Attachment 5

Operations Group Chairman's
Factual Report

DCA06MA009

Additional Landing Procedures
And Considerations

Crosswind Landings

Along with the normal landing procedures, comply with the following considerations.

(PF) When landing in a crosswind, use the following procedures:

- Fly the final approach in a wings-level attitude and crab into the wind.

- Just prior to touchdown, use the rudder to align the fuselage with the runway and simultaneously lower the upwind wing.

Use care while making these control inputs since spoiler deployment may increase descent rate and cause a firm landing.

- Use only enough cross-control inputs to prevent drift.

The longitudinal axis of the aircraft must be parallel with the runway prior to touchdown to prevent heavy side loads on the landing gear.

- After touchdown, use rudder to maintain directional control and ailerons to maintain wings level.

Aileron inputs are effective down to approximately 60 knots and the rudder is effective until approximately 60 knots.

Braking Action

When available, ATC furnishes Pilots with the braking action quality as received by other Pilots or airport management. The quality of braking action is described as normal, good, fair, poor, or nil.

When Pilots report braking action quality they should use descriptive terms that are easily understood, for example: "Braking action is poor for the first half of the runway" along with the aircraft type.

When braking action advisories are in effect, ATC will issue the latest braking action report information to each arriving and departing aircraft. Pilots should be prepared for deteriorating braking conditions and should request current runway condition information if it is not given by the controller. Pilots should also be prepared to provide a descriptive runway braking condition report to the controller after landing. If time permits, Pilots should advise Dispatch of current braking action reports when braking action is less than good. If time constrained, advise Operations to provide braking action reports to Dispatch.

When tower controllers receive runway braking action reports which include the terms poor or nil, or whenever weather conditions are conducive to deteriorating or rapidly changing runway braking conditions, the tower will include on the ATIS broadcast the statement, "Braking action advisories are in effect."

Runway Friction Reports

At airports with friction measuring devices, airport management should conduct friction measurements on runways covered with compacted snow and ice. Numerical readings may be obtained by using any FAA approved friction measuring device. It is not necessary to designate the type of friction measuring device used since they all provide essentially the same numerical reading when the values are 40 or lower.

MU or friction values range from 0 to 100. For frozen contaminants on runway surfaces, a MU value of 40 or less is the level at which aircraft braking performance and directional control begin to deteriorate. The lower the MU value, the less effective braking performance and directional control become.

When the MU value for any one-third of an active runway is 40 or less, a report should be given to ATC by airport management for dissemination to Pilots. The report will provide the following:

- Runway measured.
- Time of measurement.
- MU values for each zone—given in the direction of takeoff and landing.
- Contaminant conditions—wet snow, dry snow, slush, etc.

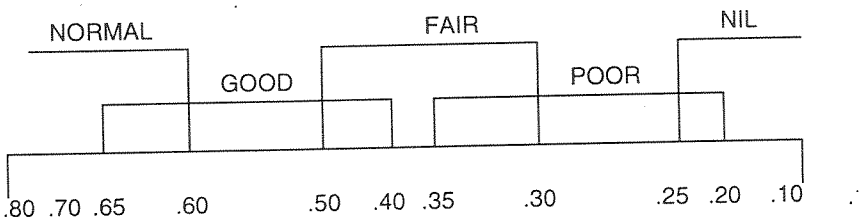
A report should also be given when MU values rise above 40 in all zones of a runway that had previously reported MU values below 40.

Pilots should use MU information, aircraft performance characteristics, and wind conditions to determine if the runway is suitable for a safe landing.

No correlation has been established between MU values and the descriptive terms mentioned above. The following scales provide guidance only.

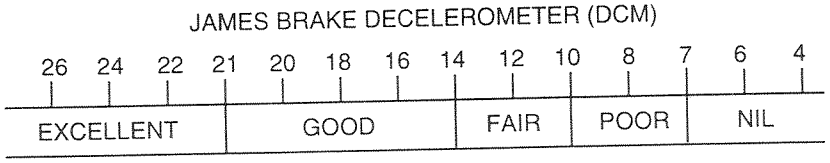
MU Meter Scale—International Scale

The Tapley Meter, Bowmonk Meter, Saab Friction Tester, Runway Friction Tester, and the Skiddometer all have scales similar to the MU Meter and the numeric values may be used interchangeably.



James Brake Decelerometer—DCM

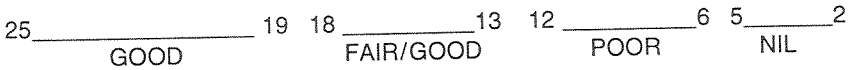
DCM readings in the United States are calibrated in terms of deceleration measured in feet per second squared. Maximum deceleration on the scale is 32 feet per second squared, the equivalent of one G.



Runway Friction Reports—Military RCR

Runway Condition Reading (RCR) values may be encountered at military alternates or on CAM charters.

RCR Scale



Landings under Braking Advisories Less than GOOD

Braking action reports less than GOOD are classified according to the most critical term (FAIR, POOR, NIL, or combinations). Operations are prohibited on all surfaces classified as 'NIL.'

Evaluate landing performance using the OPC. The -700 OPC landing module computes a deceleration rate as a combination of reversers and brakes. **(-300/-500)** The OPC computes landing performance based on 'brakes only' deceleration. Actual braking performance using brakes and thrust reversers will decrease computed landing distance.

