m	3 000 m

Approach Runways										
Runway Classification										
Surface and dimension [a]	**Non-instrument Code number**				**Non-precision approach Code number**			**Precision approach category I, II or III Code Number**		
								I Code Number		**II or III Code Number**
	1	**2**	**3**	**4**	**1,2**	**3**	**4**	**1,2**	**3,4**	**3,4**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Slope	5 %	4 %	3.33 %	2.5 %	3.33 %	2 %	2 %	2.5 %	2 %	2 %
Second section										
Length	-	-	-	-	-	3 600 m[bc]	3 600 m[bc]	12 000 m	3 600 m[bc]	3 600 m[b]
Slope	-	-	-	-	-	2.5 %	2.5 %	3 %	2.5 %	2.5 %
Horizontal section										
Length	-	-	-	-	-	8 400 m[bc]	8 400 m[bc]	-	8 400 m[bc]	8 400 m[b]
	-	-	-	-	-					
Total										
Total Length	-	-	-	-	-	15 000 m	15 000 m	15 000 m	15 000 m	15 000 m

Approach Runways										
Runway Classification										
Surface and dimension [a]	**Non-instrument Code number**				**Non-precision approach Code number**			**Precision approach category I, II or III Code Number**		
								I Code Number		**II or III Code Number**
	1	**2**	**3**	**4**	**1,2**	**3**	**4**	**1,2**	**3,4**	**3,4**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
TRANSITIONAL										
Slope	20 %	20 %	14.3 %	14.3 %	20 %	14.3 %	14.3 %	14.3 %	14.3 %	14.3 %
INNER TRANSITIONAL										
Slope	-	-	-	-	-	-	-	40 %	33.3 %	33.3 %
BALKED LANDING SURFACE										
Length of inner edge	-	-	-	-	-	-	-	90 m	120 m[eb]	120 m[e]
Distance from threshold	-	-	-	-	-	-	-	c[d]	1 800 m[de]	1 800 m[d]
Divergence (each side)	-	-	-	-	-	-	-	10 %	10 %	10 %
Slope	-	-	-	-	-	-	-	4 %	3.33 %	3.33 %

Approach Runways										
Runway Classification										
Surface and dimension [a]	Non-instrument Code number				Non-precision approach Code number			Precision approach category I, II or III Code Number		
								~~I Code Number~~		~~II or III Code Number~~
	1	2	3	4	1,2	3	4	1,2	3,4	~~3,4~~
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	~~(11)~~

Notes:

a. All dimensions are measured horizontally unless specified otherwise.

b. Where the code letter is F (Code element 2 of Table A-1), the width is increased to 140 m.

~~b~~c. Variable length (CS ADR-DSN.J.475(c) or CS ADR-DSN.J.480(d)).

~~c~~d. Distance to the end of strip.

~~d~~e. Or end of runway whichever is less.

~~e. Where the code letter is F (Code element 2 of Table A-1), the width is increased to 140 m.~~

Table J-1. Dimensions and slopes of obstacle limitation surfaces — Approach runways

CS ADR-DSN.L.535 is amended as follows:

CS ADR-DSN.L.535 Threshold marking

(a) Applicabililty:

A threshold marking should be provided at the threshold of a runway.

(b) A threshold marking should be provided at the threshold of a paved non-instrument runway where the code number is 1 or 2 and additional conspicuity of the beginning of the runway available for landing is necessary.

(~~b~~c) Characteristics:

[…]

(~~c~~d) Displaced threshold:

[…]

CS ADR-DSN.L.555 is amended as follows:

CS ADR-DSN.L.555 Taxiway centre line marking

[…]

(b) Characteristics:

[…]

(4) Where taxiway centre line marking is provided in accordance with ~~(a) 2~~ (a)(2) above, the marking should be located on the centre line of the designated taxiway.

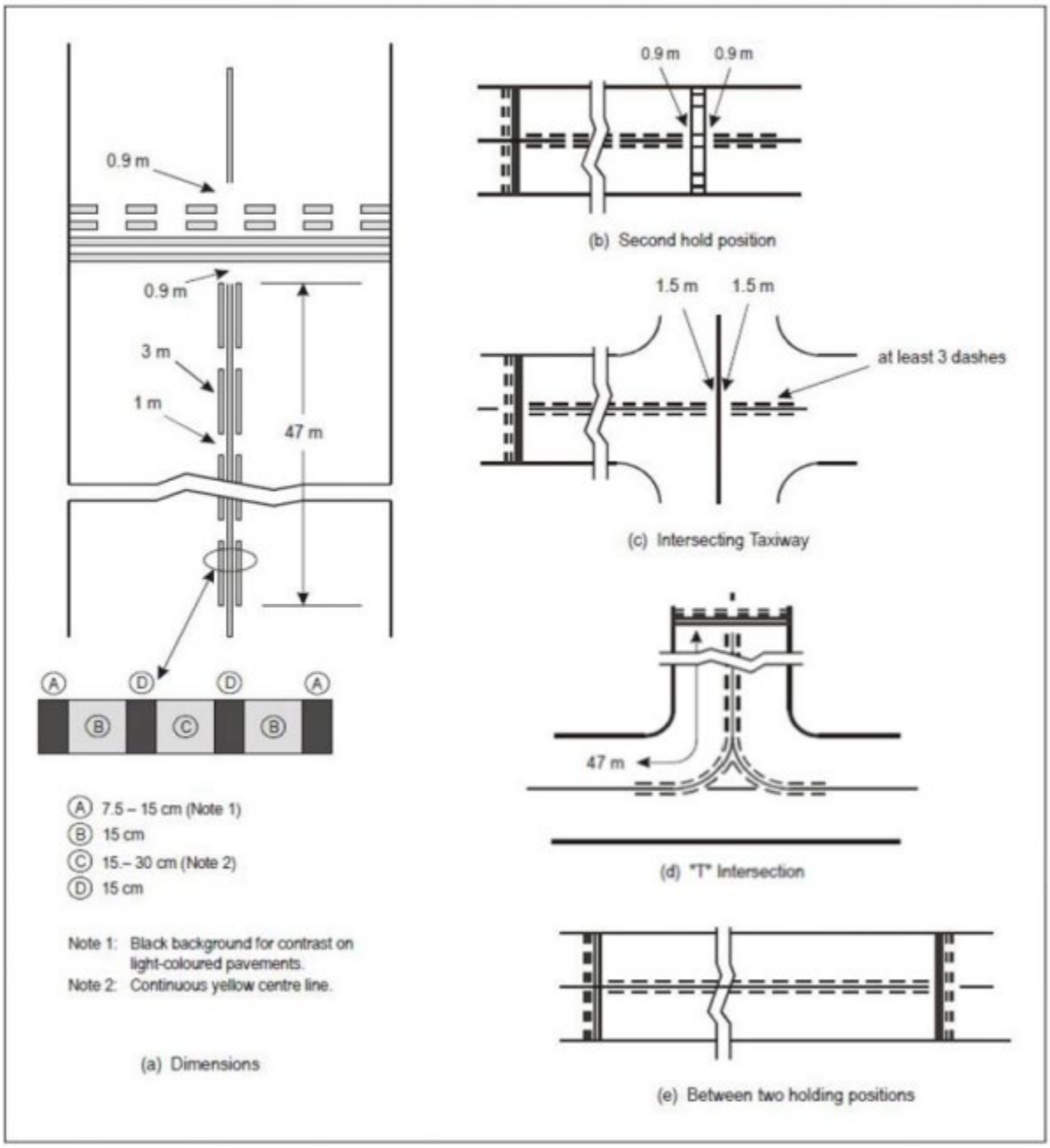
[…]

CS ADR-DSN.L.570 is amended as follows:

CS ADR-DSN.L.570 Enhanced taxiway centre line marking

[…]

[The existing Figure L-6 is replaced with the following figure which shows a solid centre line in Figure L-6(d).]



CS ADR-DSN.L.605 is amended as follows:

CS ADR-DSN.L.605 Mandatory instruction marking

[…]

(b) Location:

(1) The mandatory instruction marking on taxiways~~, where the code letter is A, B, C, or D,~~ for aeroplanes with OMGWS up to but not including 9 m should be located across the taxiway equally placed about the taxiway centre line and on the holding side of the runway-holding position marking as shown in Figure L-9(A). The distance between the nearest edge of the marking and the runway-holding position marking or the taxiway centre line marking should be not less than 1 m.

(2) The mandatory instruction marking on taxiways ~~where the code letter is E or F,~~ for aeroplanes with OMGWS of 9 m up to but not including 15 m should be located on ~~the~~ both sides of the taxiway centre line marking and on the holding side of the runway-holding position marking as shown in Figure L-9(B). The distance between the nearest edge of the marking and the runway-holding position marking~~,~~ or the taxiway centre line marking should be not less than 1 m.

(c) Characteristics:

(1) A mandatory instruction marking should consist of an inscription in white on a red background. Except for a ~~NO ENTRY~~ no-entry marking, the inscription should provide information identical to that of the associated mandatory instruction sign.

(2) A ~~NO ENTRY~~ no-entry marking should consist of an inscription in white reading NO ENTRY on a red background.

[…]

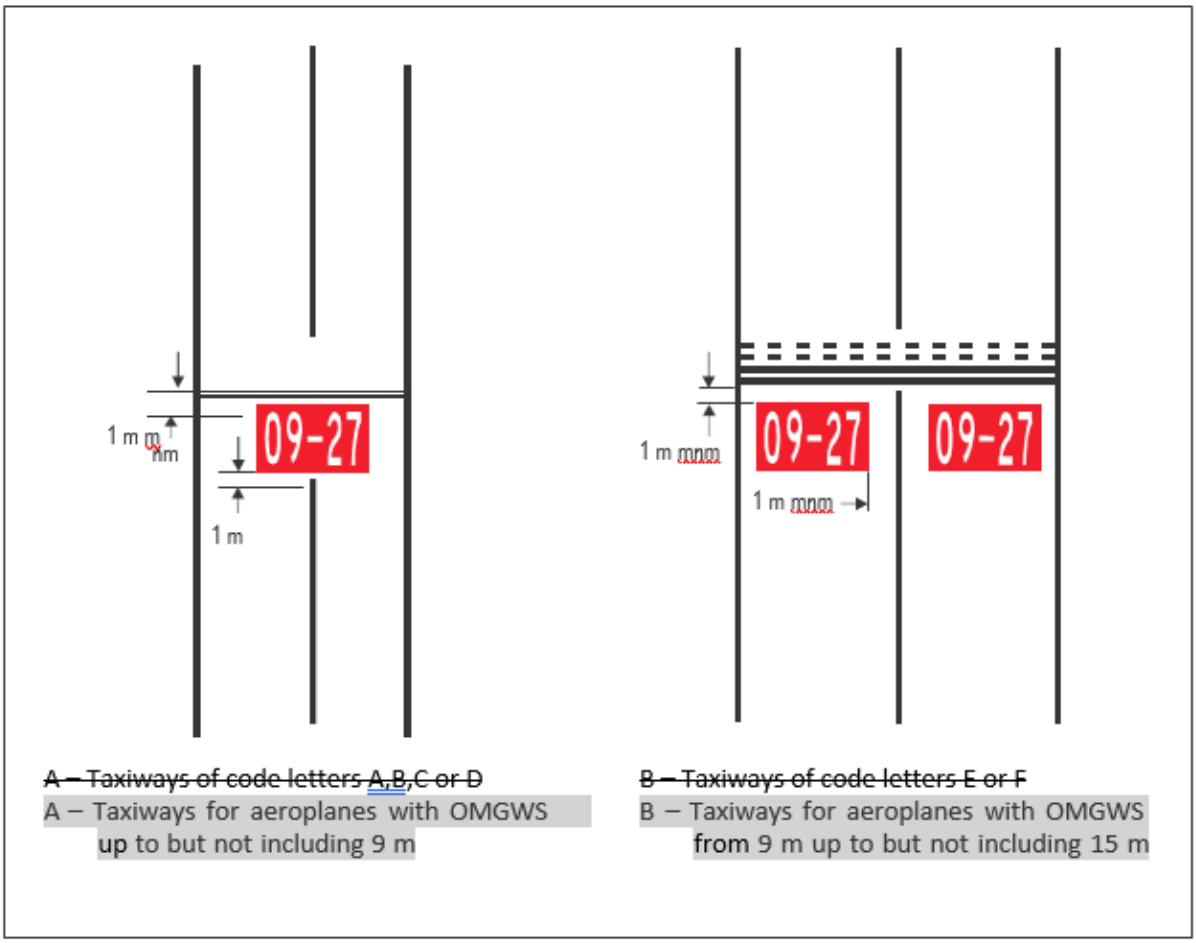


Figure L-9 Mandatory instruction markings

CS ADR-DSN.L.610 is amended as follows:

CS ADR-DSN.L.610 Information marking

[…]

(b) Characteristics:

[…]

(3) The character height, spacing and the form and proportions of the inscription should be as for mandatory instruction markings.

~~(4) The spacing of characters for information marking should be as specified in Table N-3(c).~~

[…]

GM1 ADR-DSN.M.615 is amended as follows:

GM1 ADR-DSN.M.615 General

[…]

(b) In dusk or poor visibility conditions by day, lighting can be more effective than marking. For lights to be effective in such conditions or in poor visibility by night, they should be of adequate intensity. To obtain the required intensity, it should usually be necessary to make the light directional, in which case the arcs over which the light shows should be adequate and so orientated as to meet the operational requirements. The runway lighting system should be considered as a whole, to ensure that the relative light intensities are suitably matched to the same end and are maintained over time. Guidance on maintenance criteria for aeronautical ground lights and of the use of a site is contained in ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.

