Airport Winter Safety and Operations

Mark Carroll, Delta Airlines Flight Safety

Mike Meigs, Office of Runway Safety

Pete Hahn, Lead Airport Inspector

Rick Schoder, Airport Inspector

April 14, 2010
FAA/ANM Conference

Federal Aviation Administration

Winter Operations

Airline Perspective

Mark Carroll
Program Manager – Flight Safety
Delta Air Lines

Winter Operations – Airline Perspective

- **Key Words**
- **Incident Investigations**
- **Special Winter Operations Airport (SWOA) program**

Team
&
Communication

DELTA
FLIGHT SAFETY

Timely
&
Accurate


2007/01/01
00:00:08

Historical Runway Excursion Events

Similar contributing factors:

1. Rapidly changing conditions
2. Field condition reports (FICONs)
    1. Accuracy
    2. Timeliness
3. Subjective braking action reports (PIREP, vehicle)
4. Tailwind & crosswind
5. Other factors:
    - Runway not closed with NIL conditions
    - Non-standard phraseology
    - Information not communicated to pilots

Special Winter Operations Airport Program

Objective:

To mitigate risks of runway excursions during winter operations

History:

1. **Late 90's with enhancements over the years**
   - Airport visits (NWA safety, flight operations, dispatchers, ALPA, FAA-CMO, FAA-airports)
   - Special Winter Ops Airport designation, with additional restrictions

Create Partnerships to meet objective:

1. **Airports**
   - Communicate timely & accurate field conditions
   - Enhance snow plans
   - Use of up to date friction measuring devices
2. **FAA**
   - Standardization of airports on snow and ice removal plans
   - Increase oversight of airports

Special Winter Operations Airport Selection

Risk matrix basis:

1. History of incidents at the airport

NOTE: An incident is defined as any airport management/FICON reporting issues as defined by Flight Safety, and/or runway/taxiway excursions.

1. ILS available for the primary runway
2. Centerline lighting to the primary runway
3. Vertical guidance (VASI/PAPI) to primary runway
4. Use of a Tapley decelerometer used as primary runway friction equipment
5. Lack of CFME runway friction equipment
6. Field elevation weighted risk
7. Runway length weighted risk

Considerations and Operational Restrictions

The following consideration and operational restrictions only apply when snow, ice, or slush exists on the runway of intended takeoff or landing; or if snow/freezing precipitation is falling and accumulating on the runway:

1. Runway friction test or PIREP less than 1 hour old is required but should be updated more frequently if weather conditions dictate. Obtain MU friction values for each 1/3 runway.
2. Thrust reversers must be operative (contact dispatch if failure occurs enroute)
3. Approach to runway must have vertical guidance
4. Landing with more than 3 knot tailwind is prohibited
5. DC-9 Only – Mu > .26 or PIREP > POOR

In Summary

Create a partnership with all airports to:

- Increase communications
- Enhanced snow plans
- Timely and accurate field condition reporting
- Standardized communications
- Utilize latest technology

Questions?

Paved Runway Condition Assessment Matrix

Proposed New Method for Assessing Pavement Conditions

- **Use of a Condition Code as "shorthand" for conditions, to replace Mu reports to pilots and operators**
- **New way of describing conditions, based on defined terms and increments**

Airport Operator's Matrix

- **8 December 2005, landing overrun Chicago's Midway Airport**
- **The FAA chartered the Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC)**
- **Representatives from:**
  - Airports
  - Airplane Manufacturers
  - Airplane Operators
  - Regulatory Authorities
  - Industry Associations

PAVED RUNWAY CONDITION ASSESSMENT TABLE

Airport Estimated Runway Condition Assessment				Pilot Reports (PIREPs) Provided To ATC And Flight Dispatch
Runway Condition Assessment – Reported		Downgrade Assessment Criteria		
Code	Runway Description	Mu (μ)	Deceleration And Directional Control Observation	PIREP
6	*Any Temperature:* • Dry	-	-	Dry
5	*Any Temperature:* • Wet (Smooth, Grooved or PFC) • Frost *Any Temperature with 1/8" or less of:* • Water • Slush • Dry Snow • Wet Snow	40μ or higher	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	Good
4	*At or Colder than -13°C at any depth:* • Compacted Snow	39-36μ	Brake deceleration and controllability is between Good and Medium.	Good to Medium
3	*Any Temperature:* • Wet (Slippery) *At or Colder than -3°C and Greater than 1/8" of:* • Dry or Wet Snow *Warmer than -13°C and at or Colder than -3°C at any Depth:* • Compacted Snow	35-30μ	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	Medium
2	*Any Temperature and Greater than 1/8" of:* • Water • Slush *Warmer than -3°C at greater than 1/8":* • Dry or Wet Snow *Warmer than -3°C at any Depth:* • Compacted Snow	29-26μ	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	Medium to Poor
1	*At or colder than -3°C at any Depth of:* • Ice	25-21μ	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	Poor
0	*Any Temperature and any Depth of:* • Wet Ice • Water on top of Compacted Snow • Dry or Wet Snow over Ice *Temperature Warmer than -3°C at any Depth:* • Ice	20μ or lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	Nil

