



International
Civil Aviation
Organization

Organisation
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Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 (514) 954-6717

Ref.: AN 4/1.2.23-09/30

9 April 2009

Subject: Adoption of Amendment 10 to Annex 14
Volume I

Action Required: a) Notify any disapproval before
20 July 2009; b) Notify any differences and compliance
before 19 October 2009 and 18 October 2010.

Sir/Madam,

1. I have the honour to inform you that Amendment 10 to the *Aerodromes— Aerodrome Design and Operations* (Annex 14, Volume I to the Convention on International Civil Aviation) was adopted by the Council at the sixth meeting of its 186th Session on 4 March 2009. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (www.icao.int/icaonet).

2. When adopting the amendment, the Council prescribed 20 July 2009 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 10, to the extent it becomes effective, will become applicable on 19 November 2009, except for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4 which will become applicable on 18 November 2010.

3. Amendment 10 arises from:

- a) recommendations of the first meeting of the Aerodromes Panel (AP/1);
- b) recommendations of the seventh meeting of the Operations Panel (OPSP/7);
- c) the development of harmonized provisions relating to safety management in Annex 1 — *Personnel Licensing*, Annex 6 — *Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes* and Part III — *International Operations — Helicopters*, Annex 8 — *Airworthiness*, Annex 11 — *Air Traffic Services*, Annex 13

— *Aircraft Accident and Incident Investigation* and Annex 14, Volume I, as a continuation of the harmonization effort initiated by the Secretariat in 2005; and

- d) Secretariat study concerning the inclusion of public health emergencies in aerodrome emergency planning.

4. The proposed amendment covers new and revised provisions on the promulgation of the status of aerodrome certification, enhanced taxiway centreline marking and mandatory instruction marking to help prevent runway incursions, visual aids for wind turbines to denote obstacles, advanced visual docking guidance systems to provide pilots with more precise docking guidance, recalculation of extinguishing agents for larger aeroplanes in a given category to ensure adequate protection for rescue and fire fighting, wildlife hazard reduction and inspection and maintenance of movement areas.

5. The proposed amendment to the definition of “Instrument runway” is consequential to the amendment of the definition of “Approach and landing operations using instrument approach procedures” in Annex 6.

6. The proposed amendment on safety management is a continuation of the harmonization of related provisions in Annex 6, Parts I and III, Annex 11, and Annex 14, Volume I, initiated in 2005. The proposal centres around the introduction of two frameworks, one for the implementation and maintenance of a State safety programme (SSP), the other for the implementation and maintenance of a service provider's safety management system (SMS). It also includes editorial/alignment amendments to the Annexes under consideration.

7. The proposed amendment on aerodrome emergency planning stems from the need to include in Annex 14, Volume I “public health emergencies” as example of emergencies to be considered by aerodrome authorities in the development of aerodrome emergency plans.

8. In accordance with the decision of the 26th Session of the Assembly, I would like to bring to your attention the Organization’s long-standing practice of providing documentation to States upon request. In this regard, I wish to refer you to the ICAO-NET website (www.icao.int/icaonet) where you can access all relevant documentation. The practice of dispatching printed copies of such documentation has now been discontinued.

9. In conformity with the Resolution of Adoption, may I request:

- a) that before 20 July 2009 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 10, concerning which your Government wishes to register disapproval, using the form in Attachment B for this purpose. Please note that only statements of disapproval need be registered and if you do not reply it will be assumed that you do not disapprove of the amendment;
- b) that before 19 October 2009¹ you inform me of the following, using the form in Attachment C for this purpose:
 - 1) any differences that will exist on 19 November 2009² between the national regulations or practices of your Government and the provisions of the whole of

¹ 18 October 2010 for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4.

² 18 November 2010 for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4.

Annex 14, Volume I as amended by all amendments up to and including Amendment 10, and thereafter of any further differences that may arise;

- 2) the date or dates by which your Government will have complied with the provisions of the whole of Annex 14, Volume I, as amended by all amendments up to and including Amendment 10.

10. With reference to the request in paragraph 9 a) above, it should be noted that a registration of disapproval of Amendment 10 or any part of it in accordance with Article 90 of the Convention does not constitute a notification of differences under Article 38 of the Convention. To comply with the latter provision, a separate statement is necessary if any differences do exist, as requested in paragraph 9 b) 1). It is recalled in this respect that international Standards in Annexes have a conditional binding force, to the extent that the State or States concerned have not notified any difference thereto under Article 38 of the Convention.

11. Guidance on the determination and reporting of differences is given in the Note on the Notification of Differences in Attachment D.

12. Please note that a detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

13. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 9b) above, to the ICAO Regional Director accredited to your Government.

14. As soon as practicable after the amendment becomes effective, on 20 July 2009, replacement pages incorporating Amendment 10 will be forwarded to you.

Accept, Sir/Madam, the assurances of my highest consideration.

Taïeb Chérif
Secretary General

Enclosures:

- A — Amendment to the Foreword of Annex 14 Volume I
- B — Form on notification of disapproval of all or part of Amendment 10 to Annex 14 Volume I
- C — Form on notification of compliance with or differences from Annex 14 Volume I
- D — Note on the Notification of Differences

ATTACHMENT A to State letter AN 4/1.2.23-09/30

AMENDMENT TO THE FOREWORD OF ANNEX 14, VOLUME I, FOURTH

Add the following at the end of Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>
10	Secretariat, First meeting of the Aerodromes Panel, Seventh Meeting of the Operations Panel	Definitions of instrument runway and obstacle; certification of aerodromes; aerodrome data; enhanced taxiway centre line marking; mandatory instruction marking; taxiway edge lights; advanced visual docking guidance system; mandatory instruction signs; marking and lighting of wind turbines; public health emergencies in aerodrome emergency planning, rescue and fire fighting; wildlife strike hazard reduction; pavement monitoring and maintenance; chromaticity and luminance factors of green colour in Appendix 1; notes to Figures A2-9 and A2-10 for isocandela diagrams for runway edge lights in Appendix 2; NO ENTRY sign in Figure A4-2 in Appendix 4; guidance on runway surface evenness, location of displaced threshold and rescue and fire fighting in Attachment A and, as of 18 November 2010, safety management.	D 20 July 2009 19 November 2009 18 November 2010

**NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF
AMENDMENT 10 TO ANNEX 14, VOLUME I**

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada H3C 5H7

(State) _____ hereby wishes to disapprove the following parts of
Amendment 10 to Annex 14, Volume I:

Signature _____

Date _____

NOTES

- 1) If you wish to disapprove all or part of Amendment 10 to Annex 14, Volume I please dispatch this notification of disapproval to reach ICAO Headquarters by 20 July 2009. If it has not been received by that date it will be assumed that you do not disapprove of the amendment. **If you approve of all parts of Amendment 10, it is not necessary to return this notification of disapproval.**
- 2) This notification should not be considered a notification of compliance with or differences from Annex 14, Volume I. Separate notifications on this are necessary. (See Attachment C.)
- 3) Please use extra sheets as required.

**NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES
FROM ANNEX 14, VOLUME I
(including all amendments up to and including Amendment 10)**

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada H3C 5H7

1. No differences will exist on _____ between the national regulations and/or practices of **(State)** _____ and the provisions of Annex 14, Volume I including all amendments up to and including Amendment 10.

2. The following differences will exist on _____ between the regulations and/or practices of **(State)** _____ and the provisions of Annex 14, Volume I including Amendment 10 (Please see Note 3) below.)

a) Annex Provision (Please give exact paragraph reference)	b) Difference Category (Please indicate A, B, or C)	c) Details of Difference (Please describe the difference clearly and concisely)	d) Remarks (Please indicate reasons for the difference)
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(Please use extra sheets as required)

3. By the dates indicated below, **(State)** _____ will have complied with the provisions of Annex 14, Volume I including all amendments up to and including Amendment 10 for which differences have been notified in 2 above.

a) Annex Provision (Please give exact paragraph reference)	b) Date	c) Comments
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(Please use extra sheets as required)

Signature _____

Date _____

NOTES

- 1) If paragraph 1 above is applicable to you, please complete paragraph 1 and return this form to ICAO Headquarters. If paragraph 2 is applicable to you, please complete paragraphs 2 and 3 and return the form to ICAO Headquarters.
- 2) Please dispatch the form to reach ICAO Headquarters by 19 October 2009¹.
- 3) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.
- 4) Guidance on the notification of differences from Annex 14, Volume I is provided in the Note on the Notification of Differences at Attachment D.
- 5) Please send a copy of this notification to the ICAO Regional Director accredited to your Government.

¹ 18 October 2010 for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4.

**NOTE ON THE NOTIFICATION OF DIFFERENCES TO ANNEX 14, VOLUME I
AND FORM OF NOTIFICATION**

(Prepared and issued in accordance with instructions of the Council)

1. *Introduction*

1.1 The Assembly and the Council, when reviewing the notification of differences by States in compliance with Article 38 of the Convention, have repeatedly noted that the state of such reporting is not entirely satisfactory.

1.2 With a view to achieving a more comprehensive coverage, this note is issued to facilitate the determination and reporting of such differences and to state the primary purpose of such reporting.

1.3 The primary purpose of reporting of differences is to promote safety and efficiency in air navigation by ensuring that governmental and other agencies, including operators and service providers, concerned with international civil aviation are made aware of all national regulations and practices in so far as they differ from those prescribed in the ICAO Standards.

1.4 Contracting States are, therefore, requested to give particular attention to the notification before 19 October 2009¹ of differences with respect to Standards in Annex 14, Volume I. The Council has also urged Contracting States to extend the above considerations to Recommended Practices.

1.5 Contracting States are asked to note further that it is necessary to make an explicit statement of intent to comply where such intent exists, or where such is not the intent, of the difference or differences that will exist. This statement should be made not only to the latest amendment but to the whole Annex, including the amendment.

1.6 If previous notifications have been made in respect of this Annex, detailed repetition may be avoided, if appropriate, by stating the current validity of the earlier notification. States are requested to provide updates of the differences previously notified after each amendment, as appropriate, until the difference no longer exists.