[…]

CS ADR-DSN.M.635 is amended as follows:

CS ADR-DSN.M.635 Precision approach Category II and III lighting system

[…]

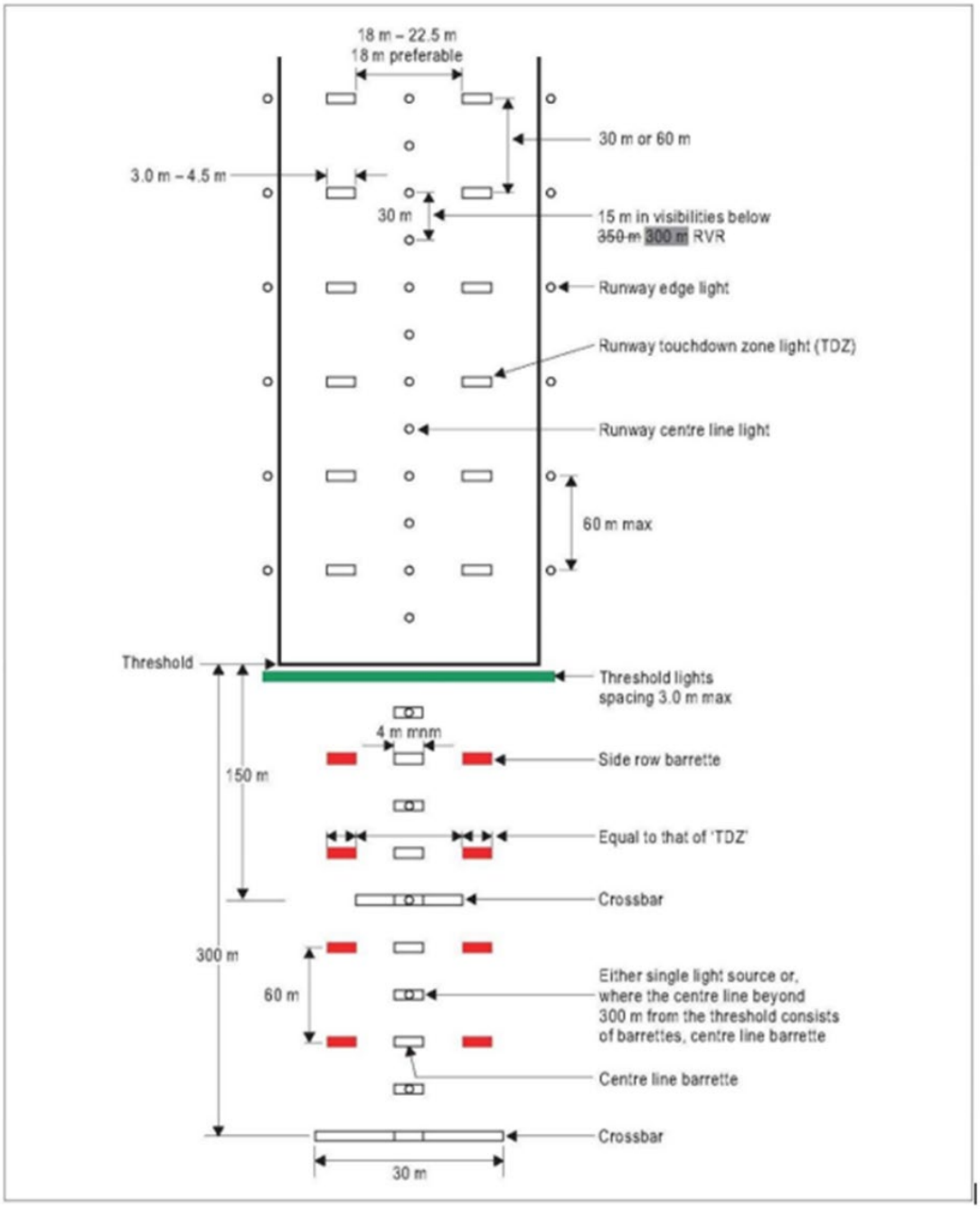


Figure M-3B. Inner 300 m approach and runway lighting for precision approach runways, Categories II and III where the serviceability levels of the lights specified as maintenance objectives in CS ADR-DSN.S.895 can be demonstrated

CS ADR-DSN.M.675 is amended as follows:

CS ADR-DSN.M.675 Runway edge lights

[…]

(b) Location and positioning:

(1) Runway edge lights should be placed along the full length of the runway and should be in two parallel rows equidistant from the centre line.

(2) Runway edge lights should be placed along the edges of the area declared for use as the runway ~~or outside the edges of the area at a distance of not more than 3 m~~.

(3) Where the width of the area which could be declared as runway~~,~~ exceeds 60 m, the distance between the rows of lights should be determined taking into account the nature of the operations, the light distribution characteristics of the runway edge lights, and other visual aids serving the runway.

[…]

CS ADR-DSN.M.685 is amended as follows:

CS ADR-DSN.M.685 Runway end lights

[…]

(b) Location and positioning:

(1) Runway end lights should be placed on a line at right angles to the runway axis as near to the end of the runway as possible ~~and, in any case, not more than 3 m outside the end~~.

[…]

CS ADR-DSN.M.690 is amended as follows:

CS ADR-DSN.M.690 Runway centre line lights

[…]

(c) Location:

Runway centre line lights should be located along the centre line of the runway, except that the lights may be uniformly offset to the same side of the runway centre line by not more than 60 cm where it is not practicable to locate them along the centre line. The lights should be located from the threshold to the end at longitudinal spacing of approximately 15 m. Where the serviceability level of the runway centre line lights specified as maintenance objectives in CS ADR.DSN.S.895 can be demonstrated, and the runway is intended for use in runway visual range conditions of ~~350~~300 m or greater, the longitudinal spacing may be approximately 30 m.

[…]

GM1 ADR-DSN.M.700 is amended as follows:

GM1 ADR-DSN.M.700 Rapid exit taxiway indicator lights (RETILs)

[…]

(b) Rapid exit taxiway indicator lights should be considered on a runway intended for use in runway visual range conditions less than a value of ~~350~~300 m where the traffic density is heavy.

[…]

CS ADR-DSN.M.705 is amended as follows:

CS ADR-DSN.M.705 Stopway lights

(a) Applicability:

Stopway lights should be provided for a stopway intended for use at night.

(b) Location:

(1) Stopway lights should be placed along the full length of the stopway and should be in two parallel rows that are equidistant from the centre line and coincident with the rows of the runway edge lights. The spacing between the lights should be in accordance with CS ADR-DSN.M.675(b)(4). Stopway lights placed along the edge of the stopway should consist of at least one pair of lights.

(2) At least four uni-directional stopway lights equally spaced across the width of the stopway should be provided across the end of a stopway on a line at right angles to the stopway axis as near to the end of the stopway as possible ~~and, in any case, not more than 3 m outside the end~~.

[…]

CS ADR-DSN.M.710 is amended as follows:

CS ADR-DSN.M.710 Taxiway centre line lights

[…]

(b) Applicability:

(1) Taxiway centre line lights should be provided on an exit taxiway, taxiway, de-icing/anti-icing facility, and apron intended for use in runway visual range conditions less than a value of ~~350~~300 m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and taxiway edge lights~~,~~ and centre line marking provide adequate guidance.

(2) Taxiway centre line lights should be provided on a taxiway intended for use at night in runway visual range conditions of ~~350~~300 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where taxiway edge lights~~,~~ and centre line marking provide adequate guidance.

[…]

(4) Taxiway centre line lights should be provided on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of ~~350~~300 m, except that these lights need not be provided where the traffic density is light and taxiway edge lights~~,~~ and centre line marking provide adequate guidance.

[…]

(c) Characteristics:

(1) Except as provided for in paragraph (c)(3) below, taxiway centre line lights on a taxiway other than an exit taxiway and on a runway forming part of a standard taxi-route should be fixed lights showing green with beam dimensions such that the light is visible only from aeroplanes on, or in the vicinity of, the taxiway.

[…]

(4) Taxiway centre line lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-16, U-17, or U-18, as appropriate, for taxiways intended for use in runway visual range conditions of less than a value of ~~350~~300 m; Figure U-19 or Figure U-20, as appropriate, for other taxiways.

(5) Where higher intensities are required, from an operational point of view, taxiway centre line lights on rapid exit taxiways intended for use in runway visual range conditions less than a value of ~~350~~300 m should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-16. The number of levels of brilliancy settings for these lights should be the same as that for the runway centre line lights.

[…]

CS ADR-DSN.M.715 is amended as follows:

CS ADR-DSN.M.715 Taxiway centre line lights on taxiways, runways, rapid exit taxiways, or on other exit taxiways

[…]

(b) Taxiway centre line lights on taxiways:

(1) Taxiway centre line lights on a straight section of a taxiway should be spaced at longitudinal intervals of not more than 30 m, except that:

(i) intervals less than 30 m should be provided on short straight sections; and

(ii) on a taxiway intended for use in RVR conditions of less than a value of ~~350~~300 m, the longitudinal spacing should not exceed 15 m.

[…]

(3) On a taxiway curve the spacing of taxiway centre line lights should be as specified in the Table M-3.

RVR	Radius of taxiway curve	Taxiway centre line lights spacing on taxiway curves
< ~~350~~ 300 m	< 400 m	Not greater ~~than7.5 m~~ than 7.5 m. This spacing should extend for 60 m before and after the curve.
	~~>~~≥ 400 m	Not greater than 15 m
~~> 350~~ ≥ 300 m	< 400 m	Not greater than 7.5 m
	~~401~~ 400 m to 899 m	Not greater than 15 m
	~~>~~≥ 900 m	Not greater than 30 m

Table M-3. Taxiway centre line lights spacing on taxiway curves

[…]

(e) Taxiway centre line lights on runways:

Taxiway centre line lights on a runway forming part of a standard taxi-route, and intended for taxiing in runway visual range conditions less than a value of ~~350~~300 m should be spaced at longitudinal intervals not exceeding 15 m.

[…]

(g) Taxiway centre line lights on straight sections of taxiways:

Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.

[…]

CS ADR-DSN.M.720 is amended as follows:

CS ADR-DSN.M.720 Taxiway edge lights

[…]

(b) Location and positioning:

[…]

(4) The lights should be located as near as practicable to the edges of the taxiway, runway turn pad, holding bay, de-icing/anti-icing facility, apron or runway, etc.~~, or outside the edges at a distance of not more than 3 m.~~

[…]

CS ADR-DSN.M.725 is amended as follows:

CS ADR-DSN.M.725 Runway turn pad lights

[…]

(b) Applicability:

(1) Runway turn pad lights should be provided for continuous guidance on a runway turn pad intended for use in runway visual range conditions less than a value of ~~350~~300 m to enable an aeroplane to complete a 180-degree turn~~,~~ and align with the runway centre line.

[…]

CS ADR-DSN.M.735 is amended as follows:

CS ADR-DSN.M.735 Intermediate holding position lights

(a) Applicability:

(1) Except where a stop bar has been installed, intermediate holding position lights should be provided at an intermediate holding position intended for use in runway visual range conditions less than a value of ~~350~~300 m.

[…]

CS ADR-DSN.M.745 is amended as follows:

CS ADR-DSN.M.745 Runway guard lights

(a) The purpose of runway guard lights is to warn pilots and drivers of vehicles, ~~when they are~~ operating on taxiways, that they are about to enter an active runway. There are two standard configurations of runway guard lights as illustrated in Figure M-12.

(b) Applicability:

(1) Runway guard lights, Configuration A, should be provided at each taxiway/runway intersection associated with a runway intended for use in:

(i) runway visual range conditions ~~less than a value~~ of ~~550~~1 200 m where a stop bar is not installed; and

(i) runway visual range conditions of ~~values between 550 m and~~ 1 200 m where the traffic density is heavy.

(2) As part of runway incursion prevention measures, runway guard lights, Configuration A or B, should be provided at each taxiway/runway intersection where runway incursion hot spots have been identified, and used under all weather conditions during day and night.

(3) Configuration B runway guard lights should not be collocated with a stop bar.

(4) Where more than one runway-holding position exists at a runway/taxiway intersection, only the set of runway guard lights associated with the operational runway-holding position should be illuminated.

(c) Location:

(1) Runway guard lights, Configuration A, should be located at each side of the taxiway on the holding side of the runway-holding position marking ~~and at the same distance as the runway-holding position marking~~.

(2) Runway guard lights, Configuration B, should be located across the taxiway on the holding side of the runway-holding position marking ~~and at the same distance as the runway-holding position marking~~.

(d) Characteristics:

(1) Runway guard lights, Configuration A, should consist of two pairs of yellow lights.

(2) Runway guard lights, Configuration B, should consist of yellow lights spaced at intervals of 3 m across the taxiway.

(3) The light beam should be unidirectional and ~~aligned so as to be visible to the pilot of an aeroplane taxiing~~ should show yellow in the direction of approach to the runway holding position.

[…]

GM1 ADR-DSN.M.745 is amended as follows:

GM1 ADR-DSN.M.745 Runway guard lights

(a) ~~Some other device or design, e.g. specially designed optics, may be used in lieu of the visor~~ Runway incursions may take place in all visibility or weather conditions. The use of runway guard lights at runway-holding positions can form part of effective runway incursion prevention measures.

(b) Where taxiways are substantially wider than those specified in CS ADR-DSN.D.245, such as wide-throat taxiways, the lights in Configuration A, located at each of the sides, are likely to be missed by pilots and may be necessary to be supplemented by a row of lights (inset) located across the taxiway, Configuration B.

(~~b~~c) Higher light intensities may be required to maintain ground movement at a certain speed in low visibilities.

(~~c~~d) The optimum flash rate is dependent on the rise and fall times of the lamps used. Runway guard lights, Configuration A, installed on 6.6 ampere series circuits have been found to look best when operated at 45 to 50 flashes per minute per lamp. Runway guard lights, Configuration B, installed on 6.6 ampere series circuits have been found to look best when operated at 30 to 32 flashes per minute per lamp.

(~~d~~e) Where there is a need to enhance the contrast between the on- and off-state of runway guard lights, Configuration A, intended for use during the day, a visor of sufficient size to prevent sunlight from entering the lens without interfering with the function of the fixture should be located above each lamp. Some other device or design, e.g. specially designed optics, may be used in lieu of the visor.

(~~e~~f) Active runway is to consider any runway or runways currently being used for take-off or landing. When multiple runways are used, they are all considered active runways.

(g) Additional guidance on runway guard lights is given in ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.

GM1 ADR-DSN.M.755 is amended as follows:

GM1 ADR-DSN.M.755 Visual docking guidance system

(a) The factors to be considered in evaluating the need for a visual docking guidance system are in particular: the number and type(s) of aircraft using the aircraft stand, weather conditions, space available on the apron, and the precision required for manoeuvring into the parking position due to aircraft servicing installation, passenger ~~loading~~ boarding bridges, etc.

(b) The accuracy of the system shall be adequate for the type of loading passenger boarding bridge and fixed aircraft servicing installations with which it is to be used.

(~~b~~c) Care is required in both the design and on-site installation of the system to ensure that reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.

CS ADR-DSN.M.770 is amended as follows:

CS ADR-DSN.M.770 Road-holding position light

(a) Applicability:

A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway should be used in runway visual range conditions less than a value of ~~550~~1 200 m.

(b) Location:

A road-holding position light should be located adjacent to the holding position marking 1.5 m (±0 5 m) from one edge of the road, i.e. left or right as appropriate to the local road traffic regulations.

(c) Characteristics:

(1) The road-holding position light should comprise:

(i) a controllable red (stop)/green (go) traffic light; or

(ii) a flashing-red light.

[…]

CS ADR-DSN.M.771 is amended as follows:

CS ADR-DSN.M.771 No-entry bar

(a) Applicability:

A no-entry bar should be provided across a taxiway which is intended to be used as an exit only taxiway. The purpose of a no-entry bar is to assist in preventing inadvertent access of traffic to that taxiway.

(b) Location:

(1) A no-entry bar should be located across the taxiway at the end of an exit only taxiway where it is desired to prevent traffic from entering the taxiway in the wrong direction.

(2) A no-entry bar should be collocated with a no-entry sign and/or a no-entry marking.

(c) Characteristics:

(1) A no-entry bar should consist of unidirectional lights spaced at uniform intervals of no more than 3 m showing red in the intended direction(s) of approach to the runway.

