



International  
Civil Aviation  
Organization

Organisation  
de l'aviation civile  
internationale

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de Aviación Civil  
Internacional

Международная  
организация  
гражданской  
авиации

منظمة الطيران  
المدني الدولي

国际民用  
航空组织

Tel.: +1 514-954-6717

Ref.: AN 4/1.2.28-20/35

3 April 2020

**Subject:** Adoption of Amendment 15 to Annex 14,  
Volume I

**Action required:** a) Notify any disapproval before  
20 July 2020; b) Notify any differences and compliance  
before 5 October 2020<sup>1</sup>; c) Consider the use of the  
Electronic Filing of Differences (EFOD) System for  
notification of differences and compliance

Sir/Madam,

1. I have the honour to inform you that Amendment 15 to the International Standards and *Recommended Practices, Aerodromes — Aerodrome Design and Operations* (Annex 14, Volume I to the Convention on International Civil Aviation) was adopted by the Council at the fourth meeting of its 219th Session on 9 March 2020. 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 (<http://portal.icao.int>) where you can access all other relevant documentation.

2. When adopting the amendment, the Council prescribed 20 July 2020 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 15, to the extent it becomes effective, will become applicable on 5 November 2020<sup>2</sup>.

3. Amendment 15 arises from the recommendations developed by the third meeting of the Aerodrome Design and Operations Panel (ADOP/3) and the eighth meeting of the PANS-Aerodromes Study Group (PASG/8).

<sup>1</sup> 3 October 2022 for provisions related to airport master plan; and  
28 October 2024 for provisions related to pavement rating.

<sup>2</sup> 3 November 2022 for provisions related to airport master plan; and  
28 November 2024 for provisions related to pavement rating.

4. The amendment to the aerodrome design and operations specifications concerns, inter alia, provisions related to airport master planning for the expansion of existing and construction of new airports to cater for the rapid growth of air transport; accommodation of aeroplanes with folding wing tips; a new methodology for reporting pavement strength; improvements to selected physical characteristics and visual aids used at aerodrome with the objectives of enhancing safety as well as capacity and efficiency.

5. The amendment concerning aerodrome operational management consists essentially of the inclusion of notes to the specifications stemming from the amendment to the *Procedures for Air Navigation Services (PANS) - Aerodromes* (Doc 9981) as a result of the introduction of new chapters on aerodrome operational management (training; inspections of the movement area; work in progress; foreign object debris control; wildlife hazard management; apron safety; runway safety; and airside driver permit scheme and vehicle/equipment safety requirements).

6. Due to the restructuring of Annex 15 – *Aeronautical Information Services*, a consequential editorial amendment to Notes 1 and 2 of paragraph 2.5.5, is included in Amendment 15 to Annex 14, Volume I.

7. The subjects are given in the amendment to the Foreword of Annex 14, Volume I, a copy of which is in Attachment A.

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

- a) that before 20 July 2020 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 15 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 5 October 2020<sup>1</sup> you inform me of the following, using the Electronic Filing of Differences (EFOD) System or the form in Attachment C for this purpose:
  - 1) any differences that will exist on 5 November 2020<sup>2</sup> between the national regulations or practices of your Government and the provisions of the whole of Annex 14, Volume I, as amended by all amendments up to and including Amendment 15, and thereafter of any further differences that may arise; and
  - 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 15.

9. With reference to the request in paragraph 8 a) above, it should be noted that a registration of disapproval of Amendment 15 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

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<sup>1</sup> 3 October 2022 for provisions related to airport master plan; and  
28 October 2024 for provisions related to pavement rating.

<sup>2</sup> 3 November 2022 for provisions related to airport master plan; and  
28 November 2024 for provisions related to pavement rating.

in paragraph 8 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.

10. With reference to the request in paragraph 8 b) above, it also should be noted that the ICAO Assembly, at its 39th Session (27 September to 6 October 2016), resolved that Member States should be encouraged to use the EFOD System when notifying differences (Resolution A39-22 refers). The EFOD System is currently available on the Universal Safety Oversight Audit Programme (USOAP) restricted website (<http://www.icao.int/usoap>) which is accessible by all Member States. You are invited to consider using this for notification of compliance and differences.

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

12. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 8 b) above, to the ICAO Regional Office accredited to your Government.

13. At the fifth meeting of its 204th Session, the Council requested that States, when being advised of the adoption of an Annex amendment, be provided with information on implementation and available guidance material, as well as an impact assessment. This is presented for your information in Attachments E and F, respectively.

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

Fang Liu  
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 15 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
- E — Implementation task list and outline of guidance material in relation to Amendment 15 to Annex 14, Volume I
- F — Impact assessment in relation to Amendment 15 to Annex 14, Volume I



ATTACHMENT A to State letter AN 4/1.2.28-20/35

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

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>
15	<p>Third meeting of the Aerodrome Design and Operations Panel (ADOP/3)</p> <p>Eighth meeting of the PANS-Aerodromes Study Group (PASG/8)</p>	<p>Revised definition of precision approach runway category III; airport master plan; aeroplanes equipped with folding wing tips; reporting of pavement strength; reporting of works in progress on movement areas; width of clearways; standardized taxiway nomenclature; runway guard lights; no-entry bars; minimum sizes of signs; autonomous aircraft detection system; visual aids for denoting closed runways and taxiways or part thereof; training of aerodrome personnel; procedures on management of wildlife, apron safety and establishment of airside driver permit.</p>	<p>9 March 2020 20 July 2020 5 November 2020 3 November 2022 28 November 2024</p>

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ATTACHMENT B to State letter AN 4/1.2.28-20/35

NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF  
AMENDMENT 15 TO ANNEX 14, VOLUME I

To: The Secretary General  
International Civil Aviation Organization  
999 Boulevard Robert-Bourassa  
Montréal, Quebec  
Canada H3C 5H7

(State) \_\_\_\_\_ hereby wishes to disapprove the following parts of  
Amendment 15 to Annex 14, Volume I:

Signature \_\_\_\_\_

Date \_\_\_\_\_

*NOTES*

- 1) If you wish to disapprove all or part of Amendment 15 to Annex 14, Volume I, please dispatch this notification of disapproval to reach ICAO Headquarters by 20 July 2020. 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 15, 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.

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**NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES FROM  
ANNEX 14, VOLUME I  
(Including all amendments up to and including Amendment 15)**

To: The Secretary General  
International Civil Aviation Organization  
999 Boulevard Robert-Bourassa  
Montréal, 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 15.

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 15 (Please see Note 2) below.)