2. *Notification of differences to Annex 14, Volume I including Amendment 10*

2.1 Past experience has indicated that the reporting of differences to Annex 14, Volume I has in some instances been too extensive since some appear merely to be a different manner of expressing the same intent.

2.2 Guidance to Contracting States in the reporting of differences to Annex 14, Volume I can only be given in very general terms. Where the national regulations of States call for compliance with procedures that are not identical but essentially similar to those contained in the Annex, no difference should be reported since the details of the procedures existing are the subject of notification through the medium of aeronautical information publications. Although differences to Recommended Practices are not notifiable under Article 38 of the Convention, Contracting States are urged to notify the Organization of the differences between their national regulations and practices and any corresponding Recommended Practices contained in an Annex. States should categorize each difference notified on the basis of whether the corresponding national regulation is:

¹ 18 October 2010 for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4.

- a) ***More exacting or exceeds the ICAO Standard or Recommended Practice (SARP) (Category A)***. This category applies when the national regulation is more demanding than the corresponding SARP, or imposes an obligation within the scope of the Annex which is not covered by a SARP. This is of particular importance where a State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;
- b) ***Different in character or other means of compliance (Category B)****. This category applies when the national regulation is different in character from the corresponding ICAO SARP, or when the national regulation differs in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and
- c) ***Less protective or partially implemented/not implemented (Category C)***. This category applies when the national regulation is less protective than the corresponding SARP; or when no national regulation has been promulgated to address the corresponding SARP, in whole or in part.

2.3 When a Contracting State deems an ICAO Standard concerning aircraft, operations, equipment, personnel, or air navigation facilities or services to be not applicable to the existing aviation activities of the State, notification of a difference is not required. For example, a Contracting State that is not a State of Design or Manufacture and that does not have any national regulations on the subject, would not be required to notify differences to Annex 8 provisions related to the design and construction of an aircraft.

2.4 For States that have already fully reported differences from Annex 14, Volume I or have reported that no differences exist, the reporting of any further differences occasioned by the amendment should be relatively straightforward; however, attention is called to paragraph 1.5 wherein it is indicated that this statement should be not only to the latest amendment but to the whole Annex, including the amendment.

3. *Form of notification of differences*

3.1 Differences should be notified in the following form:

- a) ***Reference***: The number of the paragraph or subparagraph in Annex 14, Volume I as amended which contains the Standard or Recommended Practice to which the difference relates;
- b) ***Category***: Indicate the category of the difference as A, B or C in accordance with paragraph 2.2 above.
- c) ***Description of the difference***: Clearly and concisely describe the difference and its effect;
- d) ***Remarks***: Under “Remarks” indicate reasons for the difference and intentions including any planned date for implementation.

*The expression “different in character or other means of compliance” in b) would be applied to a national regulation which achieves, by other means, the same objective as that of the corresponding ICAO SARPs and so cannot be classified under a) or c).

3.2 The differences notified will be recorded in a Supplement to the Annex, normally in the terms used by the Contracting State when making the notification. In the interest of making the supplement as useful as possible, please make statements as clear and concise as possible and confine remarks to essential points. Comments on implementation, in accordance with paragraph 4 b) 2) of the Resolution of Adoption, should not be combined with those concerning differences. The provision of extracts from national regulations cannot be considered as sufficient to satisfy the obligation to notify differences. General comments that do not relate to specific differences will not be published in Supplements.

AMENDMENT No. 10

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERODROMES

ANNEX 14

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

VOLUME I

AERODROME DESIGN AND OPERATIONS

The amendment to Annex 14, Volume I, contained in this document was adopted by the Council of ICAO on **4 March 2009**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **20 July 2009** will become effective on that date and will become applicable on **19 November 2009** and **18 November 2010** as specified in the Resolution of Adoption. (State letter AN 4/1.2.23-09-30 refers.)

MARCH 2009

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 10 TO INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

ANNEX 14, VOLUME I

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 4 March 2009 Amendment 10 to the International Standards contained in the document entitled *International Standards and Recommended Practices, Aerodromes* which for convenience is designated Annex 14, Volume I to the Convention;

2. *Prescribes* 20 July 2009 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;

3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 19 November 2009¹;

4. *Requests the Secretary General:*

a) to notify each Contracting State immediately of the above action and immediately after 20 July 2009 of those parts of the amendment which have become effective;

b) to request each Contracting State:

1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 19 November 2009¹ between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 19 October 2009², and thereafter to notify the Organization of any further differences that arise;

2) to notify the Organization before 19 October 2009² of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;

c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, when the notification of such differences is important for the safety of air navigation, following the procedure specified in subparagraph b) above with respect to differences from Standards.

¹ 18 November 2010 for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4

² 18 October 2010 for paragraphs 1.5.1, 1.5.2, 1.5.3 and 1.5.4

**NOTES ON THE PRESENTATION OF THE
AMENDMENT TO ANNEX 14, VOLUME I**

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT OF AMENDMENT 10 TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERODROMES

**ANNEX 14
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION
VOLUME 1 — AERODROME DESIGN AND OPERATIONS**

Editorial Note. — Text applicable in 2009.

CHAPTER 1. GENERAL

*Introductory Note. — This Annex contains Standards and Recommended Practices (specifications) that prescribe the physical characteristics and obstacle limitation surfaces to be provided for at aerodromes, and certain facilities and technical services normally provided at an aerodrome. **It also contains specifications dealing with obstacles outside those limitations surfaces.** It is not intended that these specifications limit or regulate the operation of an aircraft.*

...

1.1 Definitions

...

Instrument runway. One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

...

c) *Precision approach runway, category II.* An instrument runway served by ILS and/or MLS and visual aids intended for operations with a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than ~~350~~ **300** m.

d) *Precision approach runway, category III.* An instrument runway served by ILS and/or MLS to and along the surface of the runway and:

A — intended for operations with a decision height lower than 30 m (100 ft), or no decision height and a runway visual range not less than ~~200~~ **175** m.

B — intended for operations with a decision height lower than 15 m (50 ft), or no decision height and a runway visual range less than ~~200~~ **175** m but not less than 50 m.

...

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or that
- b) extend above a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

...

1.4 Certification of aerodromes

Note.— *The intent of these specifications is to ensure the establishment of a regulatory regime so that compliance with the specifications in this Annex can be effectively enforced. It is recognized that the methods of ownership, operation and surveillance of aerodromes differ among States. The most effective and transparent means of ensuring compliance with applicable specifications is the availability of a separate safety oversight entity and a well-defined safety oversight mechanism with support of appropriate legislation to be able to carry out the function of safety regulation of aerodromes. When an aerodrome is granted a certificate, it signifies to aircraft operators and other organizations operating on the aerodrome that, at the time of certification, the aerodrome meets the specifications regarding the facility and its operation, and that it has, according to the certifying authority, the capability to maintain these specifications for the period of validity of the certificate. The certification process also establishes the baseline for continued monitoring of compliance with the specifications. Information on the status of certification of aerodromes would need to be provided to the appropriate aeronautical information services for promulgation in the Aeronautical Information Publication (AIP). See 2.13.1 and Annex 15, Appendix 1, AD 1.5.*

1.4.1 States shall certify aerodromes used for international operations in accordance with the specifications contained in this Annex as well as other relevant ICAO specifications through an appropriate regulatory framework.

1.4.2 **Recommendation.**— States should certify aerodromes open to public use in accordance with these specifications as well as other relevant ICAO specifications through an appropriate regulatory framework.

1.4.3 The regulatory framework shall include the establishment of criteria and procedures for the certification of aerodromes.

Note.— *Guidance on a regulatory framework is given in the Manual on Certification of Aerodromes.*

1.4.4 As part of the certification process, States shall ensure that an aerodrome manual which will include all pertinent information on the aerodrome site, facilities, services, equipment, operating procedures, organization and management including a safety management system, is submitted by the applicant for approval/acceptance prior to granting the aerodrome certificate.

Note.— *The intent of a safety management system is to have in place an organized and orderly approach in the management of aerodrome safety by the aerodrome operator. Guidance on an aerodrome safety management system is given in the Safety Management Manual (SMM) (Doc 9859) and in the Manual on Certification of Aerodromes (Doc 9774).*

...

CHAPTER 2. AERODROME DATA

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2.9 Condition of the movement area and related facilities

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2.9.3 ~~Recommendation.~~—To facilitate compliance with 2.9.1 and 2.9.2, inspections of the movement area ~~should~~ **shall** be carried out each day at least once where the code number is 1 or 2 and at least twice where the code number is 3 or 4.

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

...

2.11 Rescue and fire fighting

...

2.11.2 **Recommendation.**— *The level of protection normally available at an aerodrome should be expressed in terms of the category of the rescue and fire fighting services as described in 9.2 and in accordance with the types and amounts of extinguishing agents normally available at the aerodrome*

2.11.3 ~~Significant e~~ **C**hanges in the level of protection normally available at an aerodrome for rescue and fire fighting shall be notified to the appropriate air traffic services units and aeronautical information 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 shall be advised accordingly.

Note.— ~~A significant change in the level of protection is considered to be~~ **C**hanges in the level of protection from that ~~a change in the category of the rescue and fire fighting service from the category~~ normally available at the aerodrome ~~could~~ **r**esulting from a change in ~~the~~ **a**vailability of extinguishing agents, equipment to deliver the agents or personnel to operate the equipment, etc.

2.11.4 **Recommendation.**— *A significant change should be expressed in terms of the new category of the rescue and fire fighting service available at the aerodrome.*

...

2.13 Coordination between aeronautical information services and aerodrome authorities

2.13.1 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and aerodrome authorities responsible for aerodrome services to report to the responsible aeronautical information services unit, with a minimum of delay:

- a) information on **the status of certification of aerodromes and** aerodrome conditions (ref. 1.4, 2.9, 2.10, 2.11 and 2.12);
- b) the operational status of associated facilities, services and navigation aids within their area of responsibility;
- c) any other information considered to be of operational significance.

...

CHAPTER 5. VISUAL AIDS FOR NAVIGATION

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5.2.8 Taxiway centre line marking

Application

5.2.8.1 Taxiway centre line marking shall be provided on a paved taxiway, de-icing/anti-icing facility and apron where the code number is 3 or 4 in such a way as to provide continuous guidance between the runway centre line and aircraft stands.