(2) Taxiway centre line lights installed beyond the no-entry bar, looking in the direction of the runway, should not be visible when viewed from the taxiway. ~~The lighting circuit should be so designed that:~~

~~(i) no-entry bars are switchable selectively or in groups;~~

~~(ii) when a no-entry bar is illuminated, any taxiway centre line lights installed beyond the no-entry bar, when viewed towards the runway, should be extinguished for a distance of at least 90 m; and~~

~~(iii) when a no-entry bar is illuminated, any stop bar installed between the no-entry bar and the runway should be extinguished.~~

(3) The intensity in red light and beam spreads of no-entry bar lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figures U-16 to U-20, as appropriate.

(4) No-entry bar lights chromaticity should be in accordance with the specifications in CS ADR-DSN.U.930 and Figure U-1A or U-1B, as appropriate.

GM1 ADR-DSN.M.771 is amended as follows:

GM1 ADR-DSN.M.771 No-entry bar

~~(a) A no-entry bar is intended to be controlled either manually or automatically by air traffic services.~~

(~~b~~a) Runway incursions may take place in all visibility or weather conditions. The use ~~provision~~ of no-entry bars ~~at taxiway/runway intersections and their use at night and in all visibility conditions~~ can form part of effective runway incursion prevention measures.

(~~c~~b) Where necessary to enhance conspicuity, extra lights should be installed uniformly.

(~~d~~c) A pair of elevated lights should be added to each end of the no-entry bar where the in-pavement no-entry bar lights might be obscured from a pilot's view, for example, by snow or rain, or where a pilot may be required to stop the aircraft in a position so close to the lights that they are blocked from view by the structure of the aircraft.

(~~e~~d) Where no-entry bars are specified as components of an advanced surface movement guidance and control system and where, from an operational point of view, higher intensities are required to maintain ground movements at a certain speed in very low visibilities or in bright daytime conditions, the intensity in red light and beam spreads of no-entry bar lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figures U-21, U-22 or U-23, as appropriate.

(~~f~~e) High-intensity no-entry bars are typically used only in case of an absolute necessity and following a safety assessment.

(~~g~~f) Where a wide beam fixture is required, the intensity in red light and beam spreads of no-entry bar lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figures U-21 or U-23, as appropriate.

(~~h~~g) Care is required in the design of the electrical system to ensure that all of the lights of a no-entry bar will not fail at the same time. No-entry bar lights should be

supplied with power on a separate circuit to other runway lighting so that they may be used when other lighting is switched off.

The following CS ADR-DSN.M.772 is inserted:

CS ADR-DSN.M.772 Pilot Controlled Lighting (PCL)

(a) The control of an AGL system from beyond the boundary of a certificated aerodrome whether from the ground or in the air is required to be approved subject to a satisfactory proposal by the aerodrome operator to the CAA.

(b) PCL shall not be operated until CAA approval has been granted.

(c) Where PCL is intended to be installed, an operational requirement proposed by the aerodrome operator shall be submitted to the CAA as part of the proposal.

(d) PCL shall only be available when enabled by the ATCO/AFISO/AGCS.

(e) A method of clearly showing that PCL is enabled shall be provided.

(f) Where PCL interfaces to AGL Control and Monitoring equipment, it shall not interfere with the normal operation of the AGL CMS.

(g) PCL when activated shall only operate the AGL for a pre-set time of 15 minutes after which the AGL shall automatically return to previous setting. This time may be adjusted dependent on the type of operation conducted by the aerodrome, subject to CAA approval.

(h) PCL Configuration, including:

(1) activation time;

(2) number of Press-to-Talk Clicks (PTT - Microphone Keying);

(3) lighting systems activated; and

(4) lighting intensities,

shall be clearly described in the relevant procedure manuals.

(i) Requirements for ground radio equipment used for PCL are described in CAP 670 IAS01.

(j) ICAO Doc 9157 Aerodrome Design Manual, Part 5, Chapter 10 ‘Aircraft radio control of aerodrome lighting (ARCAL)’ provides guidance on the configuration of PCL, with examples provided in Table 10-1. Justification for the selection of the lighting controlled by PCL should be included in the operational requirement.

(k) Where an existing PCL system previously approved by the CAA for the sole use of the emergency services is to be made available to others, an appropriate method of operation shall be agreed between all users.

(l) The operational requirement proposed by the aerodrome operator shall include:

(1) a description of the control equipment;

(2) full details of any AGL to be installed;

(3) the method(s) of switching the system; and demonstration that any additional control equipment will have no detrimental effect;

(4) the extent of AGL to be controlled by PCL;

(5) a comprehensive safety case as part of the change management process;

(6) examples of documentary or other control measures to cover out of hours operations;

(7) details of the arrangements between based operators;

(8) details of the changes to the Aerodrome Manual, associated manuals and ATS manuals; and

(9) details of the arrangements for the notification of periods when the PCL is available, and details of periods when the PCL is unavailable.

CS ADR-DSN.N.775 is amended as follows:

CS ADR-DSN.N.775 General

[…]

(c) Characteristics:

(1) Signs should be frangible. Those located near a runway or taxiway should be sufficiently low to preserve clearance for propellers and the engine pods of jet aircraft. The installed height of the sign should not exceed the dimension shown in the appropriate column of Table N-1, except for runway distance remaining signs.

[…]

~~(4) The inscriptions on a sign should be in accordance with the provisions of Figures N-2A to N-2H and N-3.~~

(~~5~~4) Signs should be illuminated when intended for use:

(i) in runway visual range conditions less than a value of 800 m; ~~or~~

(ii) at night in association with instrument runways; or

(iii) at night in association with non-instrument runways where the code number is 3 or 4, meeting the lowest minimum luminance requirements of paragraph (c)(12)(ii).

(~~6~~5) Signs should be retroreflective and/or illuminated when intended for use at night in association with non-instrument runways where the code number is 1 or 2.

(~~7~~6) Where variable pre-determined information is required, a variable sign should be provided.

(i) A variable message sign should show a blank face when not in use.

(ii) In case of failure, a variable message sign should not provide information that could lead to unsafe action from a pilot or a vehicle driver.

(iii) The time interval to change from one message to another on a variable message sign should be as short as practicable and should not exceed 5 seconds.

(7) The taxiing guidance signs should be in accordance with the specifications of paragraphs (c)(8) to (c)(22).

(8) The location distance for taxiing guidance signs including runway exit signs should conform to Table N-1.

Sign height (mm)				Perpendicular distance from defined taxiway pavement edge to near side of sign	Perpendicular distance from defined runway pavement edge to near side of sign
Runway code number	Legend	Face (min)	Installed (max)		
1 or 2	200	~~400~~ 300	700	5–11 m	3–10 m
1 or 2	300	~~600~~ 450	900	5–11 m	3–10 m
3 or 4	300	~~600~~ 450	900	11–21 m	8–15 m
3 or 4	400	~~800~~ 600	1000	11–21 m	8–15 m

Table N-1. Location distances for taxiing guidance signs including runway exit signs

(~~8~~9) Inscription heights should conform to the Table N-2.

[Table N-2 unchanged]

(~~9~~10) Where a taxiway location sign is installed in conjunction with a runway designation sign (see CS ADR-DSN.N.785(b)(9)), the character size should be that specified for mandatory instruction signs.

(11) The dimensions should be as follows for:

(i) Arrow ~~dimensions should be as follows:~~

Legend height	Stroke
200 mm	32 mm
300 mm	48 mm
400 mm	64 mm

(ii) Stroke ~~width for single letter should be as follows:~~

Legend height	Stroke
200 mm	32 mm
300 mm	48 mm
400 mm	64 mm

(1~~0~~2) Sign luminance should be as follows:

(i) Where operations are conducted in runway visual range conditions less than a value of 800 m, average sign luminance should be at least:

Red	30 cd/~~m2~~m^2
Yellow	150 cd/~~m2~~m^2
White	300 cd/~~m2~~m^2

(ii) Where operations are conducted in accordance with CS ADR-DSN.N.775(c)(~~5~~4)(ii) and (c)(~~6~~5), average sign luminance should be at least:

Red	10 cd/~~m2~~m^2
Yellow	50 cd/~~m2~~m^2
White	100 cd/~~m2~~m^2

Note: In runway visual range conditions less than a value of 400 m, there will be some degradation in the performance of signs.

(1~~1~~3) The luminance ratio between red and white elements of a mandatory instruction sign should be between 1:5 and 1:10.

(1~~2~~4) The average luminance of the sign is calculated by establishing grid points as shown in Figure N-1, and using the luminance values measured at all grid points located within the rectangle representing the sign.

(1~~3~~5) The average value is the arithmetic average of the luminance values measured at all considered grid points.

(1~~4~~6) The ratio between luminance values of adjacent grid points should not exceed 1.5:1. For areas on the sign face where the grid spacing is 7.5 cm, the ratio between luminance values of adjacent grid points should not exceed 1.25:1. The ratio between the maximum and minimum luminance value over the whole sign face should not exceed 5:1.

(1~~5~~7) The forms of characters, i.e. letters, numbers, arrows, and symbols, should conform to those shown in Figures N-2A to N-2H. The width of characters and the space between individual characters should be determined as indicated in Table N-3.

(16~~8~~)The face height of signs should be as follows:

Legend height	Face height (min)
200 mm	400 mm
300 mm	600 mm
400 mm	800 mm

(17~~9~~)The face width of signs should be determined using Figure N-3 except that, where a mandatory instruction sign is provided on one side of a taxiway only, the face width should not be less than:

(i) 1.94 m where the code number is 3 or 4; and

(ii) 1.46 m where the code number is 1 or 2.

(~~18~~20) Borders:

(i) The black vertical delineator between adjacent direction signs should have a width of approximately 0.7 of the stroke width.

(ii) The yellow border on a stand-alone location sign should be approximately 0.5 of the stroke width.

(21~~9~~)The colours of signs should be in accordance with the appropriate specifications in CHAPTER U — Colours for aeronautical ground lights, markings, signs and panels.

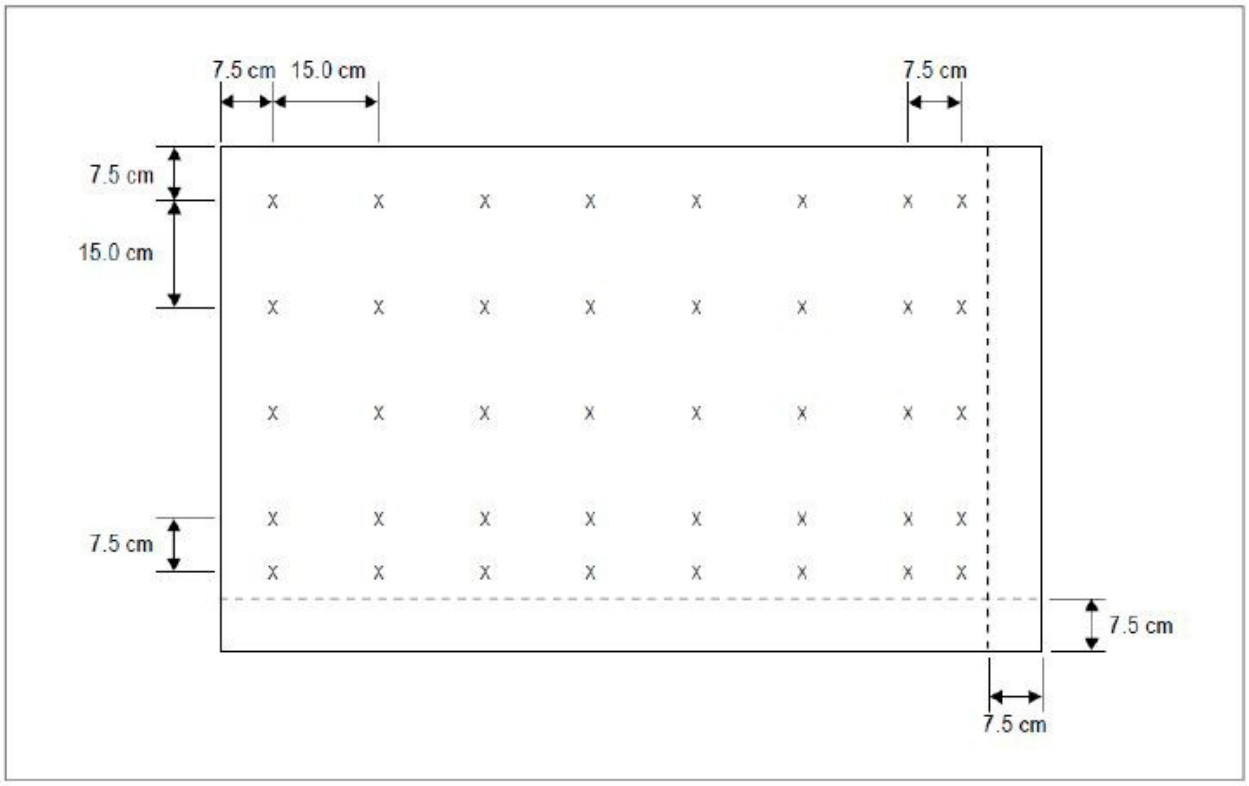
(20~~2~~)~~If instruction or information during a certain period of time, and/or there is a need to display variable pre-determined information, a variable information sign should be provided.~~

~~(i) A variable message sign should show a blank face when not in use.~~

~~(ii) In case of failure, a variable message sign should not provide information that could lead to unsafe action from a pilot or a vehicle driver.~~

~~(iii) The time interval to change from one message to another on a variable message sign should be as short as practicable and should not exceed 5 seconds.~~

If the runway threshold is displaced from the extremity of the runway, a sign showing the designation of the runway may be provided for aeroplanes taking off.



Note 1: The average luminance of a sign is calculated by establishing grid points on a sign face showing typical inscriptions and a background of the appropriate colour (red for mandatory instruction signs and yellow for direction and destination signs) as follows:

(a) Starting at the top left corner of the sign face, establish a reference grid point at 7.5 cm from the left edge and the top of the sign face.

(b) Create a grid of 15 cm spacing horizontally and vertically from the reference grid point. Grid points within 7.5 cm of the edge of the sign face should be excluded.

(c) Where the last point in a row/column of grid points is located between 22.5 cm and 15 cm from the edge of the sign face (but not inclusive), an additional point should be added 7.5 cm from this point.

(d) Where a grid point falls on the boundary of a character and the background, the grid point should be slightly shifted to be completely outside the character.

Note 2: Additional grid points may be required to ensure that each character includes at least five evenly spaced grid points.

Note 3: Where one unit includes two types of signs, a separate grid should be established for each type.

Figure N-1. Grid points for calculating average luminance of a sign

[Figures N-2A to N-2H unchanged]

[The existing Figure N-3 is replaced with the following figure which has the vertical distances of H/2 replaced with H/4 (min).]

