GRF AND AIRLINES

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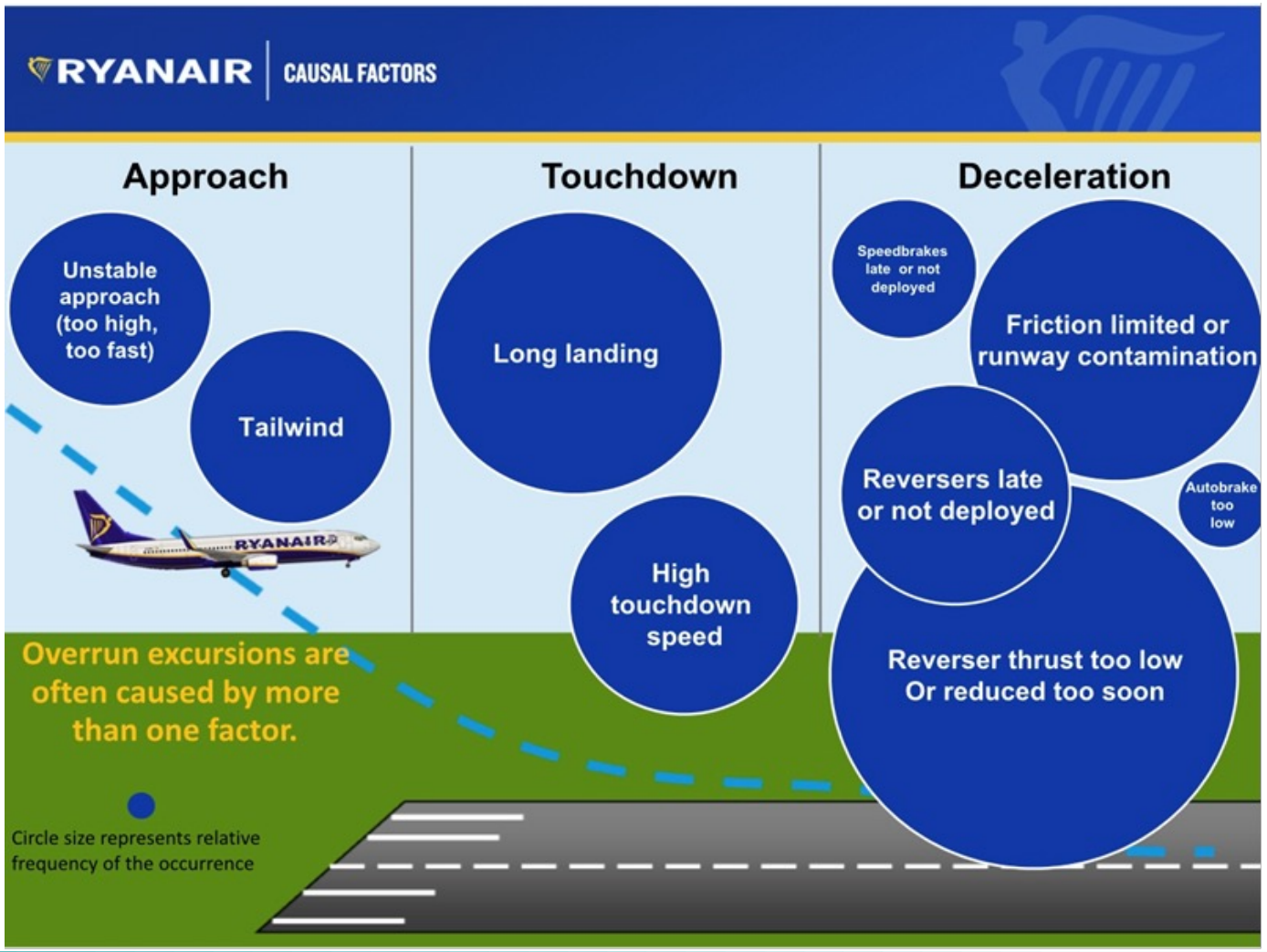
MALTA AIR RYANAIR

SUMMARY

- SMS contributory factors
- Fleet equipment
- SMS – Flight Crew Awareness
- GRF implementation in Flight Crew Training
- Runway Condition Assessment and Reporting
- Air Report (AIREP) - PIREPS
- GRF Performance assessment guidance
- LDTA – Crew procedures
- KORA RE TEM