5.2.8.2 **Recommendation.**— *Taxiway centre line marking should be provided on a paved taxiway, de-icing/anti-icing facility and apron where the code number is 1 or 2 in such a way as to provide continuous guidance between the runway centre line and aircraft stands.*

5.2.8.3 Taxiway centre line marking shall be provided on a paved runway when the runway is part of a standard taxi-route and:

- a) there is no runway centre line marking; or
- b) where the taxiway centre line is not coincident with the runway centre line.

5.2.8.4 Recommendation.— *Where it is necessary to denote the proximity of a runway-holding position, enhanced taxiway centre line marking should be provided.*

Note.— *The provision of enhanced taxiway centre line marking may form part of runway incursion prevention measures.*

5.2.8.5 Where provided, enhanced taxiway centre line marking shall be installed at all taxiway/runway intersections at that aerodrome.

Location

5.2.8.4.6 Recommendation.— *On a straight section of a taxiway the taxiway centre line marking should be located along the taxiway centre line. On a taxiway curve the marking should continue from the straight portion of the taxiway at a constant distance from the outside edge of the curve.*

Note.— *See 3.9.6 and Figure 3-2.*

5.2.8.5.7 Recommendation.— *At an intersection of a taxiway with a runway where the taxiway serves as an exit from the runway, the taxiway centre line marking should be curved into the runway centre line marking as shown in Figures 5-6 and 5-25. The taxiway centre line marking should be extended parallel to the runway centre line marking for a distance of at least 60 m beyond the point of tangency where the code number is 3 or 4, and for a distance of at least 30 m where the code number is 1 or 2.*

5.2.8.6.8 Recommendation.— *Where taxiway centre line marking is provided on a runway in accordance with 5.2.8.3, the marking should be located on the centre line of the designated taxiway.*

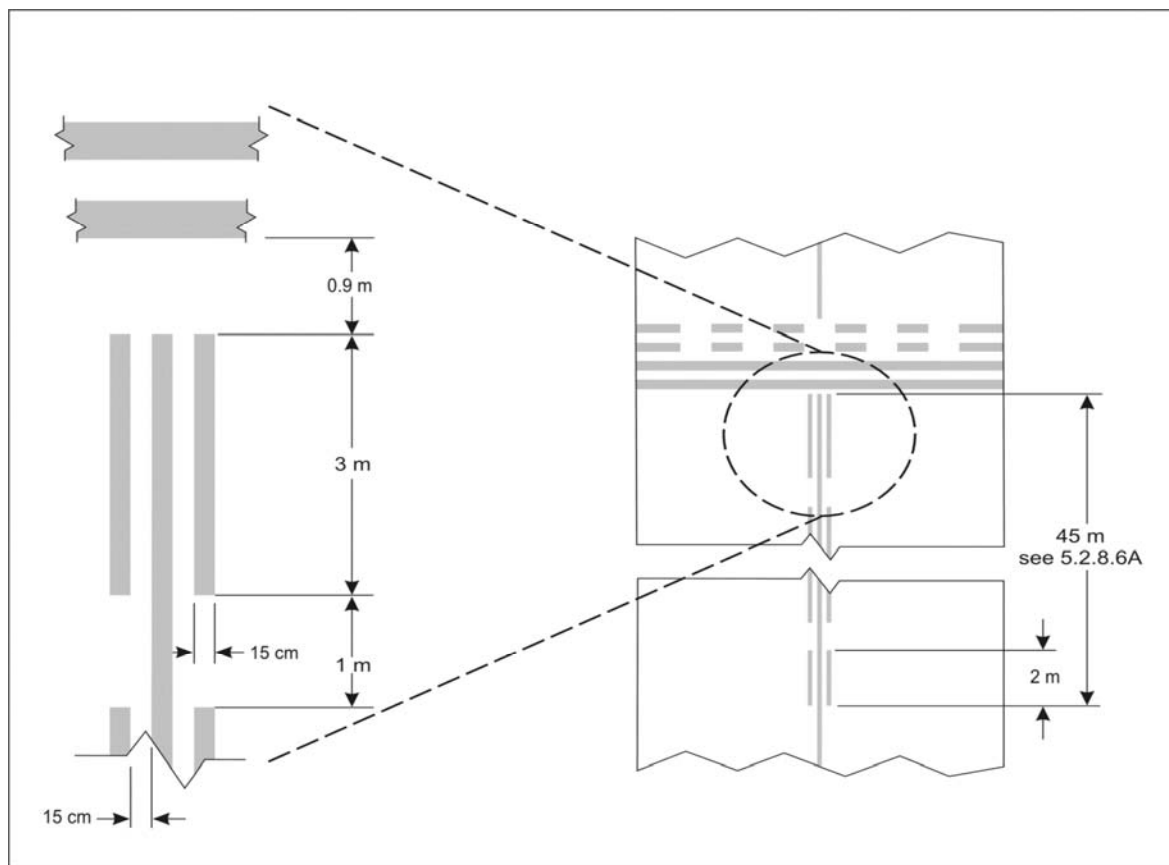
5.2.8.9 Where provided, an enhanced taxiway centre line marking shall extend from the runway holding position Pattern A (as defined in Figure 5-6, Taxiway markings) to a distance of up to 45 m (a minimum of three (3) dashed lines) in the direction of travel away from the runway or to the next runway holding position, if within 45m distance.

Characteristics

5.2.8.7.10 A taxiway centre line marking shall be at least 15 cm in width and continuous in length except where it intersects with a runway-holding position marking or an intermediate holding position marking as shown in Figure 5-6.

5.2.8.11 Enhanced taxiway centre line marking shall be as shown in Figure 5-6A.

Editorial Note.— Insert new Figure 5-6A as follows:



5-6A Enhanced taxiway centre line marking

5.2.16 Mandatory instruction marking

Note. — Guidance on mandatory instruction marking is given in the Aerodrome Design Manual, Part 4.

Application

5.2.16.1 Where it is impracticable to install a mandatory instruction sign in accordance with 5.4.2.1, a mandatory instruction marking shall be provided on the surface of the pavement.

5.2.16.2 **Recommendation.** — *Where operationally required, such as on taxiways exceeding 60 m in width, or to assist in the prevention of a runway incursion, a mandatory instruction sign should be supplemented by a mandatory instruction marking.*

Location

5.2.16.3 The mandatory instruction marking on taxiways, where the code letter is A, B, C, or D, shall be located across the taxiway equally placed about the taxiway centerline and on the holding side of the runway-holding position marking as shown in Figure 5-9 (a). The distance between the nearest edge of the marking and the runway holding position marking or the taxiway centre line marking shall be not less than 1 m.

5.2.16.4 The mandatory instruction marking on taxiways, where the code letter is E or F, shall be located on ~~the left hand side~~ both sides of the taxiway centre line marking and on the holding side of the runway-holding position marking as shown in Figure 5-9 (b). The distance between the nearest edge of the marking and the runway holding position marking or the taxiway centre line marking shall be not less than 1 m.

5.2.16.5 **Recommendation.**— *Except where operationally required, a mandatory instruction marking should not be located on a runway.*

Characteristics

5.2.16.6 A mandatory instruction marking shall consist of an inscription in white on a red background. Except for a NO ENTRY marking, the inscription shall provide information identical to that of the associated mandatory instruction sign.

5.2.16.7 A NO ENTRY marking shall consist of an inscription in white reading NO ENTRY on a red background.

5.2.16.8 Where there is insufficient contrast between the marking and the pavement surface, the mandatory instruction marking shall include an appropriate border, preferably white or black.

5.2.16.9 **Recommendation.**— *The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and 2 m where the code letter is A or B. The inscriptions should be in the form and proportions shown in Appendix 3.*

5.2.16.10 **Recommendation.**— *The background should be rectangular and extend a minimum of 0.5 m laterally and vertically beyond the extremities of the inscription.*

Editorial Note.— Replace Figure 5-9 with new Figure 5-9 as follows:

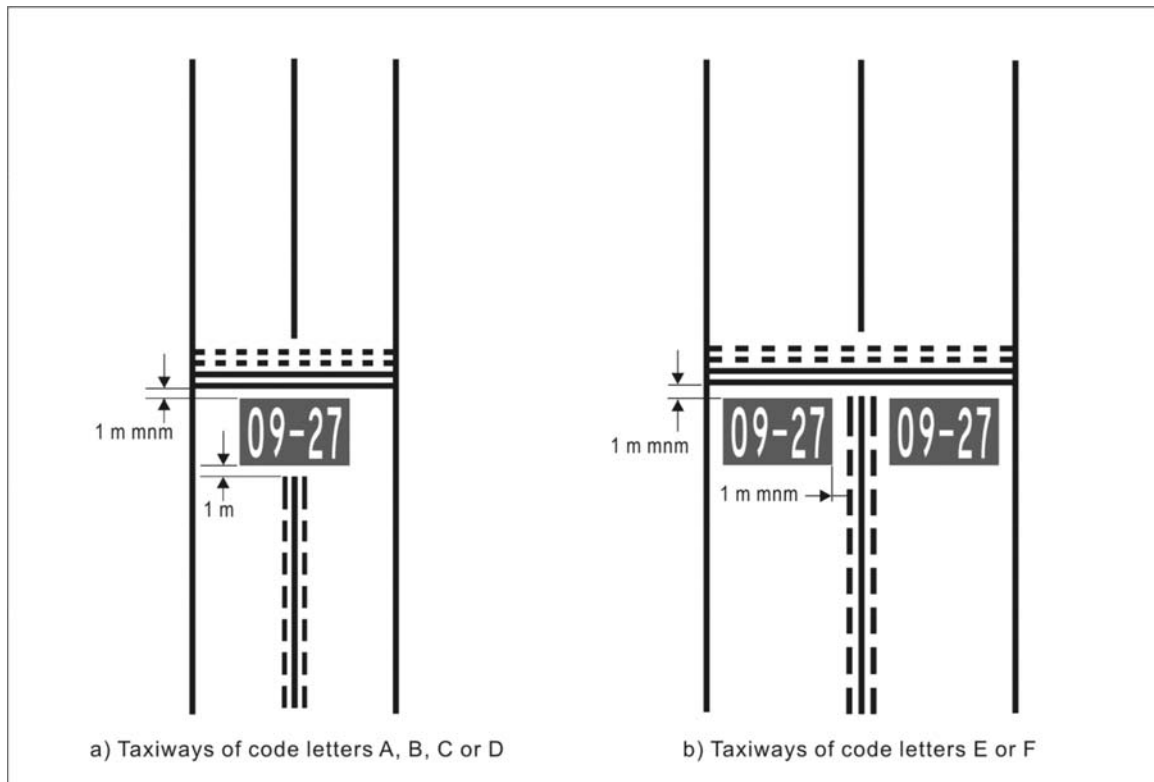


Figure 5-9. Mandatory instruction marking

...