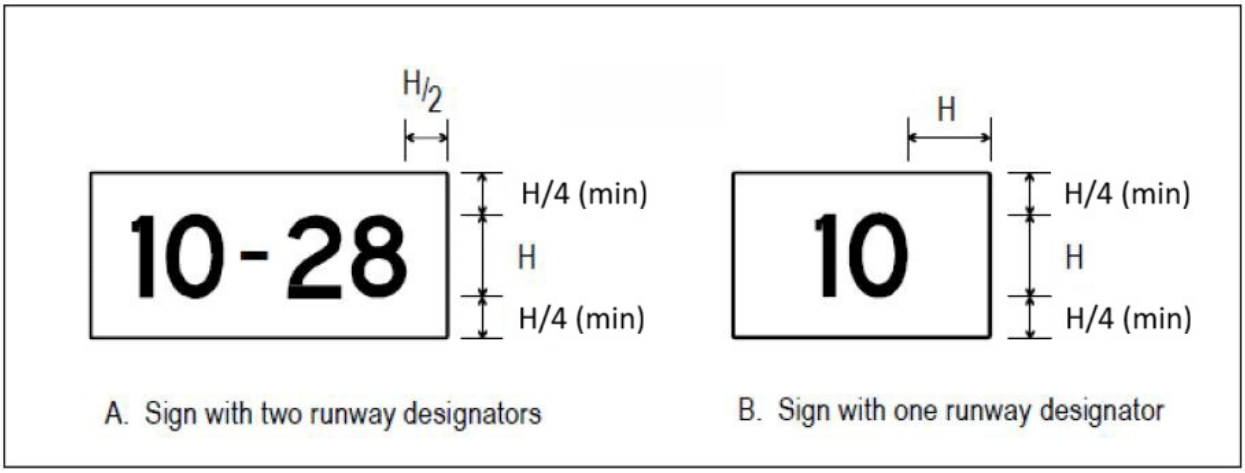


Figure N-3. Sign dimensions

[Tables N-3(a) to N-3(d) unchanged]

e) Width of numeral			
Numeral ~~Code No.~~	Numeral height (mm)		
	200	300	400
	Width (mm)		
1	50	74	98
2	137	205	274
3	137	205	274
4	149	224	298
5	137	205	274
6	137	205	274
7	137	205	274
8	137	205	274
9	137	205	274
0	143	214	286

INSTRUCTIONS

1. To determine the proper SPACE between letters or numerals, obtain the code number from table a) or b) and enter table c) for that code number to the desired letter or numeral height.
2. The space between words or groups of characters forming an abbreviation or symbol should be equal to 0.5 to 0.75 of the height of the characters used except that where an arrow is located with a single character such as 'A→', the space may be reduced to not less than one quarter of the height of the character in order to provide a good visual balance.
3. Where the numeral follows a letter or vice versa, use Code 1.
4. Where a hyphen, dot, or diagonal stroke follows a character or vice versa, use Code 1.
5. For the intersection take-off sign, the height of the lower case 'm' is 0.75 of the height of the preceding character. The spacing from the preceding character is at Code 1 for the character height in Table N-3(c).

Table N-3 Letter and numeral width and space between letters or numerals.

GM1 ADR-DSN.N.775 is amended as follows:

GM1 ADR-DSN.N.775 General

(a) Signs may need to be orientated to improve readability.

~~(b) If the runway threshold is displaced from the extremity of the runway, a sign showing the designation of the runway may be provided for aeroplanes taking off.~~

(~~c~~b) Guidance on signs is contained in ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 11.

(~~d~~c) Guidance on frangibility is contained in ICAO Doc 9157, Aerodrome Design Manual, Part 6, Frangibility.

(~~e~~d) Guidance on measuring the average luminance of a sign is contained in ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.

CS ADR-DSN.N.780 is amended as follows:

CS ADR-DSN.N.780 Mandatory instruction signs

(a) Applicability:

(1) A mandatory instruction sign should be provided to identify a location beyond which an aircraft taxiing or vehicle should not proceed unless authorised by the aerodrome control tower.

(2) Mandatory instruction signs should include runway designation signs, Category I, II, or III holding position signs, runway-holding position signs, road-holding position signs, and ~~NO ENTRY~~ no-entry signs.

[…]

(8) A ~~NO ENTRY~~ no-entry sign should be provided when entry into an area is prohibited.

(b) Location:

[…]

(2) A Category I, II, or III holding position sign should be located on each side of the ~~runway- holding~~ runway-holding position marking facing the direction of the approach to the critical area.

(3) A ~~NO ENTRY~~ no-entry sign should be located at the beginning of the area to which entrance is prohibited on each side of the taxiway as viewed by the pilot.

[…]

(c) Characteristics:

[…]

(4) The inscription on a ~~NO ENTRY~~ no-entry sign should be in accordance with Figure N-4.

[…]

CS ADR-DSN.N.785 is amended as follows:

CS ADR-DSN.N.785 Information signs

[…]

(c) Characteristics:

[…]

(2) A location sign should consist of an inscription in yellow on a black background and, where it is a stand-alone sign, should have a yellow border.

[…]

(11) A taxiway should be identified by a designator that is used only once on an aerodrome and comprising a single letter, two letters, or a combination of a letter or letters followed by a number.

(12) When designating taxiways~~,~~:

(i) ~~the use of~~ the letters I, O, or X should not be used, ~~and the use of words such as 'inner' and 'outer' should be avoided wherever possible,~~ to avoid confusion with the numerals 1~~,~~ and 0, and the closed marking~~.~~; and

(ii) the use of words such as 'inner' and 'outer' should be avoided wherever possible.

(13) The use of numbers alone on the manoeuvring area should be reserved for the designation of runways.

(14) Apron stand designators should not be the same as taxiway designators.

[Figure N-6 unchanged]

The following CS ADR-DSN.N.786 is inserted:

CS ADR-DSN.N.786 Runway distance remaining signs (RDRS)

(a) Runway excursions may take place in all visibility or weather conditions. The use of RDRS can form part of effective runway excursion prevention measures. The purpose of RDRS is to provide pilots with distance-to-go information to the extremity of the runway, to enhance situational awareness and enable pilots to decide whether to commence a go-around and to apply braking action for more efficient roll-out and runway exit speeds. It is essential that pilots operating at aerodromes with RDRS be familiar with the purpose of these signs.

(b) RDRS do not have to be provided at all aerodromes. An aerodrome considering the installation of such signs may wish to assess their need individually, depending on factors such as runway length, aerodrome elevation, aerodrome geometry, traffic levels, lack of runway end safety area, lack of runway friction and climate.

(c) RDRS are placed along the full length of the runway at longitudinal spacing of 300 m (±30 m), parallel and equidistant from the runway centre line as in Configurations A, B or C, illustrated in Figure N-6A.

(d) RDRS are arranged by any of three different configurations as shown in Figure N-6A.

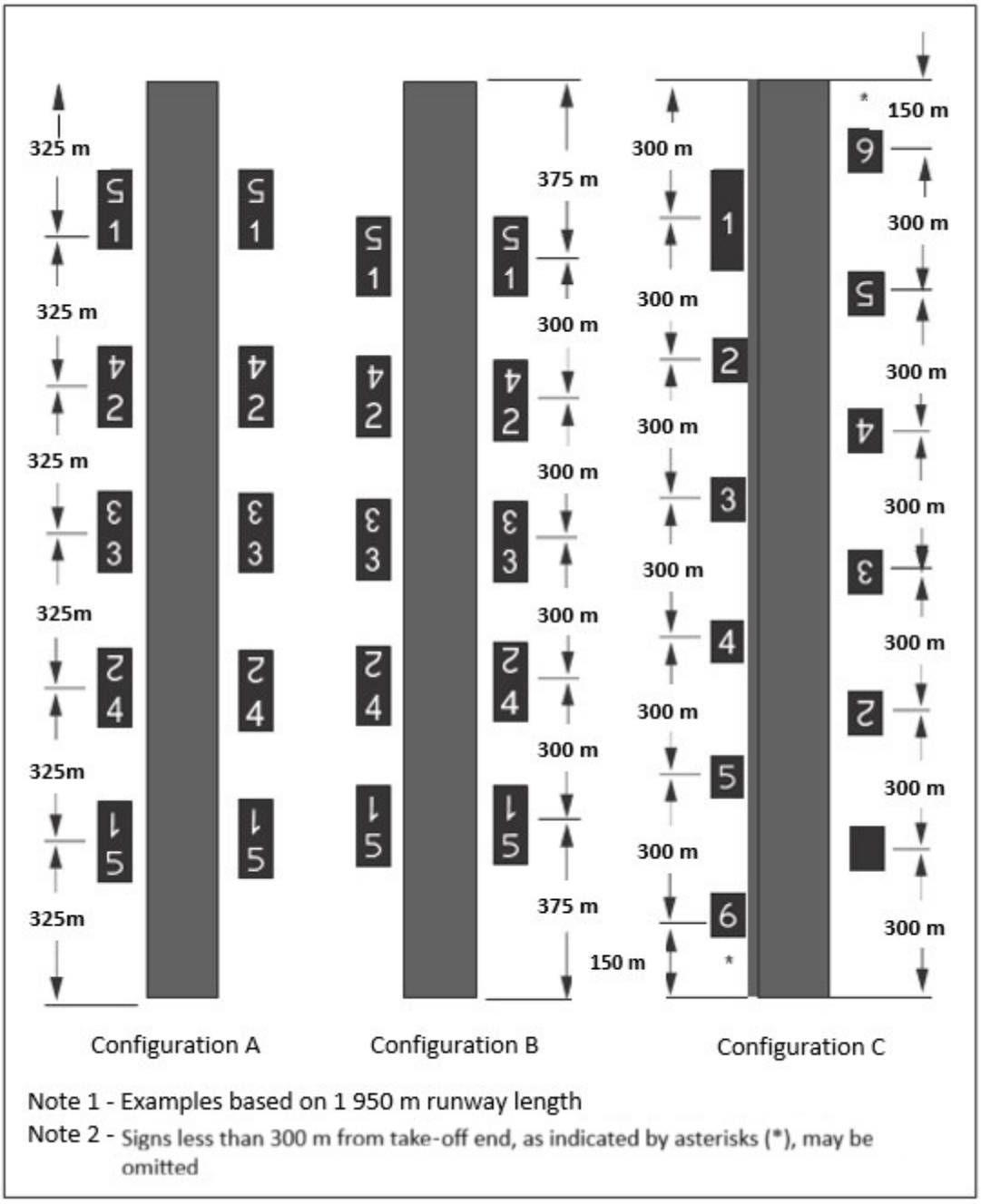


Figure N-6A Runway distance remaining sign configuration

(e) In Configuration A, the RDRS consist of double-faced signs and are located on both sides of the runway. Where the runway length is not an exact multiple of 300 m, the signs are placed at locations where the runway total length is divided equally.

(f) In Configuration B, the RDRS consist of double-faced signs and are located on both sides of the runway. Where the runway length is not an exact multiple of 300 m, one-half of the excess distance is added to the distance of each sign from each runway extremity.

(g) To illustrate the case where the distance between the end of the runway and the sign is the maximum, for a runway length of 1 950 m, the excess distance is 150 m and the location of the last sign on each runway end is 300 m plus one-half of 150 m, or 375 m. This configuration allows a maximum of 375 m at the end of the runway, but the other signs are exactly 300 m apart.

(h) For Configurations A and B, the signs may be omitted on one side of the runway because of clearance conflict or by design.

(i) In Configuration C, the RDRS consist of single-faced signs and are located on one side of each runway, viewed in the direction of take-off or landing. The advantage of Configuration C is that the runway distance remaining is more accurately reflected for a runway length that is not an exact multiple of 300 m.

(j) An RDRS may be omitted if the sign cannot be placed within the tolerance of ±30 m.

(k) Location

(1) Where provided, RDRS shall be placed along the full length of the runway at longitudinal spacing of approximately 300 m, parallel and equidistant from the runway centre line.

(2) Displaced threshold areas that are used for take-off and/or roll-out are treated as part of the runway for purposes of locating the signs.

(3) Runway distance remaining signs shall be placed outside the edges of the runway at a distance shown in Table N-4.

(l) Characteristics

(1) Where provided, an RDRS shall consist of an inscription in white on a black background.

(2) The installed height of the RDRS shall not exceed the dimension shown in the appropriate column in Table N-4 below. All RDRS on one runway shall be the same size.

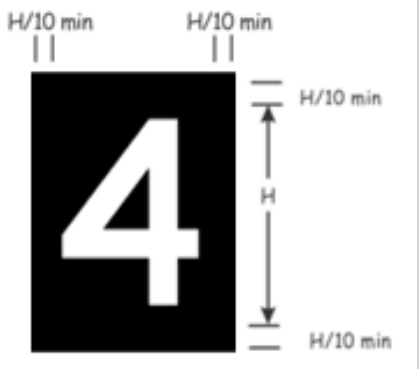
(3) The face width of runway distance remaining sign (RDRS) shall be determined using Figure N-6B.

Sign height (mm)				Perpendicular distance from defined runway pavement edge to near side of sign
Code Number	Legend	Face (min)	Installed (max)	
1 or 2	600	760	1 070	6 – 10.5 m
3 or 4	1 000	1 200	1 520	15 – 22.5 m
3 or 4	1 200	1 500	1 600	25 m or more

Table N-4 Location distances for runway distance remaining signs

(m) The inclusion of detailed specifications for RDRS is not intended to imply that an RDRS has to be provided. Guidance on installing RDRS is given in the Aerodrome Design Manual (ICAO Doc 9157), Part 4, Visual Aids.

(n) Provisions related to the identification and mitigation of hazards, including the need for safety assessment related to runway safety, is available in PANS-Aerodromes (ICAO Doc 9981), Chapter 8.



"H" stands for the inscription height.

Figure N-6B Sign dimensions for RDRS

GM1 ADR-DSN.P.825 is amended as follows:

GM1 ADR-DSN.P.825 Taxiway edge markers

(a) At small aerodromes, taxiway edge markers may be used, in lieu of taxiway edge lights, to delineate the edges of taxiways, particularly at night. Additional guidance is given in ~~(~~ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids~~, Chapter 2, paragraph 2.4.1)~~.

(b) On a straight section of a taxiway, taxiway edge markers should be spaced at uniform longitudinal intervals of not more than 60 m. On a curve the markers should be spaced at intervals less than 60 m so that a clear indication of the curve is provided. The markers should be located as near as practicable to the edges of the taxiway, or outside the edges at a distance of not more than 3 m. Additional guidance is given in ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids~~, Chapter 2, paragraph 2.4.2~~.

(c) The markers commonly used are cylindrical in shape. Ideally, the design of the marker should be such that, when installed properly, no portion should exceed 35 cm total height above the mounting surface. However, where significant snow heights are possible, markers exceeding 35 cm in height may be used but their total height should be sufficiently low to preserve clearance for propellers, and for the engine pods of jet aircraft. Additional guidance is given is ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids~~, Chapter 2, paragraph 2.4.4~~.

(d) A taxiway edge marker should be lightweight and frangible. One type of marker meeting these requirements is detailed in Figure GM-P-1. The post is made up of

flexible PVC and its colour is blue. The sleeve, which is retro-reflective, is also blue. Note that the area of the marked surface is 150 cm^2. Additional guidance is given in ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids~~, Chapter 2, paragraph 2.4.5~~.