<b>a) Annex Provision</b> (Please give exact paragraph reference)	<b>b) Details of Difference</b> (Please describe the difference clearly and concisely)	<b>c) Remarks</b> (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 15 for which differences have been notified in 2 above.

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

Signature \_\_\_\_\_

Date \_\_\_\_\_

*NOTES*

- 1) If paragraph 1 above is applicable to your State, 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) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.
- 3) Guidance on the notification of differences is provided in the Note on the Notification of Differences and in the *Manual on Notification and Publication of Differences* (Doc 10055).
- 4) Please send a copy of this notification to the ICAO Regional Office accredited to your Government.

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**NOTE ON THE NOTIFICATION OF DIFFERENCES**  
*(Prepared and issued in accordance with instructions of the Council)*

1. *Introduction*

1.1 Article 38 of the *Convention on International Civil Aviation* (“Convention”) requires that a Contracting State notify ICAO any time it does not comply with a Standard in all respects, it does not bring its regulations or practices into full accord with any Standard, or it adopts regulations or practices differing in any particular respect from the Standard.

1.2 The Assembly and the Council, when reviewing the notification of differences by Contracting States in compliance with Article 38 of the Convention, have repeatedly noted that the timeliness and currency of such notifications is not entirely satisfactory. Therefore, this note is issued to reiterate the primary purpose of Article 38 of the Convention and to facilitate the determination and notification of differences.

1.3 The primary purpose of the notification of differences is to promote safety, regularity 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 Standards contained in Annexes to the Convention.

1.4 Contracting States are, therefore, requested to give particular attention to the notification of differences with respect to Standards in all Annexes, as described in paragraph 4 b) 1) of the Resolution of Adoption.

1.5 Although differences from Recommended Practices are not notifiable under Article 38 of the Convention, the Assembly has urged Contracting States to extend the above considerations to Recommended Practices contained in Annexes to the Convention, as well.

2. *Notification of differences from Standards and Recommended Practices (SARPs)*

2.1 Guidance to Contracting States in the notification of differences to Standards and Recommended Practices (SARPs) can only be given in very general terms. Contracting States are further reminded that compliance with SARPs generally extends beyond the issuance of national regulations and requires establishment of practical arrangements for implementation, such as the provision of facilities, personnel and equipment and effective enforcement mechanisms. Contracting States should take those elements into account when determining their compliance and differences. The following categories of differences are provided as a guide in determining whether a notifiable difference exists:

- a) ***A Contracting State’s requirement is more exacting or exceeds a SARP (Category A).*** This category applies when the national regulation and practices are more demanding than the corresponding SARP, or impose an obligation within the scope of the Annex which is not covered by the SARP. This is of particular importance where a Contracting State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;

- b) *A Contracting State's requirement is different in character or the Contracting State has established other means of compliance (Category B)\*.* This category applies, in particular, when the national regulation and practices are different in character from the corresponding SARP, or when the national regulation and practices differ in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and
- c) *A Contracting State's requirement is less protective, partially implemented or not implemented (Category C).* This category applies when the national regulation and practices are less protective than the corresponding SARP; when no national regulation has been promulgated to address the corresponding SARP, in whole or in part; or when the Contracting State has not brought its practices into full accord with the corresponding SARP.

These categories do not apply to Not Applicable SARP. Please see the paragraph below.

2.2 **Not Applicable SARP.** When a Contracting State deems a SARP 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 from Annex 8 provisions related to the design and construction of an aircraft.

2.3 **Differences from appendices, tables and figures.** The material comprising a SARP includes not only the SARP itself, but also the appendices, tables and figures associated with the SARP. Therefore, differences from appendices, tables and figures are notifiable under Article 38. In order to file a difference against an appendix, table or figure, States should file a difference against the SARP that makes reference to the appendix, table or figure.

2.4 **Differences from definitions.** Contracting States should notify differences from definitions. The definition of a term used in a SARP does not have independent status but is an essential part of each SARP in which the term is used. Therefore, a difference from the definition of the term may result in there being a difference from any SARP in which the term is used. To this end, Contracting States should take into consideration differences from definitions when determining compliance or differences to SARPs in which the terms are used.

2.5 The notification of differences should be not only to the latest amendment but to the whole Annex, including the amendment. In other words, Contracting States that have already notified differences are requested to provide regular updates of the differences previously notified until the difference no longer exists.

2.6 Further guidance on the identification and notification of differences, examples of well-defined differences and examples of model processes and procedures for management of the notification of differences can be found in the *Manual on Notification and Publication of Differences* (Doc 10055).

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\* The expression "different in character or other means of compliance" in b) would be applied to a national regulation and practice which achieve, by other means, the same objective as that of the corresponding SARPs or for other substantive reasons so cannot be classified under a) or c).

3. *Form of notification of differences*

3.1 Differences can be notified:

- a) by sending to ICAO Headquarters a form on notification of compliance or differences; or
- b) through the Electronic Filing of Differences (EFOD) System at [www.icao.int/usoap](http://www.icao.int/usoap).

3.2 When notifying differences, the following information should be provided:

- a) the number of the paragraph or subparagraph which contains the SARP to which the difference relates\*;
- b) the reasons why the State does not comply with the SARP, or considers it necessary to adopt different regulations or practices;
- c) a clear and concise description of the difference; and
- d) intentions for future compliance and any date by which your Government plans to confirm compliance with and remove its difference from the SARP for which the difference has been notified.

3.3 The differences notified will be made available to other Contracting States, normally in the terms used by the Contracting State when making the notification. In the interest of making the information as useful as possible, Contracting States are requested to ensure that:

- a) statements be as clear and concise as possible and be confined to essential points;
- b) the provision of extracts from national regulations not be considered as sufficient to satisfy the obligation to notify differences; and
- c) general comments, unclear acronyms and references be avoided.

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\* This applies only when the notification is made under 3.1 a).



**IMPLEMENTATION TASK LIST AND OUTLINE OF GUIDANCE MATERIAL  
IN RELATION TO AMENDMENT 15 TO ANNEX 14, VOLUME I**

**1. IMPLEMENTATION TASK LIST**

1.1 Essential steps to be followed by a State in order to implement the amendment to Annex 14, Volume I:

- a) identification of the rule-making process necessary to transpose the new ICAO provisions into national regulations;
- b) establishment of a national implementation plan that takes into account the new ICAO provisions;
- c) conducting of a gap analysis between the new ICAO provisions and national framework;
- d) drafting of the necessary modification(s) to the national regulations;
- e) official adoption of the national regulations and means of compliance;
- f) modification of the oversight framework according to the new national regulations;
- g) filing of State differences with ICAO, if necessary;
- h) publication of significant differences in the AIP;
- i) implementation of the new national regulations by aerodrome operators; and
- j) oversight by the State on the implementation of regulations.

