



ECA
Piloting Safety

ECA Position Paper

Runway Surface Conditions Assessment & Reporting

Today's situation

Over a 10-year period, the Accident Investigation Board Norway (AIBN) has received 30 reports of accidents and incidents related to operations on contaminated and slippery runways. Nine of these reports concerned accidents and serious incidents. In the same period AIBN has published 12 investigation reports and issued 36 safety recommendations.

ECA's concerns concur with the AIBN report "Winter operations, Friction Measurements and conditions for friction predictions", issued in May 2011.

- "The AIBN believes that incidents relating to slippery runways occur because the involved parties do not realise that existing rules and regulations are based on a simplification of the actual physical conditions. The measured/estimated friction values are used as scientific truths and not compared to other meteorological conditions ('safety indicators')."
- "The safety margins are reduced by operational procedures which to a limited degree take into account the uncertainties connected to input parameters used for landing distance calculations. The AIBN's findings are supported by research programs and studies."
- "The AIBN findings show that the national regulations governing operations on contaminated and slippery runways are less strict than those that govern operations in summer conditions. This is in spite of the ICAO and EASA guidelines and regulations which prescribe that if winter operations are to be performed on a regular basis, the authorities require the operators to take special measures in order to attain an 'equivalent level of safety' to summer conditions."

ECA notes that

- today's **reporting and measuring system is out of date** and gives no reliable correlation between ground friction tests and airplane braking performance.
- **friction tests are not reliable**, especially during tests on contaminated runways with small spread (< 3 K) between OAT and Dew Point.
- **pilots' knowledge on the background of today's system is limited** and mostly restricted to the use of tables and performance computers.

- **pilot reports are not standardised**, mostly subjective and have only restricted operational value.
- **runway friction is handled differently at European airports and between European countries**, although there is an international ICAO standard for runway condition reporting.

Way forward

Following last year ICAO State Letter (AN 4/1.1.55-15/30) a new set of Standards and Recommended Practices (SARPs) regarding operations on contaminated and slippery runways will be applicable as of late 2018. The implementation of the amended SARPs into EASA regulatory framework will take place by latest 2020.

We welcome the changes to set forth as leading to an increase of both, in the level of standardisation in Europe and elsewhere as well as in the level of flight safety overall. ECA's goal is to ensure that procedures are correctly understood and applied by those responsible – the pilots. A number of key recommendations have also been developed to ensure a smooth and effective implementation of the revised SARPs in Europe.

ECA's recommendations

1. **Ensure pilots' contribution and inputs** in all on-going and upcoming EASA rulemaking activities related to SARPs implementation, in the extensive research programmes and in the Take-Off and Landing Performance Assessment (TALPA) trials that are under way or planned ahead.
2. **Standardise within Europe the use of the new Runway Condition Assessment Matrix**, the global reporting format and the the even more important contribution of pilot reports.
3. **Secure the development of new procedures, tables and inflight software** to enhance the pilots' ability to assess a slippery or contaminated runway.
4. **Ensure proper training and education of line pilots** before implementation.

Ensure pilots' contribution and inputs in all on-going activities

EASA:

EASA should continue to invite ECA to assign highly competent pilots with exhaustive technical knowledge to join EASA's relevant committees, and EASA bodies involved in the implementation.

National regulators:

All national regulators should invite the experts of national airline pilot associations to participate in working groups and symposiums responsible for SARPs implementation. Most ECA Member Associations have Flight Safety Committees with qualified and skilled personnel.

Aerodromes:

Aerodromes should invite national pilot associations to designate a locally based pilot to join Local Runway Safety Team (LRST) and/or other Flight safety related committees. The committees should be involved in all local trials and in the development of local regulations related to the forthcoming implementation.

Fully standardise the use of new RWY Condition Assessment Matrix, global reporting format and PIREPs

In ECA's view **current regulation and procedures have many inconsistencies:**

- The revised SNOWTAM recommendations and procedures issued by ICAO a few years ago are handled differently from state to state. Some states are still publishing μ values for the use in landing and T/O performance calculations, some are solely using the ICAO recommended procedure.
By issuing the μ values in the SNOWTAM many operators are still using measured friction values in hundredths (1/100) and independent of the type of friction measuring device that is used.
- There is no European guidance for airports to produce Estimated Braking Action reports. There is no information to pilots about this fact.
- There is no standard for PIREPs. In the TALPA 'world', however, they have a direct effect on runway operations, a fact unknown to those pilots not using it. The implications of up-and downgrading are also not known to pilots. In most countries, there is no guidance for standardized PIREPs.
- There are different tables describing braking action values, some differing from TALPA matrix values.

How can we best avoid such differences in operational procedures to develop in the new EASA regulation?

- ECA believes it is **imperative that the new EASA regulation allows few or no adaptations or exemptions** by local/national authorities.
- EASA should **encourage and consult Member States with most experience on operations on slippery and contaminated runways** to lead the way in the forthcoming rulemaking activities. This may reduce the need for any future national adaptations/exemptions.
- EASA should **develop relevant guidance material to assist Member States** in the implementation and compliance of the regulation.

Secure development of new procedures, tables and inflight software to enhance the pilot's ability to assess a slippery or contaminated runway

The UK CAA established a Winter Operation Group (WIG) following the severe weather experienced in UK in 2010. The group consisted of stakeholders representing Operators, ATC, Airports and Regulator.

WIG reviewed all existing documentation/procedures and also used "The Winter operations report" from the Norwegian AIBN and results from the US TALPA Aviation Rulemaking Committee (ARC) to produce new guidance material and updated AIP and AIC pages regarding the reporting of runway surface conditions.

