ICAO/ACI Symposium on Implementation of the New Global Reporting Format for Runway Surface Condition (GRF2019)

TALPA IMPLEMENTATION EVOLUTION

Presented to: ICAO/ACI GLOBAL REPORTING FORMAT (GRF2019) CONFERENCE

By: U. S. Federal Aviation Administration

Date: MARCH 26 TO 28, 2019

Federal Aviation Administration

TALPA Evolution

- **History**
  - Airplane landing and excursion on contaminated surface
  - NTSB set in motion various recommendations
  - Originated as a Aviation Rulemaking Committee Initiative
  - Implemented via voluntary efforts
  - Created tools/capabilities to assess surface conditions
  - Tied assessed condition to airplane performance

TALPA Evolution

Stakeholder Participants

•Regulatory Authorities

- ✈FAA (Airports, Flight Standards, Certification, NOTAMS, Rulemaking, Legal)
- ✈Transport Canada
- ✈Brazilian Certification Authority
- ✈EASA (Limited Participation)

•Other Organizations

- ✈Air Transport Association
- ✈Airline Pilots Association
- ✈Airports Council International
- ✈Allied Pilots Association
- ✈National Air Carrier Association
- ✈National Business Aviation Association
- ✈National Transportation Safety Board
- ✈Neubert Aero Corporation
- ✈Regional Airline Association
- ✈Southwest Airlines Pilot Association
- ✈Allied Pilots Association

•Airplane Operators

•Part 121

- ✈ ABX Air
- ✈ Alaska
- ✈ American Eagle
- ✈ American
- ✈ Continental
- ✈ Delta
- ✈ Express Jet
- ✈ Federal Express
- ✈ Northwest
- ✈ Pinnacle
- ✈ Southwest
- ✈ United
- ✈ UPS
- ✈ US Airways

•Airplane Operators

•Part 91-K/125/135

- ✈Alpha Flying, Inc
- ✈Bombardier Flexjet
- ✈Chantilly Air
- ✈Flight Works
- ✈Jet Solutions

- ✈Conoco Phillips Alaska
- ✈Net Jets
- ✈Pogo Jet, Inc

•Airports

- ✈Cherry Capital
- ✈Chicago Airport System
- ✈Chicago O'Hare
- ✈Grand Rapids Regional
- ✈Minneapolis/St. Paul Airport System

•Airplane Manufacturers

- ✈Airbus
- ✈Boeing
- ✈Bombardier
- ✈Cessna
- ✈Eclipse
- ✈Embraer
- ✈Gulfstream
- ✈Hawker

TALPA Evolution

Airport Operator RCAM Version

Assessment Criteria		Downgrade Assessment Criteria		
Runway Condition Description	Code	Mu (μ) [1]	Vehicle 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	40 or Higher	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
5° F (-15°C) and Colder outside air temperature: • Compacted Snow	4	39 to 30	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 (3mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than 5° F (-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 (3mm) inch depth of: • Water • Slush	2	29 to 21	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice [2] • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	0	20 or Lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

Aircraft Operator RCAM Version

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

TALPA Evolution – Moderator/Speakers

- **Mr. CHARLES.J.ENDERS III (Moderator)**
  - FAA AFS-220 AIR CARRIR OPERATIONS
  - Charles.j.enders@faa.gov Telephone: 202-267-4557
- **Mr. PAUL GIESMAN**
  - FAA TRANSPORT STANDARDS and PERFORMANCE
  - Paul.Giesman@faa.gov Telephone: 206-231-3156
- **Mr. PHILLIP DAVENPORT**
  - FAA OFFICE OF AIRPORTS
  - Phillip.davenport@faa.gov Telephone: 202-267-7072
- **Mr. JOE MANTELLO**
  - FAA TRAFFIC MANAGEMENT OFFICE
  - Joe.Mantello@faa.gov Telephone: 773-601-7695

TALPA – Airplane Performance

US FAA Transport Standards

Presented to: ICAO/ACI Symposium on GRF2019

By: Mr. Paul Giesman

Date: 26 to 28 March 2019

Federal Aviation Administration

Airplane Performance

- **Data basis**
  - Same for all manufacturers and operators
    - One set of assumptions when manufacturers create data
    - One set of operating guidelines for operators
  - ICAO and EASA adopted same time-of-arrival landing performance basis

Airplane Performance

- **Two important parts**
  - Manufacturer data to support implementation of TALPA
    - AC 25-31 – Takeoff – non-issue, AC's consistent to the greatest degree possible with EASA contaminated runway certification requirements
    - AC 25-32 – Landing – Time of Arrival performance data
  - Guidance for operators on implementation of performance data
    - FAA 8900 order
    - Future plan to make content from 8900 order also available by Advisory Circular