**2. STANDARDIZATION PROCESS**

2.1 Effective date: 20 July 2020

2.2 Applicability date: 5 November 2020, except for:

- a) provisions related to airport master plan, 3 November 2022; and
- b) provisions related to pavement rating, 28 November 2024.

2.3 Embedded date(s): N/A

### 3. SUPPORTING DOCUMENTATION

#### 3.1 ICAO documentation

<b>Title</b>	<b>Type (PANS/TI/Manual/Circ)</b>	<b>Planned publication date</b>
Doc 9157, <i>Aerodrome Design Manual</i> , Part 1 — <i>Runways</i>	Updated guidance	November 2020
Doc 9157, <i>Aerodrome Design Manual</i> , Part 2 — <i>Taxiways, Aprons and Holding Bays</i>	Updated guidance	November 2020
Doc 9157, <i>Aerodrome Design Manual</i> , Part 3 — <i>Pavements</i>	Updated guidance	November 2020
Doc 9157, <i>Aerodrome Design Manual</i> , Part 4 — <i>Visual Aids</i>	Updated guidance	November 2020
Doc 9184, <i>Airport Planning Manual</i> , Part 1 — <i>Master Planning</i>	Updated guidance (rewrite of manual)	November 2021

### 4. IMPLEMENTATION ASSISTANCE TASKS

<b>Type</b>	<b>Global</b>	<b>Regional</b>
Workshops		Planning and Implementation Regional Groups (PIRGs) working groups

### 5. UNIVERSAL SAFETY OVERSIGHT AUDIT PROGRAMME (USOAP)

5.1 Existing protocol questions may need amendment or new protocol questions may be required. This will be assessed during the next amendment cycle of the protocol questions.

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**IMPACT ASSESSMENT IN RELATION TO AMENDMENT 15 TO  
ANNEX 14, VOLUME I**

**1. INTRODUCTION**

1.1 Amendment 15 to Annex 14, Volume I introduces new and modified specifications related to airport master planning, pavement rating, physical characteristics, visual aids for navigation and for denoting obstacles, and aerodrome operational management.

**2. IMPACT ASSESSMENT**

2.1. *Safety impact:* Positive. A standardized taxiway naming convention is intended to reduce confusion regarding navigation on the airport surface, improve awareness of runway crossings and to ensure that an extra level of awareness is available to aircraft crews and vehicle operators thus reducing the risk of runway incursions and taxiway confusion. With respect to provision related to clearway, adapting the width of a clearway according to the associated runway strip allows implementing clearways on Codes 1 and 2 non-instrument runways and results in a coherent approach for all kinds of safety areas. With regards to the amendments related to stop bars, runway guard lights, no-entry bars, the amendments are expected to eliminate ambiguities related to the application of the various visual aids at aerodromes and assist in reducing the risk of runway incursions.

2.2 *Financial impact:* Positive. In respect of provisions related to aeroplanes with folding wing tips, there is expected to be significant savings where not all parts of the aerodromes need to be improved to accommodate such aeroplanes to comply with the higher code. Once the wings are folded, the aeroplane can manoeuvre on areas designated for lower codes.

2.3 *Security impact:* Nil.

2.4 *Environmental impact:* Positive. The process of airport master planning makes reference to relevant provisions in Doc 9184, *Airport Planning Manual, Part 2 — Land Use and Environmental Control*. Provisions related to aeroplanes with folding wing tips are expected to reduce instances of overdesign in construction and leads to less use of natural resources and a more environmentally-efficient use of land surface. In respect of standardized taxiway naming, improved navigation leads to better efficiency and reduced taxiing fuel burn. Aircraft detection system, when installed, reduces the level of light pollution. It also reduces the potential for birds causing wildlife/bird strike hazards to aviation to be attracted by lights.

2.5 *Efficiency impact:* Positive. Good airport planning contributes to improved airport capacity in a timely manner. Delays will be reduced through more precise and up-to-date planning that provides the right facilities at the right time without compromising future needs and opportunities, thus avoiding significant delays due to capacity constraints. In respect of aeroplanes with folding wing tips, the provisions are expected to ensure more efficient use of existing aerodrome land surface and avoid unnecessary runway or taxiway relocations. Improvement to provisions related to no-entry bar may help aerodrome operators to make better use of the visual aid and have the potential to reduce the number of misleading operations.

2.6 *Expected implementation time:* Up to one year from the applicability date.



**AMENDMENT No. 15**

**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 **9 March 2020**. 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 2020** will become effective on that date and will become applicable on **5 November 2020** as specified in the Resolution of Adoption. (State letter AN 4/1.2.28-20/35 refers.)

**MARCH 2020**

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**AMENDMENT 15 TO THE INTERNATIONAL STANDARDS AND  
RECOMMENDED PRACTICES**

**ANNEX 14 — AERODROMES  
VOLUME I — AERODROME DESIGN AND OPERATIONS**

**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 9 March 2020 Amendment 15 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Aerodromes — Aerodrome Design and Operations* which for convenience is designated Annex 14, Volume I to the Convention;
2. *Prescribes* 20 July 2020 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 5 November 2020<sup>1</sup>;
4. *Requests the Secretary General:*
  - a) to notify each Contracting State immediately of the above action and immediately after 20 July 2020 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 5 November 2020<sup>1</sup> between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 5 October 2020<sup>2</sup>, and thereafter to notify the Organization of any further differences that arise;
    - 2) to notify the Organization before 5 October 2020<sup>2</sup> 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, following the procedure specified in subparagraph b) above with respect to differences from Standards.

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<sup>1</sup> 3 November 2022 for provisions related to airport master plan; and  
28 November 2024 for provisions related to pavement rating.

<sup>2</sup> 3 October 2022 for provisions related to airport master plan; and  
28 October 2024 for provisions related to pavement rating.

**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:

~~Text to be deleted is shown with a line through it.~~

text to be deleted

New text to be inserted is highlighted with grey shading.

new text to be inserted

~~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 15**  
**TO THE**  
**INTERNATIONAL STANDARDS**  
**AND RECOMMENDED PRACTICES**

**AERODROMES**

**ANNEX 14**  
**TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME I**  
**AERODROME DESIGN AND OPERATIONS**

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20. The ACNR-PCNR<sup>††</sup> method of reporting pavement strength ATT A-30

...