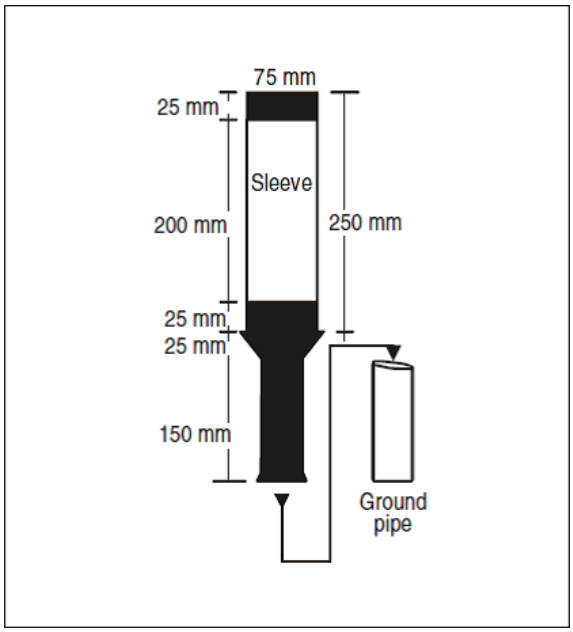


Figure GM-P-1. Taxiway edge marker

GM1 ADR-DSN.Q.840 is amended as follows:

GM1 ADR-DSN.Q.840 Objects to be marked and/or lighted within the lateral boundaries of the obstacle limitation surfaces

[…]

(c) Overhead wires, cables, etc., crossing a river, waterway, valley or highway should be marked and their supporting towers marked and lighted if a safety assessment indicates that the wires or cables could constitute a hazard to aircraft.

(d) An autonomous aircraft detection system may be installed on or near an obstacle (or group of obstacles such as wind farms) within or outside the lateral boundaries of the obstacle limitation surfaces. This system is designed to operate the lighting only when it detects an aircraft approaching the obstacle, to reduce light exposure to local residents. Additional guidance on the design and installation of an autonomous aircraft detection system is available in the ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids. The inclusion of this guidance is not intended to imply that such a system has to be provided.

CS ADR-DSN.Q.845 is amended as follows:

CS ADR-DSN.Q.845 Marking of fixed objects

[…]

[The existing Figure Q-6 is replaced with the following figure which has some of the text to the right of the last diagram removed].

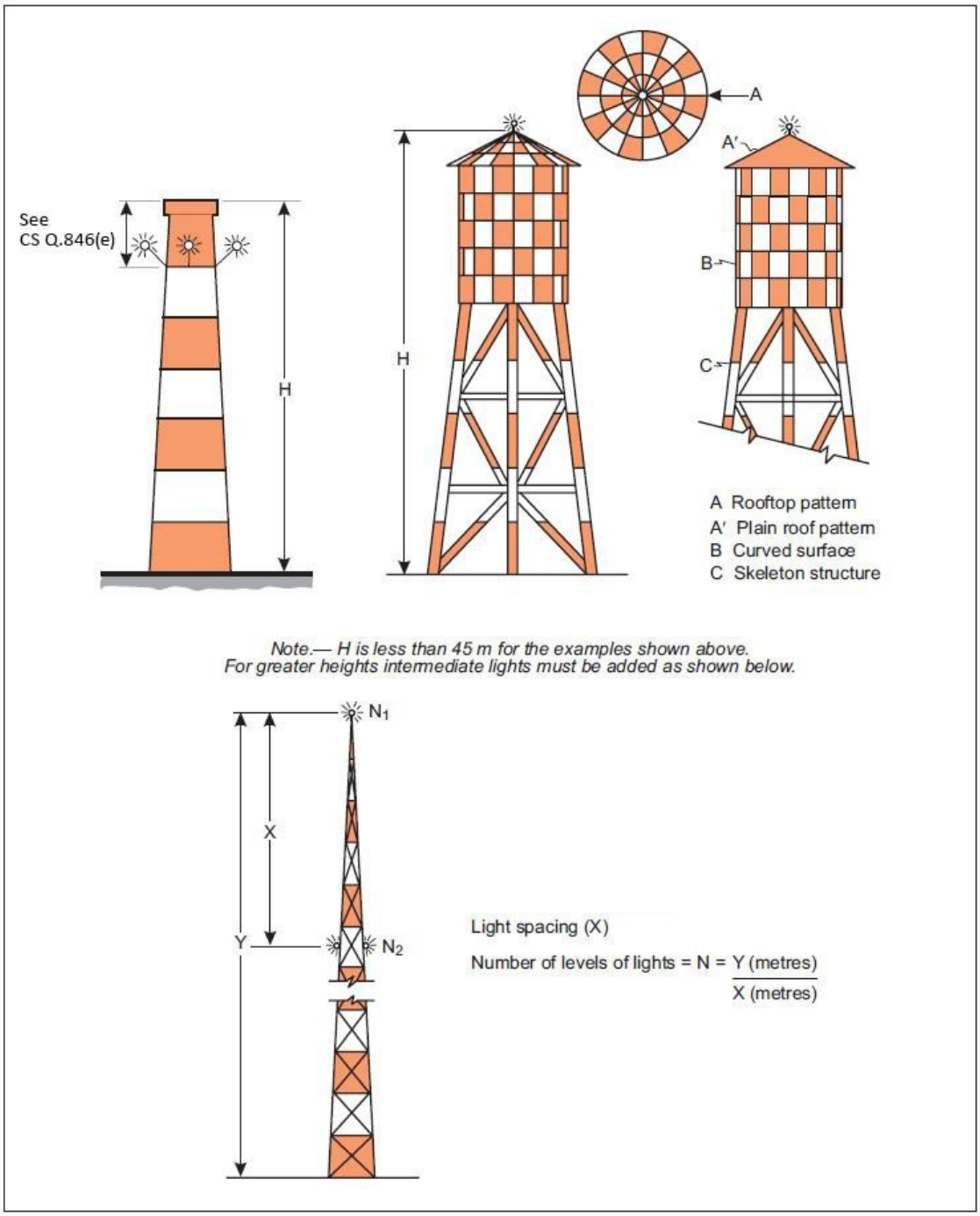


Figure Q-2. Examples of marking and lighting of tall structures

CS ADR-DSN.Q.850 is amended as follows:

CS ADR-DSN.Q.850 Lighting of other objects

[…]

(d) Low-intensity obstacle lights on objects with limited mobility such as passenger boarding ~~aero~~bridges should be fixed-red, and, as a minimum, be in accordance with the specifications for low-intensity obstacle lights, Type A, in Table Q-1. The intensity of the lights should be sufficient to ensure conspicuity considering the intensity of the adjacent lights and the general levels of illumination against which they would normally be viewed.

CS ADR-DSN.Q.852 is amended as follows:

CS ADR-DSN.Q.852 Marking and lighting of overhead wires, cables, supporting towers, etc.

[…]

Benchmark Intensity	Minimum requirements					Recommendations				
	Vertical elevation angle (b)			Vertical beam spread (c)		Vertical elevation angle (b)			Vertical beam spread (c)	
	0°		-1°			0°	-1°	-10°		
	Minimum average intensity (a)	Minimum intensity (a)	Minimum intensity (a)	Minimum beam spread	Intensity (a)	Maximum intensity (a)	Maximum intensity (a)	Maximum intensity (a)	Maximum beam spread	Intensity (a)
200 000	200 000	150 000	75 000	3°	75 000	250 000	112 500	75 000	7°	75 000
100 000	100 000	75 000	37 500	3°	37 500	125 000	56 250	37 500	7°	37 500
20 000	20 000	15 000	7 500	3°	7 500	25 000	11 250	7 500	N/A	N/A
2 000	2 000	1 500	750	3°	750	2 500	1 125	750	N/A	N/A

Note: This table does not include recommended horizontal beam spreads. CS ADR-DSN.Q.846(c) requires 360° coverage around an obstacle. Therefore, the number of lights needed to meet this requirement will depend on the horizontal beam spreads of each light as well as the shape of the obstacle. Thus, with narrower beam spreads, more lights will be required.

(a) 360° horizontal. All intensities are expressed in Candela. For flashing lights, the intensity is read into effective intensity, as determined in accordance with ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.

(b) Elevation vertical angles are referenced to the horizontal when the light unit is levelled.

(c) Beam spread is defined as the angle between the horizontal plan and the directions for which the intensity exceeds that mentioned in the 'intensity' column.

Note: an extended beam spread may be necessary under specific configuration and justified by a~~n aeronautical study~~ safety assessment.

Table Q-3. Light distribution for medium- and high-intensity obstacle lights according to benchmark intensities of Table Q-1

[…]

CS ADR-DSN.R.855 is amended as follows:

CS ADR-DSN.R.855 Closed runways and taxiways, or parts thereof

(a) Applicability:

A closed marking should be displayed on a runway, or taxiway, or portion thereof which is permanently closed to the use of all aircraft.

(b) Location of closed markings:

On a runway, a closed marking should be placed at each end extremity of the runway, or portion thereof, declared closed, and additional markings should be so placed that the maximum interval between markings does not exceed 300 m. On a taxiway a closed marking should be placed at least at each end of the taxiway or portion thereof closed.

(c) A closed runway marking should be displayed on a temporarily closed runway or taxiway or portion thereof, except that such marking may be omitted when the closing is of short duration and adequate warning by air traffic services is provided.

(~~c~~d) Characteristics of closed markings:

The closed marking should be of the form and proportions as detailed in Figure R-1, Illustration (a), when displayed on a runway, and should be of the form and proportions as detailed in Figure R-1, Illustration (b), when displayed on a taxiway. The marking should be white when displayed on a runway and should be yellow when displayed on a taxiway.

(~~d~~e) When a runway, or taxiway, or portion thereof is permanently closed, all normal runway and taxiway markings should be obliterated.

(~~e~~f) In addition to closed markings, when the runway, or taxiway, or portion thereof closed is intercepted by a usable runway or taxiway which is used at night, unserviceability lights should be placed across the entrance to the closed area at intervals not exceeding 3 m (see CS ADR-DSN.R.870(c)(2)).

(g) Lighting on systems provided for a closed runway or taxiway or portion thereof shall not be operated, except as required for maintenance purposes or where operationally required.

(h) When an area is temporarily closed, frangible barriers or markings utilising materials other than paint or other suitable means may be used to identify the closed area.

(i) Procedures pertaining to the planning, coordination, monitoring and safety management of works in progress on the movement area are specified in the PANS-Aerodromes (ICAO Doc 9981).

[Figure R-1 unchanged]

The following CS ADR-DSN.R.857 is inserted:

CS ADR-DSN.R.857 Closed runway lighting

(a) Application:

Where operationally desirable, closed runway lighting should be provided on a temporarily closed runway at an aerodrome provided with runway lighting.

(b) Location:

A closed runway lighting shall be placed on the centre line, at each extremity of the runway, declared closed.

(c) Characteristics:

The closed runway lighting as viewed by the pilot shall be of the equivalent elevated form and proportions as detailed in Figure R-2, showing a minimum of five lights uniformly spaced on each branch, with a minimum interval as specified by Table R-1.

(d) Closed runway lights shall show flashing variable white in the direction of approach to the runway, at a rate of one second on and one second off.

(e) Closed runway lights shall automatically revert to fixed lights in the event of the flashing system failure.

Number of lights per branch	Minimum interval between light centres
5	1.5 m
7	1.0 m
9	0.8 m

Table R-1. Minimum interval between closed runway lights centres

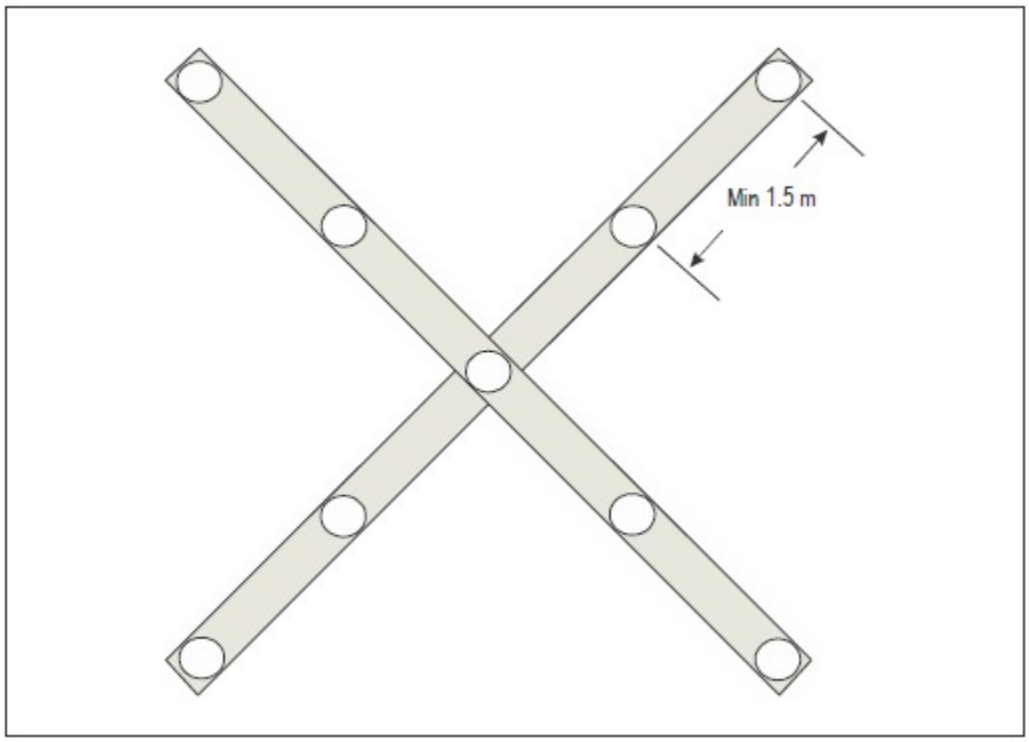


Figure R-2. Example of equivalent elevated closed runway lighting with five lights per branch

The following GM1 ADR-DSN.R.857 is inserted:

GM1 ADR-DSN.R.857 Closed runway lighting

(a) In dusk or poor visibility conditions by day, lighting can be more effective than markings. Placement of a closed runway lighting on the runway designation marking would enhance the situational awareness of the runway closure to the pilot.

(b) The closed runway lighting is intended to be controlled either automatically or manually by air traffic services or by the aerodrome operator.

(c) The closed runway lighting may be either stationary or mobile.

(d) The stationary closed runway lighting may be formed as if shadowed (i.e. stretched) from the equivalent elevated structure.

(e) Guidance on the sizing of a stationary closed runway lighting is given in the Aerodrome Design Manual (ICAO Doc 9157), Part 4, Visual Aids.

CS ADR-DSN.R.870 is amended as follows:

CS ADR-DSN.R.870 Unserviceable areas

(a) Applicability of unserviceability ~~markers and~~ lights:

Unserviceability ~~markers~~ lights ~~should be displayed~~ shall be provided on a movement area used at night wherever any portion of ~~a taxiway, apron, or holding bay~~ the movement area is declared unfit for the movement of aircraft but it is still possible for aircraft to bypass the area safely. ~~On a movement area used at night, unserviceability lights should be used.~~

(b) Location:

Unserviceability markers and lights should be placed at intervals sufficiently close so as to delineate the unserviceable area.

(c) Characteristics:

~~(1) Unserviceability markers should consist of conspicuous upstanding devices such as flags, cones, or marker boards.~~

~~(2)~~ An unserviceability light should consist of a red fixed light. The light should have intensity sufficient to ensure conspicuity considering the intensity of the adjacent lights and the general level of illumination against which it would normally be viewed. In no case should the intensity be less than 10 cd of red light.

