Takeoff and Landing Performance Assessment (TALPA)

A New Process for Determining Runway Conditions

Presented to: Air Traffic Services Facilities

By: Terminal Standards & Procedures

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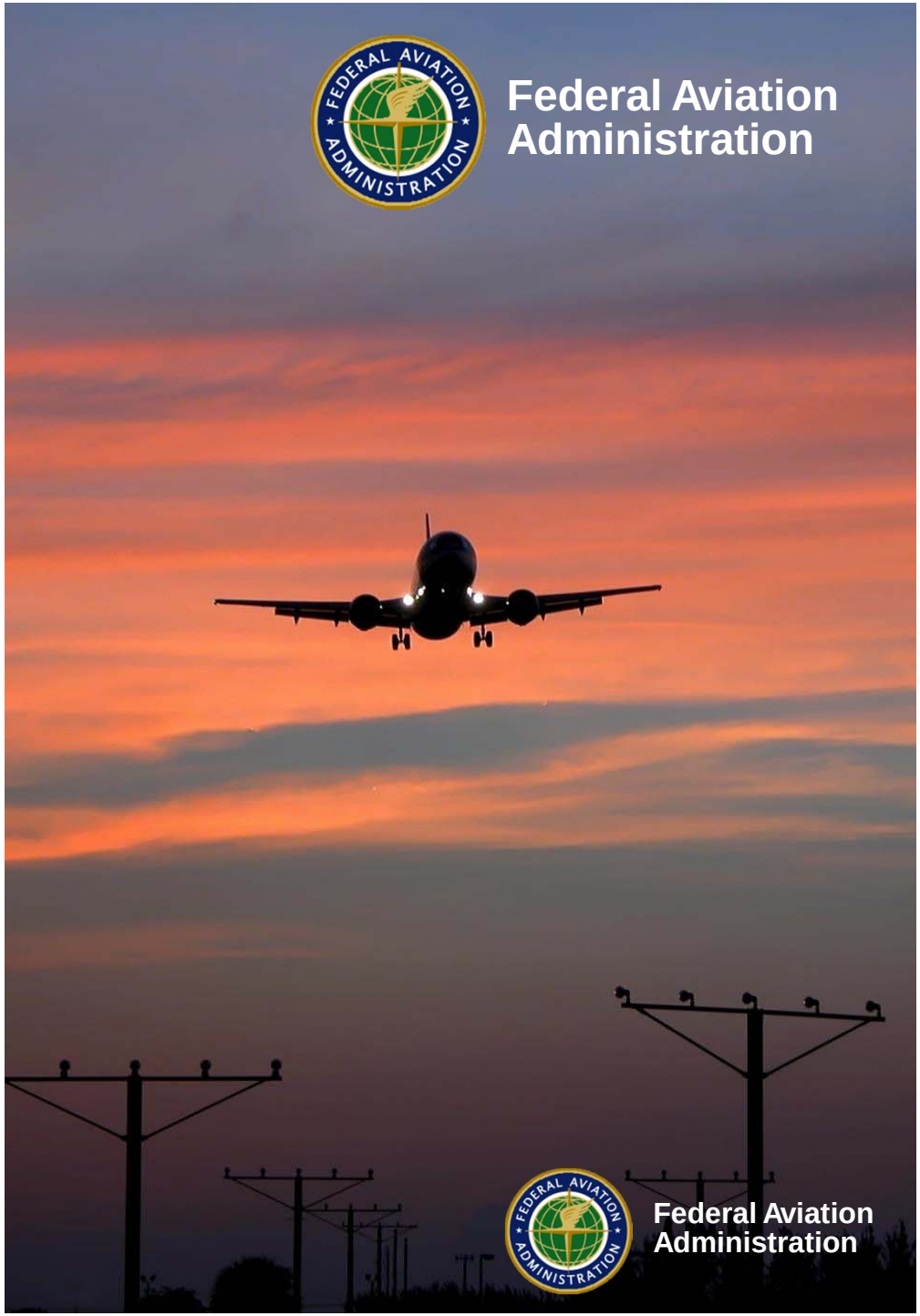

December 8, 2005 – SWA 1248

A Boeing 737 experienced an overrun at Chicago Midway Airport, which resulted in a non-passenger fatality.

The FAA and NTSB determined that procedures to assess runway contamination required improvements. TALPA was created to reduce further risk of runway overrun accidents/incidents caused by weather and other factors.