**ABBREVIATIONS AND SYMBOLS**

*(used in Annex 14, Volume I)*

*Abbreviations*

ACN<sup>†</sup> Aircraft classification number

ACNR<sup>††</sup> Aircraft classification number rating

ADP Airside driver permit

AIP Aeronautical information publication

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<sup>†</sup> Applicable until 27 November 2024.

<sup>††</sup> Applicable as of 28 November 2024.

DME Distance measuring equipment

E Modulus of elasticity

FOD Foreign object debris

...

PCN<sup>†</sup> Pavement classification number

PCNR<sup>††</sup> Pavement classification ~~number~~ rating

...

VOR Very high frequency omnidirectional radio range

WHMP Wildlife hazard management programme

WIP Work in progress

...

## CHAPTER 1. GENERAL

### 1.1 Definitions

...

**Aircraft classification number (ACN).**<sup>†</sup> A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.

**Aircraft classification ~~number~~ rating (ACNR).**<sup>††</sup> A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.

...

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

...

- d) **Precision approach runway, category III.** A runway served by visual aids and non-visual aid(s) intended for landing operations following an instrument approach operation type B ~~to and along the surface of the runway and:~~

~~A~~ intended for operations with a decision height (DH) lower than 30 m (100 ft), or no decision height and a runway visual range ~~not~~ less than ~~175~~ 300 m or-

<sup>†</sup> Applicable until 27 November 2024.

<sup>††</sup> Applicable as of 28 November 2024.

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

~~C — intended for operations with no decision height (DH) and no runway visual range limitations.~~

*Note 1.— Visual aids need not necessarily be matched to the scale of non-visual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.*

*Note 2.— Refer to Annex 6 - Operation of Aircraft for instrument approach operation types.*

...

**Pavement classification number (PCN).**<sup>†</sup> A number expressing the bearing strength of a pavement for unrestricted operations.

**Pavement classification number rating (PCNR).**<sup>††</sup> A number expressing the bearing strength of a pavement for unrestricted operations.

...

## 1.4 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 2.— 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. Annex 19 — Safety Management contains the safety management provisions applicable to certified aerodromes. ~~Guidance on a harmonized safety management system is given in the~~ Overarching guidance on safety management systems is provided in the Safety Management Manual (SMM) (Doc 9859) and in the Manual on Certification of Aerodromes (Doc 9774). Procedures on the management of change; conduct of safety assessment; reporting and analyses of safety occurrences at aerodromes; runway safety; and continuous monitoring to enforce compliance with applicable specifications so that hazards are identified and risks are assessed and mitigated, ~~can be found~~ are specified in the PANS-Aerodromes (Doc 9981).*

...

<sup>†</sup> Applicable until 27 November 2024.

<sup>††</sup> Applicable as of 28 November 2024.



## 1.5 Airport design

*Applicable until 2 November 2022*

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

*Note.— Guidance on all aspects of the planning of aerodromes including security considerations is contained in the Airport Planning Manual (Doc 9184), Part 1.*

1.5.2 **Recommendation.**— *The design of aerodromes should take into account, where appropriate, land-use and environmental control measures.*

*Note.— Guidance on land-use planning and environmental control measures is contained in the Airport Planning Manual (Doc 9184), Part 2.*

## 1.5 Airport design and master plan

*Applicable as of 3 November 2022*

*Introductory Note.— A master plan for the long-term development of an aerodrome displays the ultimate development in a phased manner and reports the data and logic upon which the plan is based. Master plans are prepared to support modernization of existing aerodromes and creation of new aerodromes, regardless of size, complexity, and role. It is important to note that a master plan does not constitute a confirmed implementation programme. It provides information on the types of improvements to be undertaken in a phased manner. Guidance on all aspects of the planning of aerodromes is contained in the Airport Planning Manual (Doc 9184), Part 1.*

1.5.1 **Recommendation.**— *A master plan containing detailed plans for the development of aerodrome infrastructure should be established for aerodromes deemed relevant by States.*

*Note 1.— A master plan represents the development plan of a specific aerodrome . It is developed by the aerodrome operator based on economic feasibility, traffic forecasts, current and future requirements provided by, among others, aircraft operators (see 1.5.3).*

*Note 2.— A master plan may be required when the lack of capacity at an airport, due to conditions such as, but not limited to expected traffic growth, changing weather and climatic conditions or major works to address safety or environmental concerns, would put the connectivity of a geographical area at risk or cause severe disruption to the air transport network.*

1.5.2 **Recommendation.**— *The master plan should:*

- a) contain a schedule of priorities including a phased implementation plan; and*
- b) be reviewed periodically to take into account current and future aerodrome traffic .*

**1.5.3 Recommendation.**— *Aerodrome stakeholders, particularly aircraft operators, should be consulted in order to facilitate the master planning process using a consultative and collaborative approach.*

*Note 1.*— *Provision of advanced planning data to facilitate the planning process include future aircraft types, characteristics and numbers of aircraft expected to be used, the anticipated growth of aircraft movements, number of passengers and amount of cargo projected to be handled.*

*Note 2.*— *See Annex 9, Chapter 6 on the need for aircraft operators to inform aerodrome operators concerning the former's service, schedule and fleet plans to enable rational planning of facilities and services in relation to the traffic anticipated.*

*Note 3.*— *See ICAO's Policies on Charges for Airports and Air Navigation Services Doc 9082), Section 1, regarding consultation with users concerning provision of advance planning data and protection of commercially sensitive data.*

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

*Note.*— ~~*Guidance on all aspects of the planning of aerodromes including security considerations is contained in the Airport Planning Manual (Doc 9184), Part 1.*~~

**1.5.25 Recommendation.**— *The design of aerodromes should take into account, ~~where appropriate,~~ land-use and environmental control measures.*

*Note.*— *Guidance on land-use planning and environmental control measures is contained in the Airport Planning Manual (Doc 9184), Part 2.*

...

**Table 1-1. Aerodrome reference code**  
(see 1.6.2 to 1.6.4)

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	65 m up to but not including 80 m

*Note 1.— Guidance on planning for aeroplanes with wingspans greater than 80 m is given in the Aerodrome Design Manual (Doc 9157), Parts 1 and 2.*

*Note 2.— Procedures on conducting 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.*

...

## CHAPTER 2. AERODROME DATA

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### 2.5 Aerodrome dimensions and related information

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2.5.5 The geographical coordinates of obstacles in Area 2 (the part within the aerodrome boundary) and in Area 3 shall be measured and reported to the aeronautical information [...].