Under braking advisories less than 'GOOD,' use Normal Landing procedures except for the following:

(PF) If conditions make hydroplaning a concern, make a firm Touchdown.

A firm touchdown can prevent hydroplaning from developing and will also extend the flight and ground spoilers more quickly.

Dynamic hydroplaning can occur at groundspeeds above 110 knots and once started, may continue to significantly lower speeds. If the main wheels are not aligned straight while on the runway, the aircraft will continue to hydroplane to a lower speed.

(PF) When landing in crosswind conditions combined with reduced braking action ('FAIR' down to 'POOR TO NIL'), maintain the crab angle all the way through touchdown.

Allowing the aircraft to touchdown without removing the crab angle will eliminate drift toward the downwind side of the runway.

(PF) After nose wheel touchdown, apply the brakes smoothly, symmetrically, and with moderate to firm pedal pressure.

Do not cycle or pump the brakes. Hold moderate brake pressure until a safe stop is assured.

(PF) Brakes and thrust reversers should be applied together.

- Use thrust reversers as soon as possible during landing roll.

Under emergency conditions, maximum reverse thrust may be used until reaching a complete stop.

- Use reverse thrust between a minimum of 85 percent N_1 to a maximum of go-around N_1.

Brakes are effective 3-5 seconds before the thrust reversers reach desired N_1.

After the auto speedbrakes deploy, wheel braking effectiveness should improve. If the aircraft was landed in a crab, align the aircraft with the runway centerline.

Do not pump the brakes. When brakes are applied, anti-skid cycling may occur before the anti-skid system establishes the optimum brake pressure. In addition, braking effectiveness is greatly reduced at higher speeds. Do not confuse this gradual deceleration with anti-skid failure. If you pump the brakes, the system is forced to reestablish optimum braking, increasing landing rollout distance.

If you are hydroplaning due to heavy rain, the wheels may not be rotating. If this is occurring, you will not detect any braking effectiveness or anti-skid cycling. Pilots have reported that it felt like they were sliding on ice. As long as the aircraft continues to track straight down the runway centerline, continue braking and reversing. If the aircraft begins to drift off of runway centerline, you may not regain directional control before you depart the prepared surface.

Avoid large or abrupt directional control inputs.

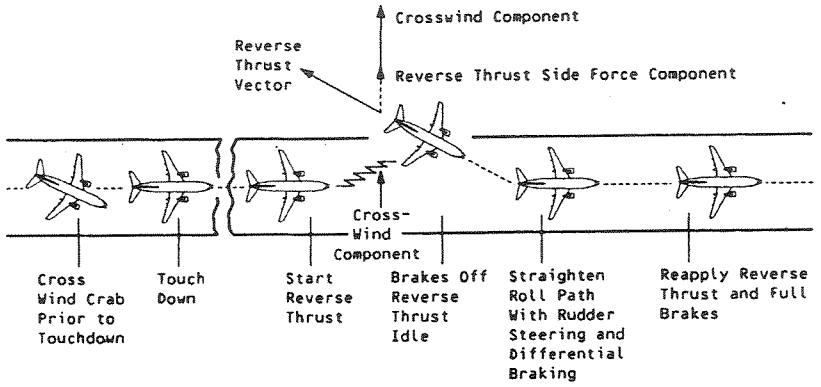
This may lead to skidding.

Rudder control is effective down to 60 knots. Transition to nose wheel steering using small inputs. Apply forward pressure to the control column to improve nose wheel steering effectiveness.

Caution: Do not use full forward control column position because this may exceed nose gear structural limits.

If the aircraft begins to weathervane into the wind and drift toward the downwind edge of the runway, reduce reverse thrust to idle and release the brakes. Use rudder steering and differential braking, as required, to regain the runway centerline. When re-established on the runway centerline, reapply brakes and reverse thrust, as necessary.

If the aircraft is allowed to weathervane into the wind, reverse thrust side force combined with a crosswind on a wet or slippery runway can cause the aircraft to drift to the downwind side of the runway. Main gear tire cornering forces are reduced when the anti-skid system is operating at maximum braking effectiveness. This procedure will minimize the reverse thrust side force component and provide the tire cornering forces necessary to realign with the runway centerline.



Overweight Landing

Landing the aircraft in excess of the maximum structural landing weight is not permitted unless there is an abnormal or emergency situation where the Captain exercises command (emergency) authority. The declaration of an emergency is not required solely for an overweight landing, but the situation that caused the overweight landing may necessitate a declaration. There are no adverse handling characteristics associated with overweight landings.

Use the following procedures and techniques when landing overweight.

Note: Use of flaps 30 rather than flaps 40 is recommended to provide increased margin to flap placard speed.

Observe FOM flap maneuvering speeds during flap extension.

Use the longest available runway, and consider wind and slope effects (OPC). Where possible avoid landing in tailwinds, on runways with negative slope, or on runways with less than good braking conditions. Do not carry excess airspeed on final. This is especially important when landing during an engine inoperative or other non-normal condition. At weights above the maximum landing weight, the final approach maximum wind correction may be limited by the flap placards and load relief system.

Fly a normal profile. Ensure that a higher than normal rate of descent does not develop. Do not hold the airplane off waiting for a smooth landing. Fly the airplane onto the runway at the normal touchdown point. If a long landing is likely to occur, go-around. After touchdown, immediately apply maximum reverse thrust using all of the available runway for stopping to minimize brake temperatures. Do not attempt to make an early runway turnoff.