LANDING PERFORMANCE AND OPERATIONAL BEST PRACTICES WEBINAR

PHENOM 100/300

LEGACY 450/500

PRAETOR 500/600

WHAT YOU NEED TO KNOW BEFORE THE LIVE STARTS

- During the presentation, please keep your **microfone muted** and your camera off.
- Please use the **chat box** to send your **questions**.
- We will have **30 minutes at the end** for questions.
- The **connection** may vary, as we are live. If the presenter's connection goes down, the producer will make the inclusion again, stay connected. There may be a “delay” and you just have to wait.
- If your connection goes down, we recommend you **log in again**.

AGENDA

01. **Introduction**

02. **Landing Performance and Procedures**

    - Field Length – Certification and Dispatch Considerations
    - Effects of Technique Variations on the Landing Distance
    - Assessment of Landing Distance at Time of Arrival
    - Climb - Certification and Dispatch Considerations

03. **Landing Performance Software**

04. **Summary**

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01. **Introduction**
02. Landing Performance and Procedures
    - Field Length – Certification and Dispatch Considerations
    - Effects of Technique Variations on the Landing Distance
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    - Climb - Certification and Dispatch Considerations
03. Landing Performance Software
04. Summary

LANDING PERFORMANCE AND OPERATIONAL BEST PRACTICES SEMINAR

OBJECTIVE

Provide information on landing performance and procedural aspects. This webinar is focused on Phenom 100/300, Legacy 450/500, and Praetor 500/600. Two-hour duration.

- Content (1h30min)
- Questions (up to 30 minutes)

INTRODUCTION AND MOTIVATION

LANDING PERFORMANCE AND OPERATIO PRACTICES SEM

oncern with safe
he ***Global Action***
n of Runway

RUNWAY EXCURSION PREVENTION

A COMPLEX TASK

Safe landings and runway excursion prevention depend on a joint and coordinated effort of all the aviation players. The effects of the risk factors are highly cumulative:

- Runway condition maintenance and reporting – **Airports, ATC**
- Aircraft performance and operations – **Manufactorer, Operator, Training Providers**
- Adherence to policies for safe descent and approach planning - **Operator**
- Well defined stabilised approach criteria and adherence - **Manufactorer, Operator**
- Safe landing and go-around practices - **Operator, Training Providers**

LANDING PERFORMANCE AND OPERATIONAL BEST PRACTICES SEMINAR

In this seminar, we will aim at the following prevention actions:

- Build understanding on runway condition report standards and recommendations.
- Reinforce recommended landing techniques.
- Reinforce the understanding of aircraft performance numbers.
    a) For landing dispatch
    b) For reassessment of landing distance inflight (at time-of-arrival)

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FIELD LENGTH – CERTIFICATION AND DISPATCH CONSIDERATIONS

Certified Landing Distances

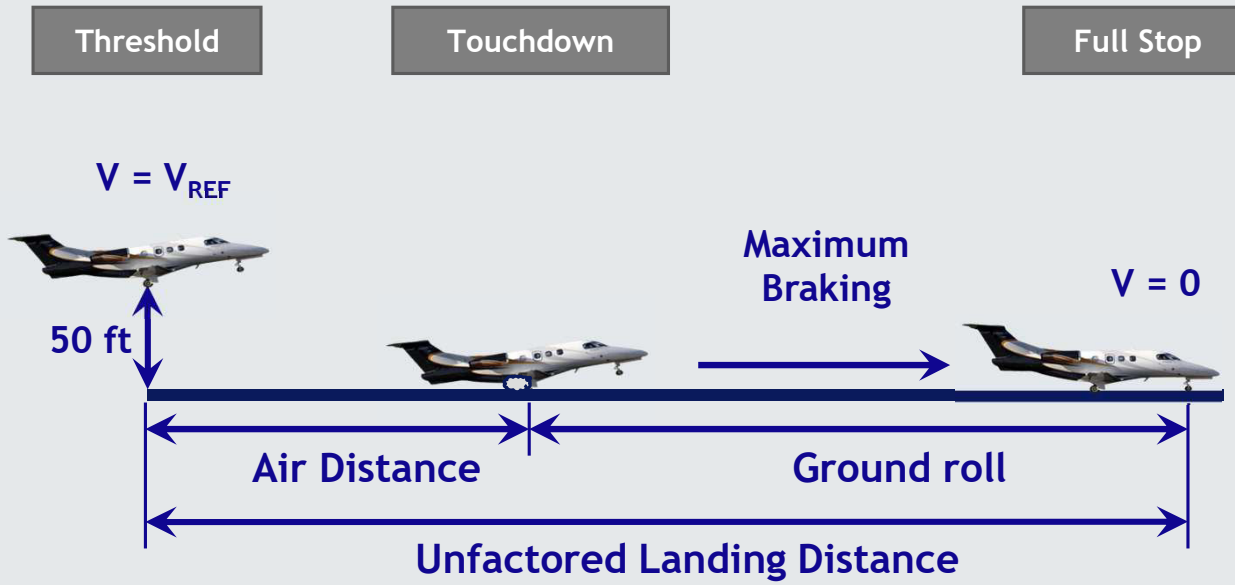
- Defined by regulation as basis for dispatch.
- The horizontal distance necessary to land and come to a complete stop from a point 50 feet above the landing surface must be determined, for standard temperatures at each weight and altitude within the operational limits established for landing.
- So, the distance is determined for the landing configuration for each:
  - Weight
  - Altitude
  - ISA conditions

DRY RUNWAY LANDING DISTANCE

Demonstrated during certification flight tests

- Threshold crossing
  - At 50 ft
  - At VREF
  - With 3° glide angle
- Touchdown
  - Minimal flare
- Ground roll
  - Maximum brake application after gear touchdown

UNFACTORED LANDING DISTANCE (DRY)



FIELD LENGTH – CERTIFICATION AND DISPATCH CONSIDERATIONS
PHENOM 100 EXAMPLE

LANDING DATA

LANDING TECHNIQUE

The landing performance data in this manual is based on the following conditions:

- Steady three degree angle approach at V_{REF} in landing configuration;
- V_{REF} airspeed maintained at runway threshold;
- Idle thrust established at runway threshold;
- Attitude maintained until MLG touchdown;
- Maximum brake applied immediately after MLG touchdown;
- Antiskid system operative.

If these performance techniques are not strictly used for a typical landing made during normal operations, the distances may be longer.

UNFACTORED LANDING DISTANCES

Unfactored landing distance is the actual distance to land the airplane from a point 50 ft above runway threshold to complete stop, using the landing technique described in the beginning of this section.

Unfactored Landing Distance tables are presented for a set of pressure altitudes and winds for the conditions below:

- Dry runway;
- Zero slope;
- Ice Protection System:
  For Wingstab OFF, Engine Ice Protection OFF or ON,
  For Wingstab ON, Engine Ice Protection ON;
- Temperature: ISA;
- No SAT effect;
- No V_{REF} Overspeed;
- No Drag Index.