~~(3) An unserviceability cone should be at least 0.5 m in height and red, orange, or yellow, or any one of these colours in combination with white.~~

~~(4) An unserviceability flag should be at least 0.5 m square and red, orange, or yellow, or any one of these colours in combination with white.~~

~~(5) An unserviceability marker board should be at least 0.5 m in height and 0.9 m in length, with alternate red and white, or orange and white vertical stripes.~~

GM1 ADR-DSN.R.870 is amended as follows:

GM1 ADR-DSN.R.870 Unserviceable areas

[…]

(b) The spacing required for marking and lights should take into account visibility conditions, geometric configurations of the area~~,~~ and potential height differences of terrain so that the limits of unserviceable area is readily visible to pilot.

[…]

(f) If the lights are directional, they should be orientated so that, as far as possible, their beams are aligned in the direction from which aircraft or vehicles should approach.

[…]

(h) Unserviceable area lights ~~should be~~ are frangible. Their height ~~should be~~ is sufficiently low to preserve clearance for propellers and for engine pods of jet aircraft.

(i) Procedures pertaining to the planning, coordination, monitoring and safety management of works in progress on the movement area are specified in the PANS-Aerodromes (ICAO Doc 9981).

The following CS ADR-DSN.R.871 is inserted:

CS ADR-DSN.R.871 Unserviceability markings

(a) Application:

(1) Where operationally required, unserviceability signs should be supplemented by unserviceability markings on the surface of the pavement.

(2) Where it is impracticable to install an unserviceability sign, an unserviceability marking shall be provided on the surface of the pavement.

(b) Location:

Unserviceability markings should be displayed across the surface of the taxiway or apron where necessary and positioned so as to be legible from the cockpit of an approaching aircraft.

(c) Characteristics:

(1) Unserviceability markings shall consist of an inscription in black upon an orange background.

(2) The character height should be 4 m. The inscriptions should be in the form and proportions shown in CS.ADR-DSN.L.610 Information marking.

(3) The background should be rectangular and extend a minimum of 0.5 m laterally and vertically beyond the extremities of the inscription.

The following CS ADR-DSN.R.872 is inserted:

CS ADR-DSN.R.872 Unserviceability signs

(a) Application:

(1) Unserviceability signs shall be provided where there is an operational need to indicate temporary changes to runway declared distances.

(2) Where operationally required, unserviceability signs should be supplemented by unserviceability markings on the surface of the pavement. Where it is impracticable to install an unserviceability sign, an unserviceability marking shall be provided on the surface of the pavement.

(3) Existing signs shall be removed or obscured at an aerodrome if they provide inadequate or misleading information regarding unserviceability areas.

(4) The information provided by unserviceability signs shall not be in conflict with the information provided by the appropriate aeronautical information services.

(b) Location:

(1) Unserviceability signs shall be located where operationally needed on the movement area. The location distances on the manoeuvring area shall be as per taxiing guidance signs in Table N-1.

(2) The location of unserviceability signs shall not visually obscure or provide conflicting information with existing operationally required visual aids.

(c) Characteristics:

(1) Unserviceability signs shall be frangible. Those located near a runway or taxiway shall be sufficiently low to preserve clearance for propellers and the engine pods of jet aircraft. The installed height of unserviceability signs shall not exceed the dimension for taxiing guidance signs shown in Table N-1.

(2) Unserviceability signs shall be rectangular, as shown in Figure R-3, with the longer side horizontal.

(3) The inscriptions on an unserviceability sign shall be in accordance with the provisions of Chapter N.

(4) Unserviceability signs shall consist of an inscription in black on an orange background. Unserviceability signs shall be supplemented by a black outline measuring 10 mm in width for runways where the code number is 1 or 2, and 20 mm in width for runways where the code number is 3 or 4.

(5) The inscription on an unserviceability sign shall consist of a legible, clear and simple message, only providing the useful and necessary information for the safety of the operation.

(6) Unserviceability signs shall be retroreflective in accordance with the provisions of Chapter N.

(7) Where there is a need to enhance the conspicuity of unserviceability signs, they should be supplemented by two red or yellow simultaneously flashing lights. The intensity and the beam spread of these lights should be in accordance with the specifications in Chapter U, Figure U-27.

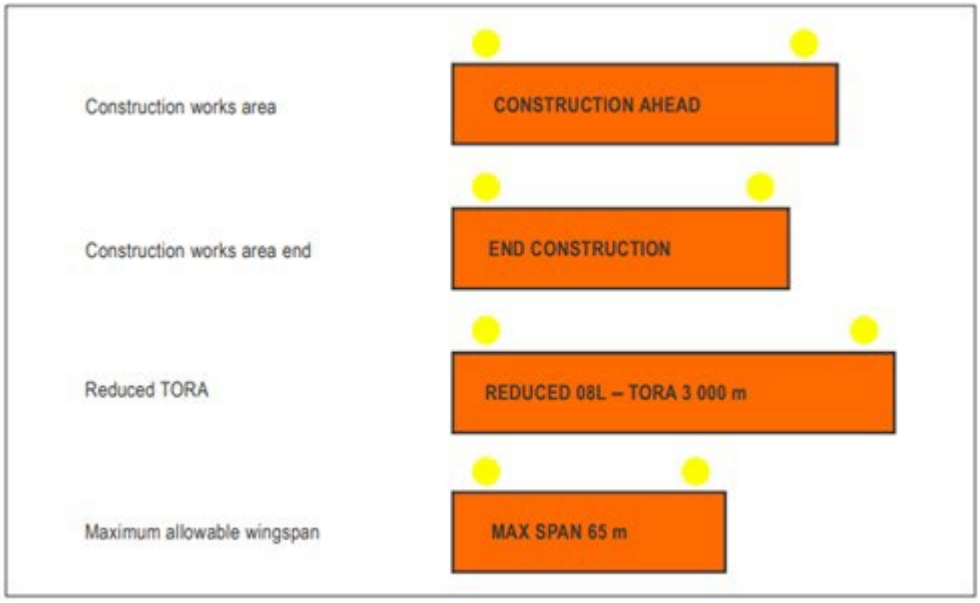


Figure R-3. Examples of unserviceability signs

The following GM1 ADR-DSN.R.872 is inserted:

GM1 ADR-DSN.R.872 Unserviceability signs

(a) Temporary changes to the movement area may include a reduction in the runway length, reduction in the maximum allowable wingspan, taxiway closure or any other closure to the movement area. Unserviceability signs provide relevant information to aerodrome users to maintain an acceptable level of safety during aircraft and vehicle operations, by reducing the risk of potential confusion and enhancing the awareness of such temporary changes.

(b) Unserviceability signs can be used to indicate temporary closed or restricted areas, as well as to provide information on operational restrictions to aerodrome users.

(c) The information provided by unserviceability signs supplements that which is provided by the appropriate aeronautical information services unit.

The following CS ADR-DSN.R.873 is inserted:

CS ADR-DSN.R.873 Unserviceability markers

(a) Application:

(1) Unserviceability markers shall be displayed wherever any portion of a taxiway, apron or holding bay is unfit for the movement of aircraft but it is still possible for aircraft to bypass the area safely.

(2) Unserviceability markers shall be placed at intervals sufficiently close, so as to delineate the unserviceable area.

(b) Characteristics:

(1) Unserviceability markers shall consist of conspicuous upstanding devices such as flags, cones or marker boards.

(2) An unserviceability cone should be at least 0.5 m in height and red, orange, or yellow, or any one of these colours in combination with white.

(3) An unserviceability flag should be at least 0.5 m square and red, orange, or yellow, or any one of these colours in combination with white.

(4) An unserviceability marker board should be at least 0.5 m in height and 0.9 m in length, with alternate red and white, or orange and white vertical stripes.

CS ADR-DSN.S.880 is amended as follows:

CS ADR-DSN.S.880 Electrical power supply systems

[…]

(d) The following aerodrome facilities should 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;

(2) obstacle lights which are essential to ensure the safe operation of aircraft;

(3) approach, runway and taxiway lighting as specified in CS ADR-DSN.M.625 to CS ADR-DSN.M.745;

(4) closed runway lighting, if provided in accordance with CS ADR-DSN.R.857 and connected to the primary power supply;

(45) meteorological equipment;

(~~5~~6) essential equipment and facilities for the parking position if provided, in accordance with CS ADR-DSN.M.750(a) and CS ADR-DSN.M.755(a); and

(~~6~~7) illumination of apron areas over which passengers may walk.

Note: Specifications for secondary power supply for radio navigation aids and ground elements of communications systems are given in ICAO Annex 10, Volume I, Chapter 2.

[Table S-1 unchanged]

CS ADR-DSN.S.885 is amended as follows:

CS ADR-DSN.S.885 System design

[…]

(c) Where a runway forming part of a standard taxi-route is provided with runway lighting and taxiway lighting, the lighting systems should be interlocked to preclude the possibility of simultaneous operation of both forms of lighting.

(d) The electrical systems for the power supply and the control of the closed runway lighting shall be so designed that the closed runway lighting system is operated independently of runway lighting systems.

CS ADR-DSN.S.890 is amended as follows:

CS ADR-DSN.S.890 Control and monitoring

(a) A system of control and monitoring ~~should~~ shall be employed to indicate the operational status of the lighting systems.

(b) The design of the control and monitoring system shall be ergonomically sound, easy to operate, simple to understand and unambiguous and it shall be configured so as to prevent accidental mis-selection of the AGL.

(~~b~~c) Where lighting systems are used for aircraft control purposes, such systems should be monitored automatically so as to provide an indication of any fault which may affect the control functions. This information ~~should~~ shall be automatically relayed to the air traffic service unit.

(~~c~~d) Where a change in the operational status of lights has occurred, an indication ~~should~~ shall be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.

(~~d~~e) For a runway meant for use in runway visual range conditions less than a value of 550 m, the lighting systems detailed in Table S-1 ~~should~~ shall be monitored automatically so as to provide an indication when the serviceability level of any element falls below a minimum serviceability level specified in CS ADR-DSN.S.895(c) to (g). This information ~~should~~ shall be automatically relayed to the maintenance crew.

(~~e~~f) For a runway meant for use in runway visual range conditions less than a value of 550 m, the lighting systems detailed in Table S-1 ~~should~~ shall be monitored automatically to provide an indication when the serviceability level of any element falls below a minimum level, below which operations should not continue. This information ~~should~~ shall be automatically relayed to the air traffic services unit and displayed in a prominent position.

(g) The remote control and monitoring facilities provided for ATC use shall be approved by both the CAA Aerodrome Oversight section and ATM Oversight Section under Article 205 of the Air Navigation Order 2016.

(h) Further guidance on the manner in which serviceability information may be presented in remote control facilities in ATC VCRs can be found in CAP 670, ATS Safety Requirements, Part B, Section 2: ATC 01: ATC Support Systems and Facilities and Part C, Section 5 IAS01: Information and Alerting Systems.

(i) The complexity of the AGL control and monitoring system will depend upon the operational requirements of the aerodrome concerned. The functional requirements of the AGL system shall meet the current operational requirements but have due regard for ease of routine maintenance and future modifications or expansion.

(j) The AGL control and monitoring system shall:

(1) be suitable for the aerodrome and be adaptable to changes in an aerodrome's physical characteristics (layout, installations, etc.) or operational procedures;

(2) be inspired by safety in such a way that allows for the redundancy of equipment or elements which are critical for failsafe design;

(3) have a high dependability;

(4) be capable of communicating with other related systems, as required;

(5) demonstrate the correct operation of any interfaces and the detection of faults or incorrect operation (such as regular polling as one method); and

(6) ensure component parts are designed to fail safe and provide an accurate indication of their status under various fault conditions (for example loss of power to a CCR).

(k) Where software is used for the purpose of control or monitoring of the AGL, the following aspects shall be addressed:

(1) through analysis of the potential hazards introduced by the software to perform system functions, target safety integrity levels shall be specified for each software function. The chosen software design and build tools, and operating system, shall be shown to be appropriate for the production of the software to achieve the target safety integrity levels;

(2) known hazardous software states shall be either removed or mitigated by the total system design; and

(3) documented evidence shall be produced to demonstrate accomplishment of the target safety integrity levels;

(l) The requirements for software in safety related ATS systems are contained in CAP 670, ATS Safety Requirements Part B, Section 3, SW 01: Regulatory Objectives for Software Safety Assurance in ATS Equipment.

(m) For a runway meant for use in runway visual range conditions less than a value of 550 m, the minimum serviceability level of any element of the lighting system is detailed in Table S-1, below which operations shall not continue.

(n) Additional guidance on air traffic control interface and visual aids monitoring is given in ICAO Doc 9157, Aerodrome Design Manual, Part 5, Electrical System.

MONITORING DISPLAYS

(o) The aspects to consider for a monitoring display are:

(1) if the indicator is on, the relevant AGL circuit(s) is on and serviceable;

(2) if the indicator is off, the relevant AGL circuit(s) is (are) off; and

(3) if the indicator is active (i.e. flashing) and accompanied by an audible alert, the AGL serviceability state has changed, or a relevant fault/mismatch has occurred.

(p) When reporting to flight crew of the serviceability of the AGL, the AGL operator needs to be able to state whether the AGL is in one of the following states:

(1) Serviceable;

(2) Downgraded; or

(3) Failed.

(q) Where a new system is installed or significant modification is carried out on an existing system, the AGL control and monitoring system shall be capable of determining and indicating which of the states above applies.

(r) For existing AGL control and monitoring systems, a method of reporting such states should be implemented. Using existing indications and a look-up table is one method that may be suitable.

(s) The status of the AGL will probably differ according to visibility conditions and other factors; therefore, the status report (or look-up table) shall reflect these factors.

(t) Further guidance on the assessment of AGL serviceability and the presentation of this information is provided in CAP 670, ATS Safety Requirements Part B, Section 2: ATC 01.

(u) Consideration should be given to the provision of an intermediate warning level or pre-alarm that indicates a degradation of performance of the AGL and the likelihood of further degradation to alarm level. In the event of a warning level being achieved, action may be taken to prevent an alarm state being reached.

(v) Verification of AGL performance shall be derived from a device that is designed to monitor the true status of the services selected. Any such device should be proved to be satisfactory to the CAA.

(w) For constant current series circuits, an acceptable means of providing verification of luminous intensity is the detection of the true root mean square (RMS) current within the primary series circuit.

(x) Direct fit LED fittings with the correct CCR produces different results. When matched correctly they are typically in the low amps range. Until such time as definitive guidance is available, information on the luminance intensity, tolerance

and equivalent current ratings and tolerances shall be extracted from the manufacturer's site acceptance test and commissioning documentation, provided as part of the safety assurance documentation, and included in the associated equipment maintenance schedule as "red" figures.

(y) This type of verification for either system does not, however, provide an assurance that the AGL meets the photometric requirements.

(z) The integrity of this verification method shall be augmented by the adoption of a maintenance regime that incorporates the measurement of the photometric characteristics of the AGL while in service.

