Use of Ice Control Sand on the Movement Area

Each year, Boeing typically receives questions concerning the use of ice control sand on the movement areas of an airport and whether this is acceptable. We offer the following comments regarding the subject of ice control sand:

ICAO and FAA both call for sanding runways to enhance pavement friction characteristics during winter operations in freezing conditions. Sanded runways in freezing conditions are thus considered normal operations. The operator must account for reported braking action in the performance calculations as appropriate.

Boeing is not aware of any severe Foreign Object Damage (FOD) events that have been attributed to the use of ice control sand, where the sand met the recommended specifications.

The FAA and ICAO both publish ice control sand specifications. Normally, airports apply ice control sand when they have no other means available to remedy slippery, frozen surface situations. Boeing recommends airport operators remove the sand just as soon as the reason for its application has passed, thereby minimizing any foreign object damage potential. Ice control sand is intended to be applied by the airport very sparingly, aiming to avoid accumulations, and in such a way so as to embed into the ice or snow surface so as to create traction on the frozen surface.

The most widely recognized specification for ice control sand is from ICAO (the International Civil Aviation Organization) which calls for:

100% of the sand to pass a 4.75 mm (#4) sieve,
97 to 100% passing a 2.36 mm (#8) sieve,
30 to 60% passing a 1.18 mm (#16) sieve,
0 to 10% passing a .30 mm (#50) sieve, and
0 to 2% passing a .18 mm (#80) sieve.

The above specification is quoted from the ICAO "Airport Services Manual" - Part 2 - Pavement Surface Conditions, section 7.7.13 through 7.7.19, and the FAA version is similar (Ref: FAA Advisory Circular AC150/5200-30A, page 29, para. 28). Regarding particle size, Boeing recommends the ICAO standard maximum size of 4.75mm (0.187 inch) in diameter not be exceeded.

The described fractioning of the applied material creates a mix of sand particles that tends to be large (something that might be describe more like "pea-gravel" rather than "sand"), but for the material to be effective, the relative larger sizes are helpful. The larger sizes are important for ice control sand because it is intended to be stored indoors (usually in a heated, airport surface equipment garage) which allows the material to retain some warmth. When applied to a frozen surface, the latent heat helps

the individual particles to settle slightly into the ice or hard-packed snow, thus embedding into the surface and ensuring friction improvement.

Sand that meets the ICAO specification can be very difficult to acquire in some locations, thus masonry sand (or something similar) is sometimes used as a substitute. The masonry sand tends to have smaller particle sizes which contain a large quantity of fine materials at the #100 and #200 sieve sizes. This sand does not embed well and is easily blown away by winds and jet blast, and thus it tends to be not very effective.

Regarding thrust reversers, the use of reverse thrust should be no different on runways that have been treated with ice control sand as compared to typical deployment on hard surfaced runway operations. At speeds below 80 knots, the power settings should be modulated to idle, and at 60 knots the reverse thrusters should be stowed.

Additional questions concerning this issue can be directed to Boeing's Airport Compatibility group as follows:

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