Runways slipperiness

The cold, blustery Midwest winters invariably bring snow, ice, and generally unpleasant flying conditions that typically reduce the number of hours that we pilots make, compared to summer. But when you do fly in winter, there are some new challenges, like engine pre-heating discussed in the last newsletter, and runway traction which we discuss today.

"How's the traction?" is what it boils down to, but no one uses that term. The fancy term used by the FAA is "Takeoff and Landing Performance Assessment (TALPA)" which is an umbrella term for all things related to paved runways that aren't dry. Specifically:

> The Takeoff and Landing Performance Assessment (TALPA) initiative aims to reduce the risk of runway overruns by providing airport operators with a method to accurately and consistently determine the runway condition when a paved runway is not dry….. **Beginning October 1, 2016**, 0900 UTC, federally obligated airports will use TALPA procedures to conduct runway assessments and to report those conditions in newly formatted Field Condition (FICON).

How does that affect you? Simple: the FAA introduced another acronym (must have had a fire sale on acronyms this month…) called RCAM (Runway Condition Assessment Matrix) to quantify the runway condition. It's actually a very good, logical method, but I think pilots are required to make fun of anything the FAA puts out, even if it's a really good thing, like now.

While we are all used to pilots describing the runway traction as "Good" or "Poor" or "Nil" that is pretty subjective and could easily lead to vast differences of opinion and reporting between one airport and another, as "Medium" may mean one thing at one airport and the equivalent of "Poor" at another. Effective last October 16th, airports are to use the following table (it's not really a 'matrix' in the proper sense of the word, it's a table, but they call it a matrix) to convert/standardize 7 levels of traction from "6" (dry) down to "0" (Nil).

Bryce Walter is the Assistant Operations Coordinator here at Chicago Executive who is responsible for checking-and-reporting these conditions at all times that the airport is open. He reports to Andrew Wolanik, the CEA Operations Coordinator who is ultimately responsible for TALPA compliance.

Bryce elaborated, saying that "During a precipitation storm, we will check friction values continuously using the Bowmonk Decelerometer device. We then use the calculated value, along with the depth of the contaminates to calculate the new runway condition code." The "Bowmonk decelerometer" is basically a sensor box mounted to a regular service vehicle whose gyros are used to make these measurements. "The decelerometer does not have a friction wheel that rides against the ground (those are even more expensive). It is a box mounted inside the truck that measures the kinetic energy and analyzes the vehicle's deceleration and "bounce." says Bryce.

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Walter is also very clear about safety concerns regarding even suspected, dangerous runway conditions. “We shut down the runway if the condition drops below 3, a friction value of 30 on the Bowmonk. They must be at least a level 3 which is ‘medium’” he stated. “Furthermore, we even shut down the runway if we get 2 successive pilot reports of ‘nil’ until we can go out and personally test/verify this condition.

All 3 runways at CEA adhere to these rules.

Finally, note that there is not a single value for the entire runway, but 3 numbers that each describe successive thirds of the runway. So “3-4-5” means that the first third of the runway (touch down zone) is quality “3”, followed by “4” and a “5” at the very end.

CEA uses a combination of wet and dry chemicals on the runways to help keep the ice from forming, and can go through a few tons of the stuff on a single pass of the runway. Not only is this stuff not cheap, EPA regulations require eliminating one of the commonly used chemicals, and replacing it with something about 3x more expensive. That’s not going to make Scott’s job any easier (Scott Campbell is the Chief Financial Officer at CEA). Salt is not used because of its corrosive nature, and sand is not used because it can get sucked into the engine.

Measuring and reporting frequency is not well-defined. For example, on a bright, sunny, dry day with 20F temps, you don’t need to run the truck out every hour to say “Yep, the pavement is still bone dry!” - especially since you have to temporarily shut down the runway to send the truck out there. But on days like this past Jan 16th with the temp right at freezing and a drizzling mist in the air, the conditions could easily be changing by the hour.

So Bryce’s team monitors the conditions and sends the “Bowmonk truck” out when they think it is needed, and certainly whenever tower tells them that they got 2 successive NIL Pireps. Tower then records that RCAM information and puts it on the ATIS, for the active runway which at PWK will invariably be 16/34, but the other runway RCAMs may be available upon request. They also put it on the AWOS (847/465-0291). But since measurements aren’t normally taken every hour (e.g., runway conditions don’t change much from hour to hour unless there’s precipitation or the temp hovers right around freezing), the RCAM is reported on the ATIS/AWOS with an ‘as of… ’ time, so you know if the numbers are current or many hours old. For example, it is 9am on Wednesday as I write this and the AWOS says “… at time of Tower closing *(presumably meaning last night)*, runway 16 condition code is 5-5-5”

And for your “This seems weird, but that’s how we do it” file:

> As a PiRep, you report the breaking to ATC as “Good”, “Medium”, “Poor” or “Nil”, but ATC will read it to YOU as the 6 to 0 numeric scale.

No, that doesn’t make a lot of sense to me either…

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TABLE 1-1. OPERATIONAL RUNWAY CONDITION ASSESSMENT MATRIX (RCAM) BRAKING ACTION CODES AND DEFINITIONS

Assessment Criteria		Control/Braking Assessment Criteria	
Runway Condition Description	**RwyCC**	**Deceleration or Directional Control Observation**	**Pilot Reported Braking Action**
• Dry	6	—	—
• Frost • Wet (Includes damp and 1/8 inch depth or less of water) ***1/8 inch (3mm) depth or less of:*** • Slush • Dry Snow • Wet Snow	5	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
-15ºC and Colder outside air temperature: • Compacted Snow	4	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
• Slippery When Wet (wet runway) • Dry Snow or Wet Snow (any depth) over Compacted Snow ***Greater than 1/8 inch (3 mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than -15ºC outside air temperature:*** • Compacted Snow	3	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
Greater than 1/8 inch(3 mm) depth of: • Water • Slush	2	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice	1	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice • Slush over Ice • Water over Compacted Snow • Dry Snow or Wet Snow over Ice	0	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

CEA Runway is shut down

Note: The unshaded portion of the RCAM is associated with how an airport operator conducts a runway condition assessment.
Note: The shaded portion of the RCAM is associated with the pilot's experience with braking action.
Note: The Operational RCAM illustration will differ from the RCAM illustration used by Airport Operators.
Note: Runway condition codes, one for each third of the landing surface, for example 4/3/3, represent the runway condition

Henry@ExecutiveTenantsClub.com cell: 847/682-4550