AST – FPAW ABAR

Runway Monitoring - Aircraft Braking Action Report

October 25, 2022

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Agenda

✓Why the topic of Aircraft Braking Action Reports is worthy of discussion

✓What is this regulatory history behind this topic

✓What is the technical and procedural status of recent innovations

✓Next steps

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Aircraft Braking Action Reports

Runway Excursions continue to be a leading cause of aircraft accidents, hull losses and fatalities due to the volume of accidents and incident. The risk is still present

Pilots being surprised by unexpected runway conditions is no longer an unavoidable risk or the cost of doing business

16 Runway Excursions in 2022 YTD reported

IATA Annual Safety Reports show about 25% of runway excursions are a result of meteorological factors in most years

Most individual accidents don't result in fatalities, but the volume of RE adds up!

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NTSB Safety Recommendation A-16-23

Opened: 10/06/2016 **Closed** 09/12/2018

...work with industry to develop the technology to outfit transport-category airplanes with equipment and procedures to routinely calculate, record, and convey the airplane braking ability required and/or available to slow or stop the airplane during the landing roll.

Feasibility demonstrated to the FAA via BAA contracts using aircraft flight data to measure and report braking performance on 03/15/2016

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NTSB Safety Recommendation A-16-24

Opened: 10/06/2016…not closed

If the systems described in Safety Recommendation A-16-23 are shown to be technically and operationally feasible, work with operators and the system manufacturers to develop procedures that ensure that airplane-based braking ability results can be readily conveyed to, and easily interpreted by, arriving flight crews, airport operators, air traffic control personnel, and others with a safety need for this information."

The technology has been developed and is deployed on over 2,000 jet transport aircraft who have supplied data on over 16 million landings during past 10+ years.

Appropriate AC's published or in process

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ABAR reporting exists today

ASTM International developed standards applicable to ABAR:

- E3188-19 Standard Terminology for Aircraft Braking Performance
- E3266-20 Standard Guide for Friction Limited Aircraft Braking Measurement and Reporting
- Developed by SAPOE: Same folks who supported TALPA leading to GRF

Transport Canada Advisory Circular 700-060

- “Braking Action Reports” established procedural construct for using Aircraft Braking Action Reports (ABAR) and Pilot Braking Action Reports (PBAR)
- Differentiation between Pilot Braking Action Reports (PBAR) and Aircraft Braking Action Reports (ABAR) based on levels of precision and accuracy

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ABAR: How does it work

Upon landing…

- Collect aircraft sensor data as described by ASTM standards
- Isolate and measure all forces affecting deceleration throughout the landing roll
- Determine whether a friction limit was reached and the wheel brake coefficient throughout the landing
- Mapping the wheel brake coefficient to a standardized scale
- Reporting the braking action in standard terms to all with a need to know

AST provides ABAR: Cockpits through airline data center, VPN/MQ messaging to airlines/airports/ATC, SMS/Email and AST UI to interested parties

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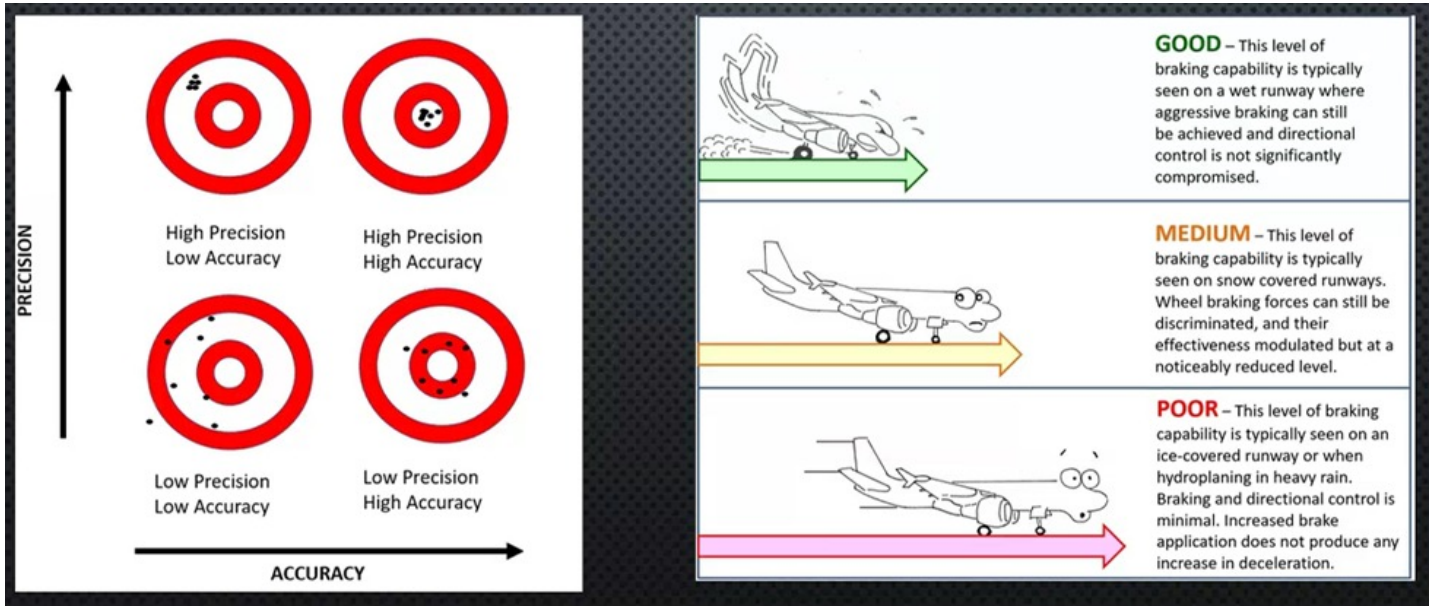
Precision and Accuracy



Demonstration of required Precision and Accuracy allows operators to expand from 3 braking action descriptions (Good, Medium, Poor) to include Medium-Good and Medium-Poor

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Next Steps:

In process: FAA revision of AC 91-79: “Mitigating the Risks of a Runway Overrun Upon Landing”

- Harmonization with Transport Canada AC 700-060 “Braking Action Reports
- Recognizes requirement for PBAR and ABAR to demonstrate prescribed levels of Precision and Accuracy

Next: Deployment of FAA Acceptance/Approval process based on compliance to ASTM Standards

- AST utilizes big-data approach prescribed by E3266-20 Standard Guide for Friction Limited Aircraft Braking Measurement and Reporting

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Thank You

Questions?

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