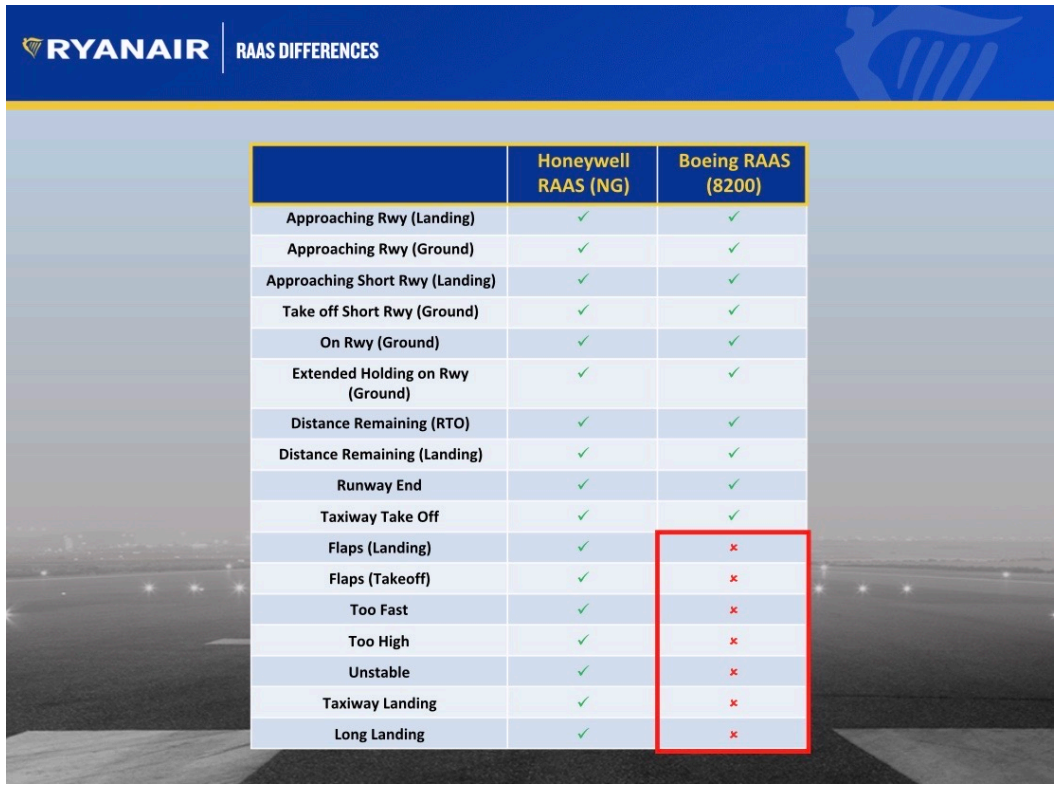
SMS contributory factors



- Contaminated runways
- Incorrect performance calculation
- Reported runway conditions differing from actual conditions
- Wind components in excess of operational limitations
- Aircraft component or system failure
- Inappropriate handling technique
- Inappropriate decision to reject above V1
- Inappropriate decision to continue from an unstable approach

FLEET EQUIPMENT

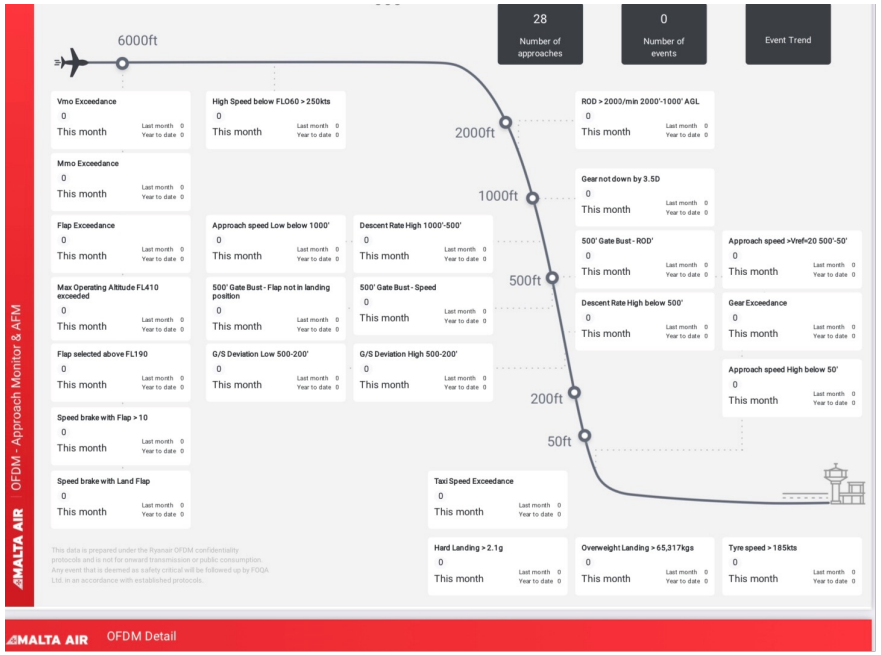
Runway Situation Awareness Tools (RSAT)