5.3.17 Taxiway edge lights

...

Characteristics

5.3.17.7 Taxiway edge lights shall be fixed lights showing blue. The lights shall show up to at least ~~30~~ 75° above the horizontal and at all angles in azimuth necessary to provide guidance to a pilot taxiing in either direction. At an intersection, exit or curve the lights shall be shielded as far as practicable so that they cannot be seen in angles of azimuth in which they may be confused with other lights.

5.3.17.8 The intensity of taxiway edge lights shall be at least 2 cd from 0° to 6° vertical, and 0.2 cd at any vertical angles between 6° and 75°.

...

Editorial Note.— Insert new Section 5.3.25 as follows.

5.3.25 Advanced visual docking guidance system

Application

Note 1.— *Advanced visual docking guidance systems (A-VDGS) include those systems that, in addition to basic and passive azimuth and stop position information, provide pilots with active (usually sensor-based) guidance information, such as aircraft type indication (in accordance with ICAO Document 8643), distance-to-go information and closing speed. Docking guidance information is usually provided on a single display unit.*

Note 2.— *An A-VDGS may provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.*

5.3.25.1 **Recommendation.**— *An A-VDGS should be provided where it is operationally desirable to confirm the correct aircraft type for which guidance is being provided, and/or to indicate the stand centre line in use, where more than one is provided for.*

5.3.25.2 The A-VDGS shall be suitable for use by all types of aircraft for which the aircraft stand is intended.

5.3.25.3 The A-VDGS shall only be used in conditions in which its operational performance is specified.

Note 1.— *The use of the A-VDGS in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.*

Note 2.— *Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.*

5.3.25.4 The docking guidance information provided by an A-VDGS shall not conflict with that provided by a conventional visual docking guidance system on an aircraft stand if both types are provided and are in operational use. A method of indicating that the A-VDGS is not in operational use or unserviceable, shall be provided.

Location

5.3.25.5 The A-VDGS shall be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre.

Note.— *Usually the pilot-in-command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.*

Characteristics

5.3.25.6 The A-VDGS shall provide, at minimum, the following guidance information at the appropriate stage of the docking manoeuvre:

- a) an emergency stop indication;
- b) the aircraft type and model for which the guidance is provided;
- c) an indication of the lateral displacement of the aircraft relative to the stand centre line;
- d) the direction of azimuth correction needed to correct a displacement from the stand centre line;
- e) an indication of the distance to the stop position;
- f) an indication when the aircraft has reached the correct stopping position; and
- g) a warning indication if the aircraft goes beyond the appropriate stop position.

5.3.25.7 The A-VDGS shall be capable of providing docking guidance information for all aircraft taxi speeds encountered during the docking manoeuvre.

Note.— See the Aerodrome Design Manual, Part 4, for an indication of the maximum aircraft speeds relative to distance to the stopping position.

5.3.25.8 The time taken from the determination of the lateral displacement to its display shall not result in a deviation of the aircraft, when operated in normal conditions, from the stand centreline greater than 1 m.

5.3.25.9 **Recommendation.**— *The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table 5.X.*

Guidance information	max. deviation at stop position (stop area)	max. deviation at 9 m from stop position	max. deviation at 15 m from stop position	max. deviation at 25 m from stop position
Azimuth	±250 mm	±340 mm	±400 mm	±500 mm
Distance	±500 mm	±1000 mm	±1300 mm	Not specified

Table 5.X Recommended displacement accuracy

5.3.25.10 Symbols and graphics used to depict guidance information shall be intuitively representative of the type of information provided.

Note.— The use of colour would need to be appropriate and need to follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effects of colour contrasts would also need to be considered.

5.3.25.11 Information on the lateral displacement of the aircraft relative to the stand centre line shall be provided at least 25m prior to the stop position.

Note.— The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point.

5.3.25.12 Continuous closure distance and closure rate shall be provided from at least 15 m prior to the stop position.

5.3.25.13 **Recommendation.**— *Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.*

5.3.25.14 Throughout the docking manoeuvre, an appropriate means shall be provided on the A-VDGS to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the A-VDGS, no other information shall be displayed.

5.3.25.15 Provision to initiate an immediate halt to the docking procedure shall be made available to personnel responsible for the operational safety of the stand.

5.3.25.16 **Recommendation.**— *The word “STOP” in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.*

End of new text

Editorial Note.— Renumber existing Sections accordingly.

...

5.4 Signs

...

Characteristics

5.4.2.12 A mandatory instruction sign shall consist of an inscription in white on a red background.

5.4.2.13 **Recommendation.**— *Where, owing to environmental or other factors, the conspicuity of the inscription on a mandatory instruction sign needs to be enhanced, the outside edge of the white inscription should be supplemented by a black outline measuring 10 mm in width for runway code numbers 1 and 2, and 20 mm in width for runway code numbers 3 and 4.*

5.4.2.14 **14** The inscription on a runway designation sign shall consist of the runway designations of the intersecting runway properly oriented with respect to the viewing position of the sign, except that a runway designation sign installed in the vicinity of a runway extremity may show the runway designation of the concerned runway extremity only.

Editorial Note.— Renumber existing paragraphs accordingly.

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CHAPTER 6. VISUAL AIDS FOR DENOTING OBSTACLES

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Editorial Note.— Insert new Section 6.4 as follows.

6.4 Wind turbines

6.4.1 A wind turbine shall be marked and/or lighted if it is determined to be an obstacle.

Note.— see 4.3.1 and 4.3.2.

Markings

6.4.2 **Recommendation.**— *The rotor blades, nacelle and upper 2/3 of the supporting mast of wind turbines should be painted white, unless otherwise indicated by an aeronautical study.*

Lighting

6.4.3 **Recommendation.**— *When lighting is deemed necessary, medium intensity obstacle lights should be used. In the case of a wind farm, i.e. a group of two or more wind turbines, it should be regarded as an extensive object and the lights should be installed:*

- a) *to identify the perimeter of the wind farm;*
- b) *respecting the maximum spacing, in accordance with 6.3.14, between the lights along the perimeter, unless a dedicated assessment shows that a greater spacing can be used;*
- c) *so that, where flashing lights are used, they flash simultaneously; and*
- d) *so that, within a wind farm, any wind turbines of significantly higher elevation are also identified wherever they are located.*

6.4.4 **Recommendation.**— *The obstacle lights should be installed on the nacelle in such a manner as to provide an unobstructed view for aircraft approaching from any direction.*

Editorial Note.— End of new text.

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CHAPTER 9. AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATIONS

9.1 Aerodrome emergency planning

General

Introductory Note.— Aerodrome emergency planning is the process of preparing an aerodrome to cope with an emergency occurring at the aerodrome or in its vicinity. The objective of aerodrome emergency planning is to minimize the effects of an emergency, particularly in respect of saving lives and maintaining aircraft operations. The aerodrome emergency plan sets forth the procedures for coordinating the response of different aerodrome agencies (or services) and of those agencies in the surrounding community that could be of assistance in responding to the emergency. Guidance material to assist the appropriate authority in establishing aerodrome emergency planning is given in the Airport Services Manual, Part 7.

9.1.1 An aerodrome emergency plan shall be established at an aerodrome, commensurate with the aircraft operations and other activities conducted at the aerodrome.

9.1.2 The aerodrome emergency plan shall provide for the coordination of the actions to be taken in an emergency occurring at an aerodrome or in its vicinity.

Note 1.— Examples of emergencies are: aircraft emergencies, sabotage including bomb threats, unlawfully seized aircraft, dangerous goods occurrences, building fires, ~~and~~ natural disaster ~~and~~ public health emergencies.

Note 2.— Examples of public health emergencies are increased risk of travellers or cargo spreading a serious communicable disease internationally through air transport and severe outbreak of a communicable disease potentially affecting a large proportion of aerodrome staff.

9.1.3 The plan shall coordinate the response or participation of all existing agencies which, in the opinion of the appropriate authority, could be of assistance in responding to an emergency.

Note 1.— Examples of agencies are:

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

Note 2.— Public health services include planning to minimise adverse effects to the community from health related events and deal with population health issues rather than provision of health services to individuals.

...

9.2 Rescue and fire fighting

General

Introductory Note.— The principal objective of a rescue and fire fighting service is to save lives. For this reason, the provision of means of dealing with an aircraft accident or incident occurring at, or in the immediate vicinity of, an aerodrome assumes primary importance because it is within this area that there are the greatest opportunities of saving lives. This must assume at all times the possibility of, and need for, extinguishing a fire which may occur either immediately following an aircraft accident or incident, or at any time during rescue operations. The principal objective of a rescue and fire fighting service is to save lives in the event of an aircraft accident or incident occurring at, or in the immediate vicinity of, an aerodrome. The rescue and fire fighting service is provided to create and maintain survivable conditions, to provide egress routes for occupants and to initiate the rescue of those occupants unable to make their escape without direct aid. The rescue may require the use of equipment and personnel other than those assessed primarily for rescue and fire fighting purposes.

The most important factors bearing on effective rescue in a survivable aircraft accident are: the training received, the effectiveness of the equipment, the speed with which personnel and equipment designated for rescue and fire fighting purposes can be put into use.

Requirements to combat building and fuel farm fires, or to deal with foaming of runways, are not taken into account.

...