~~— Note 1.— See Annex 15, Appendix 1, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Areas 2 and 3.~~

~~Note 2.— PANS-AIM (Doc 10066), Appendix 4 and 8 provides requirements for obstacle data determination in Areas 2 and 3.~~

### 2.6 Strength of pavements

*Applicable until 27 November 2024*

...

### 2.6 Strength of pavements

*Applicable as of 28 November 2024*

2.6.1 The bearing strength of a pavement shall be determined.

2.6.2 The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5 700 kg shall be made available using the aircraft classification ~~number rating~~ – pavement classification ~~number rating~~ (ACN-PCN) (ACR-PCR) method by reporting all of the following information:

- a) the pavement classification ~~number rating~~ (PCN PCR) and numerical value;
- b) pavement type for ACN-PCN-ACR-PCR determination;

...

~~Note.— If necessary, the PCNs 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 (Doc 9157, Part 3).~~

2.6.3 The pavement classification ~~number~~ (PCN) ~~rating~~ (PCR) reported shall indicate that an aircraft with an aircraft classification ~~number~~ (ACN) ~~rating~~ (ACR) equal to or less than the reported PCR can operate on the pavement subject to any limitation on the tire pressure, or aircraft all-up mass for specified aircraft type(s).

~~Note.— Different PCNs PCRs may be reported if the strength of the pavement is subject to significant seasonal variation.~~

2.6.4 The ACN ACR of an aircraft shall be determined in accordance with the standard procedures associated with the ~~ACN-PCN~~ ACR-PCR method.

*Note.*— The standard procedures for determining the ACN ACR of an aircraft are given in the Aerodrome Design Manual (Doc 9157), Part 3. For convenience, several aircraft types currently in use have been evaluated on rigid and flexible pavements founded on the four subgrade categories in 2.6.6 b) below and the results tabulated in that manual. 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 detailed in 2.6.6 b) below.

2.6.5 For the purpose of determining the ACN ACR, the behaviour of a pavement shall be classified as equivalent to a rigid or flexible construction.

2.6.6 Information on pavement type for ACN-PCN ACR-PCR determination, subgrade strength category, maximum allowable tire pressure category and evaluation method shall be reported using the following codes:

a) *Pavement type for ACN-PCN ACR-PCR determination:*

	<i>Code</i>
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).

b) *Subgrade strength category:*

	<i>Code</i>
<i>High strength:</i> characterized by $K=150 \text{ MN/m}^3$ and representing all $K$ values above $120 \text{ MN/m}^3$ for rigid pavement, and by $\text{CBR}=15$ and representing all $\text{CBR}$ values above 13 for flexible pavements. characterized by $E=200 \text{ MPa}$ , and representing all $E$ values equal to or above $150 \text{ MPa}$ for rigid and flexible pavements.	A
<i>Medium strength:</i> characterized by $K=80 \text{ MN/m}^3$ and representing a range of $K$ of 60 to $120 \text{ MN/m}^3$ for rigid pavements, and by $\text{CBR}=10$ and representing a range in $\text{CBR}$ of 8 to 13 for flexible pavements. characterized by $E=120 \text{ MPa}$ and representing a range in $E$ values equal to or above $100 \text{ MPa}$ and strictly less than $150 \text{ MPa}$ , for rigid and flexible pavements.	B
<i>Low strength:</i> characterized by $K=40 \text{ MN/m}^3$ and representing a range of $K$ of 25 to $60 \text{ MN/m}^3$ for rigid pavements, and by $\text{CBR}=6$ and representing a range in $\text{CBR}$ of 4 to 8 for flexible pavements. characterized by $E=80 \text{ MPa}$ and representing a range in $E$ values equal to or above $60 \text{ MPa}$ and strictly less than $100 \text{ MPa}$ , for rigid and flexible pavements.	C
<i>Ultra-low strength:</i> characterized by $K=20 \text{ MN/m}^3$ and representing all $K$ values below $25 \text{ MN/m}^3$ for rigid pavements, and by $\text{CBR}=3$ and representing all $\text{CBR}$ values below 4 for flexible pavements. characterized by $E=50 \text{ MPa}$ and representing all $E$ values strictly less than $60 \text{ MPa}$ , for rigid and flexible pavements.	D

c) *Maximum allowable tire pressure category:*

	<i>Code</i>
<i>Unlimited:</i> no pressure limit	W
<i>High:</i> pressure limited to $1.75 \text{ MPa}$	X
<i>Medium:</i> pressure limited to $1.25 \text{ MPa}$	Y

	<i>Code</i>
<i>Low:</i> pressure limited to 0.50 MPa	Z
<i>Note.</i> — See Note 5 to 10.2.1 where the pavement is used by aircraft with tire pressures in the upper categories.	

d) *Evaluation method:*

	<i>Code</i>
<i>Technical evaluation:</i> representing a specific study of the pavement characteristics and application of pavement behaviour technology and the types of aircraft which the pavement is intended to serve.	T
<i>Using aircraft experience:</i> representing a knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use.	U

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

*Example 1.*— If the bearing strength of a rigid pavement, resting on a medium strength subgrade, has been assessed by technical evaluation to be PCN PCR 80 760 and there is no tire pressure limitation, then the reported information would be:

PCN PCR 80 760 / 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 PCN PCR 50 550 and the maximum tire pressure allowable is 1.25 MPa, then the reported information would be:

PCN PCR 50 550 / F / A / Y / U

*Note.*— Composite construction.

~~— *Example 3.*— If the bearing strength of a flexible pavement, resting on a medium strength subgrade, has been assessed by technical evaluation to be PCN PCR 40 and the maximum allowable tire pressure is 0.80 MPa, then the reported information would be:~~

~~— PCN PCR 40 / F / B / 0.80 MPa / T~~

~~*Example 4.*— If a pavement is subject to a B747-400 all-up mass limitation of 390 000 kg, then the reported information would include the following note.~~

~~*Note.*— The reported PCN is subject to a B747-400 all-up mass limitation of 390 000 kg.~~

2.6.7 **Recommendation.**— Criteria should be established to regulate the use of a pavement by an aircraft with an ACN ACR higher than the PCN PCR reported for that pavement in accordance with 2.6.2 and 2.6.3.

*Note.*— Attachment A, Section 20, details a simple method for regulating overload operations while the Aerodrome Design Manual, (Doc 9157), Part 3, includes the descriptions of more detailed procedures for evaluation of pavements and their suitability for restricted overload operations.