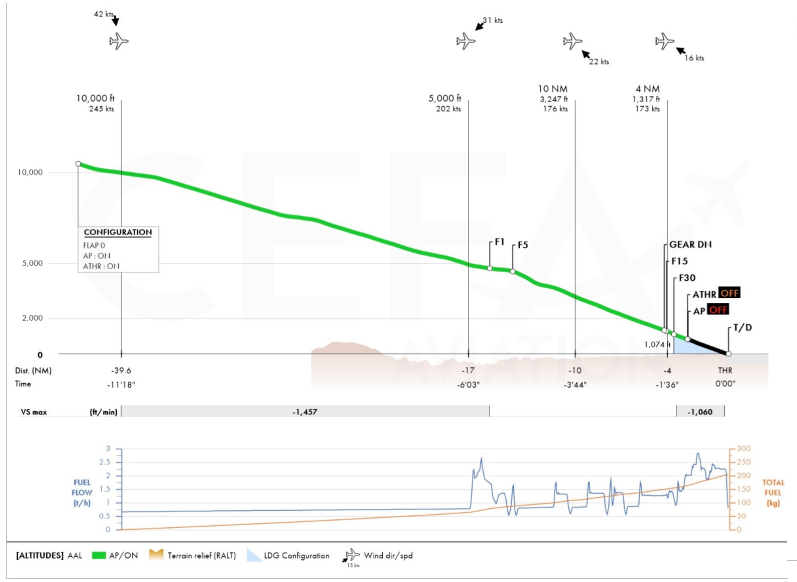
	Honeywell RAAS (NG)	Boeing RAAS (8200)
Approaching Rwy (Landing)	✓	✓
Approaching Rwy (Ground)	✓	✓
Approaching Short Rwy (Landing)	✓	✓
Take off Short Rwy (Ground)	✓	✓
On Rwy (Ground)	✓	✓
Extended Holding on Rwy (Ground)	✓	✓
Distance Remaining (RTO)	✓	✓
Distance Remaining (Landing)	✓	✓
Runway End	✓	✓
Taxiway Take Off	✓	✓
Flaps (Landing)	✓	×
Flaps (Takeoff)	✓	×
Too Fast	✓	×
Too High	✓	×
Unstable	✓	×
Taxiway Landing	✓	×
Long Landing	✓	×

- The RSAT concept emphasizes a three-pronged approach that includes flight crew procedure updates, a training aid for flight crew, and airplane systems changes to assist flight crew situational awareness.
- RSAT is a set of tools designed to prevent runway overrun and incursions. RSAT is an umbrella term for RAAS, Overrun Warnings (ORW) and Speedbrake warnings.
- Runway Awareness Alerting System (RAAS) was installed across 550 aircrafts fleet. This technology provides flight crew with aural warnings and alerts relating to take off and landing runway operations.

SMS – FLIGHT CREW AWARENESS



- We Developed and rolled out a new Operational Flight Data Monitoring (OFDM) concept, MyOFDM which provides captains and first officers with individual approach, landing and taxi reports creating greater awareness of operational performance and exceedances.
- Based ON OFDM data, we updated our Airfield Briefs to include KORA precursors and to highlight potential challenges associated with specific airports.
- CEFA Aviation video replay: This system allows pilots to watch a video replay of their flights thus providing an ongoing opportunity for positive training.



GRF implementation in Flight Crew Training

- GRF was implemented via e-learning, recurrent training and checking including classroom, Q&A and live dedicated events for GFR / winter operations, internal publications.

