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USE OF PAVEMENT UNDER OVERLOAD OPERATIONS

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1 Purpose

- 1.1 The purpose of this Aerodrome Safety Publication is to promulgate supplementary guidance materials to the Standards and Recommended Practices (SARPS) in the Manual of Aerodrome Standards (MOAS). This publication provides guidance on what is acceptable to the Aerodrome and ANS Regulation Division (AAR) the use of pavement under overload operations.

2 Applicability

- 2.1 This Publication applies to all operators of aerodromes certified under paragraph 67 of the Singapore Air Navigation Order (ANO). Aerodrome operators should examine each state's practice listed in this Publication, considering the size, complexity and scope of operations at the aerodrome to determine what applies.

3 Effective Date

- 3.1 This ASP takes effect on 25 April 2017.

4 Introduction

- 4.1 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 in pavement life expectancy and relatively small acceleration of pavement deterioration

5 Use of pavement under overload operations

- 5.1 MOAS clause 6.2.6.7 recommends that when the magnitude of overload and/or frequency of use of pavement by aircraft with an ACN higher than the PCN reported for that pavement do not justify a detailed analysis, the following criteria should be used to determine the allowable extent of overload operations:

- a) for flexible pavements, occasional movements by aircraft with ACN not exceeding 10 per cent above the reported PCN should not adversely affect the pavement;
 - b) for rigid or composite pavements, in which a rigid pavement layer provides a primary element of the structure, occasional movements by aircraft with ACN not exceeding 5 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
 - d) the annual number of overload movements should not exceed approximately 5 per cent of the total annual aircraft movements.
- 5.2 MOAS clause 6.2.6.7A recommends that such overloading movements should not normally be permitted on pavements exhibiting signs of distress or failure. Furthermore, it should be avoided when the strength of the pavement or its subgrade could be weakened by water. Where overload operations are conducted, the airport operator should review the relevant pavement condition regularly, and should also review the criteria for overload operations periodically since excessive repetition of overloads can cause severe shortening of pavement life or require major rehabilitation of pavement.
- 5.3 For those aircraft operations where the magnitude of overload and/or the frequency of use exceed the limits of the criteria given above, it is recommended that the advisability of allowing the operation be determined on the basis of a detailed engineering analysis comparing the individual aircraft load to the structural capability of the pavement.
- 5.4 The airport operator should also have a detailed engineering analysis of the airside pavements carried out to determine the maximum overloads which could safely be allowed in the event that an “emergency only” type of aircraft operation is required on short notice. The determination of “emergency only” overload limits should be based on ensuring the safety of the aircraft from pavement surface “break-through” during the “emergency” operation.

6 Reference

Manual of Aerodrome Standards (MOAS);
Doc 9157 - ICAO Aerodrome Design Manual, Part 3
Transport Canada Advisory Circular 302-011 - Airport Pavement Bearing Strength Reporting

7 **Queries**

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