FIELD LENGTH – CERTIFICATION AND DISPATCH CONSIDERATIONS
PRAETOR 600 EXAMPLE

LANDING DATA

LANDING TECHNIQUE

The landing performance data presented in the OPERA software is based on the following conditions:

- Stabilized three-degree angle approach trimmed at V_{REF} in landing configuration;
- V_{REF} airspeed maintained at runway threshold (50 ft);
- Idle thrust established at runway threshold (50 ft);
- After touch down, the pilot command the nose downward using full sidestick input to derotate the airplane at the maximum practical rate;
- Upon touching the nose gear, maximum brake applied;
- Antiskid function operative.

UNFACTORED LANDING DISTANCE - DRY RWY

Unfactored landing distance as described in block 5-01 are presented for a set of pressure altitudes and winds for the conditions below:

- Flap setting;
- Autobrake OFF;
- Ice protection mode OFF or ALL (WINGSTAB + ENG 1/2);
- Dry runway;
- 0% slope;
- ISA temperature for ice protection OFF and 5°C for ice protection ALL;
- OAT effect;
- No V_{REF} overspeed;
- No drag index.

FIELD LENGTH – CERTIFICATION AND DISPATCH CONSIDERATIONS

Example - Phenom 100 ANAC/FAA

Weight = 4000 kg (8818 lb)

Altitude = 2000 ft

Calm wind

ULD = 842 m (2763 ft)

What if we have?

- Slope = -1% ?
- 5 KIAS OVSP ?
- OAT = 30 deg ?

ULD = 1046 m (3432 ft) (24% distance increase, OPERA run)

PHENOM BY EMBRAER

PHENOM 100
Airplane Flight Manual
Performance

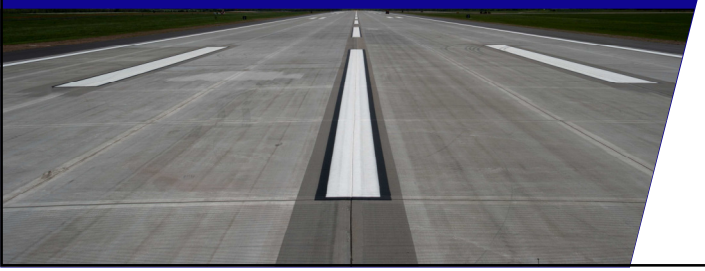
UNFACTORED LANDING DISTANCE (m)
ENGINE ICE PROTECTION OFF/ON – WINGSTAB OFF
FLAP 3 – ISA CONDITIONS
PW617F-E ENGINES

Weight (kg)	ALTITUDE							
	1000 ft				2000 ft			
	WIND							
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
3200	880	735	688	643	895	749	702	656
3300	873	729	683	638	888	743	697	651
3400	879	734	688	643	894	748	702	657
3500	895	750	703	658	911	765	718	672
3600	911	764	718	672	927	780	733	687
3700	927	779	732	686	943	795	747	701
3800	943	794	747	700	960	810	762	716
3900	959	809	762	715	976	826	778	731
4000	975	825	777	730	993	842	793	746
4100	990	839	790	743	1008	856	807	760
4200	1007	855	806	758	1026	872	823	775
4300	1024	871	822	774	1043	889	839	791
4400	1042	887	838	789	1061	905	856	807
4500	1057	902	852	803	1077	920	870	821
4600	1075	918	868	819	1095	937	887	837
4700	1091	934	883	834	1112	953	902	852
4800	1107	949	898	848	1128	969	918	867

CAUTION: SHADED AREAS REPRESENT CONDITIONS WHERE THE MAXIMUM LANDING WEIGHT OR CLIMB LIMITED WEIGHT WAS EXCEEEDED.

Before We Proceed

Landing Distance Test Methods

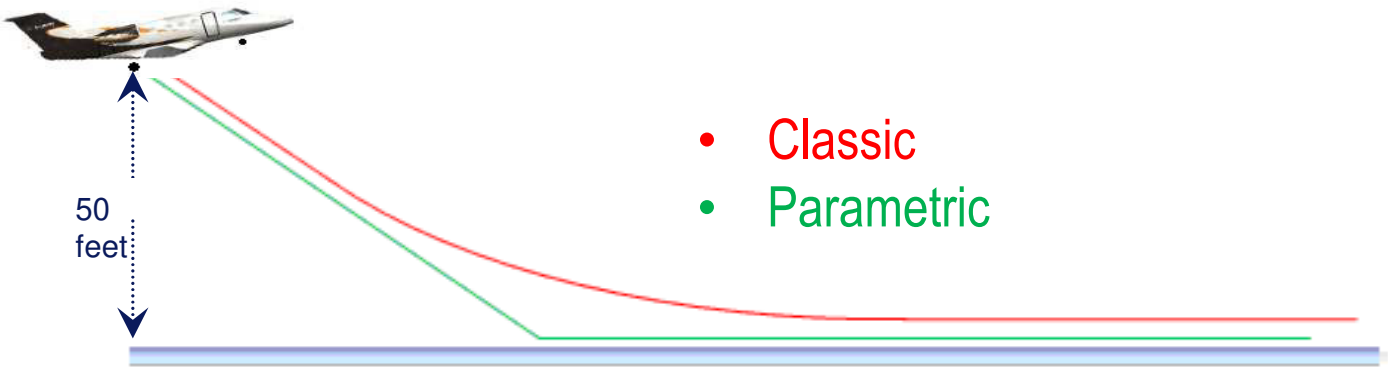


Classic

- Allows more flare.
- The classical method considers a data interpolation of about 6 flight test points.
- More conservative.

Parametric

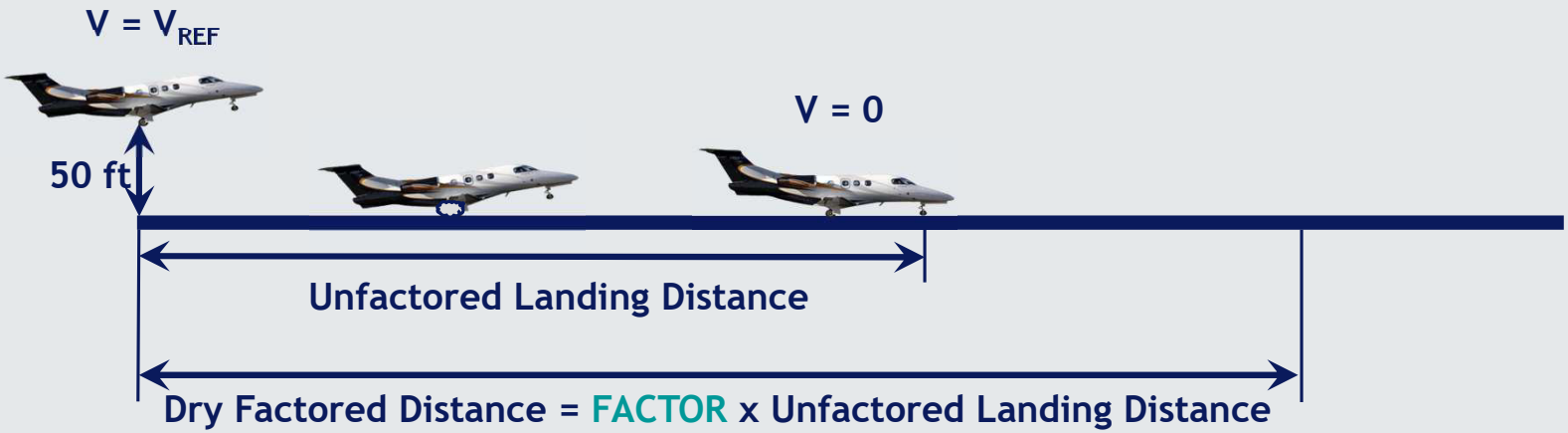
- Less flare.
- The parametric method considers a data interpolation of more than 40 flight test points.
- Less conservative.



