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EASA Webinar on GRF

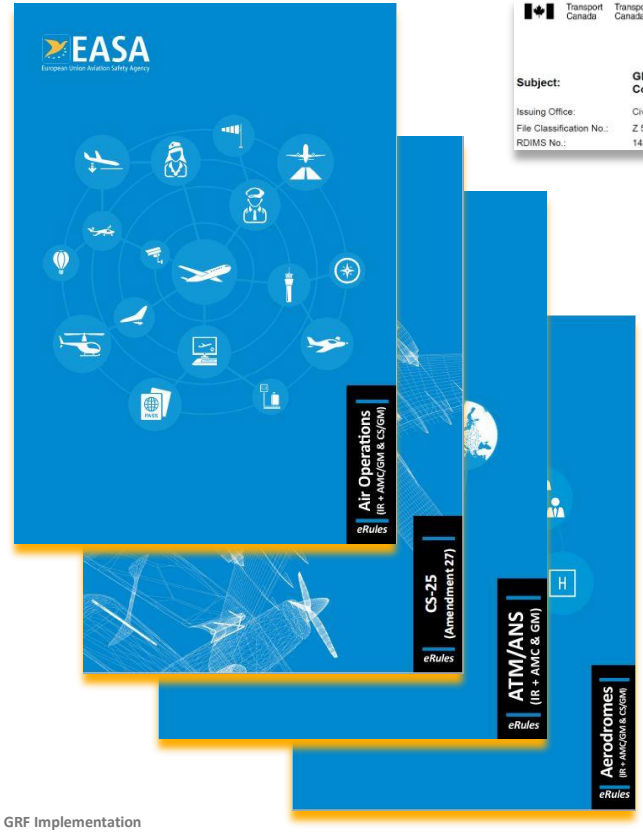
Operator’s feedback from the GRF implementation

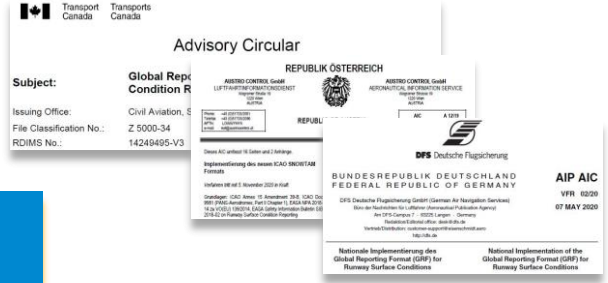
01. March 2023 FRA A/TP-P

Heinz Conrad

Public

GRF - Implementation





Manufacturer

- FCOMs
- FCTMs
- Performance Data

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GRF - Implementation


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Introduction of new Global Reporting Format and new rules for Inflight landing Assessment at Time of Arrival

Prepared by:

AO/PB-P Performance Expert Community

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AO/PB-P / Aircraft Performance Lufthansa Group / 2020

LH Group Performance Community

- **prepared "GRF Compendium"**
- **supported implementation**
- **provided performance data**

Operations Manual Part A

- Definitions
- Policies
- General limitations

Operations Manual Part B

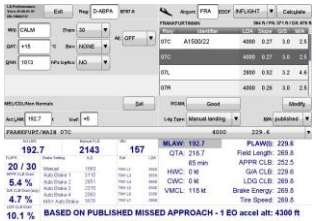
- Aircraft specific data
- Specific limitations

Operations Manual Part C

- Country specific GRF information (eg: GRF formats)

Training Documents

Performance Applications (EFB and Dispatch)



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GRF - Implementation

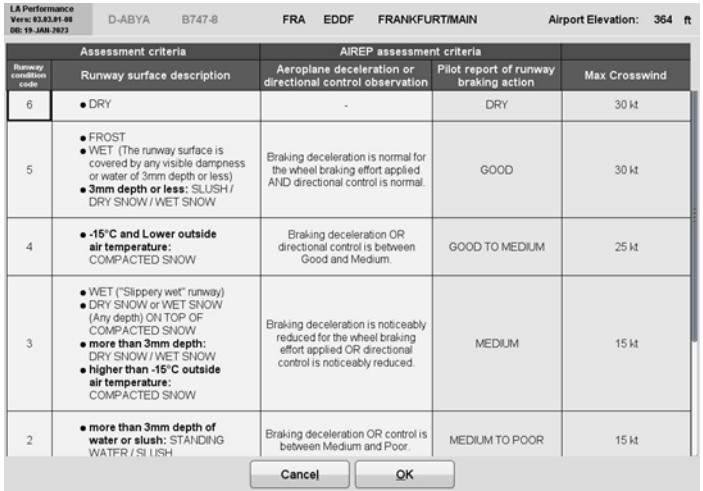
Smooth GRF Implementation for Landing

- Delay (Nov 2020 -> Aug 2021) and introduction in summer helped
- Since implementation the winters have been mild
- Airbus introduced ILD/FLD already 10 years ago

Crews understood the GRF concepts of dealing with RWY-Thirds

- Use lowest RWCC
- Check how much of first third is flared over
- Shorten the runway by a third for a RWYCC outlier, but use x-wind limit of outlier.