(aa) Technical serviceability information about the AGL system other than that required to meet the requirements detailed in typical luminosity settings must be displayed and trigger alerts at ATC or other operational positions. Warnings should be given to engineering positions and alarms displayed or triggered at ATC or other operational positions.

(ab) All operationally significant events, alarms or failures shall be recorded and retained for at least 30 days.

(ac) The content of a hard copy record may be restricted to error and principal switching messages if no circumstances occurred that might require an investigation into the AGL system integrity, condition, or state during the period.

(ad) Magnetic, optical, or electronic storage should contain all monitored data.

GM1 ADR-DSN.S.890 is amended as follows:

GM1 ADR-DSN.S.890 Control and monitoring

[…]

The following CS ADR-DSN.S.891 is inserted:

CS ADR-DSN.S.891 Control and monitoring IRVR interfaces

(a) The IRVR interface shall be designed to meet the integrity requirements required by both the AGL Control System and the IRVR, where installed.

(b) The information used for IRVR interfaces shall be derived from the primary circuit monitoring on the selected runways CCRs (or an independent approved circuit monitoring device if fitted). Only if the runway edge CCRs and runway centreline CCR's where applicable, (see note below) confirm they have the same primary circuit setting, there are no faults (except minor warning such as a lamp out) and these settings match the controller's selection should the information be presented to the IRVR system. The IRVR interface output shall not be derived directly from the controller's selection.

(c) The RVR assessments shall be based on the lights from which pilots derive their main guidance. Where there are both edge lights and centre line lights, it is normal

to use edge lights when RVR assessment is above 550 m; with lower visual range, the use of centre line lights for the lowest RVR values is because of:

(1) inferior directional guidance provided by edge lights; and

(2) edge lights become dimmer than centre line lights when viewed off axis.

(d) Where runway centre line lighting is to be used in the IRVR calculations for CAT II and CAT III operations, it shall be identified within the safety assurance documentation for both the AGL and IRVR systems.

(e) If the intensity of the centreline fittings is the same as that of the runway edge fittings, the standard set of intensity levels programmed into the IRVR system can be used.

(f) Should the runway centre line lighting have a different output intensity to the runway edge lights for a given lighting level selection, either:

(1) the lower of the two figures shall be used for the IRVR calculation; or

(2) the IRVR software shall be capable of switching to the runway centreline intensity when the reported visibility goes below 550 m at a given lighting intensity selection.

(g) Justification for the selection and information relating to the capability of the IRVR system to address this shall be included in the Safety Assurance documentation submitted to the CAA.

HARDWIRED IRVR INTERFACES

(h) Table S-1(a) provides a typical example of an AGL runway edge, hardwired IRVR interface logic table with the input and standard/expected output for various conditions. The correct operation of the IRVR interface and IRVR system shall be defined and tested as part of the site acceptance and commissioning checks for both new installations and system modifications that may have an impact.

(i) The standard runway edge and centreline – IRVR interface will normally consist of a set of six volt free contacts or earthed contacts indicating:

(1) 0%;

(2) 1%;

(3) 3%;

(4) 10%;

(5) 30%; and

(6) 100%.

(j) Some systems may provide an alarm contact, 80%, 0.3% and 0.1% as additional indications. 0.3% and 0.1% are not used for runway edge and 80% would normally replace 100% and the appropriate intensity programmed into the IRVR system.

(k) The loss of all inputs to the IRVR shall result in a fault message, but on older systems this may not be the case and the output of 0% for a fault condition shall result in a “Lamps Too Low” output on the IRVR display.

(l) The IRVR interface shall be designed to fail safe, in that should the IRVR interface lose connection to the control system, or the system lose power, the output of the interface will either provide an indication of 0%, alarm or no output on any of the six lines, depending on the configuration or input capabilities of the connected IRVR system.

NETWORKED IRVR INTERFACES

(m) A networked IRVR interface shall have a handshaking mechanism allowing both the AGL control system and the IRVR system to detect a loss of communication.

(n) The correct operation of the IRVR interface and IRVR system shall be defined and tested as part of the site acceptance and commissioning checks for both new installations and system modifications that may have an impact.

(o) The exact configuration will depend on the capabilities of the connected IRVR system and shall be defined for the system and included in any safety assurance documentation.

AUDIO VISUAL ALARMS

(p) An audio-visual alarm shall be provided in order to draw the attention of the AGL operator to any disparity between the AGL selection and the corresponding verification derived from the field/CCR tell-back indication, whenever a selected AGL circuit fails or fails to activate.

(q) Only faults on the runway edge lights (and centreline lights if applicable) or a control system failure should be sent to the IRVR interface.

(r) The audio alarm shall be capable of being temporarily suppressed while the visual indication of the fault should remain on both the control panel and monitoring display panel, where these are separately located, until the fault is cleared. Subsequent failures shall reactivate the audio alarm even when the fault has not been cleared fully.

<table>
<tr><th rowspan="2">Controller Section</th><th rowspan="2">Runway edge lights CCR1</th><th rowspan="2">Runway edge lights CCR2</th><th colspan="6">IRVR Interface Input</th><th colspan="2">IRVR Interface</th></tr>
<tr><th>Off / 0%</th><th>1%</th><th>3%</th><th>10%</th><th>30%</th><th>100%</th><th>Alarm*</th><th>Output</th></tr>
<tr><td>Off / 0%</td><td>Off / 0%</td><td>Off / 0%</td><td>Active</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Off / 0%</td></tr>
<tr><td>1%</td><td>1%</td><td>1%</td><td>Inactive</td><td>Active</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>1%</td></tr>
<tr><td>3%</td><td>3%</td><td>3%</td><td>Inactive</td><td>Inactive</td><td>Active</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>3%</td></tr>
<tr><td>10%</td><td>10%</td><td>10%</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Active</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>10%</td></tr>
<tr><td>30%</td><td>30%</td><td>30%</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Active</td><td>Inactive</td><td>Inactive</td><td>30%</td></tr>
<tr><td>100%</td><td>100%</td><td>100%</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Inactive</td><td>Active</td><td>Inactive</td><td>100%</td></tr>
<tr><td colspan="3">Any Significant Fault</td><td colspan="6" rowspan="4">Any other combination</td><td rowspan="5">Active</td><td rowspan="5">No output or Off / 0%</td></tr>
<tr><td colspan="3">CCRs disagree</td></tr>
<tr><td colspan="3">Controller selection and one/both CCRs disagree</td></tr>
<tr><td colspan="3">Control system failure</td></tr>
<tr><td colspan="3">Corruption</td><td colspan="6">Invalid combination / two or more active</td></tr>
</table>

* Alarm output if fitted

Note: The same principal to be applied if more than two CCRs are used to provide the edge lighting (and centreline if applicable) on the runway.

Table S-1(a) Hardwired RVR Interface Logic Output

CS ADR-DSN.S.895 is amended as follows:

CS ADR-DSN.S.895 Serviceability levels

(a) A light should be deemed to be unserviceable when the main beam average intensity is less than 50 % of the value specified in the appropriate ~~Figure~~ figure in CS ADR-DSN.U.940. For light units where the ~~designed~~ main beam average intensity is ~~above~~ required to be higher than the value ~~shown~~ specified in the appropriate figure in CS ADR-DSN.U.940, a light will be deemed unserviceable when the main beam average intensity value is less than 50 % of the higher value ~~should be related to that design~~ and not the value specified in CS ADR-DSN.U.940.

Note: Guidance on maintenance criteria for aeronautical ground lights, on the use of a site standard and on using a higher main beam average intensity is contained in the Aerodrome Design Manual (ICAO Doc 9157), Part 4, Visual Aids.

[…]

(c) The system of preventive maintenance employed for a precision approach runway Category II or III should 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 % of the lights are serviceable in each of the following particular significant elements:

(i) precision approach Category II and III lighting system, the inner 450 m;

(ii) runway centre line lights;

(iii) runway threshold lights; and

(iv) runway edge lights~~.~~;

(2) 90 % of the lights are serviceable in the touchdown zone lights;

(3) 85 % of the lights are serviceable in the approach lighting system beyond 450 m; and

(4) 75 % of the lights are serviceable in the runway end lights.

~~(5)~~Note 1: In order to provide continuity of guidance, the allowable percentage of unserviceable lights should not be permitted in such a way as to alter the basic pattern of the lighting system.

~~(6)~~Note 2: Additionally, an unserviceable light should not be permitted adjacent to another unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted.

(d) The system of preventive maintenance 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 ~~550~~300 m should have the following objectives:

(1) no more than two lights should remain unserviceable; and

(2) two adjacent lights should not remain unserviceable unless the light spacing is significantly less than that specified.

(e) The system of preventive maintenance employed for a taxiway intended for use in runway visual range conditions less than a value of ~~550~~300 m should have as its objective that no two adjacent taxiway centre line lights be unserviceable.

[…]

(g) 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 should have as its objective that, during any period of operations, all runway lights are serviceable, and that in any event:

(1) at least 95 % of the lights are serviceable in the runway centre line lights (where provided) and in the runway edge lights; and~~;~~

(2) at least 75 % of the lights are serviceable in the runway end lights.

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

(h) 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 should have as its objective that, during any period of operations, all runway lights are serviceable, and that, in any event, at least 85 % of the lights are serviceable in the runway edge lights, runway centreline lights and runway end lights. In order to provide continuity of guidance, an unserviceable light should not be permitted adjacent to another unserviceable light.

Light type	CAT II/III Approach	CAT I Approach	RVR<550 m take-off	RVR~~>~~≥550 m take-off
Approach inner 450 m	95 %	85 %	-	-
Approach outer 450 m	85 %	85 %	-	-
Runway threshold	95 %	85 %	-	-
Runway centre line	95 %	85 %	95 %	85 %
Runway edge	95 %	85 %	95 %	85 %
Runway end	75 %	85 %	75 %	85 %
Touchdown zone	90 %	(85 %)[a]	-	-
Note (a): If touchdown zone lights are available.				

Table S-2. Allowable percentages of serviceable lights

CS ADR-DSN.T.915 is amended as follows:

CS ADR-DSN.T.915 Siting of equipment and installations on operational areas

[…]

(b) Unless its function requires it to be there for air navigation or for aircraft safety purposes, no equipment or installation endangering an aircraft should be located:

(1) on a runway strip, a runway end safety area, a taxiway strip, or within the following distances~~:~~, if it would endanger an aircraft, or

(2) on a clearway if it would endanger an aircraft in the air.

Code Letter	Distance between taxiway, other than aircraft stand taxilane, centre line to object (metres)
A	15.5
B	20
C	26
D	37
E	43.5
F	51

(c) Any equipment or installation required for air navigation or for aircraft safety purposes which should be located:

(1) on that portion of a runway strip within:

(i) 75 m of the runway centre line where the code number is 3 or 4; or

(ii) 45 m of the runway centre line where the code number is 1 or 2; or

(2) on a runway end safety area, a taxiway strip, or within the distances specified in Table D-1; or

(3) on a clearway and which would endanger an aircraft in the air; ~~should be frangible and mounted as low as possible.~~

should be frangible and mounted as low as possible.

(d) Unless its function requires it to be there for air navigation or for aircraft safety purposes, or if after a safety assessment, it is determined that it would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes, no equipment or installation should be located within 240 m from the end of the strip and within:

(1) 60 m of the extended centre line where the code number is 3 or 4; or

(2) 45 m of the extended centre line where the code number is 1 or 2; ~~of a precision approach runway Category I, II or III.~~

of a precision approach runway Category I, II or III.

(e) Any equipment or installation required for air navigation or for aircraft safety purposes which should be located on or near a strip of a precision approach runway Category I, II, or III and which:

~~(1) is situated on that portion of the strip within 77.5 m of the runway centre line where the code number is 4 and the code letter is F; or~~

(~~2~~1) is situated within 240 m from the end of the strip and within:

(i) 60 m of the extended runway centre line where the code number is 3 or 4; or

(i) 45 m of the extended runway centre line where the code number is 1 or 2; or

(~~3~~2) penetrates the inner approach surface, the inner transitional surface, or the balked landing surface; ~~should be frangible and mounted as low as possible.~~

should be frangible and mounted as low as possible.

[…]

GM1 ADR-DSN.T.915 is amended as follows:

GM1 ADR-DSN.T.915 Siting of equipment and installations on operational areas

[…]

(e) The term ‘aircraft safety purposes’ refers to the installation of arresting systems which are frangible and intended to enhance safety in the event of an aircraft overrun.

CS ADR-DSN.U.930 is amended as follows:

CS ADR-DSN.U.930 Colours for aeronautical ground lights

(a) The chromaticity of aeronautical ground lights with filament-type light sources should be within the following boundaries:

CIE Equations (see Figure U-1A):

(1) Red

Purple boundary y = 0.980 – x

Yellow boundary y = 0.335 Note: see CS ADR-DSN.M.645(c)(2)(ii)

[…]

(d) The chromaticity of aeronautical ground lights with solid state light sources, e.g. LEDs, should be within the following boundaries:

CIE Equations (see Figure U-1B):

(1) Red

Purple boundary y = 0.980 – x

Yellow boundary y = 0.335;

Yellow boundary y = 0.320.

Note: see CS ADR-DSN.M.645(c)(2)(ii)

[…]

CS ADR-DSN.U.935 is amended as follows:

CS ADR-DSN.U.935 Colours for markings, signs and panels

[…]

(c) The chromaticities and luminance factors of ordinary colours, colours of retroreflective materials, and colours of internally illuminated ~~(internally illuminated)~~ signs and panels should be determined under the following standard conditions:

[…]

(d) The chromaticity and luminance factors of ordinary colours for markings and externally illuminated signs and panels should be within the following boundaries when determined under standard conditions.

CIE Equations (see Figure U-2):

[…]

(1) Yellowish green

Green boundary y = 1.317x + 0.4

White boundary y = 0.910 – x

Yellow boundary y = 0.867x + 0.4

Note: This yellowish green area is not shown in Figure U-2.

[…]

CS ADR-DSN.U.940 is amended as follows:

CS ADR-DSN.U.940 Aeronautical ground light characteristics

[Figure U-5 and caption unchanged]

Notes:

[…]

(d) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-6 and caption unchanged]

Notes:

[…]

(d) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-7 and caption unchanged]

Notes:

[…]

(c) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-8 and caption unchanged]

Notes:

[…]

(c) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-9 and caption unchanged]

Notes:

[…]

(c) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-10 and caption unchanged]

Notes:

[…]

(d) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-11 and caption unchanged]

Notes:

[…]

(d) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-12 and caption unchanged]

Notes:

[…]

(b) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-13 and caption unchanged]

Notes:

[…]

(e) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-14 and caption unchanged]

Notes:

[…]

(e) See collective notes for Figures U-5 to U-15, U-29 and U-30.

[Figure U-15 and caption unchanged]

Collective notes to Figures U-5 to U-15, U-29 and U-30

(a) The ellipses in each Figure are symmetrical about the common vertical and horizontal axes.

(b) Figures U-5 to U-14 show the minimum allowable light intensities. The average intensity of the main beam is calculated by establishing grid points as shown in Figure U-15 and using the intensity value measures at all grid points located within and on the perimeter of the ellipse representing the main beam. The average value is the arithmetic average of light intensities measured at all considered grid points.