DRY FACTORED LANDING DISTANCE

PHENOM 100/300 – AFM EASA, POH, QRH

Dry Runway



FACTOR = 1.67 (ANAC, FAA)
What about EASA, what is the FACTOR?

DRY FACTORED LANDING DISTANCE

PHENOM 100/300 – EASA

Dry Runway

ULD DRY = dry landing distance (classic method)

FACTORED DRY = 1.67 * dry landing distance (parametric method)

FACTOR = FACTORED DRY / ULD DRY

FACTOR = VARIABLE (EASA)

DRY FACTORED LANDING DISTANCE

LEGACY 450/500 AND PRAETORS – AFM EASA, QRH EASA, AOM EASA

Dry Runway

Dry Factored Distance = FACTOR x Unfactored Landing Distance

The FACTOR is variable

WET LANDING DISTANCE

PHENOM 100/300 - AFM EASA, QRH, POH

WET landing distances are obtained as below:

- ULD WET is obtained through a mathematical calculation (no test flights, like all OEMs)
- FACTORED WET = 1.15 * FACTORED DRY

WET LANDING DISTANCE

LEGACY 450/500 AND PRAETORS – AOM EASA (FACTORED ONLY), AOM ANAC/FAA (UNFACTORED ONLY)

WET landing distances are obtained as below:

- ULD WET is obtained through a mathematical calculation (no test flights, like all OEMs)
- FACTORED WET = 1.15 * FACTORED DRY

FACTORED LANDING DISTANCES – QRH

EXAMPLE - PHENOM 100 ANAC/FAA

PERFORMANCE DATA

Landing

PW617F-E ENGINES

LANDING DISTANCE (m) – ISA

ENGINE ICE PROTECTION OFF/ON – WINGSTAB OFF

ZERO SLOPE – NO WIND – FLAP 3

ALTITUDE (ft)	WEIGHT (kg)	SPEEDS			FACTORED		UNFACTORED		CONTAMINATED RUNWAYS (m)
		V_{REF} (KIAS)	V_{AC} (KIAS)	V_{FS} (KIAS)	DRY (m)	WET (m)	DRY (m)	WET (m)	
Sea Level	3400	92	102	111	1199	1379	719	910	1379
	3500	93	103	112	1225	1408	735	934	1408
	3600	95	105	114	1248	1435	749	956	1435
	3700	96	106	115	1272	1463	763	978	1463
	3800	97	107	117	1296	1491	778	1001	1491
	3900	99	109	118	1321	1519	793	1025	1519
	4000	100	110	120	1346	1548	808	1049	1548
	4100	101	111	121	1369	1574	822	1071	1574
	4200	102	112	122	1395	1604	837	1095	1604
	4300	104	114	124	1421	1634	853	1120	1634
	4400	105	115	125	1447	1664	869	1145	1664
	4500	106	116	126	1471	1692	883	1168	1692

Weight = 4000 kg (8818 lb)

Sea Level

Calm wind

ULD DRY = 808 m (2651 ft)

FACTORED DRY = 1346 m (4416 ft)

ULD WET = 1049 m (3442 ft)

WET FACTORED = 1548 m (5079 ft)

FACTORED DRY / ULD DRY = 1346/808 = 1.67

WET FACTORED / FACTORED DRY = 1548/1346 = 1.15

DRY AND WET LANDING DISTANCES

PHENOM 100/300 - MANUALS SUMMARY

- ULD DRY is obtained from test flights (AFM, QRH, and POH).
- FACTORED DRY = FACTOR * ULD DRY (AFM EASA, QRH, and POH).
- ULD WET is obtained through a mathematical approach (no test flights, AFM EASA, QRH and POH).
- FACTORED WET = FACTORED DRY * 1.15 (AFM EASA, QRH, and POH).

FACTOR = 1.67 (ANAC, FAA)
FACTOR = VARIABLE (EASA)

DRY AND WET LANDING DISTANCES

LEGACY 450/500 AND PRAETORS - MANUALS SUMMARY

- ULD DRY is obtained from test flights (AFM ANAC/EASA, QRH, and AOM).
- FACTORED DRY = FACTOR * ULD DRY (AFM EASA, QRH EASA, and AOM EASA).
- ULD WET is obtained through a mathematical approach (no test flights, AOM ANAC/FAA).
- FACTORED WET = FACTORED DRY * 1.15 (AOM EASA).

FACTOR = VARIABLE

CONTAMINATED RUNWAY LANDING DISTANCE

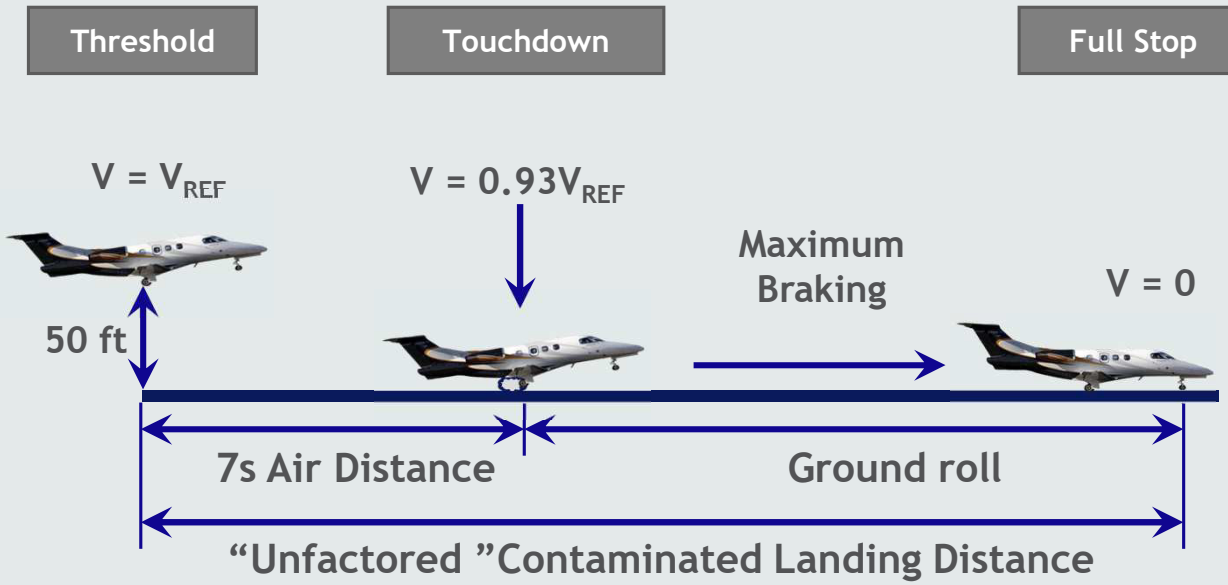
Available for specific contaminant types and depths

