EASA
Runway Friction Workshop

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U·S AIRWAYS

Contaminated Runway Operations Issues

- Various definitions of runway conditions aren't well-defined nor consistently applied
  - "Thin," "Patchy"
- Runway conditions difficult to assess
  - "⅛ inch versus ¼ inch"
- No strong correlation between defined runway conditions and actual performance
- Flight crew awareness of impact to performance is typically limited

Contaminated Runway Operations Issues

- Data availability
  - Recent certifications provide engine-inop takeoff performance while older certifications do not
  - Reliant on non-approved data where certified data missing
  - Some manufacturers do not provide stopping performance data in form of PIREP runway condition reporting – only type and depth of contaminant
- Consistent application of performance very difficult

FAA TALPA ARC

- We support the FAA TALPA ARC
  - Consistency of application including terminology, certification basis, data availability, implementation
  - Airports / FAA / Operators are encouraged to work together in the process resulting in a consistent application of NOTAMS where everyone understands intent.
  - There is an emphasis on Training. This will provide a minimum basic understanding of the concepts involved.

FAA TALPA ARC

- We support the FAA TALPA ARC (cont)
  - A practical application was sought. "Pie in the sky" approach to implementation was sacrificed for something that is achievable in a short time frame providing the most value and improvement to safety of operations.
  - Small but very meaningful changes made to current requirements and operator typical best practices.
- All of this was made possible through the TALPA ARC philosophy which stresses inclusion of the experts impacted by resulting regulation.

Lessons Learned

- Dispatch Regulations are Adequate
- Need to formalize requirement for Operational Assessment at time of arrival
- 15% Safety Margin on operational data is appropriate with a nominal air distance of 1500 ft /500m or 7 seconds air time

Lessons Learned

- Pilot reports are best indicator of conditions when available
  - Have proposed standardized reporting, but still very subjective
  - Reflect only part of runway where braking occurs
  - Aircraft size matters (Landing gear configuration, tire size and pavement loading)
  - Could be improved by cockpit readouts of braking effectiveness

Lessons Learned

- Runway contaminant type and depth most objective and should be universally available
  - Developed standardized reporting scheme
  - Builds on ICAO 1-5 numbering system with codes 0-6
  - Airports operators welcome better guidance

Lessons Learned

- Better reporting of conditions is key to better decision
  - Starts with timely reporting by airport authority
  - Need to use power of Digital NOTAMS to disseminate
  - ATC must report real-time conditions and PIREPS

Lessons Learned

- Runway Friction Measurements are unreliable
  - (More later!)

- Supplementary Data by airframe manufacturers is adequate
  - Don’t need new AFM data for existing aircraft

Lessons Learned

- Cockpit tools can be onboard computer, ACARS, or paper charts
  - Do analysis at top of descent
  - Determine acceptable conditions for runways in us
  - Be prepared to divert if conditions deteriorate
  - Treat like visibility minima

Operational Environment and Philosophy

- Airports must keep runways reasonably clear or airlines won't operate
  - Exceptions for Arctic and mountainous airports
  - Accept some deterioration of conditions during snowfall
  - Accurate reporting is the key
  - Challenging airports get more dispatcher attention
  - SWOA – Special Winter Operations Airport designation

Operational Environment and Philosophy

- Good business decisions provide good safety
  - Won't dispatch unless reasonably confident will be able to land
  - Hard to quantify in regulatory language
- U.S. airlines pro-actively cancel flights with impending storms
  - We don't operate in hurricanes either!
  - Passengers prefer knowing in advance
  - Changing plans better than being stranded

Operational Environment and Philosophy

- Contaminated runways treated like short runways
  - Studies show touchdown dispersion smaller
  - Pilots won’t allow float for a soft touchdown
  - More willing to go-around if can’t touchdown as planned

Friction Measuring Devices

- Pilots love them; engineers distrust them
- FAA guidance has changed
  - Runway measurement after Chicago MDW accident misleading
  - "Don't rely upon Mu alone"
  - TALPA ARC recommends not even reporting Mu

Friction Measuring Devices

- Canadian Joint Winter Runway Friction Program
  - Transport Canada, NASA, FAA, JAA support
  - Multi-year and Multi-million dollar study
  - Correlation of runway friction measurement and aircraft stopping under controlled conditions less than expected

Friction Measuring Devices

- Canadian Joint Winter Runway Friction Program
  - Physics of the tire/runway/contaminant interaction very complex and scaling from ground vehicle to aircraft is questionable
  - Reduced confidence that ground vehicle measurement systems will be able to accurately predict aircraft stopping performance in a dynamic winter weather environment

Friction Measuring Devices

- Aircraft Instrumentation
  - Measuring aircraft braking action is good first step to modeling it
  - Better pilot support for a program that gives pilot the info instead of transmitting it
  - Not at top of priority list for safety improvements