Landing RCAM



LA Performance Vers: 03.03.01-08 DB: 19-JAN-2023 | D-ABYA B747-8 | FRA EDDF FRANKFURT/MAIN | Airport Elevation: 364 ft

Assessment criteria		AIREP assessment criteria		
Runway condition code	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action	Max Crosswind
6	• DRY	-	DRY	30 kt
5	• FROST • WET (The runway surface is covered by any visible dampness or water of 3mm depth or less) • **3mm depth or less:** SLUSH / DRY SNOW / WET SNOW	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD	30 kt
4	• **-15°C and Lower outside air temperature:** COMPACTED SNOW	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM	25 kt
3	• WET ("Slippery wet" runway) • DRY SNOW or WET SNOW (Any depth) ON TOP OF COMPACTED SNOW • **more than 3mm depth:** DRY SNOW / WET SNOW • **higher than -15°C outside air temperature:** COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM	15 kt
2	• **more than 3mm depth of water or slush:** STANDING WATER / SLUSH	Braking deceleration OR control is between Medium and Poor.	MEDIUM TO POOR	15 kt

Cancel | OK

GRF - Implementation

Discussions during implementation:

X-Check between TALPA landing data and dipatch landing data?

- not generally mandated
- makes sense only if report at dispatch was still valid at ETA

How to name the new landing distances in OM/A or trainings documents?

- EASA: LDTA (unfactored)
- Airbus: ILD (unfactored), FLD (factored)
- Boeing: OLD or OpLD (factored and unfactored)
- “TALPA”, “Time-of-Arrival”, “Enroute” or “Inflight” Landing Distances

Will crews receive RCRs in a timely manner?

- this was a big concern prior implementation
- turned out not to be an issue?

GRF - Implementation

Minor topics after implementation:

Crew feedback on “NR” in GRFs.

- Different occurences of depth reporting (same airport within 2h):

```
5/5/5 100/100/100 NR/NR/NR DRY SNOW/DRY SNOW/DRY SNOW
5/5/5 100/100/100 01/01/01 DRY SNOW/DRY SNOW/DRY SNOW
5/5/5 100/100/100 03/03/03 DRY SNOW/DRY SNOW/DRY SNOW
```

- “NR” on coverage reporting for less than 10%.

“Specially Prepared Winter Runway”

- considered as a forbidden upgrade to RWYCC 4, rather than a reporting condition in its own right
- probably due to confusion of the colloquial use of “prepared” (eg: sanded, chemically treated) with the well defined term

What does the “G” in GRF stand for ?

- The reporting format is not “global” !

GRF - Implementation

Regulatory Topics to be reviewed

Reference	Problem description	Suggestion
GM1 CAT.POL.A.230(a) List of alternate airports to be calculated using dispatch criteria.	The language doesn‘t make it clear that this GM actually cascades to CAT.POL.A.235 (is valid for wet/contaminated runways, too).	Clarification is needed. Maybe a similar GM could be added to CAT.POL.A.235, too.
CAT.POL.A.230(e) and .235(e) Dispatch criteria.	(e) For dispatching the aeroplane, the aeroplane shall either: (1) ... (2) ... It was never intended to choose between the two conditions.	Delete „either“, add „;and“ to first condition. ☺ Already fixed by Commission Implementing Regulation (EU) 2023/217, 1 Feb 2023
CAT.POL.A.215(c); and CAT.POL.A.220(a)	Both rules stipulate that the enroute alternate airport has to be checked using the dispatch landing requirements.	References to CAT.POL.A.230 and .235 should be changed to CAT.OP.MPA.300ff

GRF - Implementation

Airbus Data Provision

- Provided TALPA landing distance data (SCAP*) more than 10 years ago
- Provided dispatch landing data (SCAP) for reportable conditions
- Provided comprehensive recommendations in FCOM and FCTM

Embraer Data Provision

- Provided TALPA landing distance data for normal landing in December 2020 (after original GRF deadline)
- Provided TALPA landing distance data for Non-Normal conditions in November 2022