Runway Condition Assessment and Reporting

- 3 Kelvin-Spread Rule : air temperature of at or colder than + 3 degrees Celsius with a dew point spread of 3 degrees Celsius or less.
- Importance of updated weather information and RCR.
- In the absence of an updated RCR, assume a RWYCC of 2 (minimum standing water depth of 4 mm) when rainfall intensity is:
- MODERATE or HEAVY on an UNGROOVED runway
- HEAVY on a GROOVED runway

Runway Condition Assessment Matrix (RCAM)

Assessment Criteria for Airport Operator Use Only		Control/Braking Assessment Criteria for Pilot Reports of Braking Action	
Runway Condition Description	RWYCC	Deceleration or Directional Control Observation	AIREP or PIREP
• DRY	6	---	---
• FROST • WET (includes damp and 3mm depth or less of water) 3mm depth or less of: • SLUSH • DRY SNOW • WET SNOW	5	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
OAT -15°C and Colder: • COMPACTED SNOW	4	Braking deceleration OR directional control is between Good and Medium.	GOOD to MEDIUM
• SLIPPERY WHEN WET (wet runway) • DRY SNOW or WET SNOW (any depth) over COMPACTED SNOW Greater than 3mm depth of: • DRY SNOW • WET SNOW OAT -14°C and Warmer: • COMPACTED SNOW	3	Braking deceleration is noticeably reduced for the wheel braking effort applied OR Directional control is noticeably reduced.	MEDIUM
Greater than 3mm depth of: • WATER • SLUSH	2	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM to POOR
• ICE	1	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
• WET ICE • SLUSH OVER ICE • WATER ON TOP on top of COMPACTED SNOW • DRY SNOW or WET SNOW on top of ICE	0	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

Air Report (AIREP) - PIREPS

- Whenever requested by ATC, or if the runway braking action encountered during the landing roll is not as good as reported in the Runway Condition Report (RCR), the Commander must notify Air Traffic Services (ATS) by AIREP as soon as practicable using the terms, GOOD, GOOD TO MEDIUM, MEDIUM, MEDIUM TO POOR, POOR and LESS THAN POOR

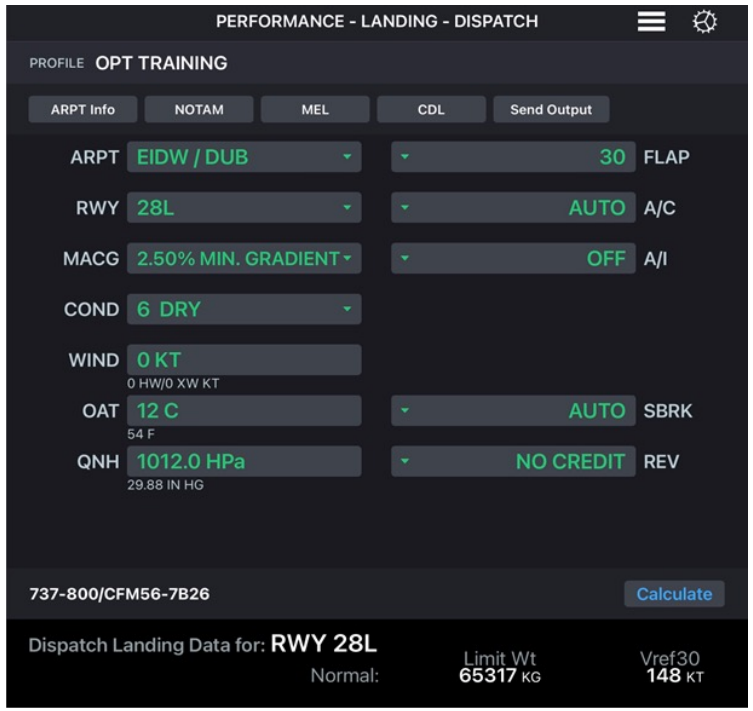
- The friction readings from ground friction measuring vehicles do supply an additional piece of information for the pilot to evaluate when considering runway conditions for landing. Crews should evaluate these readings in conjunction with the PIREPS (pilot reports and the physical description of the runway (snow, slush, ice, standing water etc.) when planning the landing. Special care should be taken in evaluating all the information available when braking action is reported as POOR or if slush/standing water is present on the runway