EASA AMC 25.1592

- Runway friction consideration as described in AMC
- Airborne distance 7 s
- 7% VREF bleed until touchdown
- Hydroplaning, spray impingement drag and landing gear displacement drag considered

CONTAMINATED RUNWAY LANDING DISTANCE

PHENOM 100/300 (AFM EASA, POH, AND QRH)
LEGACY 450/500 AND PRAETOR (OPERA)



Contaminated Landing Distance = 1.15 *
“Unfactored ”Contaminated Landing Distance

Contaminated Runway Landing Distance for each contaminant type and depth.

CONTAMINATED LANDING DISTANCE – QRH

EXAMPLE - PHENOM 100 FAA

PERFORMANCE DATA

Landing

PW617F-E ENGINES

LANDING DISTANCE (ft) – ISA

ENGINE ICE PROTECTION OFF/ON – WINGSTAB OFF

ZERO SLOPE – NO WIND – FLAP 3

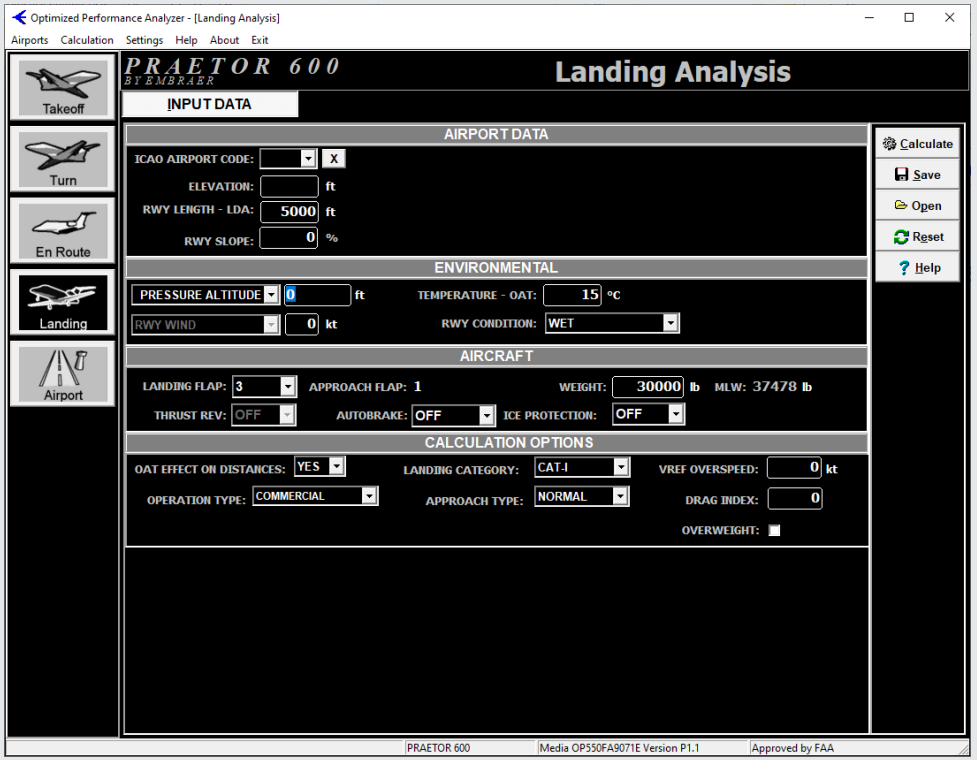
ALTITUDE (ft)	WEIGHT (lb)	SPEEDS			FACTORED		UNFACTORED		CONTAMINATED RUNWAYS (ft)
		V_{REF} (KIAS)	V_{AC} (KIAS)	V_{FS} (KIAS)	DRY (ft)	WET (ft)	DRY (ft)	WET (ft)	
Sea Level	7500	92	102	111	3934	4524	2360	2986	4524
	7900	94	104	114	4081	4693	2449	3123	4693
	8300	97	107	116	4224	4857	2535	3257	4857
	8700	99	109	119	4371	5027	2623	3398	5027
	9100	101	111	121	4514	5191	2708	3533	5191
	9500	104	114	124	4668	5368	2801	3679	5368
	9900	106	116	126	4819	5542	2892	3823	5542
	10300	108	118	129	4973	5719	2984	3972	5719

The QRH Contaminated Landing Distance is the greatest among:

- Standing water
- Slush
- Compacted Snow
- Dry Snow
- Wet Snow
- Depth = 3, 6, and 9 mm

DRY, WET, AND CONTAMINATED LANDING DISTANCES - OPERA

The ULD DRY, FACTORED DRY, ULD WET, FACTORED WET, and CONTAMINATED DISTANCE are all available on the OPERA (Optimized Performance Analyzer) Software.