Level of protection to be provided

9.2.3 The level of protection provided at an aerodrome for rescue and fire fighting shall be appropriate to the aerodrome category determined using the principles in 9.2.5 and 9.2.6, except that, where the number of movements of the aeroplanes in the highest category normally using the aerodrome is less than 700 in the busiest consecutive three months, the level of protection provided shall be not less than one category below the determined category.

Note.— Either a takeoff or a landing constitutes a movement.

9.2.4 **Recommendation.**— *From 1 January 2005, The level of protection provided at an aerodrome for rescue and fire fighting should be equal to the aerodrome category determined using the principles in 9.2.5 and 9.2.6.*

9.2.5 The aerodrome category shall be determined from Table 9-1 and shall be based on the longest aeroplanes normally using the aerodrome and their fuselage width.

Note. — To categorize the aeroplanes using the aerodrome, first evaluate their overall length and second, their fuselage width.

9.2.6 If, after selecting the category appropriate to the longest aeroplane's overall length, that aeroplane's fuselage width is greater than the maximum width in Table 9-1, column 3 for that category, then the category for that aeroplane shall actually be one category higher.

~~*Note.* — Guidance on categorizing aerodromes for rescue and fire fighting purposes and on providing rescue and fire fighting equipment and services is given in Attachment A, Section 17 and in the Airport Services Manual, Part 1~~

Note 1. — See guidance in the Airport Services Manual, Part 1 for categorizing aerodromes, including those for all-cargo aircraft operations, for rescue and fire fighting purposes.

Note 2. — Guidance on training of personnel, rescue equipment for difficult environment and other facilities and services for rescue and fire fighting is given in Attachment A, Section 17 and in the Airport Services Manual, Part 1.

...

Extinguishing Agents

...

9.2.12 **Recommendation.**— At aerodromes where operation by aeroplanes larger than the average size in a given category are planned, the quantities of water should be recalculated and the amount of water for foam production and the discharge rates for foam solution **should** be increased accordingly.

Note. — Additional guidance is available in Chapter 2 of the Airport Services Manual, Part 1.

9.2.12 **13** The quantity of foam concentrates separately provided on vehicles for foam production shall be in proportion to the quantity of water provided and the foam concentrate selected.

...

9.2.16 **17** The discharge rate of the foam solution shall not be less than the rates shown in Table 9-2.

Table 9-2 Minimum usable amounts of extinguishing agents

Aerodrome category	Foam meeting performance level A		Foam meeting performance level B		Complementary agents	
	Water (L)	Discharge rate foam solution/ minute (L)	Water (L)	Discharge rate foam solution/ minute (L)	Dry chemical powders (kg)	Discharge Rate kg/sec

(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	350	350	230	230	45	2.25
2	1 000	800	670	550	90	2.25
3	1 800	1 300	1 200	900	135	2.25
4	3 600	2 600	2 400	1 800	135	2.25
5	8 100	4 500	5 400	3 000	180	2.25
6	11 800	6 000	7 900	4 000	225	2.25
7	18 200	7 900	12 100	5 300	225	2.25
8	27 300	10 800	18 200	7 200	450	4.5
9	36 400	13 500	24 300	9 000	450	4.5
10	48 200	16 600	32 300	11 200	450	4.5

Note 1. — The quantities of water shown in columns 2 and 4 are based on the average overall length of aeroplanes in a given category. ~~Where operations of an aeroplane larger than the average size are expected, the quantities of water would need to be recalculated. See the Airport Services Manual, Part 1 for additional guidance.~~

Note 2. Any other complementary agent having equivalent fire fighting capability may be used.

9.2.17 **18 Recommendation.**—The complementary agents ~~should~~ shall comply with the appropriate specifications of the International Organization for Standardization (ISO).*

Editorial Note.— To be put in footnote.

* See ISO Publication ~~5923 (Carbon Dioxide), 7201 (Halogenated Hydrocarbons) and 7202 (Powder).~~

9.2.18 **19 Recommendation.** — ~~The discharge rate of complementary agents should be selected for optimum effectiveness of the agent~~ be no less than the rates shown in Table 9-2.

9.2.20 **Recommendation.** — Dry chemical powders should only be substituted with an agent that has equivalent or better fire fighting capabilities, for all types of fires where complementary agent is expected to be used.

Note.— Guidance on the use of complementary agents can be found in the Airport Services Manual — Part 1.

...

Response time

...

9.2.23 **25 Recommendation.**— The operational objective of the rescue and fire fighting service should be to achieve a response time not exceeding three minutes to any other part of the movement area in optimum visibility and surface conditions.

Note 1.— Response time is considered to be the time between the initial call to the rescue and fire fighting service, and the time when the first responding vehicle(s) is (are) in position to apply foam at a rate of at least 50 per cent of the discharge rate specified in Table 9-2.

Note 2.— To meet the operational objective as nearly as possible in less than optimum conditions of visibility, it may be necessary to provide suitable guidance and/or procedures for rescue and fire fighting vehicles

Note 32.— 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.

9.2.26 Recommendation.— *To meet the operational objective as nearly as possible in less than optimum conditions of visibility, especially during low visibility operations, suitable guidance, equipment and/or procedures for rescue and fire fighting services should be provided.*

Note.— Additional guidance is available in the Airport Services Manual, Part 1.

9.2.2427 Recommendation.— *Any other vehicles, other than the first responding vehicle(s), required to deliver the amounts of extinguishing agents specified in Table 9-2 should— shall ensure continuous agent application and shall arrive no more than one— four minutes after the first responding vehicle(s) so as to provide continuous agent application from the initial call.*

9.2.28 Recommendation.— *Any vehicles, other than the first responding vehicles(s), required to deliver the amounts of extinguishing agents specified in Table 9-2 should ensure continuous agent application and should arrive no more than three minutes from the initial call.*

...

Personnel

9.2.34 38 All rescue and fire fighting personnel shall be properly trained to perform their duties in an efficient manner and shall participate in live fire drills commensurate with the types of aircraft and type of rescue and fire fighting equipment in use at the aerodrome, including pressure-fed fuel fires.

Note 1.— Guidance to assist the appropriate authority in providing proper training is given in Attachment A, Section 17 and Airport Services Manual, Part 1; and Training Manual, Part E 2.

Note 2.— Fires associated with fuel discharged under very high pressure from a ruptured fuel tank are known as “pressure-fed fuel fires”.

...

9.4 Bird Wildlife strike hazard reduction

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

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

a) the establishment of a national procedure for recording and reporting ~~bird~~ wildlife strikes to aircraft; ~~and~~

b) the collection of information from aircraft operators, airport personnel, ~~and other sources~~ etc. on the presence of ~~birds~~ wildlife on or around the aerodrome constituting a potential hazard to aircraft operations; ~~and~~

c) an ongoing evaluation of the wildlife hazard by competent personnel.

Note.— See Annex 15, Chapter 8.

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

Note.— The IBIS is designed to collect and disseminate information on ~~bird~~ wildlife strikes to aircraft. Information on the system is included in the Manual on the ICAO Bird Strike Information System (IBIS).

9.4.3 ~~When a bird strike hazard is identified at an aerodrome, the appropriate authority shall take a~~ Action shall be taken to decrease the risk ~~the number of birds constituting a potential hazard to aircraft operations by adopting measures for discouraging their presence on, or in the vicinity of, an aerodrome to minimize the likelihood of collisions between wildlife and aircraft.~~

Note.— Guidance on effective measures for establishing whether or not ~~birds~~ wildlife, on or near an aerodrome, constitute a potential hazard to aircraft operations, and on methods for discouraging their presence, is given in the Airport Services Manual, Part 3.

9.4.4 The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any ~~such other source attracting which may attracts~~ bird wildlife activity on, or in the vicinity of, ~~an~~ to the aerodrome, or its vicinity, unless an appropriate ~~aeronautical study~~ wildlife assessment indicates that they are unlikely to create conditions conducive to a ~~bird~~ wildlife hazard problem. Where the elimination of existing sites is not possible, the appropriate authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.

Note.— **9.4.5 Recommendation** – States should give ~~Due consideration~~ ~~needs to be given to airport operators' to aviation safety~~ concerns related to land developments ~~close to the airport boundary~~ in the vicinity of the aerodrome that may attract ~~birds~~ wildlife.

...

CHAPTER 10. AERODROME MAINTENANCE

10.2 Pavements

10.2.1 The surfaces of all movement areas including pavements (runways, taxiways, and aprons) and adjacent areas shall be kept clear of inspected and their conditions monitored regularly as part of an aerodrome preventive and corrective maintenance programme with the objective of avoiding and eliminating any loose stones or other objects/debris that might cause damage to aircraft structures or engines on an aeroplane, aircraft or impair the operation of aircraft systems.

Note 1.— See 2.9.3 for inspections of movement areas.

Note 2.— Guidance on carrying out daily inspections of the movement area is given in the Airport Services Manual, Part 8, Manual of Surface Movement Guidance and Control Systems (SMGCS) and the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual.

Note 3.— Additional guidance on sweeping/cleaning of surfaces is contained in the Airport Services Manual, Part 9.

Note 4.— Guidance on precautions to be taken in regard to the surface of shoulders is given in Attachment A, Section 8, and the Aerodrome Design Manual, Part 2.

**APPENDIX 1. COLOURS FOR AERONAUTICAL GROUND LIGHTS,
MARKINGS, SIGNS AND PANELS**

...

3.2 Recommendation.— *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 A1-2):

...

g) *Green*

Yellow boundary : $x=0.313$

White boundary: $y=0.243+0.670x$

Blue boundary: $y=0.493-0.524x$

Luminance factor: $\beta=0.10$ (mm)

...

3.4 Recommendation.— *The chromaticity and luminance factors of colours for **luminescent or transilluminated** (internally illuminated) signs and panels should be within the following boundaries when determined under standard conditions.*

CIE Equations (see Figure A1-4):

...

e) *Green*

Yellow boundary : $x=0.313$

White boundary: $y=0.243+0.670x$

Blue boundary: $y=0.493-0.524x$

Luminance factor: $\beta=0.10$ minimum (day conditions)

Relative luminance: 5% (minimum)

to white (night conditions) 30% (maximum)

...

