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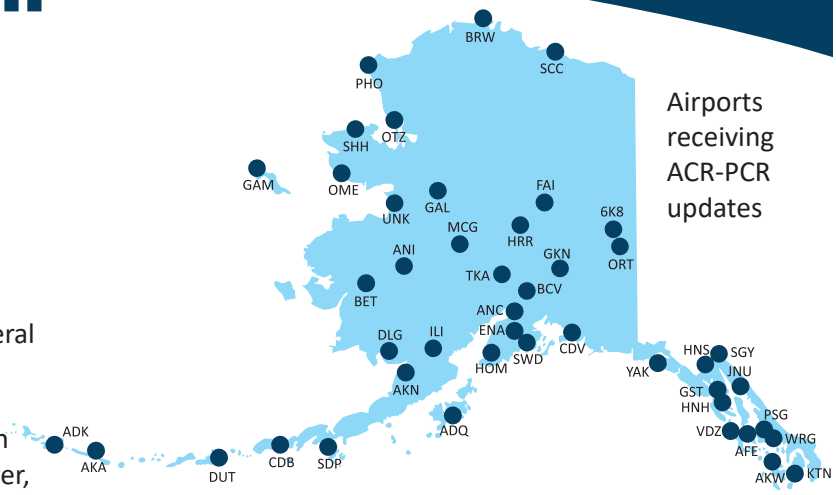
Alaska Aviation System Plan

FACT SHEET

October 2024

Aircraft Classification Rating–Pavement Classification Rating



Airports receiving ACR-PCR updates

What is the ACR-PCR?

The Aircraft Classification Rating – Pavement Classification Rating, or ACR-PCR, is the current method used by the Federal Aviation Administration (FAA) to determine pavement and aircraft operational capabilities at airports. Historically, this was determined using the ACN-PCN or Aircraft Classification Number – Pavement Classification Number method; however, with the publication of Advisory Circular (AC) 150/5335-5D, Standardized Method of Reporting Pavement Strength – PCR[1] in April 2022, the ACN-PCN was phased out. Its successor was expected to go fully into effect in September 2024.

This assessment is completed for runway pavements but can also be done for additional airport surfaces such as taxiways and aprons. The new ACR-PCR data are reflected on the 5010 master record for each airport. For more information refer to 5010 Airport Master Record Program fact sheet.[2]

DOT&PF has updated ACR-PCR data or supported development for all Part 139 certified Airports, excluding Red Dog. ACR-PCR calculations for the remaining paved public airports in Alaska are set to be completed within the next year with implementation by Airport Managers and DOT&PF M&O over the next three years.

What do the codes mean?

The ACR-PCR is a comparison of different ways to determine how aircraft loading and pavement strength interact. Generally, the PCR indicates that an aircraft with an ACR equal to or lower than the PCR can operate without weight restrictions, also referred to as unrestricted operations.

How different is the new process?

The short answer is not much because it uses the same general methodology to determine which aircraft can operate. The longer answer is the methodology was redeveloped in cooperation with the International Civil Aviation Organization (ICAO) Aerodrones Pavement Expert Group and other shareholders, including major aircraft manufacturers, ACI World, and DGAC-France; anticipating that involving critical shareholders in the redevelopment will allow for broader implementation of the pavement standards. The methodology was modified to:

- Account for fully layered elastic based pavement design
- Use uniform standard subgrade categories for flexible and rigid pavements
- Remove overly complicated factors such as alpha factor and layer equivalency factors from determination

As part of this transition, the FAA also released updated design software FAARFIELD 2.0 and ICAO-ACR, to facilitate the new calculation. However, no mathematical correlation exists between the previous pavement strength reporting ACN-PCN and the new ACR-PCR.

Key advantages of the ACR-PCR

Like its predecessor, the primary benefit of the ACR-PCR is its use as an operational and management tool for airports. As previously mentioned, a PCR indicates which aircraft can operate unrestricted at an airport. Airport management should know the limits of what the airport pavements can support; however, if too large a PCR is published, it can exceed the size of aircraft that is desired to operate out of the airport. Therefore, airport management can use the published codes to control which aircraft can operate out of an airport.

Discrepancies between the ACR and PCR

Ideally, these codes are in alignment with each other; however, they vary in some instances, most often where the PCR exceeds the ACR of routinely operating aircraft. A common reason for this variance is Alaskan airports tend to have robust and thick subbase sections to provide subgrade frost protection, among other benefits. This thicker

embankment can result in a PCR than is higher than needed for the critical aircraft.[3] When this occurs, it is usually left up to airport management to determine what PCR they publish based on what unrestricted aircraft operations they want to allow. The table herein presents Alaskan examples of these situations and how they were handled.