Background

- **The FAA established a workgroup to review related FAA regulations, policies, and industry practices in an effort to develop mitigation strategies designed to reduce and eliminate these occurrences.**

- **The workgroup found deficiencies in multiple areas, most notably in the lack of a standardized method to assess landing performance during arrival.**

- **Through testing and evaluation, the workgroup developed a new process for reporting runway conditions based on contaminant type and depth. This new process is called Takeoff and Landing Performance Assessment (TALPA).**

- **TALPA provides information to help the pilot anticipate aircraft braking performance.**

TALPA

- **Standardizes how Airports and Air Traffic Control communicate actual runway conditions to the pilots in terms that directly relate to how a particular aircraft is expected to perform.**

- **Airport operators will use the Runway Condition Assessment Matrix (RCAM) to categorize runway conditions; pilots will use it to interpret reported runway conditions.**

- **Introduces new Field Condition (FICON) NOTAM process. Contaminants are assessed in thirds of a runway (Touchdown, Midpoint, and Rollout).**

- **Airport Operations, using the contaminants from the RCAM, enters these assessments into the Federal NOTAM System (FNS).**

TALPA

- **RwyCCs are replacing *Mu* numbers, which will no longer be published in the FAA's NOTAM system.**

- **Two new categories are being introduced into existing braking action phraseology- "Good to Medium" and "Medium to Poor." Additionally, the term "Fair" is being replaced with "Medium".**

- **Nil conditions on ANY paved runway surface require the closure of that surface by airport operations. These surfaces must not be re-opened until the airport operator is satisfied that the NIL braking condition no longer exists.**

Runway Condition Assessment Matrix `(RCAM)

The RCAM is a process of describing runway conditions based on defined terms and increments. Runway conditions on the RCAM Matrix are expressed numerically from 0-6 and are known as a **runway condition code** (RwyCC).

Note: The Federal NOTAM System prohibits the use of "0" in a FICON NOTAM. ATC reportable values are 1-6.

RwyCCs replace Mu values

RwyCCs are disseminated to pilots via FICON NOTAMs and ATIS broadcasts. Pilots use the RwyCC to determine landing performance calculations.

Note: The RCAM table is strictly for use by Airport Operations personnel and not ATC.

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
-15°C 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 -15°C 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

1. Braking Action Categories

OLD	NEW
Good	Good
	Good to Medium
Fair	Medium
	Medium to Poor
Poor	Poor
Nil	Nil

2. From Mu to RwyCC

OLD	NEW
Mu values are included in the ATIS broadcast. Reportable values range from 0 thru 40. Each runway third has a reportable value. e.g., 34/34/33	**Runway Condition Codes (RwyCC) will be included in the ATIS with reportable values ranging from 1 thru 6.** **Each runway third (Touchdown, Midpoint, Rollout) will have a reportable value.** **e.g., 5/5/4**
JO 7110.65, para 3-3-4d1	**JO 7110.65, para 3-3-4d1**

3. Field Condition Assessments

OLD	NEW
Runway Condition Reading	Runway FICON NOTAM
A reading is obtained by airport management and relayed with numerical Mu values. These are disseminated to pilots by air traffic control via ATIS broadcast with braking or friction reports and cause. e.g., RWY 16, 32/32/30, snow.	A Runway FICON NOTAM comes from a Runway Condition Report obtained by Airport Operations and provides runway condition codes (RwyCC's) from contaminant types and depth. RwyCCs are identified by the RWY on which the assessment was made. NOTE: RwyCCs <u>are</u> reversible. e.g., RWY 16, 2/3/4 RWY 34, 4/3/2
JO 7110.65, para 4-7-12c.	JO 7110.65, para 4-7-12c.

4. Braking Action by Airport Ops

OLD	NEW
Currently, airport operations can determine braking action on runways if there are no recent pilot reports.	**Airport Operations will no longer determine braking action on paved runways. They will continue to determine braking action conditions on taxiways, aprons, and non-paved runways.**

How To Read A FICON NOTAM

NOTE - ***Issued only on Pilot Request, workload permitting***

Example 1: RwyCC and ONE contaminant per third

FICON NOTAM

!BOS 01/023 BOS RWY 27 FICON 3/2/2 75 PRCT COMPACTED SN, 100 PRCT 2 IN SLUSH, 100 PRCT 2 IN SLUSH OBSERVED AT 1602211330.

- **SAMPLE PHRASEOLOGY**

  *"BOS Runway 2-7, Field Condition, Three-Two-Two, **Touchdown** - Seventy-five percent Compacted Snow; **Midpoint** - One-hundred percent, Two inches Slush; **Rollout** - One-hundred percent, Two inches Slush. Observed at 1-3-3-0 Zulu."*

- **MANDATORY ATIS ENTRY:**

  Runway 2-7, Condition Code 3-2-2, at 1330Z.

  Key

  3/2/2 = RwyCC

  NOTE: RwyCC will only be listed if average total coverage is greater than 25%

  Touchdown, Midpoint, and Rollout = The 3 zones of the runway being assessed in thirds

Example 2: RwyCC and TWO contaminants per third

FICON NOTAM

!BOS 01/024 BOS RWY 27 FICON 3/4/4 75 PRCT WET AND 25 PRCT ICE, 50 PRCT WET AND 25 PRCT WET SNOW OVER COMPACTED SNOW, 30 PRCT WET AND 20 PRCT WET SNOW OVER COMPACTED SNOW OBSERVED AT 1602211430.