Editorial Note.— Replace Figure A1-2 with new Figure A1-2 as follows:

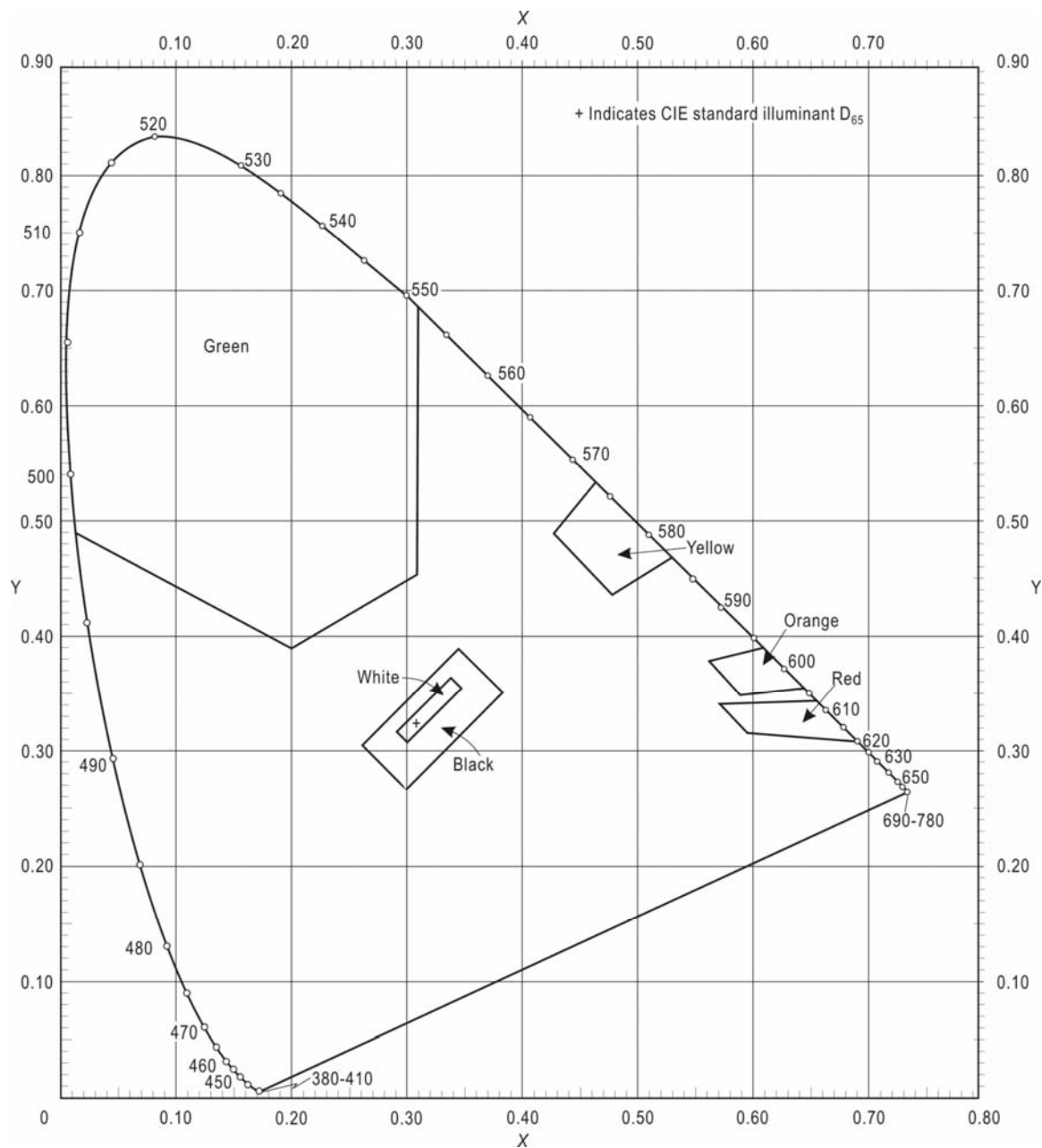


Figure A1-2 Ordinary colours for markings and externally illuminated signs and panels

Editorial Note.— Replace Figure A1-4 with new Figure A1-4 as follows:

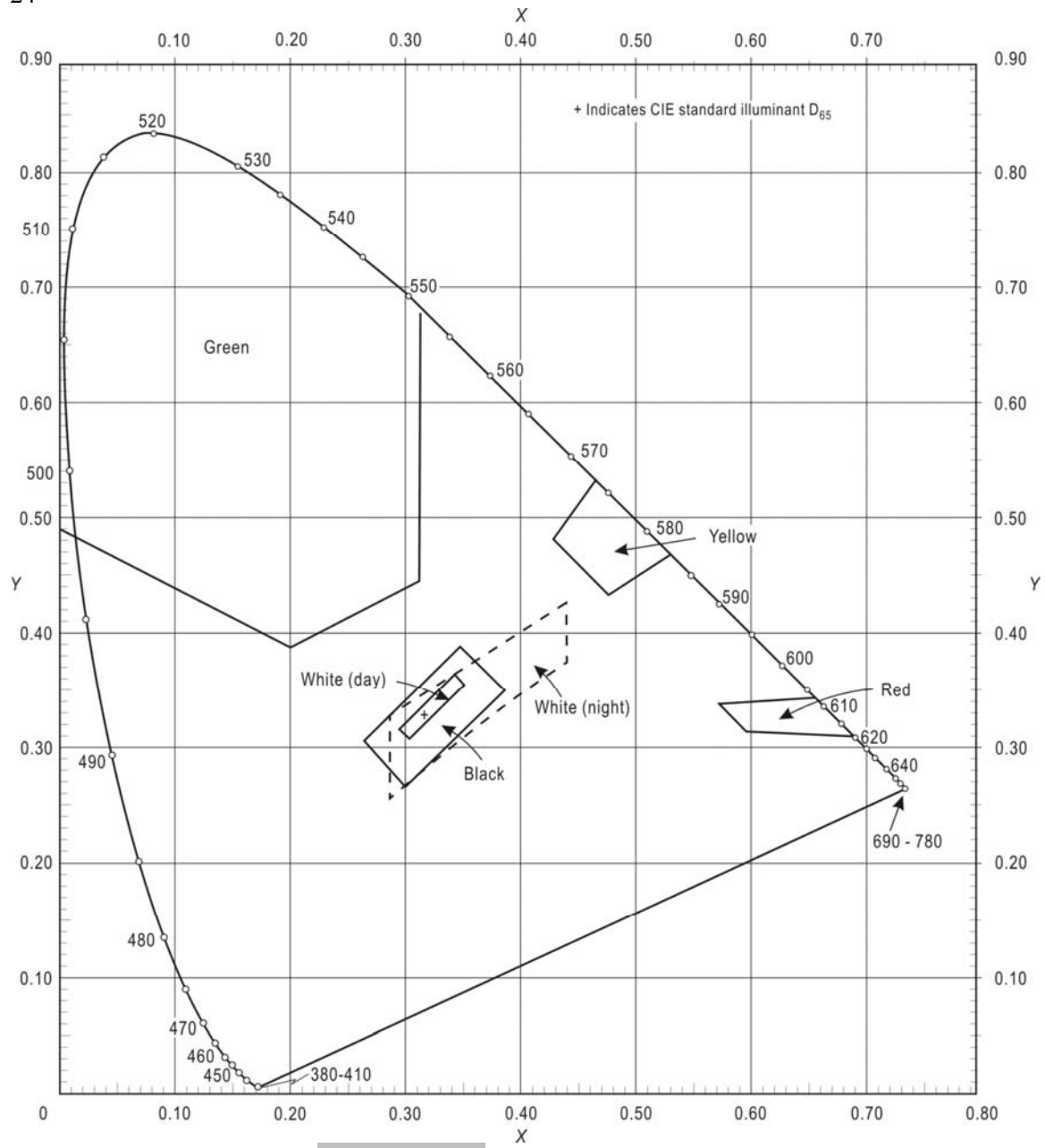


Figure A1-4. Colours of luminescent or transilluminated (internally illuminated) signs and panels

APPENDIX 2. AERONAUTICAL GROUND LIGHT CHARACTERISTICS

...

Add a new note to Figure A2-9

Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

2. Toe-in 3.5 degrees.

3. For red light, multiply values by 0.15.

4. For yellow light, multiply values by 0.40.

5. See collective notes for Figures A2-1 to A2-11.

Figure A2-9. Isocandela diagram for runway edge light where width of runway is 45 m (white light)

Add a new note to Figure A2-10

Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

2. Toe-in 4.5 degrees

3. For red light, multiply values by 0.15.

4. For yellow light, multiply values by 0.40.

5. See collective notes for Figures A2-1 to A2-11.

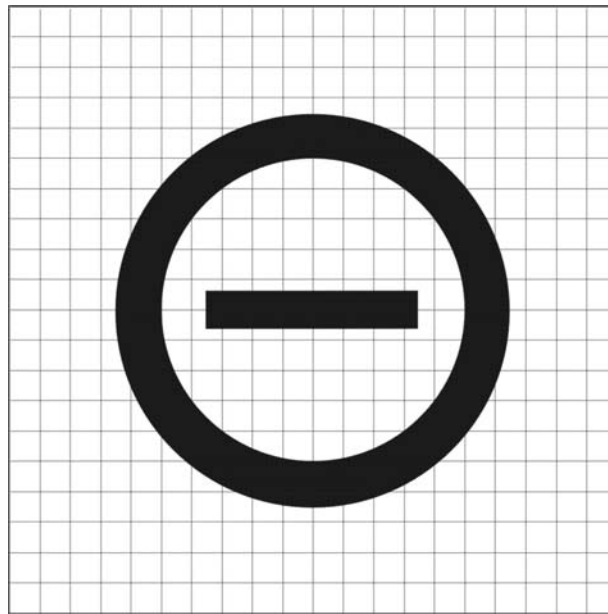
Figure A2-10. Isocandela diagram for runway edge light where width of runway is 60 m (white light)

...