Airplane Performance Manufacturers

- **Airplane performance**
  - TALPA Part 25 AC's reflect the submittal of the TALPA part 25 sub-committee
    - Seven manufacturer participants
    - FAA and Transport Canada
    - ALPA and GAMA
  - TALPA ARC included a Part 23 component
    - Limited participation
    - Report was created
      - TALPA report was not comprehensive

Airplane Performance Manufacturers

- **Implementation of TALPA is voluntary**
  - Airplane performance implementation varies
    - Manufacturer may have implemented TALPA completely
      - New certifications from when TALPA completed (2010 on)
      - All but the very oldest airplanes still in operation
    - Manufacturer may have implemented TALPA partially
      - New certifications from when TALPA completed (2010 on)
      - Provided guidance on adjusting existing data
    - Manufacturers may not have provided any data or guidance

Operational Data and Guidance Best Practices

- FAA TALPA is voluntary therefore the operational information provided are – ***"best practices for conducting a landing distance assessment at time of arrival"***
- While TALPA is voluntary for operators and manufacturers, it is mandatory for runway reporting at 14 CFR Part 139 airports and non-14 CFR Part 139 airports which accept federal funds.
  - Since mandatory for airports to report RwyCC and ATS will report Braking Action, operators want/need guidance on how manufacturer supplied performance data can be related to TALPA reported runway conditions
    - Flight operations using TALPA Landing Distance Assessment methods are, as a practical matter, necessary (i. e. required)
  - Lack of manufacturer guidance will typically lead to generic factors

Operational Data and Guidance Best Practices

- **Timeliness**
  - Typically top of descent
  - Determine how much field conditions can deteriorate and still land
- **Source of Data**
  - Preferable manufacturer historical or based on AC 25-32
  - If no data available – Generic factors maybe applied to unfactored AFM dry

Runway Condition Code						
6 (Dry)	5 Grooved/ PFC Runway Good	5 Smooth (non-grooved) Runway Good	4 Good to Medium	3 Medium	2 Medium to Poor	1 Poor
1.67	2.3	2.6	2.8	3.2	4.0	5.1
1.67	1.92	2.2	2.3	2.5	2.9	3.4
1.67	1.92	2.0	2.2	2.4	2.7	2.9
1.67	2.3	2.6	2.8	3.2	4.0	5.1

Operational Data and Guidance Best Practices

- **Safety Margin**
  - 15% recommended
- **Auto-Brake Usage**
  - Runway dry or wet runways
    - If the manual braking distance provides a 15% safety margin then the braking technique may include a combination of autobrakes and manual braking even if the selected auto brake landing data does not provide a 15% safety margin.
- **Additional Guidance**
  - Use of dispatch data
  - Touchdown point

Operational Data and Guidance Best Practices

- **Runway Condition Considerations:**
  - Runway Condition Code
  - Expected runway conditions (contaminate type and depth)
  - Pilot Braking Action report
- **Landing performance data should be based on:**
  - All the conditions that affect landing performance at TOA including:
    - Atmospheric: temperature, slope, wind etc.
    - Airplane: weight, flap and any speed additives
    - Operation: available braking devices, autoland etc.

Operational Performance Implementation Issues

- **Manufacturer's TALPA data/guidance not available**
  - Default to factor's and by nature conservative
- **Multiple contaminants reported**
  - Primarily takeoff issue
  - Data provided by manufacturer for single contaminant on the runway
  - Different airplanes have different critical contaminant for performance
  - Consensus, operators handle the choosing of the critical contaminant for performance purposes
- **Last minute industry group demand to not require reporting of wet runway via NOTAM**
- **Slippery When Wet implementation**

Location of TALPA Recommended Operating Guidelines

- **FAA Order 8900.1, Vol. 4, Chap. 3, Sec. 1, Dec. 6, 2018**
  http://fsims.avs.faa.gov/FSIMS/FSIMS.nsf/pubs/5AF54CCD5BA2070986257D1500665C7A?opendocument
- **Safety Alert for Operators 06012 Rewrite, "Landing Performance Assessments at Time of Arrival" – release imminent**
  https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/
- **FAA planned AC on TALPA operational "best practices" in 2020**

- **FAA TALPA performance guidance and practices are adopted by ICAO Airplane Performance Manual and EASA GRF rulemaking task**
  - All three entities are using the same airplane performance basis for landing time of arrival landing assessments

FAA/Office of Airports TALPA Implementation

Presented to: ICAO/ACI Symposium on GRF2019

By: Mr. Phillip Davenport

Date: 26 to 28 March 2019

Federal Aviation Administration

FAA Guidance Documents

- **Advisory Circular 150/5200-30D, *Airport Field Condition Assessments and Winter Operations Safety***
  - Detailed instructions on using the RCAM to produce RwyCCs
  - Updated general guidance, methods, and procedures
  - Source for training & awareness for all stakeholders
- **Advisory Circular 150/5200-28F, *Notices to Airmen (NOTAMs) for Airport Operators***
  - Highlighted NOTAM system for producing RwyCCs
  - Listed reportable contaminant type, percent coverage, depth and other critical elements related to field condition reporting
  - System criteria/examples to coincide with NOTAM tool

