*International Civil Aviation Organization*

Eighth Meeting of the Aerodromes Operations and Planning Sub-Group (AOP/SG/8)

*Bangkok, Thailand, 15 to 19 July 2024*

**Agenda Item 9: Any other business**

- **State's update on Implementation of ACR-PCR Method of Reporting Aerodrome Pavement Bearing Strength**

# IMPLEMENTATION OF EVALUATING THE AIRPORT PAVEMENT BEARING STRENGTH BY ACR-PCR SOFTWARE IN CHINA

(Presented by China)

**SUMMARY**

The Civil Aviation Administration of China (CAAC) has developed a software for evaluating pavement PCR using both technical and empirical methods based on the ACR-PCR method outlined in the ICAO's "Airport Design Manual - Part 3 Pavements". This software allows for the rapid and accurate acquisition of pavement PCR evaluation parameters, featuring user-friendly operation and convenient calculations. Currently, the CAAC is utilizing this software to update the PCR of pavements at all civil airports and some general aviation airports in China, establishing a Chinese approach to pavement PCR calculation.

## 1. INTRODUCTION

1.1 Overview of the CAAC-PCR Calculation Software.

a) The CAAC commissioned Tongji University to develop the CAAC-PCR calculation software to obtain PCR data for each airport more accurately and efficiently. The technical and empirical evaluations for rigid pavements and overlay pavements has been completed, and the flexible pavement PCR technical evaluation software is undergoing;

b) The calculation software is based on the ICAO proposed method by considering the structural and traffic parameters of airport pavements to derive the PCR calculation. Results of the calculation includes PCR and the maximum allowable mass of the aircraft on pavements. The empirical evaluation results include PCR, overload operating conditions, and maximum allowable mass of the aircraft on pavements;

c) Accuracy of the CAAC-PCR software is verified through forward design and reverse evaluation comparisons. As well as comparing the results with those obtained from FAARFIELD under different traffic loads and pavement structural conditions to determine the relationships between the results from the two methods.

## 2. DISCUSSION

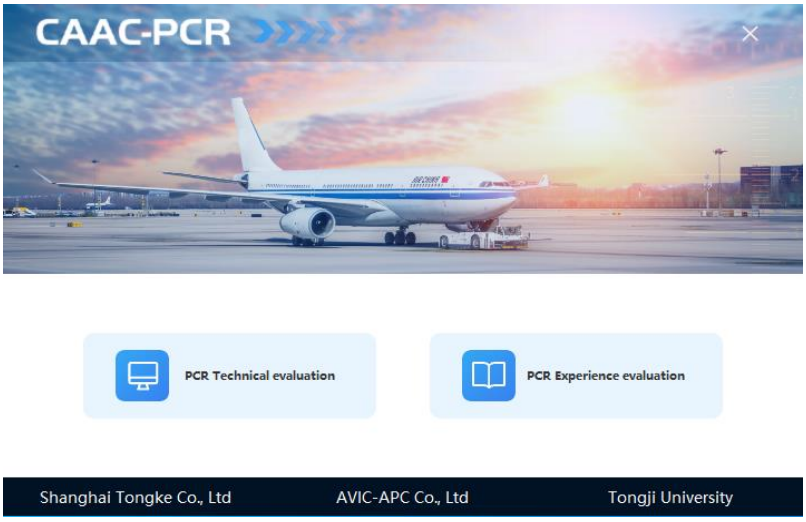
2.1 Calculation Method of ACR

a) According to the calculation methods for aircraft ACR on rigid and flexible pavements described in the “Airport Design Manual - Part 3 Pavements”, the ACR values for various aircraft types in the ACR-PCR method implemented by the CAAC are provided by aircraft manufacturers. The ACR values for different aircraft types are calculated and published by ICAO. The CAAC is willing to collaborate with member countries to improve current ACR calculation software provided by ICAO.

b) ACR is a key parameter in the ACR-PCR method, as well as the basis for pavement PCR calculation, and it is also an indicator for ACR-PCR evaluations.

2.2 CAAC-PCR Calculation Software

a) The CAAC is updating the PCR of pavements for all civil airports and some general aviation airports in China. The updated pavement PCR calculation results indicate that the evaluation results obtained using the ACR-PCR method are generally consistent with those obtained using the ACN-PCN method. However, the differences between ACR and PCR are generally smaller than those between ACN and PCN, suggesting that the ACR-PCR method provides more stringent evaluation results.




b) The CAAC will continue work on the ACR-PCR technical evaluation methods for more complex and special pavement structure types, and develop the related calculation software, and improve it based on the existing ACR-PCR evaluation method.

## 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) encourage member States involved in the research and with relevant experience to provide their inputs to ICAO for formulation of related international guidance on ACR-PCR method of evaluation of the pavement bearing strength; and

b) welcome other member States to cooperate and share their experience in application of their software programme.

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