

Notice Number: ADN 05
Issue Number: 01
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Subject: Notification of new methodology for reporting pavement strength

1. Purpose and scope

- 1.1 The objective of this Aerodrome Notice is to notify aerodrome operators and applicants of the new methodology for reporting pavement strength which is expected to replace current provisions under STS-ADR 6.7.
- 1.2 This aerodrome notice will not replace the proposed amendment process. The notice of proposed amendment will be published at the appropriate time. This aerodrome notice serves to inform aerodrome operators and applicants of the anticipated changes such that advanced preparations can be made for compliance.
- 1.3 Notwithstanding point 1.2 above, comments on if these anticipated changes are acceptable or not acceptable, and/or inputs on how these could be improved are welcomed and can be addressed to Head of Aerodrome Safety & Standards Inspectorate on seyaga@scaa.sc.
- 1.4 The new methodology for reporting pavement strength stipulated herein are expected to become applicable as of 28th November 2024.

2. Abbreviations and definitions

2.1. Abbreviations

- ACR Aircraft classification rating
- PCR Pavement classification rating

2.2. Definitions

- **Aircraft classification rating (ACR).** A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.
- **Pavement classification rating (PCR).** A number expressing the bearing strength of a pavement.

3. New methodology for reporting pavement strength

Note – the provisions below will replace the existing provisions under STS-ADR 6.7

STS-ADR 6.7 Strength of pavements

- 6.7.1. The bearing strength of a pavement shall be determined.
- 6.7.2. The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5700kg shall be made available using the aircraft classification rating – pavement classification rating (ACR- PCR) method by reporting all of the following information:

- a. the pavement classification rating (PCR) and numerical value;
- b. pavement type of ACR-PCR determination;
- c. subgrade strength category;
- d. maximum allowable tire pressure category or maximum allowable tire pressure value; and
- e. evaluation method.

Note – Guidance on reporting and publishing of PCRs is contained in the Aerodrome Design Manual (Doc 9157, Part 3).

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

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

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

Note – The standard procedures for determining the ACR of an aircraft are given in the ICAO Aerodrome Design Manual, Part 3. For convenience, dedicated software is available on the ICAO website, for computing any aircraft ACRs at any mass on rigid and flexible pavements for the four standards subgrade strength categories detailed in 6.7.6 b) below.

6.7.5. For the purposes of determining the ACR, the behavior of a pavement shall be classified as equivalent to a rigid or flexible construction.

6.7.6. Information on pavement type for 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 ACR-PCR determination:*

	<u>Code</u>
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:*

	<u>Code</u>
<i>High strength: characterized by E=200 MPa, and representing all E values equal to or above 150 MPa for rigid and flexible pavements.</i>	A
<i>Medium strength: characterized by E=120 MPa and representing a range in E values equal to or above 100 MPa and strictly less than 150 MPa, for</i>	B

rigid and flexible pavements.

Low strength: characterized by E=80 MPa and representing a range in E C values equal to or above 60 MPa and strictly less than 100 MPa, for rigid and flexible pavements.

Ultra-low strength: characterized by E=50 MPa and representing all E D values strictly less than 60 MPa, for rigid and flexible pavements.

c) *Maximum allowable tire pressure category:*

	<u>Code</u>
<i>High: no pressure limit</i>	W
<i>Medium: pressure limited to 1.50 Mpa</i>	X
<i>Low: pressure limited to 1.00 Mpa</i>	Y
<i>Very low: pressure limited to 0.50 Mpa</i>	Z

Note - See Note 5 to 14.3.1 where the pavement is used by aircraft with tire pressures in the upper categories.

d) *Evaluation method:*

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

Note – The following examples illustrate how pavement strength data are reported under the ACR-PCR method. Further guidance on this topic is contained in the Aerodrome Design Manual (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 PCR 760 and there is not tire pressure limitation, then the reported information would be:

PCR 760 / R / B / W / T

Example 2 – If the bearing strength of a composite pavement, behaving like a flexible pavement and resting on a high strength subgrade, has been assessed using aircraft experience to be PCR 550 and the maximum tire pressure allowable is 1.00 MPa, then the reported information would be:

PCR 550/ F / A / Y / U

Note – Composite construction.

- 6.7.7. **Recommendation** - Criteria should be established to regulate the use of a pavement by an aircraft with an ACR higher than the PCR reported for that pavement in accordance with 6.7.2 and 6.7.3.

Note – ICAO Annex 14 Vol. I, Attachment A, Section 20 details a simple method for regulating overload operations while the ICAO Aerodrome Design Manual, Part 3 includes the descriptions of more detailed procedures for evaluation of pavement and their suitability for restricted overload operations.

- 6.7.8. 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: 4800kg / 0.60 MPa.

4. Supplementary guidance to the ACR-PCR method of reporting pavement strength

4.1. Overload operations

4.1.1. 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 ACR not exceeding 10 per cent above the reported PCR should not adversely affect the pavement;
- b) the annual number of overload movements should not exceed approximately 5 per cent of the total annual movements, excluding light aircraft

4.1.2. Such overload movements should not normally be permitted on pavement exhibiting signs of distress or failure. Furthermore, overloading should be avoided when the strength of the pavement or its subgrade could be weakened by water. Where overload operations are conducted, the relevant pavement condition should be reviewed regularly, and the criteria for overload operations should be reviewed periodically since excessive repetition of overloads can cause severe shortening of pavement life or require major rehabilitation of pavement.

4.2. ACRs for several aircraft types

4.2.1. For convenience, 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 6.7.6 b) above.

5. Queries

- 5.1 Any queries relating to this Aerodrome Notice should be addressed to Head of Aerodrome Safety & Standards Inspectorate on seyaga@scaa.sc.

**Aerodrome Safety & Standards Inspectorate
Seychelles Civil Aviation Authority
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