ICAO

Circular 355

Assessment, Measurement and Reporting of Runway Surface Conditions

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

Appendix H

TRAINING SYLLABUS

This appendix provides an example of a syllabus for training aerodrome operator personnel and flight crews using the global reporting format. The examples are provided to support PANS-Aerodromes (Doc 9981), Part II, Chapter 1, applicable as of 5 November 2020. The syllabus provides guidance on the training that will be required for the successful roll-out of the global reporting format.

1. EXAMPLE OF A LIST OF SUBJECTS FOR TRAINING AERODROME OPERATORS ON RUNWAY SURFACE CONDITION REPORTING

Note.— It should be assumed that driving on the runway is permitted with appropriate ATC permissions in all weather conditions.

1. General	
Background	• FAA take-off and landing performance assessment (TALPA) Aviation Rulemaking Committee (ARC) recommendations • ICAO, ICAO Friction Task Force (FTF), SARPs, PANS and guidance • States, rule-making
History of friction	• Accidents • Different countries, different methods
2. New reporting format — RWYCC *Note.— Developed with major aircraft manufacturers involved in aircraft performance*	
Method	• RWYCC • Assessment • Runway thirds
3. RCAM	
RCAM layout	
Contamination definitions	
Assessment by eye and experience	
Runway length and width	

4. RCR	
Downgrade and upgrade criteria	
Aeroplane performance section	
Situational awareness section	
Timeliness – if significant change	
Landing considerations (crosswinds also factored into pilot's decision)	
Take-off considerations (crosswinds also factored into pilot's decision)	
Pilot report – AIREP feedback	
Types of errors	• Consequences • Safety margin
Reliability	• Consistency • Accuracy
5. Reporting to:	
ATC	• ATIS
AIM	• SNOWTAM
Coordination with ATC for: • runway entry; • time of assessment; and • dissemination of results.	
6. Maintenance of "slippery wet" runway	
• Trend • NOTAM • RCR	
7. Documents and records	

2. EXAMPLE OF A LIST OF SUBJECTS FOR TRAINING PILOTS ON CONTAMINATED RUNWAY OPERATIONS

2.1 Training and actual operations should be based on the fact that the assessment of the runway condition, friction measurement and estimation of braking action are not an exact science. Pilots should understand that the actual safety margins get smaller when conditions get worse and, at the same time, the assessment of the runway condition becomes more difficult in deteriorating weather. Therefore, the RCAM, RWYCCs and braking action are adaptive tools in decision-making rather than operating norms or rules. For example, a calculated 1 m margin in landing distance does not necessarily mean that the landing will be safe; the pilot must use his or her best judgement, taking different variables into account and cross-checking between sources when making decisions.

2.2 It is also good airmanship to determine how small changes in runway and/or weather conditions affect operations, for instance, how the downgrading of the RWYCC by one level or a predetermined wind change affect operations. It is good CRM to make some predetermined decisions regarding deteriorating conditions. These "canned decisions" improve situational awareness, help in late-stage decision-making and improve workload management.

Note.— Items marked with an asterisk (*) are directly linked to runway surface condition reporting.

1. General	
Contamination	• Definition* • Contaminants that cause increased drag and therefore affect acceleration, and contaminants that cause reduced braking action and affect deceleration • Slippery when wet: status*
Contaminated runway	• Runway surface condition descriptors* • Operational observations with friction devices* • Operator's policy on the use of: o reduced take-off thrust; o runway thirds in take-off and landing performance calculations; and o low visibility operations and autoland. • Stopway • Grooved runway
RWYCCs*	• RCAM* o Differences between those published for aerodromes and flight crew* o Format in use* o The use of runway friction measurements* o The use of temperature* o The concept of performance categories and ICAO runway surface condition codes* o Interpretation of "slippery wet" o Downgrade/upgrade criteria* o Difference between a calculation and an assessment*

	• Braking action* o Reporting of LESS THAN POOR → no operations • Use of aircraft wind limit diagram with contamination
RCR (reference: Doc 10064)	• Availability* • Validity* • Performance and situational awareness* • Decoding* • Situational awareness (reference: Doc 10064)*
Aeroplane control in take-off and landing (reference: Doc 10064)	• Lateral control o Windcock effect o Effect of reversers o Cornering forces o Crosswind limitations □ Operations if cleared runway width is less than published width
	• Longitudinal control o V_1 correction in correlation with minimum control speed on ground o Aquaplaning o Anti-skid o Autobrake
Take-off distance	• Acceleration and deceleration • Take-off performance limitations • Take-off distance models • Factors involved • Reason for using the type and depth of contaminant instead of RWYCC* • Safety margins
Landing distance	• Model for distance at time of landing • Factors involved

	• Safety margins o Minimum equipment list (MEL) does not include any additional margins (e.g. 15%)
ICAO's exceptions in runway reporting	• States that do not comply with ICAO*
2. Flight planning	
Dispatch/in-flight conditions	
MEL/configuration deviation list (CDL) items affecting take-off and landing performance	
Operator's policy on variable wind and gusts	
Landing performance at destination and alternates	• Selection of alternates if airport is not available due to runway conditions o En-route o Destination alternates • Number • Runway condition
3. Take-off	
• Runway selection • Take-off from a wet or contaminated runway	
4. In-flight operations	
Landing distance	• Distance at time of landing calculations o Considerations for flight crew (reference: Doc 10064)* o Operator's policy • Factors involved • Runway selection for landing • Safety margins
Use of aircraft systems	• Brakes/autobrakes • Difference between friction-limited braking and different modes of autobrakes • Reversers • Aeroplane as a friction-measuring and/or reporting system
5. Landing techniques	
Pilot procedures and flying techniques when landing on length-limited runway (reference: Doc 10064)	
Use of the Engineered Materials Arresting System (EMAS) in case of overrun	

6. Safety considerations
• Possible types of errors* • Mindfulness principles necessary for high reliability*
7. Documentation and records*
8. AIREPs (reference: Doc 10064)
• Assessment of braking action* • Terminology* • Possible automated AIREPs* (aeroplane as a friction-measuring and reporting system) • Air safety reports if flight safety has been compromised

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