(c) No deviations are acceptable in the main beam pattern when the lighting fixture is properly aimed.

(d) Average intensity ratio. The ratio between the average intensity within the ellipse defining the main beam of a typical new light and the average light intensity of the main beam of a new runway edge light should be as follows:

Figure U-5	Approach centre line and crossbars	~~1.5 to 2.0~~ 2.0 to 3.0	(white light)
Figure U-6	Approach side row	0.5 to 1.0	(red light)
Figure U-7	Threshold	1.0 to 1.5	(green light)
Figure U-8	Threshold wing bar	1.0 to 1.5	(green light)
Figure U-9	Touchdown zone	0.5 to 1.0	(white light)
Figure U-10	Runway centre line (longitudinal spacing 30 m)	0.5 to 1.0	(white light)
Figure U-11	Runway centre line (longitudinal spacing 15 m)	0.5 to 1.0 for CAT III	(white light)
		0.25 to 0.5 for CAT I, II	(white light)
Figure U-12	Runway end	0.25 to 0.5	(red light)
Figure U-13	Runway edge (45 m runway width)	1.0 to 1.5	(white light)
Figure U-14	Runway edge (60 m runway width)	1.0 to 1.5	(white light)

[…]

[Figure U-16 unchanged]

Figure U-16. Isocandela diagram for taxiway centre line (15 m spacing), RELs, no-entry bar, and stop bar lights in straight sections intended for use in runway visual range conditions of less than a value of ~~350~~300 m where large offsets can occur and for low-intensity runway guard lights, Configuration B

[…]

[Figure U-17 unchanged]

Figure U-17. Isocandela diagram for taxiway centre line (15 m spacing), no-entry bar, and stop bar lights in straight sections intended for use in runway visual range conditions of less than a value of ~~350~~300 m

[…]

[Figure U-18 unchanged]

Figure U-18. Isocandela diagram for taxiway centre line (7.5 m spacing), RELs, no-entry bar, and stop bar lights in curved sections intended for use in runway visual range conditions of less than a value of ~~350~~300 m

[…]

[Figure U-19 unchanged]

Figure U-19. Isocandela diagram for taxiway centre line (30 m, 60 m spacing), no-entry bar, and stop bar lights in straight sections intended for use in runway visual range conditions of ~~350~~300 m or greater

[…]

[Figure U-20 unchanged]

Figure U-20. Isocandela diagram for taxiway centre line (7.5 m, 15 m, 30 m spacing), no-entry bar, and stop bar lights in curved sections intended for use in runway visual range conditions of ~~350~~300 m or greater

[Figures U-21 to U-25, Collective notes to Figures U-16 to U-25, and Figure U-26 unchanged]

[Figure U-27 unchanged]

Figure U-27. Isocandela diagram for each light in low-intensity runway guard lights, Configuration A and for flashing lights supplementing unserviceability signs

[…]

[Figure U-28 and caption unchanged]

[Figure U-29 and caption unchanged]

Notes:

[…]

(b) See collective notes for Figures U-5 to U-15, ~~and Figure~~ U-29 and U-30.

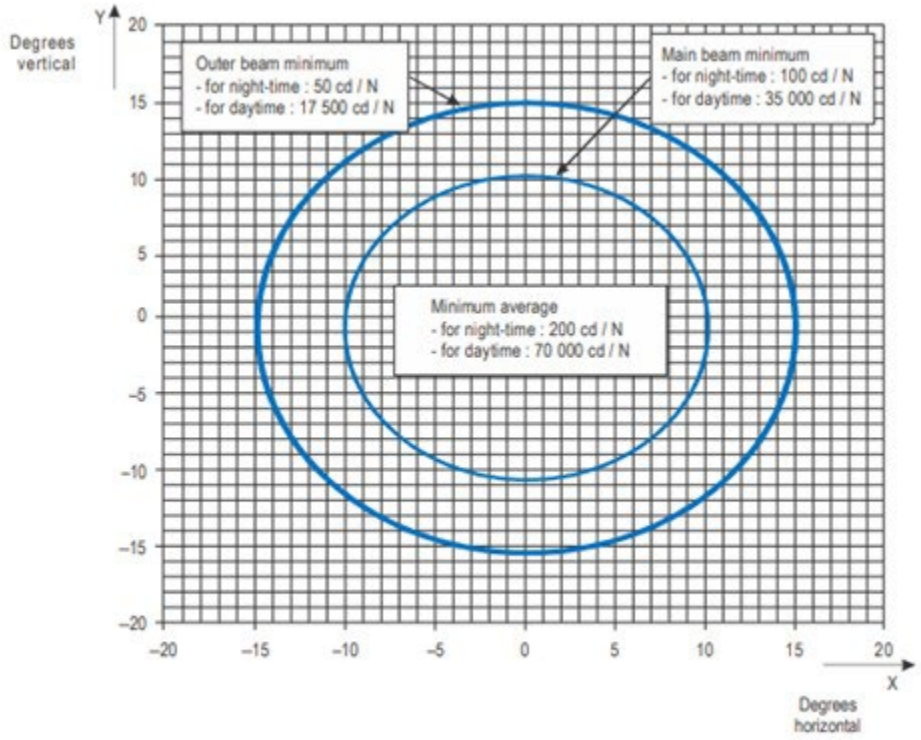


Figure U-30 Isocandela diagram for closed runway lights (white light)

Notes:

(a) Curves calculated on formula

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$$

a	10	15
b	10	15

(b) N is the total number of lights of the closed runway lighting.

(c) See collective notes for Figures U-5 to U-15, U29 and U30.

Appendix A to CAA Decision No. 0059 adopting AMC and GM for UK

From Schedule 1: UK Reg (EU) No. 139/2014

List of individual changes to AMC and GM:

New AMC and GM to be inserted:

- GM2 ADR.OPS.A.005 Aerodrome Data
- GM3 ADR.OPS.A.005 Aerodrome Data
- GM4 ADR.OPS.A.005 Aerodrome Data
- GM5 ADR.OPS.A.005 Aerodrome Data
- GM6 ADR.OPS.A.005 Aerodrome Data
- GM7 ADR.OPS.A.005 Aerodrome Data
- GM8 ADR.OPS.A.005 Aerodrome Data
- GM9 ADR.OPS.A.005 Aerodrome Data
- GM10 ADR.OPS.A.005 Aerodrome Data
- GM11 ADR.OPS.A.005 Aerodrome Data
- GM3 ADR.OPS.B.005(c) Aerodrome emergency planning
- GM4 ADR.OPS.B.005(c) Aerodrome emergency planning
- GM7 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- GM8 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- CS ADR-DSN.C.236 Engineered Materials Arresting System (EMAS)
- GM1 ADR-DSN.C.236 Engineered Materials Arresting System (EMAS)
- CS ADR-DSN M.772 Pilot Controlled Lighting (PCL)
- CS ADR-DSN.N.786 Runway Distance Remaining Signs (RDRS)
- CS ADR-DSN.R.857 Closed runway lighting
- GM1 CS-ADR.DSR.R.857 Closed runway lighting
- CS ADR-DSN.R.871 Unserviceability markings
- CS ADR-DSN.R.872 Unserviceability signs
- GM1 ADR-DSN.R.872 Unserviceability signs
- CS ADR-DSN.R.873 Unserviceability markers
- CS ADR-DSN.S.891 Control and monitoring IRVR interfaces

AMC/GM to be replaced (the number and title remain the same unless specified):

- GM2 ADR.AR.C.035(a) Issuance of certificates
- AMC1 ADR.OR.D.005(b)(11) Management system
- AMC3 ADR.OR.E.005 Aerodrome manual replaced by AMC2 ADR.OR.E.005 Aerodrome manual
- GM1 ADR.OR.E.005 Aerodrome manual
- GM2 ADR.OR.E.005 Aerodrome manual
- AMC2 ADR.OR.E.005(i)(2) Aerodrome manual replaced by AMC1 ADR.OR.E.005(i)(2) Aerodrome manual
- GM1 ADR.OPS.A.005 Aerodrome Data
- GM2 ADR.OPS.A.005(a) Aerodrome Data replaced by GM1 ADR.OPS.A.005(a) Aerodrome Data
- GM3 ADR.OPS.A.005(a) Aerodrome Data replaced by GM2 ADR.OPS.A.005(a) Aerodrome Data
- GM4 ADR.OPS.A.005(a) Aerodrome Data replaced by GM3 ADR.OPS.A.005(a) Aerodrome Data
- GM1 ADR.OPS.A.057(b) Origination of NOTAM
- GM1 ADR.OPS.A.057(d)(4) Origination of NOTAM
- GM2 ADR.OPS.A.057(d)(4) Origination of NOTAM
- GM2 ADR.OPS.A.065(a) Reporting of the runway surface condition
- GM3 ADR.OPS.A.065(a) Reporting of the runway surface condition
- GM1 ADR.OPS.B.005(a) Aerodrome emergency planning
- GM2 ADR.OPS.B.005(a) Aerodrome emergency planning
- GM4 ADR.OPS.B.005(a) Aerodrome emergency planning
- GM1 ADR.OPS.B.005(b) Aerodrome emergency planning
- AMC1 ADR.OPS.B.005(c) Aerodrome emergency planning
- GM2 ADR.OPS.B.005(c) Aerodrome emergency planning
- AMC4 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- AMC5 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- GM1 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- GM2 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- GM3 ADR.OPS.B.010(a)(2) Rescue and firefighting services
- GM4 ADR.OPS.B.010(a)(2) Rescue and firefighting services

- GM2 ADR.OPS.B.010(a)(4) Rescue and firefighting services
- AMC1 ADR.OPS.B.090 Use of the aerodrome by higher code letter aircraft
- GM1 ADR.OPS.B.090 Use of the aerodrome by higher code letter aircraft
- AMC1 ADR.OPS.C.010 Pavements, other ground surfaces and drainage
- GM2 ADR.OPS.C.010(b)(1) Pavements, other ground services and drainage
- CS ADR-DSN.A.002 Definitions
- CS ADR-DSN.A.005 Aerodrome reference code (ARC)
- GM1 ADR-DSN.B.070 Sight distance for slopes of runways
- GM1 ADR-DSN.B.085 Runway strength
- GM1 ADR-DSN.B.095 Runway turn pads
- CS ADR-DSN.B.115 Width of shoulders for runway turn pads
- GM1 ADR-DSN.B.115 Width of shoulders for runway turn pads
- CS ADR-DSN.B.125 Runway shoulders
- GM1 ADR-DSN.B.150 Runway strip to be provided
- CS ADR-DSN.B.160 Width of runway strip
- CS ADR-DSN.B.165 Objects on runway strips
- GM1 ADR-DSN.B.165 Objects on runway strips
- CS ADR-DSN.B.175 Grading of runway strips
- GM1 ADR-DSN.B.175 Grading of runway strips
- CS ADR-DSN.B.190 Strength of runway strips
- CS ADR-DSN.B.200 Stopways
- GM1 ADR-DSN.B.200 Stopways
- GM1 ADR-DSN.C.210 Runway end safety areas (RESA)
- GM1 ADR-DSN.D.240 Taxiways general
- CS ADR-DSN.D.260 Taxiway minimum separations distance
- GM1 ADR-DSN.D.285 Strength of taxiways
- CS ADR-DSN.D.325 Grading of taxiway strips
- CS ADR-DSN.D.335 Holding bays, runway-holding positions, intermediate holding positions, and road-holding positions
- CS ADR-DSN.D.340 Location of holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

- GM1 ADR-DSN.D.340 Location of holding bays, runway-holding positions, intermediate holding positions, and road-holding positions
- CS ADR-DSN.E.345 General
- GM1 ADR-DSN.E.345 General
- GM1 ADR-DSN.E.360 Slopes on aprons
- CS ADR-DSN.E.365 Clearance distances on aircraft stands
- CS ADR-DSN.G.380 Location
- GM1 ADR-DSN.G.380 Location
- GM1 ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad
- GM1 ADR-DSN.J.465 General
- CS ADR-DSN.J.480 Precision approach runways
- CS ADR-DSN L.535 Threshold marking
- CS ADR-DSN.L.555 Taxiway centre line marking
- CS ADR-DSN.L.570 Enhanced taxiway centre line marking
- CS ADR-DSN.L.605 Mandatory instruction marking
- CS ADR-DSN.L.610 Information marking
- GM1 ADR-DSN.M.615 General
- CS ADR-DSN.M.635 Precision approach Category II and III lighting system
- CS ADR-DSN.M.675 Runway edge lights
- CS ADR-DSN.N.685 Runway end lights
- CS ADR-DSN.M.690 Runway centre line lights
- GM1 ADR-DSN.M.700 Rapid exit taxiway indicator lights (RETILs)
- CS ADR-DSN M.705 Stopway lights
- CS ADR-DSN.M.710 Taxiway centre line lights
- CS ADR-DSN.M.715 Taxiway centre line lights on taxiways, runways, rapid exit taxiways, or on other exit taxiways
- CS ADR-DSN M.720 Taxiway edge lights
- CS ADR-DSN.M.725 Runway turn pads lights
- CS ADR-DSN.M.735 Intermediate holding position lights
- CS ADR-DSN.M.745 Runway guard lights
- GM1 ADR-DSN.M.745 Runway guard lights
- GM1 ADR-DSN.M.755 Visual docking guidance system

- CS ADR-DSN.M.770 Road-holding position light
- CS ADR-DSN.M.771 No-entry bar
- GM1 ADR-DSN.M.771 No-entry bar
- CS ADR-DSN.N.775 General
- GM1 ADR-DSN.N.775 General
- CS ADR-DSN.N.780 Mandatory instruction signs
- CS ADR-DSN.N.785 Information signs
- GM1 ADR-DSN.P.825 Taxiway edge markers
- GM1 ADR-DSN.Q.840 Objects to be marked and/or lighted within the lateral boundaries of the obstacle limitation surfaces
- CS ADR-DSN.Q.845 Marking of fixed objects
- CS ADR-DSN.Q.850 Lighting of other objects
- CS ADR-DSN.Q.852 Marking and lighting of overhead wires, cables, supporting towers, etc.
- CS ADR-DSN.R.855 Closed runways and taxiways, or parts thereof
- CS ADR-DSN.R.870 Unserviceable areas
- GM1 ADR-DSN.R.870 Unserviceable areas
- CS ADR-DSN.S.880 Electrical power supply systems
- CS ADR-DSN.S.885 System design
- CS ADR-DSN.S.890 Monitoring replaced by CS ADR-DSN.S.890 Control and monitoring
- GM1 CS ADR-DSN.S.890 Monitoring replaced by GM1 CS ADR-DSN.S.890 Control and monitoring
- CS ADR-DSN.S.895 Serviceability levels
- CS ADR-DSN.T.915 Siting of equipment and installations on operational areas
- GM1 ADR-DSN.T.915 Siting of equipment and installations on operational areas
- CS ADR-DSN.U.930 Colours for aeronautical ground lights
- CS ADR-DSN.U.935 Colours for markings, signs and panels
- CS ADR-DSN.U.940 Aeronautical ground light characteristics

AMC/GM to be deleted:

- none