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

- a) maximum allowable aircraft mass; and
- b) maximum allowable tire pressure.

*Example:* ~~4 000 kg/0.50~~ 4 800 kg/0.60 MPa.

...

## 2.9 Condition of the movement area and related facilities

2.9.1 Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information services units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

*Note.— The nature, format and conditions of the information to be provided are specified in ~~Annex 15~~ the PANS-AIM (Doc 10066) and the PANS-ATM (Doc 4444). Specific procedures pertaining to works in progress on the movement area and to the reporting of such works are specified in the PANS-Aerodromes (Doc 9981).*

...

## CHAPTER 3. PHYSICAL CHARACTERISTICS

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### 3.4 Runway strips

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3.4.6 **Recommendation.**— *An object situated on a runway strip which may endanger aeroplanes should be regarded as an obstacle and should, as far as practicable, be removed.*

...

*Note 3.*— *Particular attention needs to be given to the design and maintenance of an open-air storm water conveyance in order to prevent wildlife attraction, notably birds. If needed, it can be covered by a net. Procedures on wildlife management are specified in the PANS-Aerodromes (Doc 9981). Further Guidance on wildlife control and reduction can be found in the Airport Services Manual (Doc 9137), Part 3.*

...

3.4.7 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 5, shall be permitted on any part of a runway strip of a precision approach runway delineated by the lower edges of the inner transitional surfaces.

- a) ~~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~~
- b) ~~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~~
- c) ~~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 shall be permitted on this part of the runway strip during the use of the runway for landing or take-off.

*Note.*— *See Chapter 4, section 4.1 for characteristics of inner transitional surface.*

....



### 3.6 Clearways

....

#### *Width of clearways*

3.6.3 **Recommendation.**— *A clearway should extend laterally on each side of the extended centre line of the runway, to a distance of at least:*

- a) *75 m for instrument runways; and*
- b) *half of the width of the runway strip for non-instrument runways.*

....

### 3.9 Taxiways

*Note 1.— Unless otherwise indicated, the requirements in this section are applicable to all types of taxiways.*

*Note 2.— See section 5.4.3 for a standardized scheme for the nomenclature of taxiways which may be used to improve situational awareness and as a part of an effective runway incursion prevention measure.*

*Note 23.— See Attachment A, Section 22, for specific taxiway design guidance which may assist in the prevention of runway incursions when developing a new taxiway or improving existing ones with known runway incursion safety risks.*

#### **General**

3.9.1 **Recommendation.**— *Taxiways should be provided to permit the safe and expeditious surface movement of aircraft.*

*Note.— Guidance on layout and standardized nomenclature of taxiways is given in the Aerodrome Design Manual (Doc 9157), Part 2.*

....

### **3.12 Holding bays, runway-holding positions, intermediate holding positions and road-holding positions**

....

3.12.6 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 shall be in accordance with Table 3-2 and, in the case of a precision approach runway, such that a holding aircraft or vehicle will not interfere with the operation of radio navigation aids or penetrate the inner transitional surface.

*Note.— Guidance for the positioning of runway-holding positions is given Aerodrome Design Manual (Doc 9157), Part 2.*

...

**Table 3-2. Minimum distance from the runway centre line to a holding bay, runway-holding position or road-holding position**

Type of runway	Code number			
	1	2	3	4
Non-instrument	30 m	40 m	75 m	75 m
Non-precision approach	40 m	40 m	75 m	75 m
Precision approach category I	60 m <sup>b</sup>	60 m <sup>b</sup>	90 m <sup>a,b</sup>	90 m <sup>a,b,e</sup>
Precision approach categories II and III	—	—	90 m <sup>a,b</sup>	90 m <sup>a,b,e</sup>
Take-off runway	30 m	40 m	75 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 localizer facilities. Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachments C and G, respectively (see also 3.12.6).

*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.*

- ~~e.— 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, ~~The a distance of 107.5-100-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.*

....

**3.12.8 Recommendation.—** *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 3-2 should be further increased 5 m for every metre the bay or position is higher than the threshold.*

## CHAPTER 5. VISUAL AIDS FOR NAVIGATION

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### 5.3 Lights

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#### 5.3.20 Stop bars

##### *Application*

*Note 1.— A stop bar is intended to be controlled either manually or automatically by air traffic services.*

*Note 2.— Runway incursions may take place in all visibility or weather conditions. The provision of stop bars at runway-holding positions and their use at night and in visibility conditions greater than 550 m runway visual range can form part of effective runway incursion prevention measures.*

5.3.20.1 A stop bar shall be provided at every runway-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 350 m, except where:

- a) appropriate aids and procedures are available to assist in preventing inadvertent incursions of traffic onto the runway; or
- b) operational procedures exist to limit, in runway visual range conditions less than a value of 550 m, the number of:
  - 1) aircraft on the manoeuvring area to one at a time; and
  - 2) vehicles on the manoeuvring area to the essential minimum.

~~5.3.20.2 A stop bar shall be provided at every runway holding position serving a runway when it is intended that the runway will be used in runway visual range conditions of values between 350 m and 550 m, except where:~~

- ~~a) appropriate aids and procedures are available to assist in preventing inadvertent incursions of traffic onto the runway; or~~
- ~~b) operational procedures exist to limit, in runway visual range conditions less than a value of 550 m, the number of:~~
  - ~~1) aircraft on the manoeuvring area to one at a time; and~~
  - ~~2) vehicles on the manoeuvring area to the essential minimum.~~

....

*(Editorial note: Renumber subsequent paragraphs accordingly)*

....

### 5.3.23 Runway guard lights

*Note.*— *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. ~~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 a runway. There are two standard configurations of runway guard lights as illustrated in Figure 5-29.~~*

#### **Application**

5.3.23.1 Runway guard lights, Configuration A shall be provided at each taxiway/runway intersection associated with a runway intended for use in:

- a) runway visual range conditions less than a value of 550 m where a stop bar is not installed; and
- b) runway visual range conditions of values between 550 m and 1 200 m where the traffic density is heavy.

*Note 1.*— *Runway guard lights, Configuration B may supplement Configuration A when deemed necessary.*

*Note 2.*— *Guidance on the design, operation and the location of runway guard lights Configuration B is given in the Aerodrome Design Manual (Doc 9157), Part 4.*

5.3.23.2 **Recommendation.**— *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.*

5.3.23.3 **Recommendation.**— *Configuration B runway guard lights should not be collocated with a stop bar.*

5.3.23.4 Where more than one runway-holding positions exist at a runway/taxiway intersection, only the set of runway guard lights associated with the operational runway-holding position shall be illuminated.