* Standardized Computerized Airplane Performance

GRF - Implementation

Boeing Data Provision

- Added TALPA landing distance data information for Normal and Non-Normal landing to FCOM on operator's request only
- Provided TALPA landing distance data (SCAP) only for B747-8 and B787
- No TALPA data provision in SCAP for aircraft older than 747-8, 787 or 737Max
  [quote]: "in the absence of a regulatory requirement"
- Recipe "Advisory Method for Computing TALPA ARC Consistent Data" (D6-86047, September 2019)
  (does not address typical combinations, eg. autoland, thrust reverser credit)
- No policy recommendations in FCOM or FCTM
- TALPA landing distance data (SCAP) for Non-Normal conditions
- Dispatch landing data not amended to reflect all reportable conditions.
- B747-8 and B787 each use same landing distances data for dispatch on contaminated runway and inflight check

GRF - Implementation

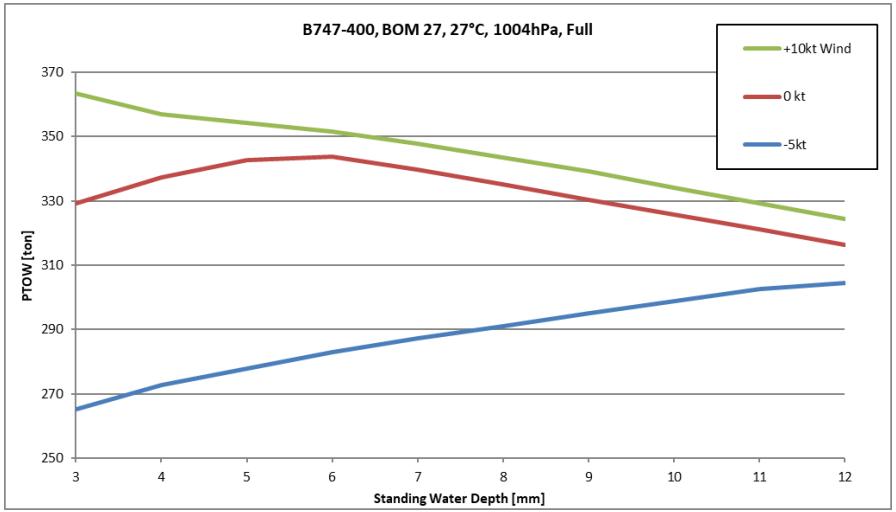
Implementation of GRF for Takeoff is a Challenge!

Accounting for different Runway Thirds

What is conservative when different conditions/depths are reported?

Reporting in Runway Thirds is no new concept within EASA.
Snowtams had it for years.
However, our pilots hardly ever saw Snowtams.

Now every report for a non-dry runway comes in Runway Thirds!

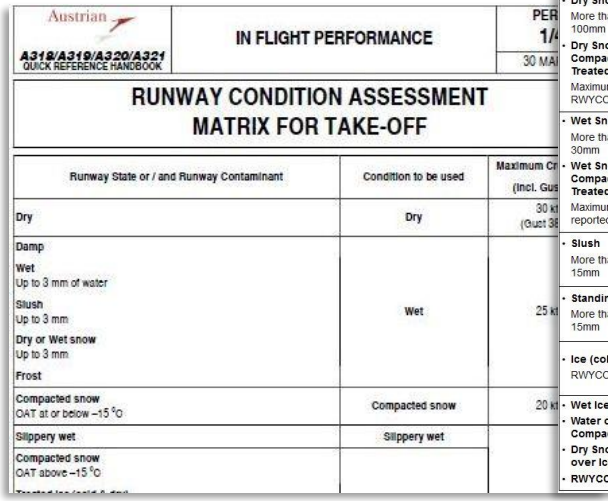


We expect our pilots to have the takeoff performance calculation completed before pushback.
An assessment of runway conditions when approaching the runway is too late.

GRF - Implementation

Upgrade/Downgrade

- Brings you outside the AFM
- Fleetwise decisions need to be made, and most likely a Safety Risk Assessment performed by the operator
  - Compacted snow data used for RWYCC 4&3
  - No credit for upgrade
  - Credit for downgrade only for x-wind limit (stipulated in ICAO Doc 10064)
  - Consider Slippery Wet a contaminant?
  - Consider eg 2mm Dry Snow a contaminant?
- TKOF RCAM is a good tool
- It's OK to delay TKOF in unclear conditions!