APPENDIX 4. REQUIREMENTS CONCERNING DESIGN OF TAXIING GUIDANCE SIGNS

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Editorial Note.— Replace the NO ENTRY sign in Figure A4-2 as follows:



NO ENTRY sign

Note. — Existing NO ENTRY signs not conforming to the above dimensions are to be replaced not later than 1 January 2012

**ATTACHMENT A. GUIDANCE MATERIAL
SUPPLEMENTARY TO ANNEX 14, VOLUME I**

...

5. Runway surface evenness

5.1 In adopting tolerances for runway surface irregularities, the following standard of construction is achievable for short distances of 3 m and conforms to good engineering practice:

Except across the crown of a camber or across drainage channels, the finished surface of the wearing course is to be of such regularity that, when tested with a 3 m straight-edge placed anywhere in any direction on the surface, there is no deviation greater than 3 mm between the bottom of the straight-edge and the surface of the pavement anywhere along the straightedge.

5.2 Caution should also be exercised when inserting runway lights or drainage grilles in runway surfaces to ensure that adequate smoothness of the surface is maintained.

5.3 The operation of aircraft and differential settlement of surface foundations will eventually lead to increases in surface irregularities. Small deviations in the above tolerances will not seriously hamper aircraft operations. In general, isolated irregularities of the order of 2.5 cm to 3 cm over a 45 m distance are tolerable. ~~Exact information of the~~ Although maximum acceptable deviations cannot be given, as it varies with the type and speed of an aircraft, the limits of acceptable surface irregularities can be estimated to a reasonable extent. The following table describes maximum and temporarily acceptable limits. If the maximum limits are exceeded, corrective action should be undertaken as soon as reasonably practicable to improve the ride quality. If the temporarily acceptable limits are exceeded, the portions of the runway that exhibit such roughness should have corrective measures taken immediately if aircraft operations are to be continued.

1-1 Surface Irregularity	Minimum Acceptable Length of Irregularity (m)								
	3	6	9	12	15	20	30	45	60
Maximum Surface Irregularity Height (or Depth) (cm)	3	3.5	4	5	5.5	6	6.5	8	10
Temporary Acceptable Surface Irregularity Height (or Depth) (cm)	3.5	5.5	6.5	7.5	8	9	11	13	15

Note that “Surface Irregularity” is defined herein to mean isolated surface elevation deviations that do not lie along a uniform slope through any given section of a runway. For the purposes of this concern, a “section of a runway” is defined herein to mean a segment of a runway throughout which a continuing general uphill, downhill or flat slope is prevalent. The length of this section is generally between 30 and 60 metres, and can be greater, depending on the longitudinal profile and the condition of the pavement.

5.4 The following figure illustrates a comparison of the surface roughness criteria with those developed by the United States Federal Aviation Administration.

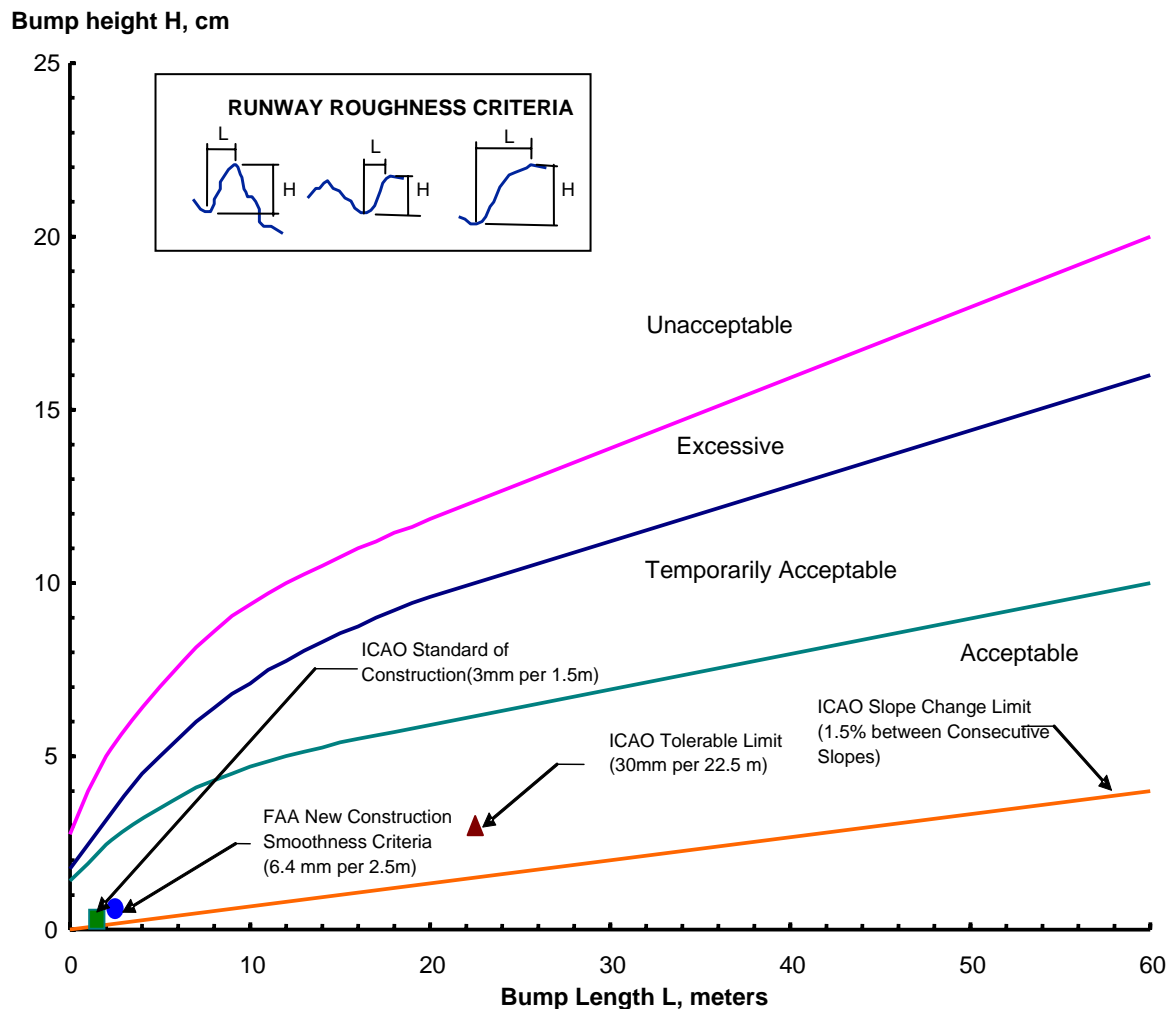


Figure A-3: Comparison of Roughness Criteria

Note — This criteria addresses single event roughness, not long wave length harmonic effects nor the effect of repetitive surface undulations.

Editorial Note.— Renumber subsequent paragraphs and figures accordingly.

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10. Location of threshold

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10.2 Displaced threshold

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10.2.5 In the event of a threshold being located according to the criteria for obstacle-free surfaces in the preceding paragraph, the obstacle marking requirements of Chapter 6 should continue to be met in relation to the displaced threshold.

10.2.6 Depending on the length of the displacement, the RVR at the threshold could differ from that at the beginning of the runway for take-offs. The use of red runway edge lights with photometric intensities lower than the nominal value of 10 000 cd for white lights increases that phenomenon. The impact of a displaced threshold on take-off minima should be assessed by the appropriate authority.

10.2.7 Provisions in Annex 14, Volume I, regarding marking and lighting of displaced thresholds and some operational recommendations can be found in paragraphs 5.2.4.9 and 10, 5.3.5.5, 5.3.8.1, 5.3.9.7, 5.3.10.3 and 7, and 5.3.12.6.

...

17. Rescue and fire fighting services

...

17.5 Facilities

17.5.1 The provision of special telephone, two-way radio communication and general alarm systems for the rescue and fire fighting service is desirable to ensure the dependable transmission of essential emergency and routine information. Consistent with the individual requirements of each aerodrome, these facilities serve the following purposes:

a) direct communication between the activating authority and the aerodrome fire station in order to ensure the prompt alerting and dispatch of rescue and fire fighting vehicles and personnel in the event of an aircraft accident or incident;

b) direct communication between the rescue and fire fighting service and the flight crew of an aircraft in emergency;

- b c) emergency signals to ensure the immediate summoning of designated personnel not on standby duty;
- e d) as necessary, summoning essential related services on or off the aerodrome; and
- d e) maintaining communication by means of two-way radio with the rescue and fire fighting vehicles in attendance at an aircraft accident or incident.

Editorial Note. — Text applicable in 2010.

CHAPTER 1. GENERAL

1.1. Definitions

~~Safety~~ **State safety programme**. An integrated set of regulations and activities aimed at improving safety.

1.5 Safety management

1.5.1 States shall establish a **State** safety programme in order to achieve an acceptable level of safety in ~~aerodrome operations~~ **civil aviation**.

Note.— A framework for the implementation and maintenance of a State safety programme is contained in Attachment C and guidance on a State safety programme is contained in the Safety Management Manual (SMM) (Doc 9859).

1.5.2 The acceptable ~~level(s)~~ **level** of safety to be achieved shall be established by the State(s) ~~concerned~~.

Note.— Guidance on safety programmes and on defining acceptable levels of safety is contained in Attachment E to Annex 11 and in the Safety Management Manual (SMM) (Doc 9859).

Note.— Guidance on defining acceptable level of safety is contained in the Safety Management Manual (SMM) (Doc 9859).

1.5.3 States shall require, as part of their **State** safety programme, that a certified aerodrome ~~operator~~ implements a safety management system acceptable to the State that, as a minimum:

- a) identifies safety hazards;
- b) ensures ~~that~~ **the implementation of** remedial action necessary to maintain ~~an acceptable level of agreed~~ **safety performance is implemented**;

- c) provides for continuous monitoring and regular assessment of the safety level achieved performance; and
- d) aims to make at a continuous improvement to of the overall level of safety performance of the safety management system.

Note.— Guidance on defining safety performance is contained in the Safety Management Manual (SMM) (Doc 9859).

1.5.4 A safety management system shall clearly define lines of safety accountability throughout a certified aerodrome operator, including a direct accountability for safety on the part of senior management.