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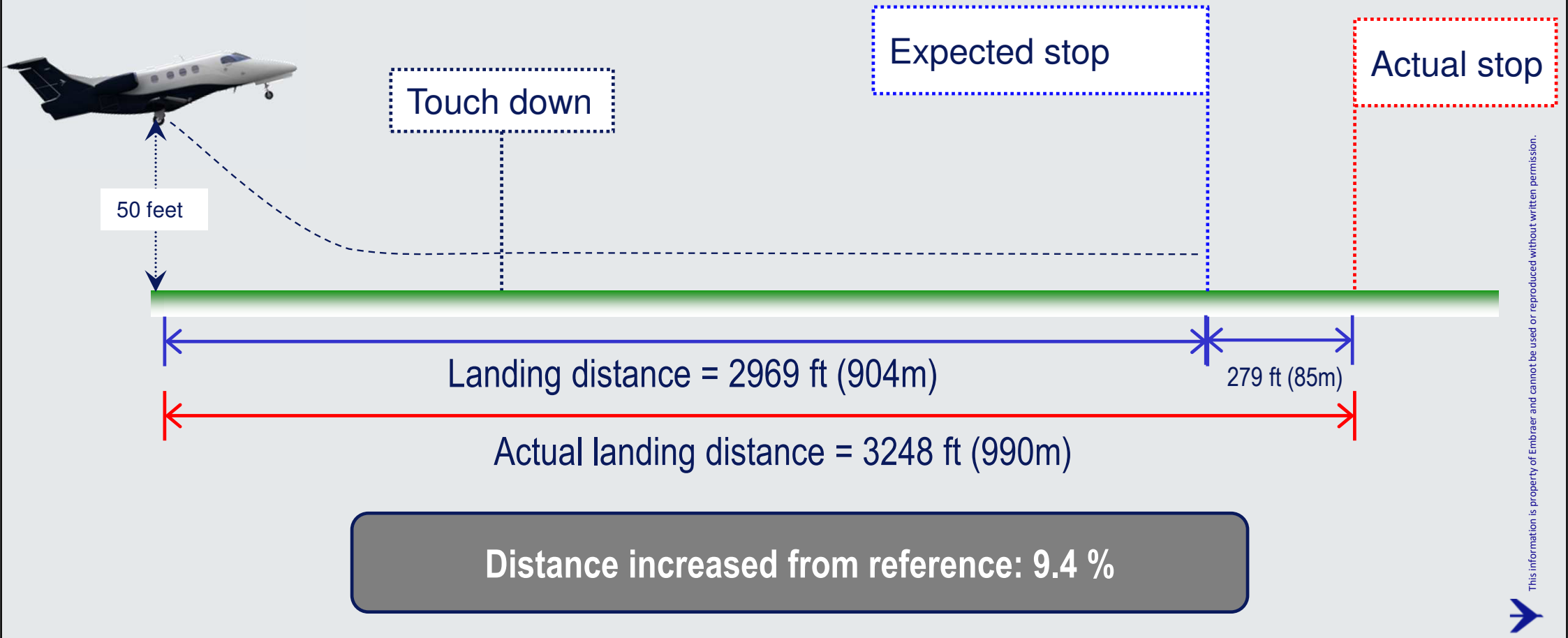
EFFECTS OF TECHNIQUE VARIATIONS ON THE LANDING DISTANCE