#### **Location**

5.3.23.45 Runway guard lights, Configuration A, shall be located at each side of the taxiway on the holding side of the runway-holding position marking ~~at a distance from the runway centre line not less than that specified for a take-off runway in Table 3-2.~~

5.3.23.56 Runway guard lights, Configuration B, shall be located across the taxiway on the holding side of the runway-holding position marking ~~at a distance from the runway centre line not less than that specified for a take-off runway in Table 3-2.~~

...

*(Editorial note: renumber subsequent paragraphs accordingly)*

5.3.23.910 The light beam shall be unidirectional and shall show yellow in the direction of approach to aligned so as to be visible to the pilot of an aeroplane taxiing to the runway-holding position.

*Note.— For guidance on orientation and aiming of runway guard lights, see the Aerodrome Design Manual (Doc 9157) Part 4.*

...

*(Editorial note: renumber subsequent paragraphs accordingly)*

....

### 5.3.29 No-entry bar

*Note 1.— A no-entry bar is intended to be controlled manually by air traffic services.*

*Note 2.— 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.*

....

#### **Location**

5.3.29.2 **Recommendation.**— *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.*

5.3.29.3 **Recommendation.**— *A no-entry bar should be co-located with a no-entry sign and/or a no-entry marking.*

*(Editorial note: renumber subsequent paragraphs accordingly)*

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#### **Characteristics**

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~~5.3.29.8 The lighting circuit shall be designed so that:~~

- ~~a) no entry bars are switchable selectively or in groups.;~~
- ~~b) when a no entry bar is illuminated, any taxiway centre line lights installed beyond the no entry bar, when viewed towards the runway, shall be extinguished for a distance of at least 90 m; and~~
- ~~c) when a no entry bar is illuminated, any stop bar installed between the no entry bar and the~~

runway shall be extinguished.

5.3.29.8 Taxiway centre line lights installed beyond the no-entry bar, looking in the direction of the runway, shall not be visible when viewed from the taxiway.

...

## 5.4 Signs

### 5.4.1 General

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**Table 5-5. Location distances for taxiing guidance signs including runway exit signs**

Code number	Legend	Sign height (mm)		Installed (max.)	Perpendicular distance from defined taxiway pavement edge to near side of sign	Perpendicular distance from defined runway pavement edge to near side of sign
		Face (min.)				
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	1100	11-21 m	8-15 m

....

### 5.4.3 Information Signs

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#### *Characteristics*

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5.4.3.35 A taxiway shall be identified by a designator that is used only once on an aerodrome comprising a single letter, two letters or a combination of a letter or letters followed by a number.

5.4.3.36 **Recommendation.**— *When designating taxiways, the use of the letters I, O or X and the use of words such as inner and outer should be avoided wherever possible to avoid confusion with the numerals 1, 0 and closed marking.*

5.4.3.37 When designating taxiways, the use of the letters I, O or X shall not be used to avoid confusion with the numerals 1, 0 and closed marking.

*(Editorial note: renumber subsequent paragraphs accordingly)*

....

5.4.3.39 **Recommendation.**— *Apron stand designators should not be the same as taxiway designators.*

## CHAPTER 6. VISUAL AIDS FOR DENOTING OBSTACLES

### 6.1 Objects to be marked and/or lighted

*Note 1.— The marking and/or lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of the obstacles. It does not necessarily reduce operating limitations which may be imposed by an obstacle.*

*Note 2.— An autonomous aircraft detection system may be installed on or near an obstacle (or group of obstacles such as wind farms), designed to operate the lighting only when the system detects an aircraft approaching the obstacle, in order to reduce light exposure to local residents. Guidance on the design and installation of an autonomous aircraft detection system is available in the Aerodrome Design Manual (Doc 9157), Part 4. The availability of such guidance is not intended to imply that such a system has to be provided.*

...

## CHAPTER 7. VISUAL AIDS FOR DENOTING RESTRICTED USE AREAS

### 7.1 Closed runways and taxiways, or parts thereof

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#### *Characteristics*

7.1.4 The closed marking shall be of the form and proportions as detailed in Figure 7-1, Illustration a), when displayed on a runway, and shall be of the form and proportions as detailed in Figure 7-1, Illustration b), when displayed on a taxiway. The marking shall be white when displayed on a runway and shall be yellow when displayed on a taxiway.

*Note 1.— When an area is temporarily closed, frangible barriers or markings utilizing materials other than paint or other suitable means may be used to identify the closed area.*

*Note 2.— Procedures pertaining to the planning, coordination, monitoring and safety management of works in progress on the movement area are specified in the PANS-Aerodromes (Doc 9981).*

...

### 7.4 Unserviceable areas

#### *Application*

7.4.1 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. On a movement area used at night, unserviceability lights shall be used.

*Note 1.— Unserviceability markers and lights are used for such purposes as warning pilots of a hole in a taxiway or apron pavement or outlining a portion of pavement, such as on an apron, that is under repair. They are not suitable for use when a portion of a runway becomes unserviceable, nor on a taxiway when a major portion of the width becomes unserviceable. In such instances, the runway or taxiway is normally closed.*

*Note 2.— Procedures pertaining to the planning, coordination, monitoring and safety management of works in progress on the movement area are specified in the PANS-Aerodromes (Doc 9981).*

...



## CHAPTER 9. AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATIONS

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### 9.1 Aerodrome emergency planning

#### *General*

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9.1.5 **Recommendation.**— *The aerodrome emergency plan document should include at least the following:*

- a) *types of emergencies planned for;*
- b) *agencies involved in the plan;*
- c) *responsibility and role of each agency, the emergency operations centre and the command post, for each type of emergency;*
- d) *information on names and telephone numbers of offices or people to be contacted in the case of a particular emergency; and*
- e) *a grid map of the aerodrome and its immediate vicinity.*

9.1.6 The plan shall observe Human Factors principles to ensure optimum response by all existing agencies participating in emergency operations.

*Note 1.*— *Guidance material on Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).*

*Note 2.*— *General principles and procedures on the training of aerodrome personnel, including training programmes and competence checks, are specified in the PANS-Aerodromes (Doc 9981).*

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### 9.2 Rescue and firefighting

...

#### *Level of protection to be provided*

...

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

*Note 2.— Principles and procedures on training, including training programmes and competence checks, are specified in the PANS-Aerodromes (Doc 9981). Further guidance on the training of personnel, rescue equipment for difficult environments and other facilities and services for rescue and firefighting is given in Attachment A, Section 18, and in the Airport Services Manual (Doc 9137), Part 1.*

...