Note.— The framework for the implementation and maintenance of a safety management system is contained in Appendix 7. Guidance on safety management systems is contained in the Safety Management Manual (SMM) (Doc 9859), and in the Manual on Certification of Aerodromes (Doc 9774).

...

Insert new Appendix 7 as follows:

APPENDIX 7. FRAMEWORK FOR SAFETY MANAGEMENT SYSTEMS (SMS)

(See Chapter 1, 1.5.4)

Introduction

This appendix specifies the framework for the implementation and maintenance of a safety management system (SMS) by a certified aerodrome. An SMS is a management system for the management of safety by an organization. The framework includes four components and twelve elements representing the minimum requirements for SMS implementation. The implementation of the framework shall be commensurate with the size of the organization and the complexity of the services provided. This appendix also includes a brief description of each element of the framework.

1. Safety policy and objectives
 - 1.1 – Management commitment and responsibility
 - 1.2 – Safety accountabilities
 - 1.3 – Appointment of key safety personnel
 - 1.4 – Coordination of emergency response planning
 - 1.5 – SMS documentation

2. Safety risk management
 - 2.1 – Hazard identification
 - 2.2 – Safety risk assessment and mitigation
3. Safety assurance
 - 3.1 – Safety performance monitoring and measurement
 - 3.2 – The management of change
 - 3.3 – Continuous improvement of the SMS
4. Safety promotion
 - 4.1 – Training and education
 - 4.2 – Safety communication

1. Safety policy and objectives

1.1 Management commitment and responsibility

The certified aerodrome shall define the organization's safety policy which shall be in accordance with international and national requirements, and which shall be signed by the accountable executive of the organization. The safety policy shall reflect organizational commitments regarding safety; shall include a clear statement about the provision of the necessary resources for the implementation of the safety policy; and shall be communicated, with visible endorsement, throughout the organization. The safety policy shall include the safety reporting procedures; shall clearly indicate which types of operational behaviours are unacceptable; and shall include the conditions under which disciplinary action would not apply. The safety policy shall be periodically reviewed to ensure it remains relevant and appropriate to the organization.

1.2 Safety accountabilities

The certified aerodrome shall identify the accountable executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the certified aerodrome, for the implementation and maintenance of the SMS. The certified aerodrome shall also identify the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the SMS. Safety responsibilities, accountabilities and authorities shall be documented and communicated throughout the organization, and shall include a definition of the levels of management with authority to make decisions regarding safety risk tolerability.

1.3 Appointment of key safety personnel

The certified aerodrome shall identify a safety manager to be the responsible individual and focal point for the implementation and maintenance of an effective SMS.

1.4 Coordination of emergency response planning

The certified aerodrome shall ensure that an emergency response plan that provides for the orderly and efficient transition from normal to emergency operations and the return to normal operations, is properly coordinated with the emergency response plans of those organizations it must interface with during the provision of its services.

1.5 SMS documentation

The certified aerodrome shall develop an SMS implementation plan, endorsed by senior management of the organization, that defines the organization's approach to the management of safety in a manner that meets the organization's safety objectives. The organization shall develop and maintain SMS documentation describing safety policy and objectives, the SMS requirements, the SMS processes and procedures, the accountabilities, responsibilities and authorities for processes and procedures, and the SMS outputs. Also as part of the SMS documentation, the certified aerodrome shall develop and maintain a safety management systems manual (SMSM), to communicate its approach to the management of safety throughout the organization.

2. Safety risk management

2.1 Hazard identification

The certified aerodrome shall develop and maintain a formal process that ensures that hazards in operations are identified. Hazard identification shall be based on a combination of reactive, proactive and predictive methods of safety data collection.

2.2 Safety risk assessment and mitigation

The certified aerodrome shall develop and maintain a formal process that ensures analysis, assessment and control of the safety risks in aerodrome operations.

3. Safety assurance

3.1 Safety performance monitoring and measurement

The certified aerodrome shall develop and maintain the means to verify the safety performance of the organization, and to validate the effectiveness of safety risks controls. The safety performance of the organization shall be verified in reference to the safety performance indicators and safety performance targets of the SMS.

3.2 The management of change

The certified aerodrome shall develop and maintain a formal process to identify changes within the organization which may affect established processes and services; to describe the arrangements to ensure safety performance before implementing changes; and to eliminate or modify safety risk controls that are no longer needed or effective due to changes in the operational environment.

3.3 Continuous improvement of the SMS

The certified aerodrome shall develop and maintain a formal process to identify the causes of substandard performance of the SMS, determine the implications of substandard performance of the SMS in operations, and eliminate or mitigate such causes.

4. Safety promotion

4.1 Training and education

The certified aerodrome shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform the SMS duties. The scope of the safety training shall be appropriate to each individual's involvement in the SMS.

4.2 Safety communication

The certified aerodrome shall develop and maintain formal means for safety communication that ensures that all personnel are fully aware of the SMS, conveys safety critical information, and explains why particular safety actions are taken and why safety procedures are introduced or changed.

End of new text.

Insert new Attachment C as follows:

ATTACHMENT C. FRAMEWORK FOR THE STATE SAFETY PROGRAMME (SSP)

Introduction

This attachment introduces a framework for the implementation and maintenance of a State safety programme (SSP) by a State. An SSP is a management system for the management of safety by the State. The framework contemplates four components and eleven elements, outlined hereunder. The implementation of an SSP is commensurate with the size and complexity of the State's aviation system, and may require coordination among multiple authorities responsible for individual element functions in the State. The SSP framework introduced in this attachment, and the safety management system (SMS) framework specified in Appendix 7 must be viewed as complementary, yet distinct frameworks. This attachment also includes a brief description of each element of the framework.

1. State safety policy and objectives
 - 1.1. State safety legislative framework
 - 1.2. State safety responsibilities and accountabilities
 - 1.3. Accident and incident investigation
 - 1.4. Enforcement policy
2. State safety risk management
 - 2.1. Safety requirements for the service provider's SMS
 - 2.2. Agreement on the service provider's safety performance
3. State safety assurance
 - 3.1. Safety oversight
 - 3.2. Safety data collection, analysis and exchange
 - 3.3. Safety-data-driven targeting of oversight on areas of greater concern or need
4. State safety promotion
 - 4.1. Internal training, communication and dissemination of safety information
 - 4.2. External training, communication and dissemination of safety information

Note.— Within the context of this attachment the term “service provider” refers to any organization providing aviation services. The term includes approved training organizations that are exposed to safety

risks during the provision of their services, aircraft operators, approved maintenance organizations, organizations responsible for type design and/or manufacture of aircraft, air traffic services providers and certified aerodromes, as applicable.

1. State safety policy and objectives

1.1 State safety legislative framework

The State has promulgated a national safety legislative framework and specific regulations, in compliance with international and national standards, that define how the State will conduct the management of safety in the State. This includes the participation of the State aviation organizations in specific activities related to the management of safety in the State, and the establishment of the roles, responsibilities and relationships of such organizations. The safety legislative framework and specific regulations are periodically reviewed to ensure they remain relevant and appropriate to the State.

1.2 State safety responsibilities and accountabilities

The State has identified, defined and documented the requirements, responsibilities and accountabilities regarding the establishment and maintenance of the SSP. This includes the directives to plan, organize, develop, maintain, control and continuously improve the SSP in a manner that meets the State's safety objectives. It also includes a clear statement about the provision of the necessary resources for the implementation of the SSP.

1.3 Accident and incident investigation

The State has established an independent accident and incident investigation process, the sole objective of which is the prevention of accidents and incidents, and not the apportioning of blame or liability. Such investigations are in support of the management of safety in the State. In the operation of the SSP, the State maintains the independence of the accident and incident investigation organization from other State aviation organizations.

1.4 Enforcement policy

The State has promulgated an enforcement policy that establishes the conditions and circumstances under which service providers are allowed to deal with, and resolve, events involving certain safety deviations internally, within the context of the service provider safety management system (SMS), and to the satisfaction of the appropriate State authority. The enforcement policy also establishes the conditions and circumstances under which to deal with safety deviations through established enforcement procedures.

2. State safety risk management

2.1 Safety requirements for the service provider's SMS

The State has established the controls which govern how service providers will identify hazards and manage safety risks. These include the requirements, specific operating regulations and implementation policies for service provider's SMS. The requirements, specific operating regulations and implementation policies are periodically reviewed to ensure they remain relevant and appropriate to the service provider's.

2.2 Agreement on service providers safety performance

The State has agreed with individual service providers on the safety performance of their SMS. The agreed safety performance of an individual service provider's SMS is periodically reviewed to ensure it remains relevant and appropriate to the service providers.

3. State safety assurance

3.1 Safety oversight

The State has established mechanisms to ensure an effective monitoring of the eight critical elements of safety oversight function. The State has also established mechanisms to ensure that the identification of hazards and the management of safety risks by service providers follow established regulatory controls (requirements, specific operating regulations and implementation policies). These mechanisms include inspections, audits and surveys to ensure that regulatory safety risk controls are appropriately integrated into the service providers SMS, that they are being practised as designed, and that the regulatory controls have the intended effect on safety risks.

3.2 Safety data collection, analysis and exchange

The State has established mechanisms to ensure the capture and storage of data on hazards and safety risks at both an individual and aggregate State's level. The State has also established mechanisms to develop information from the stored data, and to actively exchange safety information with service providers and/or other States as appropriate.

3.3 Safety-data-driven targeting of oversight on areas of greater concern or need

The State has established procedures to prioritize inspections, audits and surveys towards those areas of greater safety concern or need, as identified by the analysis of data on hazards, their consequences in operations, and the assessed safety risks.

4. State safety promotion

4.1 Internal training, communication and dissemination of safety information

The State provides training and fosters awareness and two-way communication of safety-relevant information to support, within State aviation organizations, the development of an organizational culture that fosters an effective and efficient SSP.

4.2 External training, communication and dissemination of safety information

The State provides education and promotes awareness of safety risks and two-way communication of safety-relevant information to support among service providers the development of an organizational culture that fosters an effective and efficient SMS.

End of new text.

— END —