Austrian
A318/A319/A320/A321
QUICK REFERENCE HANDBOOK

IN FLIGHT PERFORMANCE

PER 1/

30 MAI

RUNWAY CONDITION ASSESSMENT MATRIX FOR TAKE-OFF

Runway State or / and Runway Contaminant	Condition to be used	Maximum Cr (incl. Gus
Dry	Dry	30 kt (Gust 38
Damp Wet Up to 3 mm of water Slush Up to 3 mm Dry or Wet snow Up to 3 mm Frost	Wet	25 kt
Compacted snow OAT at or below –15 °C	Compacted snow	20 kt
Slippery wet	Slippery wet	
Compacted snow OAT above –15 °C		

Runway Condition Assessment Matrix for Takeoff		Crosswind Limits				
Reported Contaminant and/or Runway State	Condition to be selected for takeoff calculation	T/O Weight	Center of Gravity %MAC ≤ 20	25	30	Aft
• Dry	Dry	≥195 159 ≤122	35 35 35	35 35 35	35 35 30	28 24 28
• Damp • Wet 3mm of water or less • Slush, Dry or Wet Snow 3mm or less • Frost	Wet	≥195 159 ≤122	35 35 35	35 35 31	35 30 26	23 20 25
• Compacted Snow Any temperature • Specially Prepared Winter Runway RWYCC reported 4	Compacted Snow	≥195 159 ≤122	15 15 15	15 15 15	15 15 15	15 15 15
• Slippery Wet • Treated Ice RWYCC upgraded to 3	Slippery Wet	≥195 159 ≤122	15 15 15	15 15 15	15 15 15	13 12 15
• Dry Snow More than 3mm, maximum 100mm • Dry Snow on top of Compacted Snow or Treated Ice Maximum 100mm, RWYCC reported 3	Dry Snow with reported Depth(minimum 3mm)	≥195 159 ≤122	15 15 15	15 15 15	15 15 15	15 15 15
• Wet Snow More than 3mm, maximum 30mm • Wet Snow on top of Compacted Snow or Treated Ice Maximum 30mm, RWYCC reported 3	Wet Snow with reported Depth(minimum 3mm)	≥195 159 ≤122	15 15 15	15 15 15	15 15 15	15 15 15
• Slush More than 3mm, maximum 15mm	Slush with reported Depth	≥195 159 ≤122	15 15 15	15 15 15	15 15 15	15 15 15
• Standing Water More than 3mm, maximum 15mm	Standing Water with reported Depth	≥195 159 ≤122	15 15 15	15 15 15	15 15 15	15 15 15
• Ice (cold & dry) RWYCC reported 1	Ice	≥195 159 ≤122	5 5 5	5 5 5	5 5 5	5 5 5
• Wet Ice • Water on top of Compacted Snow • Dry Snow or Wet Snow over Ice • RWYCC reported 0	No Takeoff		-	-	-	-

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GRF - Implementation

Airbus Data Provision

- data according AMC 25.1591 (old) for all FBW-Airbus
- After GRF data for Slippery Wet have been added
- Combining different RWYCC and contaminant (for downgrading only) now available

Embraer (EMJ) Data Provision

- Dry
  Wet
  Compacted Snow
  Ice
  Standing Water: 3mm – 25.4mm
  Slush: 3mm – 29.88mm
  Wet Snow: 3mm – 50.8mm
  Dry Snow: 3mm – 126mm

GRF - Implementation

Boeing T/O Data Provision

* Combining different μ and Contaminant, No contaminant drag after V1

	B767-FAA	B747-400 - JAR	B777F – EASA *	B747-8 – EASA * B787-9 – EASA *
DRY	Flight Test	Flight Test	Flight Test	Flight Test
WET	SCAP: μ = 0.2	½ μ dry	C/S 25.109 (b) & (c)	C/S 25.109 (b) & (c)
Standing Water	SCAP: 0.08in – 0.5in	μ: adjusted Convair 880 AFM: 3mm – 13mm SCAP: 3mm – 12.7mm	μ: adjusted Convair 880 1.27mm – 12.7mm	CS25.109(c) with μ = max 0.16, min 0.05 0mm – 15.24mm
Slush	Same as Standing Water	AFM: Same as Standing Water	μ: adjusted Convair 880 1.27mm – 12.7mm	CS25.109(c) with μ = max 0.16, min 0.05 0mm – 15.24mm
Dry Snow	n/a (Standing Water depth equivalences)	Loose Snow, μ=0.2? AFM: 13mm – 51mm SCAP: 13mm – 50.8mm	Snow, μ=0.2? AFM: 1.27mm – 101mm SCAP: 1.27mm – 101.6mm	μ = 0.17, 0mm – 130.05mm
Wet Snow	n/a (Standing Water depth equivalences)	n/a (Slush Equivalent)	n/a (Slush Equivalent)	μ = 0.17, 0mm – 30.02mm Hydroplaning included
Compacted Snow	SCAP: Slippery μ 0.2	μ = 0.2	μ = 0.2	μ = 0.2
Wet Ice	SCAP: Slippery μ 0.05	μ = 0.05	μ = 0.05	μ = 0.05

Thank you
for your attention