NOTAM System

- **Enhanced tool for producing RwyCCs and reporting Field Condition NOTAMs (FICON)**
  - Modified system on how surface conditions will be reported based on the RCAM criteria
  - System reduces subjectivity and standardizes how the RwyCC is generated and published
  - System calculates and generates RwyCCs based on contaminant information input by the airport operator
    - System comprised of simple dropdown menu selections for the airport operator
    - Established a demo system for testing and familiarity
  - System business rules and methods are transferrable
    - Prepared to coordinate with implementation teams
    - FAA Order 7930.2, Notices To Airmen (NOTAMs), is governing document

Awareness Campaign

- **Time is critical for a successful implementation**
  - Developed information for operators and stakeholders to use/supplement existing training and guidance documents
  - Conducted outreach nationally via webinars, conferences, industry forums and informational bulletins for airport operators and other stakeholders
  - Recorded narrated presentations on process for utilizing the RCAM for field condition assessment and reporting
  - Sought industry participation to publish articles in trade publications on field condition assessment and reporting
  - Websites built making available information to industry and stakeholders
  - FAA Industry Day held ahead of implementation to seek feedback and address stakeholders concerns

Challenges

- **Enough time to meet implementation expectations**
- **Change impact on airport operators**
- **Break with traditional way of assessing conditions**
- **Understanding use of existing friction measuring tools after implementation**
- **Instituting new terminology**
- **Applying RwyCC upgrade/downgrade actions**

Best Practices

- **Development of a website for information and a bank of Frequently Asked Questions**
  - https://www.faa.gov/about/initiatives/talpa/
- **Capability to accept/answer stakeholders on-going questions throughout implementation**
- **Usable template as a basic framework that can be used to train stakeholders**
- **Information distribution capability to reach numerous stakeholders simultaneously and means for feedback**
- **Data gathering source for GRF analysis after implementation**

Air Traffic Control
TALPA Implementation

Presented to: ICAO/ACI Symposium on GRF2019

By: Mr. Joe Mantello

Date: 26 to 28 March 2019

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ATC Guidance Documents

- **Order JO 7110.65 – Air Traffic Control**
  - Added Runway Condition Codes (RwyCC) – “0” (worst) to “6” (best)
  - Replaced “Fair” reportable braking action report with ICAO “Medium”
  - Introduced new categories: “Good to Medium” and “Medium to Poor”
- **Order JO 7210.3 – Facility Operation and Administration**
- **Order JO 7110.10 – Flight Services**
- **Aeronautical Information Manual (AIM)**
- **Aeronautical Information Publication (AIP) ICAO**
- **Pilot/Controller Glossary**

Air Traffic Controller Required Training

- **Develop Training and Training Guidance**
  - Appropriate timelines and methods must be established
  - Training and updates must be consistent state-wide
  - Recommend establishing a training framework/template for standardization
- **Brief Procedural Changes to All Controllers**
  - Terminal facilities
  - EnRoute facilities
  - Both state run and non-government facilities

Aviation/Airspace User Procedural Changes

- **Aeronautical Information Manual (AIM)**
- **Aeronautical Information Publication (AIP)**

Publication changes:

- Removed all references to “Mu” and “friction reports”
- Incorporated new Field Condition (FICON) NOTAM format
- Replaced definition of “friction” with new understanding of Runway Braking coefficient
- Describes the Runway Condition Assessment Matrix (RCAM) as the tool for assessing runway surface conditions

ATC / Aviation Procedural Changes

- **Pilot/Controller Glossary**

Terminology changes:

  - Types of braking action
    - Changed “Fair” to “Medium”
    - Added two new categories for more precise reporting
  - Added and defined Runway Condition Code (RwyCC)
    - More accurately correlates surface contamination with expected braking action in each runway third
  - Removed Runway Condition Reading (μ)
  - Added and defined Runway Condition Report
    - RwyCCs, percentage, type/depth of contaminant coverage, by runway thirds

Emphasize Controller Procedures Not Affected

- **Controllers will** still solicit braking action reports from pilots after/upon landing
- **Controllers will** disseminate to Airport Operators, and pilots, pertinent changes to surface/landing conditions received via PIREPS/NOTAMS
- **Controllers will** disseminate new information via ATIS broadcasts like Runway Condition Codes.
- **Controllers will *not*** add the complete FICON NOTAMs to the ATIS broadcast

Conclusion & Thank you!