Another Way To Look At It…

	Dry	Wet		Contaminated										
Type	N/A	Any	Slippery When Wet	Frost	Standing Water or Slush		Wet Snow or Dry Snow		Compacted Snow			Ice		Wet Ice, Water Over Compacted Snow, Dry or Wet Snow Over Ice
Depth	N/A	N/A	N/A	N/A	1/8" or less	Greater than 1/8"	1/8" or less	Greater than 1/8"	Any	Any	Any	Any	Any	Any
Temp	Any	Any	Any	Any	Any	Any	Any	-3°C or Colder	Warmer than -3°C	-13°C or Colder	Warmer than -13°C; and, at or colder than -3°C	Warmer than -3°C	-3°C or Colder	Warmer than -3°C	Any
Rwy Code	6	5	3	5	5	2	5	3	2	4	3	2	1	0	0

Use of a Condition Code as "shorthand" for conditions, to replace Mu reports to pilots and operators

New way of describing conditions, based on defined terms and increments

Testing in Winter 2009-2010

- Validate correlation between matrix and pilot braking reports
- Determine the usability for airport operators
- Determine the usability for pilots

Next Steps with Matrix

- **Complete 2009-2010 Winter Validation**
- **FAA/Industry Group will evaluate results and revise Matrix if/as necessary**
- **Proceed with rulemaking incorporating Matrix**

New Winter Operations AC

Application

- Certificated airports are required to follow the requirements of paragraphs 5-6 (NIL) and 5-7 (Two Consecutive Poor) as of the effective date of this AC.

- Certificated airports had to submit revised Snow and Ice Control Plans to the FAA no later than April 30, 2009 for approval.

- At that time, certificated airports will be required to comply with the remaining portions of this AC.

One “NIL” Report

- FAA Flight Standards Service has determined:

NIL = UNSAFE

- PIREP or Airport assessment of NIL requires that the runway be closed before the next flight operation. The runway must remain closed until the airport operator is satisfied that the NIL condition no longer exists.

Two Consecutive “POOR” Reports

- When previous PIREPs have indicated GOOD or MEDIUM (FAIR) braking action, two consecutive POOR PIREPS should be taken as evidence that surface conditions may be deteriorating and require the airport operator to conduct a runway assessment.
  - If the airport operator has *not already* instituted its continuous monitoring procedures, this assessment must occur before the next operation.
  - If the airport operator *is already* continuously monitoring runway conditions, this assessment must occur as soon as practicable in accordance with their SICP.

Snow and Ice Control Plan

- The SICP must include:
  - instructions and procedures for handling the various types of winter storms encountered by the airport and
  - how to notify airport users in a timely manner of other than nominal runway conditions, including, but not limited to:
    - runway closures, and
    - when any portion of the movement area normally available to them is covered by snow, slush, ice, or standing water.

Airport Condition Reporting

- SICP must contain provisions for informing all airplane operators of any pavement condition that is worse than bare and dry.
- Continued transmittal of Mu values is permissible with the understanding that the numerical value has no particular significance other than to provide changing runway condition trend information when associated with previous or subsequent runway friction measurement values.

Airport Condition Reporting

Airport Condition Report

12/29/2009 3:00:00 AM Tower Initials:
12 F Friction Meter: Bowmonk

SSE 8 MPH

Surface	Mu TD	Mu MID	Mu RO	Coverage	Depth	Contaminant
31	87	89	88	Patchy	Thin	Packed Snow
03	87	85	88	Patchy	Thin	Packed Snow
Taxiway	Northwest	Southeast				
C	80	76		Patchy	Thin	Packed Snow
	Northeast	Southwest				
D	74	87		Patchy	Thin	Packed Snow
B				Patchy	Thin	Packed Snow
E				Patchy	Thin	Packed Snow
Apron						
Terminal				Patchy	Thin	Packed Snow
GA				Patchy	Thin	Packed Snow

Note: Airport Condition Reports are generally expressed in plain English

NOTAMS

- RWY 13/31 PTCHY THN PSR

  (All Mu's above 40, No NOTAM required)
- RWY 3/21 PTCHY THN PSR

  (All Mu's above 40, No NOTAM required)
- TWY ALL PTCHY THN PACKED SN
- APRON ALL PTCHY THN PACKED SN

Requirement to Improve from “POOR”

- The airport operator must take all practicable steps using all available equipment and materials that are appropriate for the condition to improve the braking action.

- If the runway cannot be improved, the airport operator must continuously monitor the runway to ensure braking action does not become NIL.

Continuous Monitoring

- Observing which exit taxiways are being used.
- Maintaining a regular program of friction testing to identify trends in runway traction.
- Monitoring runway physical conditions including air and surface temperatures, contaminant types and depths.
- Monitoring pilot communications.
- Monitoring weather patterns.

Airport-ATC Coordination

- A Letter of Agreement specifying how all pilot braking reports (PIREPS) are immediately transmitted to the airport operator may be desirable.

- Under FAA Order 7110.65, A*ir Traffic Control*, Air Traffic Controllers will not issue takeoff or landing clearance for any runway deemed “unsafe.”

NEXT REVISION

- **Conducting runway assessments – Airport Condition Reporting.**
- **Guidance on reopening a closed runway**

U.S. Department Of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Airport Winter Safety and Operations

Date: xx/xx/xx
Initiated by: AAS-100

AC No: 150/5200-30D
Change:

Questions??

- Mark.Carroll@delta.com
- Mike.Meigs@faa.gov
- Pete.Hahn@faa.gov
- Rick.Schoder@faa.gov