NOTE: *The word "**and**" denotes more than one contaminant is present in any one zone.*

- **SAMPLE PHRASEOLOGY**

  *"BOS Runway 2-7, Field Condition, Three-Four-Four, **Touchdown** - Seventy-five percent Wet and Twenty-five percent Ice; **Midpoint** - Fifty percent Wet and Twenty-Five percent Wet Snow over Compacted Snow; **Rollout** – Thirty percent Wet and Twenty percent Wet Snow over Compacted Snow. Observed at 1-4-3-0 Zulu."*

- **MANDATORY ATIS ENTRY:**

  Runway 2-7, Condition code 3-4-4, at 1430Z.

Key

3/4/4 = RwyCC

Touchdown, Midpoint, and Rollout = The 3 zones of the runway being assessed in thirds

NOTE: RwyCC's will only be listed if the average total coverage is greater than 25%

Example 3: RwyCC and same contaminant(s) over ENTIRE runway

FICON NOTAM

!BOS 01/025 BOS RWY 27 FICON 3/3/3 100 PRCT 2IN DRY SN OVER COMPACTED SN OBSERVED AT 1602211530.

- **SAMPLE PHRASEOLOGY**
  "BOS Runway 2-7, Field Condition, Three-Three-Three, One-hundred percent, Two inches Dry Snow over Compacted Snow. Observed at 1-5-3-0 Zulu."

- **MANDATORY ATIS ENTRY:**
  Runway 2-7, Condition code 3-3-3, at 1530Z.

Key

3/3/3 = RwyCC

NOTE: No Touchdown, Midpoint, or Rollout indicated. Coverage/depth are all identical across entire runway surface.

Example 4: FICON NOTAM with no RwyCC and ONE contaminant per third

FICON NOTAM

!BOS 01/026 BOS RWY 27 FICON, 10 PRCT ICE, 10 PRCT 1/8 IN DRY SN, 10 PRCT 1/8 IN DRY SN OBSERVED AT 1602211630.

- **SAMPLE PHRASEOLOGY**
  *"BOS Runway 2-7, Field Condition, **Touchdown** - Ten percent ice; **Midpoint** - Ten percent, One-eighth inch Dry Snow; **Rollout** - Ten percent, One-eighth inch Dry Snow. Observed at 1-6-3-0 Zulu."*

- **MANDATORY ATIS ENTRY:**
  Not required.

Key

No RwyCC

*NOTE: No RwyCCs listed since average total coverage is **not** greater than 25%.*

Example 5: SLIPPERY WHEN WET

FICON NOTAM

!BOS 01/026 BOS RWY 09/27 FICON 3/3/3 SLIPPERY WHEN WET OBSERVED AT 1602211430

- **SAMPLE PHRASEOLOGY**

  "*BOS runway 2-7, field condition, three-three-three, SLIPPERY WHEN WET. Observed at 1-4-3-0 Zulu."*

- **MANDATORY ATIS ENTRY:**

  RWY 2-7 CONDITION CODE 3-3-3, AT 1430Z

  NOTE: Identify the active runway when inputting information on the d-ATIS.

SLIPPERY WHEN WET is the only contaminant that is reported using both runway designators.

When rubber is on any portion of a runway surface, the entire surface is reported as SLIPPERY WHEN WET.

RwyCC Scenarios

FICON NOTAM

!BOS 01/023 BOS RWY 27 FICON 3/2/2 75 PRCT COMPACTED SN, 100 PRCT 2 IN SLUSH, 100 PRCT 2 IN SLUSH OBSERVED AT 1602211330.

Current ATIS "B"

<u>Scenario 1- RWY 27 in use</u>

AAL123 advises ATIS "B" and requests to land/depart ODO RWY 9.

- ATC does not have to issue the RwyCC. AAL123 has ATIS "B" and will reverse the advertised RwyCC.

  NOTE: *Pilots have been trained to reverse the codes when necessary.*

<u>Scenario 2- RWY 27 in use</u>

New RwyCCs have been provided to the tower, RWY 27 3/2/4. The ATIS has not been updated. AAL123 has ATIS "B".

- ATC would issue AAL123 the new RwyCC.

  NOTE: *All aircraft would need to be advised of the new RwyCC until ATIS update.*

  ***A blanket broadcast is acceptable, "attention all aircraft..."*

RwyCC Scenarios

FICON NOTAM
!BOS 01/025 BOS RWY 27 FICON 5/5/5 25 PRCT 1/8 IN DRY SN, 25 PRCT 1/8 IN DRY SN, 50PRCT 1/8 IN DRY SN OBSERVED AT 1602211530

Previous ATIS "D" with a RwyCC

FICON NOTAM
!BOS 01/026 BOS RWY 27 FICON, 10 PRCT 1/8 IN DRY SN, 10 PRCT 1/8 IN DRY SN, 20 PRCT 1/8 IN DRY SN OBSERVED AT 1602211630.

Current ATIS "E" without a RwyCC

Scenario 3- RWY 27 in use

AAL123 advises ATIS "E" and requests the RwyCC.

- ATC would advise AAL123 a RwyCC is not available

Review of TALPA changes

- **New braking action categories**
- **RwyCC replaces *Mu***
- **New FICON NOTAM format**
- **RwyCC only provided when average total percentage of runway coverage is greater than 25%**
- **SLIPPERY WHEN WET designation- (AC150/5200-28F)**