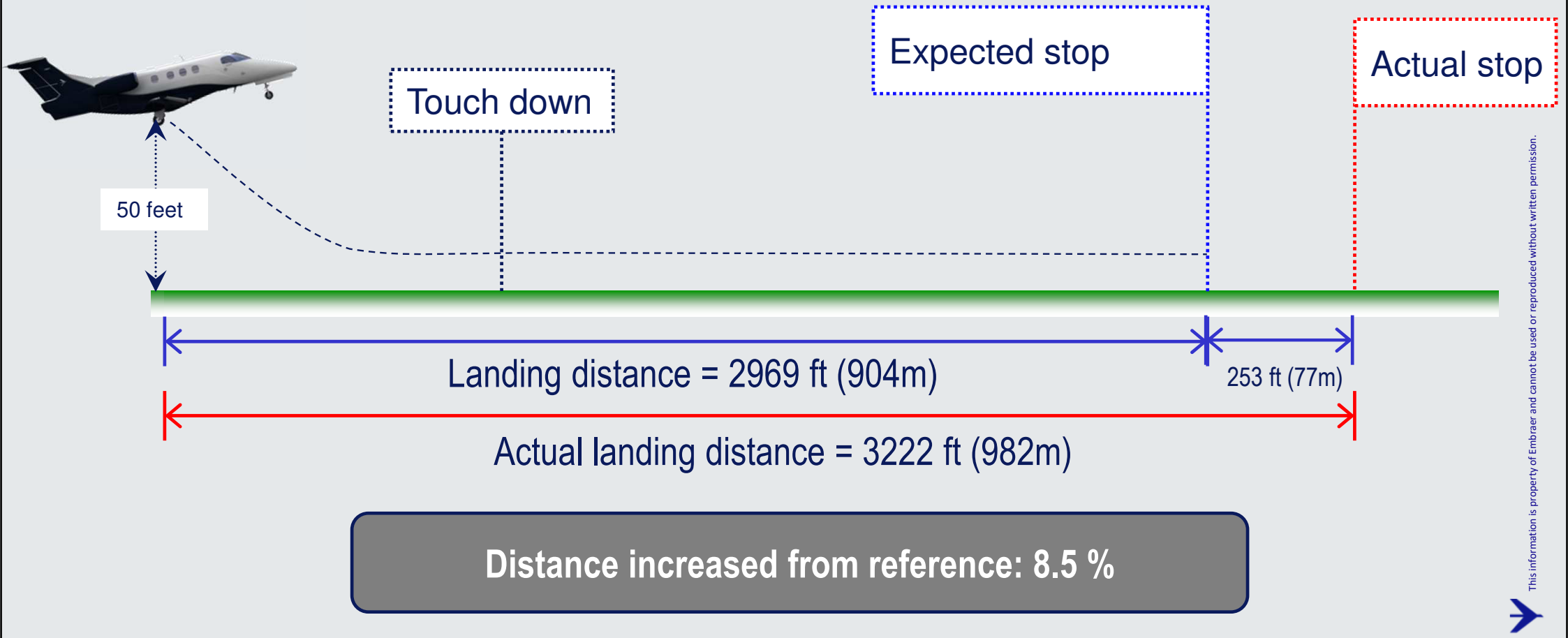
Threshold Crossing with Vref + 5kt



Distance increased from reference: 9.4 %

EFFECTS OF TECHNIQUE VARIATIONS ON THE LANDING DISTANCE

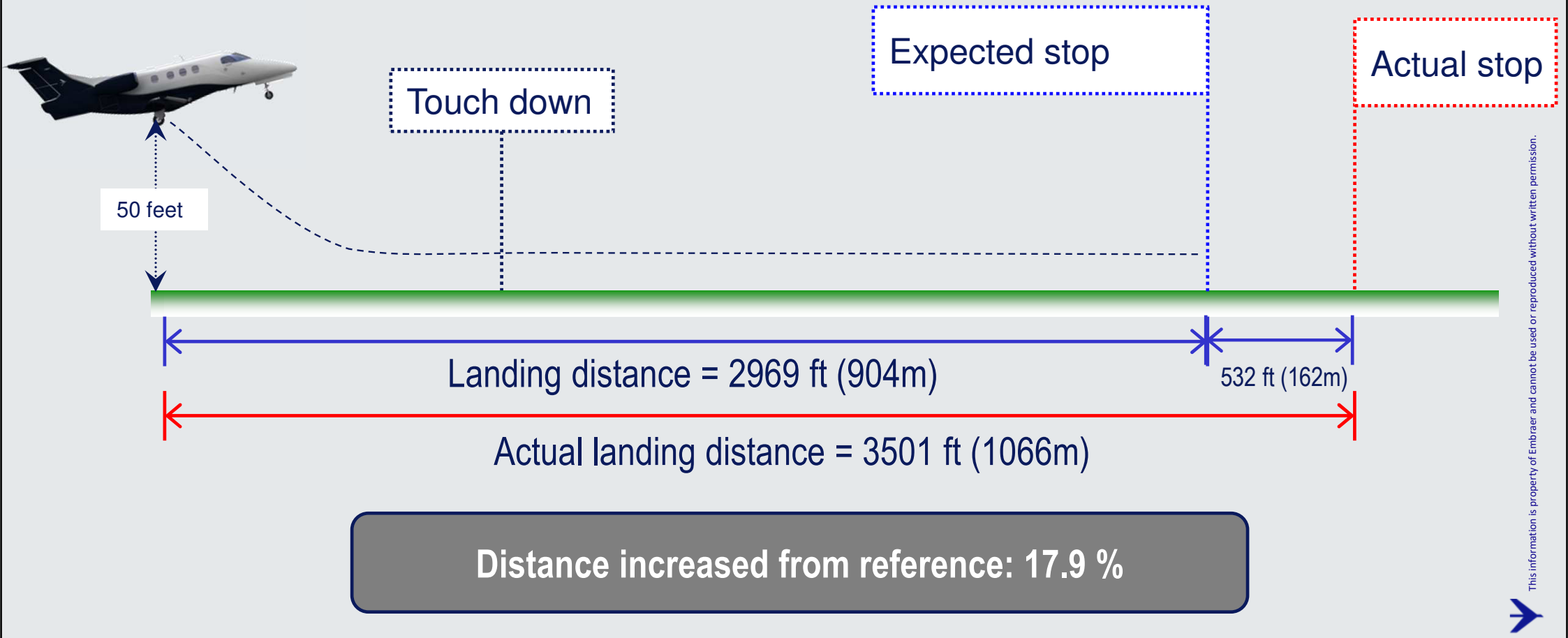
5 kts of Tailwind



Distance increased from reference: 8.5 %

EFFECTS OF TECHNIQUE VARIATIONS ON THE LANDING DISTANCE

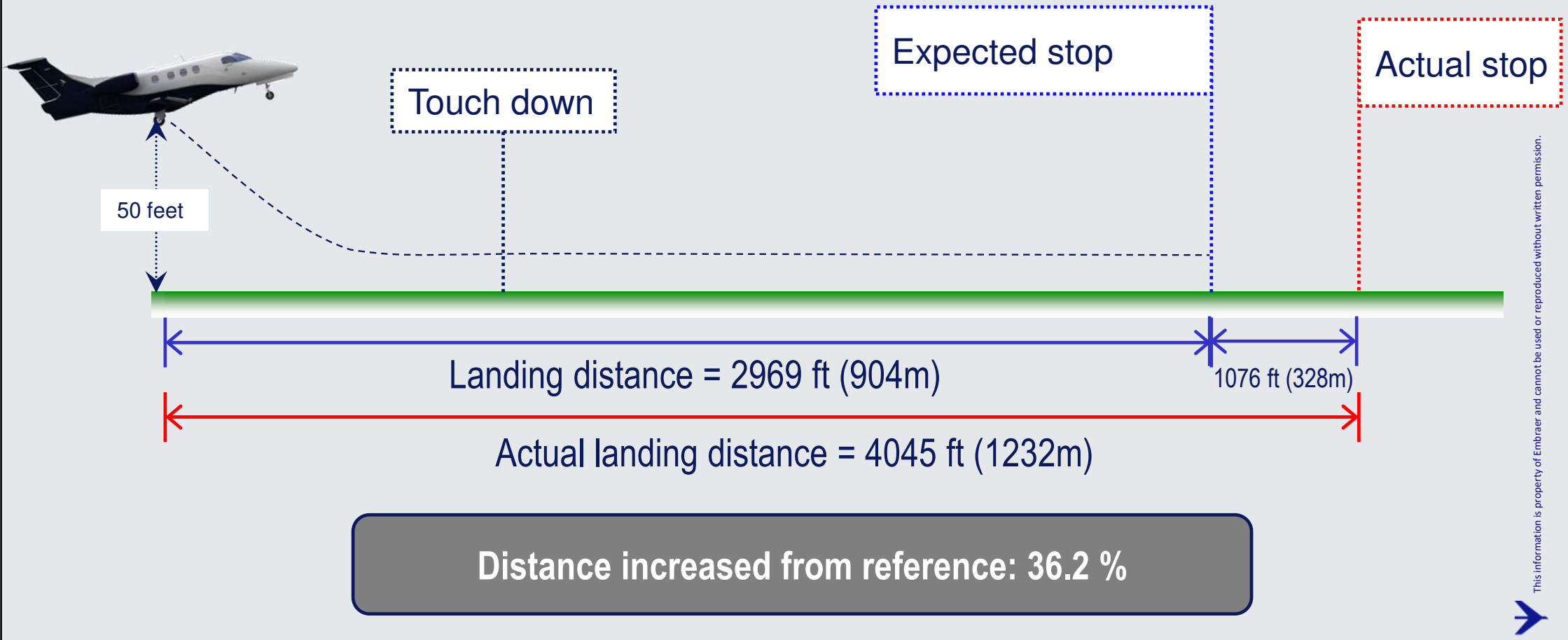
3-second Touchdown Delay



Distance increased from reference: 17.9 %

EFFECTS OF TECHNIQUE VARIATIONS ON THE LANDING DISTANCE

3-second Touchdown Delay, Vref + 5kts, and 5kts of Tailwind



Distance increased from reference: 36.2 %

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ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

Dispatch Distance Review

- Defined by regulation as basis for dispatch.
- Distance for an expected condition at arrival.
- Applicable factors determined according to the type of operation (Operational Regulations).

What about the distance required for the Actual Landing?

- Are there regulations for it?
- What are the recommendations?

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

What about the distance required for the Actual Landing?

Are there regulations for it?

- It depends on the Local Airworthiness Authority. There is no FAA or ANAC regulation about Assessment of Landing Distance at Time of Arrival.
- For EASA operators there are requirements of “Assessment of Landing Distance at Time of Arrival”.
  - **CAT.OP.MPA.303**
  - **NCC.OP.225**

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

Are there recommendations for landing distance at time of arrival?

Yes! From some airworthiness authorities and aviation institutions:

- FAA SAFO 19001 - **Landing Performance Assessments at Time of Arrival**
- FAA AC 91-79 - **Mitigating the Risks of a Runway Overrun Upon Landing**
- FAA AC 25-32 - **Landing Performance Data for Time-of-Arrival Landing Performance Assessments**

NOTE: Embraer LDTA data is based on the AC 25-32 calculation method.

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

What is common among all these requirements and recommendations?

- The reassessment of landing distance with the **actual conditions** at time of arrival.
- The use if a new calculation module (operational) different from the dispatch one.
- The use of **Safety Margins.**

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

FAA SAFO 19001 – Landing Performance Assessment at Time of Arrival

U.S. Department of Transportation
Federal Aviation Administration

SAFO

Safety Alert for Operators

SAFO 19001
DATE: 3/11/19

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

FAA SAFO 19001 – Landing Performance Assessment at Time of Arrival

- Info is provided to assist operators to ensure sufficient landing distance exist to safely make a full stop landing.
- Background. FAA actions after a Boeing 737-700 overrun at Chicago Midway Airport in December 2005.