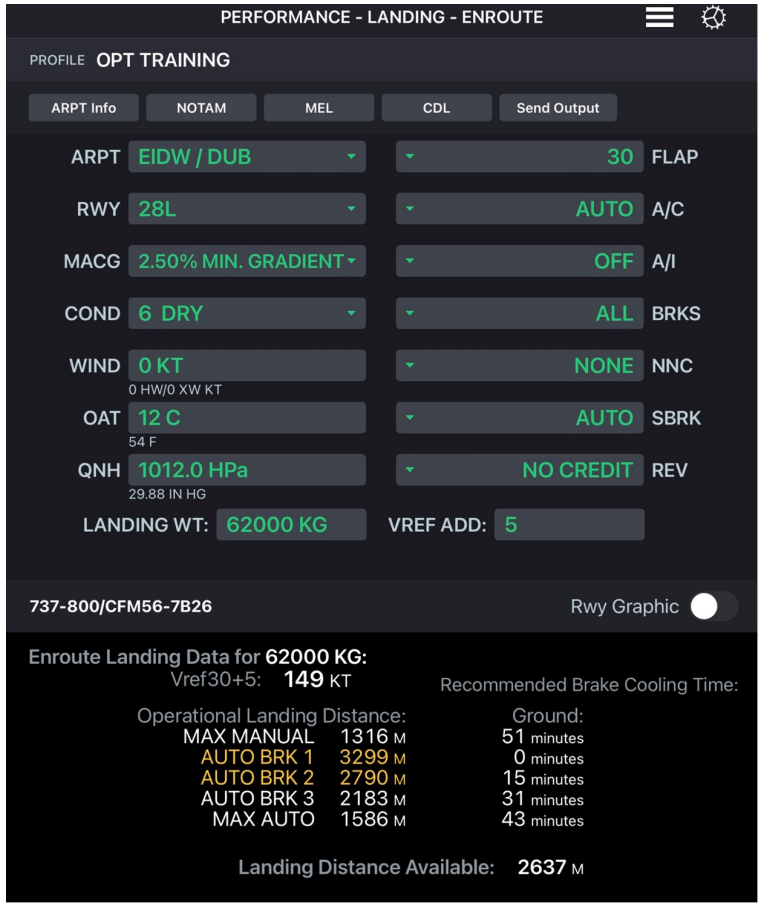
GRF Performance assessment guidance

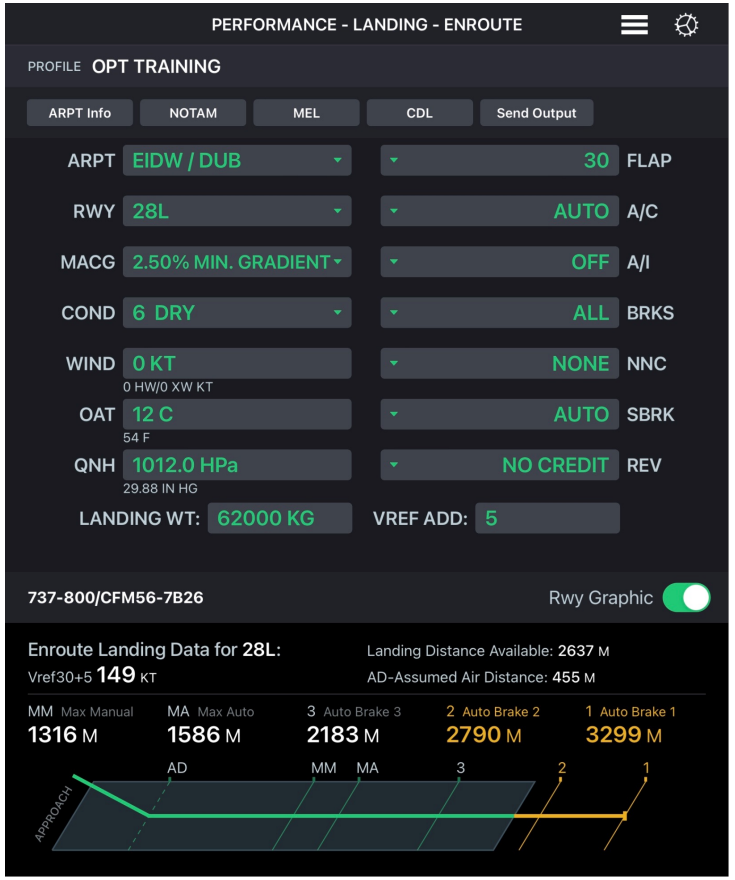
Runway Surface Condition – Performance Assessment Guidance Table