WIG have pointed out several operational considerations that ECA believes needs full attention in the forthcoming trials and rulemaking tasks:

"Considerations for Aeroplane Operators:

- *When dispatching to a destination likely to have a contaminated runway, consideration should be given to assessing the impact of an engine failure for all stages of the flight. It is also essential to make sure that the runway surface condition at both destination and alternate aerodrome is adequate. Approved performance data must be used to show compliance with the performance requirements at all times.*
- *In order to increase safety margins when landing on contaminated runways, an in-flight re-assessment should be conducted before every approach and appropriate margins applied to landing performance.*
- *When operations on contaminated runways are not limited to rare occasions, operators should provide additional measures to ensure an equivalent level of safety. Such measures could include special crew training, additional distance factoring and more restrictive wind limitations.*
- *Crosswind guidance related to operation on contaminated runways has not been demonstrated. Consequently, the guidance could be optimistic given the uncertainties and variables associated with contaminated runway operations. Operators should consider aligning their crosswind guidelines in accordance with their level of contaminated runway operational experience.*

- *Operators should ensure that their pilots understand the importance of flying a stabilised approach at the appropriate speed, terminating with a touchdown in the right place. Proper deployment of aircraft deceleration devices and correct braking technique are also critical elements to mitigating the runway-overrun risk when landing on contaminated runways. If it is likely that any of this may not be achieved, a missed approach may be the safest option.*
- *Data from the Flight Data Monitoring (FDM) system should be analysed for all types of runway surface conditions in order to identify any adverse landing trends.*
- *Chemical treatments on runways, if ingested into engines and thus cabin conditioning systems, may produce a non-toxic mist in the cabin which could easily be misidentified as smoke. It would therefore be prudent under these circumstances for pilots to brief their cabin crew accordingly.*
- *Runway friction is handled differently at European airports and varies between European countries. Therefore UK aeroplane operators should be mindful that what is described in this document (paragraph 4.2) cannot necessarily be expected in other countries.*

Considerations for Aerodrome Operators:

- *The ‘3 Kelvin Spread Rule’ (see Appendix 1, paragraph 1) is not an absolute rule but may be used as an indicator that runway surface conditions might be more slippery than anticipated.*
- *Chemicals used for runway treatment purposes may become less effective if melting snow/ice or precipitation is present. Likewise, chemicals can dry to produce a slippery film. Aerodrome personnel should continually monitor runway surface conditions after the application of chemicals.*
- *Runway surface condition reports are open to a certain amount of subjectivity due to the often dynamic nature of winter meteorology combined with the variables associated with human factors. The current UK contaminated runway surface condition assessment (matrix) trial, based on the Federal Aviation Administration (FAA) Take-Off and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee’s (ARC) proposals, should aid standardised reporting and reduce subjectivity.”*

Source: UK Civil Aviation Authority Operations on Contaminated Runways 1 August 2012 Version 1

ECA believes it is essential that EASA, national authorities, operators, ANSPs and other stakeholders make use of lessons learned with today’s system and incorporate these into the new regulation and guidance material. Non-standardised procedures and regulations as we have today, in Europe and in the rest of the world, are not acceptable.

ECA salutes the UK CAA and French DGAC for their foresight, ability and willingness to initiate the transition to the forthcoming ICAO regulation by 2020. The UK CAA started this process already in 2011 and adjusted their goals and methodology with reference to the work laid down in TALPA Aviation Rulemaking Committee and ICAO Friction Task Force.

ECA would like to recommend EASA to lead the way for a similar approach to initiate the implementation of the ICAO regulation for all its Member States well in advance of 2020.

Ensure proper training and education of pilots

ECA believes a **major focus on training is necessary to increase pilot skills and confidence in operations on slippery runways**, regardless of type of contamination.

ECA recommends **EASA to develop minimum requirements for training programs for all relevant players**, including pilots. The training should be both, an initial module to be completed before the implementation date in 2020, but also a mandatory recurrent training programme.

Training issues should include, but not be limited to:

- The introduction of:
 - Runway condition report (RCR)
 - Runway condition code (RWYCC) to be used in the RCR
 - Runway condition assessment matrix (RCAM).
 - Amended Runway surface condition descriptors.
 - Improved SNOWTAM (ADCON)
- The increased importance of Pilot Reports and their use for either downgrading or upgrading of RWYCC
- Latent dangers of Contaminated Runway Operations.
- Non-reliability of inputs into Performance Calculations at all levels: TALPA ARC leads to a normative system where pilots calculate landing distance based on Estimated Braking Actions. They receive results with a degree of exactitude of 1 meter. However, the input data used is vague at best. Before, the PIC, as part of an adaptive process, had to consider various inputs to make a decision about being able to land on a given runway. This is a serious training issue that is not being addressed for the time being.

Summary

Following last year ICAO State Letter (AN 4/1.1.55-15/30) ECA welcomes the changes set forth leading to an increase of both, the level of standardisation and the level of flight safety regarding operations on contaminated and slippery runways applicable as of late 2018.

ECA believes it is crucial that the expertise of pilots and their national associations are involved in all operational preparations, rulemaking activities and drafting of guidance material.

Training of pilots will be of utmost importance before and after implementation of new SARPs.

EASA should develop guidance material for its Member States to follow suit with the UK CAA work and issue publications regarding the uncertainties of winter operations as well as recommendations for operators and airports. It should also introduce the key elements of the TALPA ARC concept as best practice before formal implementation in 2020.

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