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

FAA SAFO 19001 – Landing Performance Assessment at Time of Arrival

- Applicability: this SAFO is applicable to part 91 airplane operators.

- The SAFO defines the Landing Distance at Time of Arrival (LDTA).

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

LDTA – DEFINITION

- More accurate assessment of actual landing distance at time of arrival, considering factors that cannot be accurately predicted at time of preflight, such as **runway contaminants, winds, speed additives, and touchdown points.**

- Considers possible variations on landing techniques, typical of operational landings.

- The LDTA is different from the certified dispatch distances.

Dispatch Module	≠	LDTA Module
OPERA		GP (L450/500, Praetors)
TOLD		QRH (Phenoms)
AFM		POH (Phenoms)

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

FAA SAFO 19001 – Landing Performance Assessment at Time of Arrival

DEFINITIONS

- **Pilot Braking Action Report (PIREP):** reflects the brake contribution to the airplane's deceleration. A PIREP Braking Action Report reflects the pilot's impression of the available wheel braking. The report may be based on directional control feedback.
- **Runway Condition Code (RWYCC)**: relates the runway condition description with the PIREP.
- **Runway Condition Description Matrix (RCAM):** correlates the runway surface condition, RWYCC, PIREP, and Deceleration or Directional Control Observation. See AC 91-79 – "Mitigating the Risks of a Runway Overrun Upon Landing".

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

TABLE 1-1. OPERATIONAL RUNWAY CONDITION ASSESSMENT MATRIX (RCAM) BRAKING ACTION CODES AND DEFINITIONS

Airport Operator Assessment Criteria		Control/Braking Assessment Criteria	
Runway Condition Description	**Code**	**Deceleration or Directional Control Observation**	**Pilot Reported Braking Action**
• Dry	6	---	---
• Frost • Wet (Includes damp and less than 1/8 inch depth of water) ***Less than 1/8 inch (3mm) depth of:*** • Slush • Dry Snow • Wet Snow	5	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
-15°C and Colder outside air temperature: • Compacted Snow	4	Braking deceleration OR directional control is between Good and Medium.	Good to Medium

FAA AC 91-79

Airport Operator Assessment Criteria		Control/Braking Assessment Criteria	
Runway Condition Description	**Code**	**Deceleration or Directional Control Observation**	**Pilot Reported Braking Action**
• Dry	6	---	---
• Frost • Wet (Includes damp and less than 1/8 inch depth of water) ***Less than 1/8 inch (3mm) depth of:*** • Slush • Dry Snow • Wet Snow	5	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
-15°C and Colder outside air temperature: • 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 ***1/8 inch depth or greater of:*** • Dry Snow • Wet Snow ***Warmer than -15°C outside air temperature:*** • Compacted Snow	3	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
1/8 inch depth or greater 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 • Water on top of Compacted Snow • Dry Snow or Wet Snow over Ice	0	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

FAA AC 91-79

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

FAA SAFO 19001 – Landing Performance Assessment at Time of Arrival

LDTA DATA EXAMPLE

Suppose we have a wet runway or a PIREP GOOD at time of arrival, then we use the data below:

RWCC 5

Legacy 450

OPERATIONAL LANDING DISTANCE (M)
EMB-545 - Honeywell AS-907-3-1E
WET (RWYCC 5)
Flap 3 - No Ice Accretion - Autobrake OFF

	REF	WEIGHT		ALT	TEMP		WIND		SLOPE		VREF	REV
BRK CONF	14000 kg landing weight	per 500 kg blw/abv 14000kg		per 1000ft above SL	per 5°C		per 5 kt		per 1%		per 5kt above VREF	per 1000m of LDTA
		below	above	above SL	below ISA	above ISA	head wind	tail wind	uphill	downhill		
MAX MAN	1264	-40	40	38	-16	43	-33	213	-14	235	211	-80

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

FAA SAFO 19001 – Landing Performance Assessment at Time of Arrival

The 15% margin

Once the actual landing distance is determined at the time of arrival, an additional safety margin of at least 15 percent should be added to actual landing distance.

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

EXAMPLE – Legacy 450

After top of descent (TOD) and before commencement of approach procedures, the crew received information of PIREP GOOD. Perform the assessment of landing distance at time of arrival, knowing that:

- Flap FULL
- No ice accretion
- Autobrake OFF
- LDW = 13000 kg (28660 lbs)
- ALT = 1000 ft
- TEMP = 10 deg above ISA
- CALM WIND
- -1% SLOPE
- NO OVSP

ASSESSMENT OF LANDING DISTANCE AT TIME OF ARRIVAL

EXAMPLE

- PIREP GOOD
- Flap FULL
- No ice accretion
- Autobrake OFF
- LDW = 13000 kg (28660 lbs)
- ALT = 1000 ft
- TEMP = 10 deg above ISA
- 5 kt headwind
- -1% SLOPE
- NO OVSP

OPERATIONAL LANDING DISTANCE (M)
EMB-545 - Honeywell AS-907-3-1E
WET (RWYCC 5)
Flap FULL - No Ice Accretion - Autobrake OFF

	REF	WEIGHT		ALT	TEMP		WIND		SLOPE		VREF	REV
BRK CONF	14000 kg landing weight	per 500 kg blw/abv 14000kg		per 1000ft above SL	per 5°C		per 5 kt		per 1%		per 5kt above VREF	per 1000m of LDTA
		below	above	above SL	below ISA	above ISA	head wind	tail wind	uphill	downhill		
MAX MAN	1036	-34	34	30	-13	31	-29	176	-11	177	204	-80

LDTA = 1036(ref) – 68(weight) + 30(alt) + 62(temp) - 29(wind) + 177(slope) + 0(ovsp) – 80(rev)

LDTA = 1128 m (3701 ft)

LDTA*1.15 = 1.15 * 1128 = 1297 m (4256 ft)

LDTA*1.15 = 1297 m (4256 ft)

LDTA – PART CAT

LEGACY 450/500 AND PRAETORS

- It is necessary to use the LDTA calculation module. It is not the same as the OPERA's calculation module.

- Distances already available in GP-8090 OPERATIONAL LANDING.

See CAT.OP.MPA.303 (a)

LDTA – PART CAT

PHENOMS

- Operators with no OPLD data can use the dispatch information for the inflight assessment.

- The LDTA data will be available soon in the QRH and POH.

See **CAT.OP.MPA.303 (b)**

LDTA – PART NCC

LEGACY 450/500 AND PRAETORS

- Distances already available in **GP-8090 OPERATIONAL LANDING.**

PHENOMS

- Operators with no OPLD data can use the performance calculated at time of dispatch.
- The LDTA data will be available soon in the QRH and POH.