#### 9.4 Wildlife strike hazard reduction

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

...

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

*Note.— Guidance on effective measures for establishing whether or not 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 (Doc 9137), Part 3. Procedures on the management of wildlife hazards on and within the vicinity of aerodromes, including the establishment of a wildlife hazard management programme (WHMP), wildlife risk assessment, land-use management and personnel training, are specified in the PANS-Aerodromes (Doc 9981), Part II, Chapters 1 and 6. Further guidance is given in the Airport Services Manual (Doc 9137), Part 3.*

...

#### 9.5 Apron management service

...

9.5.2 **Recommendation.**— *When the aerodrome control tower does not participate in the apron management service, procedures should be established to facilitate the orderly transition of aircraft between the apron management unit and the aerodrome control tower.*

*Note.— Procedures on apron safety are specified in the PANS-Aerodromes (Doc 9981). Guidance on an apron management service is given in the Airport Services Manual (Doc 9137), Part 8, and in the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476).*

...

9.5.7 An aircraft stand shall be visually monitored to ensure that the recommended clearance distances are provided to an aircraft using the stand.

*Note.— Procedures on the training of operational personnel and on apron safety and operations, are specified in the PANS-Aerodromes (Doc 9981), Part II, Chapters 1 and 7.*

...

## 9.7 Aerodrome vehicle operations

*Note 1.— Procedures on the establishment of an airside driver permit (ADP) scheme and vehicle/equipment safety requirements, including detailed personnel training, are specified in the PANS-Aerodromes (Doc 9981), Part II, Chapter 9.*

*Note 2.— Guidance on aerodrome vehicle operations is contained in Attachment A, Section 19, and on traffic rules and regulations for vehicles in the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476).*

*Note 3.— It is intended that roads located on the movement area be restricted to the exclusive use of aerodrome personnel and other authorized persons, and that access to the public buildings by an unauthorized person will not require use of such roads.*

...

## 9.9 Siting of equipment and installations on operational areas

....

9.9.5 Any equipment or installation required for air navigation or for aircraft safety purposes which must be located on or near a strip of a precision approach runway category I, II or III and which:

- a) ~~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~~
- b) is situated within 240 m from the end of the strip and within:
  - 1) 60 m of the extended runway centre line where the code number is 3 or 4; or
  - 2) 45 m of the extended runway centre line where the code number is 1 or 2; or
- eb) penetrates the inner approach surface, the inner transitional surface or the balked landing surface;

shall be frangible and mounted as low as possible.

...

## CHAPTER 10. AERODROME MAINTENANCE

### 10.1 General

...

10.1.2 **Recommendation.**— *The design and application of the maintenance programme should observe Human Factors principles.*

*Note 1.*— *Guidance material on Human Factors principles can be found in the Human Factors Training Manual (Doc 9683) and in the Airport Services Manual (Doc 9137), Part 8 — Airport Operational Services.*

*Note 2.*— *General principles and procedures on the training of aerodrome personnel, including training programmes and competence checks, are specified in the PANS-Aerodromes (Doc 9981).*

...

#### APPENDIX 4. REQUIREMENTS CONCERNING DESIGN OF TAXIING GUIDANCE SIGNS

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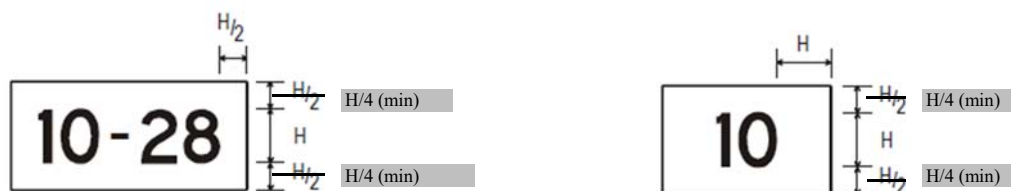
9. The forms of characters, i.e. letters, numbers, arrows and symbols, shall conform to those shown in Figure A4-2. The width of characters and the space between individual characters shall be determined as indicated in Table A4-1.

10. The face height of signs shall be as follows:

<i>Legend height</i>	<i>Face height (min)</i>
200 mm	<del>400</del> 300 mm
300 mm	<del>600</del> 450 mm
400 mm	<del>800</del> 600 mm

11. The face width of signs shall be determined using Figure A4-4 except that, where a mandatory instruction sign is provided on one side of a taxiway only, the face width shall not be less than:

...



A. Sign with two runway designators

B. Sign with one runway designator

**Figure A4-4. Sign dimensions**

*Explanatory Note to Figure A4-4: "H" stands for the inscription height*

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

...

**20. The ACN-PCN method of reporting pavement strength**

*Applicable until 27 November 2024*

...

**20. The ~~ACN-PCN~~ ACR-PCR method of reporting pavement strength**

*Applicable as of 28 November 2024*

*20.1 Overload operations*

*20.1.1* 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 of 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:

a) for flexible and rigid pavements, occasional movements by aircraft with ACN ACR not exceeding 10 per cent above the reported PCN PCR should not adversely affect the pavement;

~~b) for rigid or composite pavement, in which pavement layer provides a primary element of the structure, occasional movements by aircraft with ACN not exceeding 5 per cent above the reported PCN should not adversely affect the pavement;~~

~~c) if the pavement structure is unknown, the 5 per cent limitation should apply; and~~

~~b)~~ the annual number of overload movements should not exceed approximately 5 per cent of the total annual aircraft movements, excluding light aircraft.

*20.1.2* Such overload movements should not normally be permitted on pavement 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 appropriate authority 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.

## 20.2 ACNs<sup>†</sup>ACRs for several aircraft types

For convenience, ~~several aircraft types currently in use have been evaluated on rigid and flexible pavements founded on the four subgrade categories in Chapter 2, 2.6.6 b), and the results tabulated in the *Aerodrome Design Manual* (Doc 9157), Part 3~~ a 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 detailed in Chapter 2, 2.6.6 b).

...

## LIMITED INDEX OF SIGNIFICANT SUBJECTS INCLUDED IN ANNEX 14, VOLUME I

...

### PAVEMENT STRENGTH

ACN<sup>†</sup> for aircraft A-20.2  
aprons 3.13.3

...

ACNRs<sup>††</sup> for aircraft A-20.2  
aprons 3.13.3

...

— END —

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† Applicable until 27 November 2024.

†† Applicable as of 28 November 2024.