Airport	Discrepancy	Determination / Justification
Adak ADK	PCR far exceeds ACR	ACR used as limiting factor / Because of its military history, the airport has a strong pavement structure and is a potential diversion site for large military aircraft. However, the runway dimensions and strength far exceed the current aircraft operations requirements. As a result, airport management has limited operations based on the ACR of routinely operating aircraft instead of a larger PCR.
Kodiak ADQ	Calculated PCR far exceeds published PCR	Maintain lower PCR / The existing runways have a robust pavement structure that is strong enough to accommodate any aircraft operating in Alaska. However, this strength is not shared by the adjacent taxiway and apron, which are significantly distressed. As a result, the runways will maintain a lower PCR level, until the taxiway and apron are reconstructed. This lower PCR also impacts the ability of large aircraft to park on the aprons.

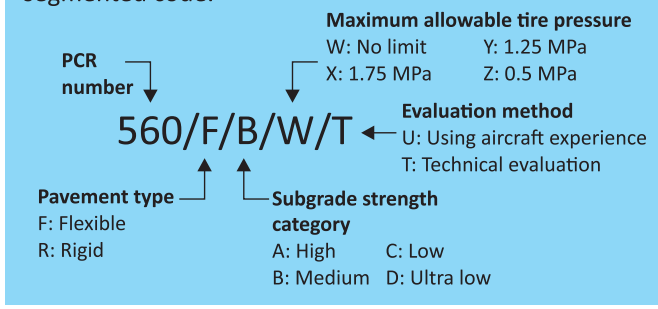
ACR-PCR calculation process

The ACR-PCR can be calculated in two ways, the aircraft method and technical method. Neither method is right or wrong, but DOT&PF prefers the technical method because it provides a more accurate PCR and does not rely as heavily on design assumptions as with the aircraft method. Technical evaluations are performed by collecting data such as aircraft traffic, subgrade stiffness, the number of times an aircraft will pass over the pavement and characteristics of pavement, base, and subbase materials. This information is then used by the FAARFIELD 2.0 program to evaluate the PCR.

If data are insufficient to follow the technical method, the aircraft method is used. When using the aircraft method, the PCR is taken as the ACR of the largest aircraft operating at the airport with a history of use without damaging the pavement.

Pavement Classification Rating (PCR)

Expresses the loadcarrying capacity of pavement for unrestricted operations. Generally listed as a five segmented code.



A new PCR evaluation is required after pavement rehabilitation or when traffic changes significantly, such as the introduction of a new aircraft type or an increase in current aircraft traffic levels not accounted for in the original analysis.

What are the limitations of the ACR-PCR?

The primary limitation to the ACR-PCR is that it only applies to airport pavements with a bearing strength of 12,500 pounds or greater. For pavement strengths less than 12,500 pounds, the general process is to report the gross weight and gear configuration of aircraft that can be accommodated. Additionally, the ACR-PCR is only intended as a management tool for airport management to determine which aircraft can operate and is not intended as pavement design or evaluation procedure.

How is the PCR different than the Pavement Condition Index (PCI) process?

Although the acronyms are similar, the PCR and PCI serve different functions. A PCI inspection is a visual assessment of airport pavement surface conditions, conducted every 3 years in Alaska, to evaluate the extent and severity of distresses like cracking and depressions. The results are entered into a PAVER database, which generates a PCI value and helps predict future pavement conditions for effective maintenance and management. The primary purpose of the PCR process is to assess and quantify the structural capacity of airport pavements, determining their ability to support specific aircraft types and loads. This helps ensure the safe operation of aircraft on runways, taxiways, and aprons by matching the pavement's strength to the weight and configuration of the aircraft it accommodates.

The ACR-PCR is a little different than its predecessor but is still a valuable tool in the management of airfield pavements. For questions on the published PCR listed in the ratings, contact Andrew Pavey (Andrew.Pavey@alaska.gov) at DOT&PF Statewide Materials.

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[1]https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentnumber/150_5335-5

[2]https://www.alaskaasp.com/media/4768/5010_fact_sheet_hi-res_5-6-24_final.pdf

[3]https://www.alaskaasp.com/media/4587/2024_02_29_final_critical_aircraft_final.pdf

The AASP project is managed by the State of Alaska Department of Transportation and Public Facilities (DOT&PF), Division of Statewide Aviation. Additional assistance is provided by the Aviation Advisory Board, private aviation organizations, local airport sponsors, air carriers, aviation related businesses and pilots.

The preparation of this document was supported in part with financial assistance through the Airport Improvement Program from the Federal Aviation Administration (AIP Grant # 3-02-0000-028-2021) as provided under Title 49 USC § 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.