Start with RWYCC	LANDING			Start with RWYCC	TAKEOFF	
RWYCC	OPT COND	CROSSWIND LIMIT	RUNWAY CONDITION DESCRIPTION	RWYCC	OPT COND	CROSSWIND LIMIT
6	6 DRY	33	DRY	6	6 DRY	33
5	5 GOOD	33	FROST, WET (includes damp) 3mm depth or less of: WATER, SLUSH, DRY SNOW or WET SNOW *DOWNGRADED RWY with RWYCC 5*	5	5 GOOD	25 (33)* *Refer to OMB 2.4.1.1
4	4 GOOD TO MEDIUM	33	COMPACTED SNOW (*OAT -15°C and colder*) SPECIALLY PREPARED WINTER RUNWAY (*refer to AFB for SPWR approval*) *DOWNGRADED RWY with RWYCC 4*	4	4 GOOD TO MEDIUM	22
3	3 MEDIUM Max depth: Dry Snow 100mm Wet snow 13mm	25	SLIPPERY WET (wet runway) COMPACTED SNOW (OAT -14°C and warmer) *UPGRADED or DOWNGRADED* RWY with RWYCC 3	3	3 MEDIUM	20
			DRY SNOW (any depth) OVER COMPACTED SNOW Greater than 3mm depth of DRY SNOW		3 DRY SNOW Max depth: 100mm	
			WET SNOW (any depth) OVER COMPACTED SNOW Greater than 3mm depth of WET SNOW		3 WET SNOW Max depth: 13mm	
2	2 MEDIUM TO POOR Max depth: Slush/Water 13mm	17	*UPGRADED or DOWNGRADED* RWY with RWYCC 2	2	2 MEDIUM TO POOR	15
			Greater than 3mm depth of WATER		2 STANDING WATER Max depth: 13mm	
			Greater than 3mm depth of SLUSH		2 SLUSH Max depth: 13mm	
1	LANDING PROHIBITED		POOR ICE	1	TAKE-OFF PROHIBITED	
0			LESS THAN POOR WET ICE / SLUSH OVER ICE / WATER on top of COMPACTED SNOW / DRY SNOW or WET SNOW on top of ICE	0		

LDTA – Crew procedures







KORA RE TEM


ANTICIPATE
Expecting than an event may occur
Anticipation builds vigilance
Vigilance is vital in aviation
RECOGNISE
Identify the existence of a threat or error
Recognition leads to recovery
RECOVER
Recover adequate safety margins to ensure
SAFE FLIGHT
SAFE FLIGHT
ANTICIPATE THE THREATS – ALWAYS PREPARE AHEAD

KORA RE TEM

Plan

- Review AFB & NOTAM – Runway Excursion threats & WIP affecting LDA
- Review RWY characteristics – Down slope, Non-standard aiming point, PAPI vs G/S TCH
- Review TAF/METAR - Convective Activity with SHRA, VRB wind, Freezing precipitation
- Obtain and assess the Runway Condition Report
- Consider deteriorating conditions, determine minimum acceptable condition and use the associated higher Flap setting and AUTOBRAKE/REV THRUST as required
- Apply MEL/CDL limitations
- ALWAYS COMPUTE LANDING DISTANCE REQUIRED

KORA RE TEM

Act

- RAAS "Long Landing"
- ORW "Overrun, go-around"
- Touchdown beyond TDZ
- Excess tailwind
- Excess speed

Don´t Press On, Press TOGA!

Do

- Limit IAS to 250kts <10,000ft
- 3000ft @ 200kts with Flap 1 (3-2-1 rule) and 10 mile rule (latest Flap 1)
- Fly a stabilised approach - Respect the Landing Gate
- Observe RAAS and ORW alerts – apply FCOM NP actions
- Correct excess speed and avoid an extended flare
- Apply decelleration devices immediately at touchdown

Check

- Tailwind?
- Heavy Rain?
- Changed runway condition?
- Stabilised criteria met at the landing gate?
- Aligned on the Centre Line?
- Glide Path or Speed deviation?
- Speed Brake Armed and Autobrake Set?
- Actual conditions, configuration and path = OPT conditions, configuration and path?

Don´t Press On, Press TOGA!

Ryanair 2023

THANK YOU FOR YOUR ATTENTION !