See **AMC1 NCC.OP.225 (e)**

AGENDA

01. Introduction

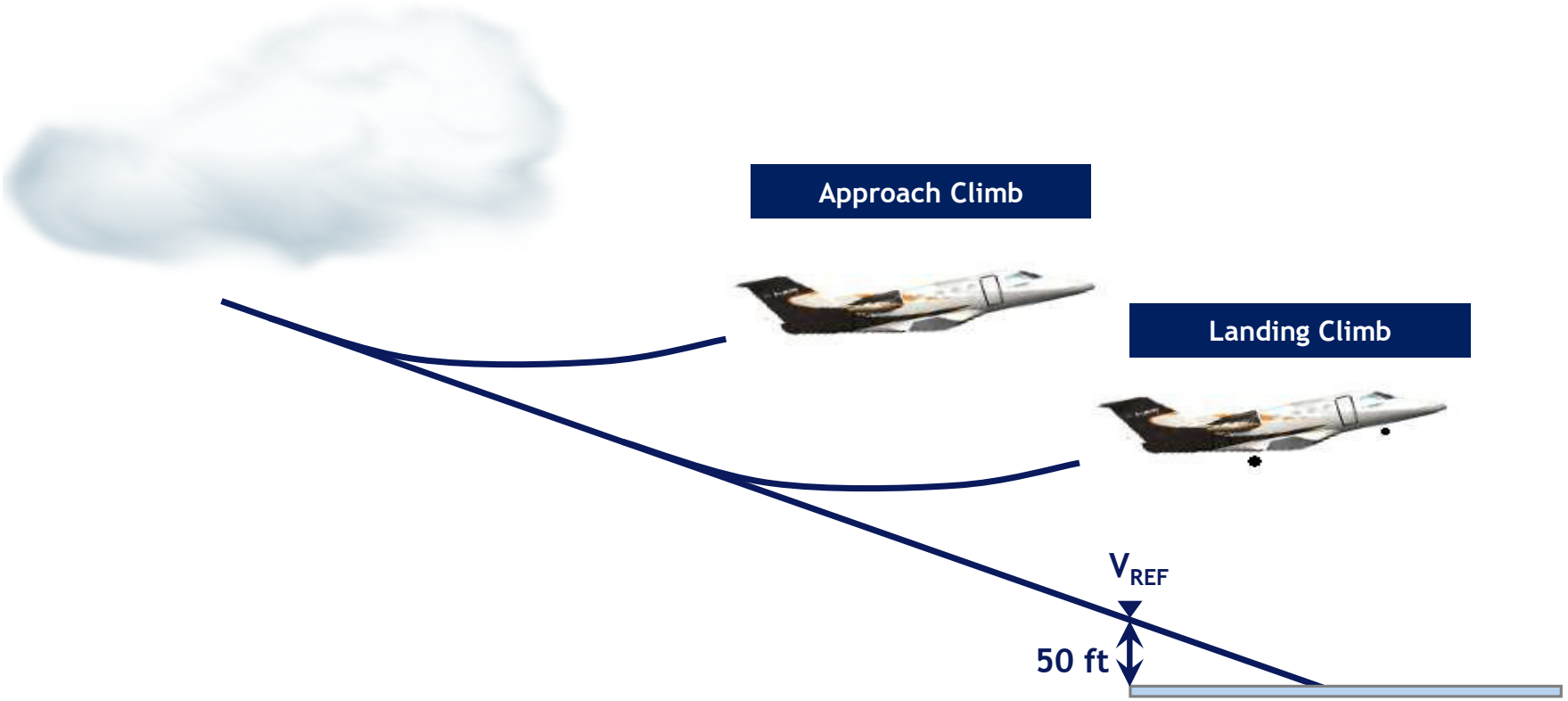
02. Landing Performance and Procedures

- Field Length – Certification and Dispatch Considerations
- Effects of Technique Variations on the Landing Distance
- Assessment of Landing Distance at Time of Arrival
- Climb - Certification and Dispatch Considerations

03. Landing Performance Software

04. Summary

CLIMB - CERTIFICATION AND DISPATCH CONSIDERATIONS



CLIMB - CERTIFICATION AND DISPATCH CONSIDERATIONS PHENOMS, L450/500, AND PRAETORS

Approach Climb Flaps: 1 or 2

Landing Flaps: 3 or Full

	Configuration			Minimum Gradients
	Gear	Flaps	Thrust	
Approach Climb	Up	Approach Climb Position	OEI GA thrust on remaining engine	2.1 %
Landing Climb	Down	Landing Position	GA thrust on all engines	3.2 %

AGENDA

01. Introduction
02. Landing Performance and Procedures
    - Field Length – Certification and Dispatch Considerations
    - Effects of Technique Variations on the Landing Distance
    - Assessment of Landing Distance at Time of Arrival
    - Climb - Certification and Dispatch Considerations
03. **Landing Performance Software**
04. Summary

LANDING PERFORMANCE SOFTWARE

FIRST PRINCIPLES

- Uses the certified calculation module
- Specific analysis which results in optimum performance
- OPERA

SECOND PRINCIPLES

- Uses approved performance databases
- More conservative performance values
- Some third-party providers' software

AGENDA

01. Landing Performance
    - Field Length – Certification and Dispatch Considerations
    - Assessment of Landing Distance at Time of Arrival
    - Effects of Technique Variations on the Landing Distance
    - Emergency and Abnormal Conditions Landing Assessment
    - Climb - Certification and Dispatch Considerations
02. Landing Performance Software
03. **Summary**

SUMMARY

ULD DRY	Basic Certified Distance for Landing Dispatch
FACTORED DRY	Equals ULD multiplied by 1.67 or other FACTOR
ULD WET	Obtained through a mathematical calculation
FACTORED WET	FACTORED DRY * 1.15
CONTAMINATED RUNWAY DISTANCE	For each contaminant depth and type
REASSESSMENT AT TIME OF ARRIVAL	Recommended procedure to prevent runway excursion. EASA requirement.
LDTA	Actual landing distance at time of arrival
REASSESSMENT OF LDTA (ACCEPTABLE METHODS)	1.15*LDTA, reassessed dispatch distance, or landing distance determined at the time of dispatch, as applicable
Climb Performance Limits	Minimum required climb capability for dispatch
Landing Performance Software	First Principles (OPERA). Second Principles (some third-party software)

REFERENCES

FAA SAFO 19001 - **Landing Performance Assessments at Time of Arrival**

FAA AC 91-79 - **Mitigating the Risks of a Runway Overrun Upon Landing**

FAA AC 25-32 - **Landing Performance Data for Time-of-Arrival Landing Performance Assessments**

Air Ops Regulation CAT.OP.MPA.303 - **In-flight check of the landing distance at time of arrival — aeroplanes**

Air Ops Regulation NCC.OP.225 - **Approach and landing conditions**

GP 8143 - **LANDING PROCEDURE BEST PRACTICES AND RECOMMENDATIONS (for Phenoms)**

Video OV-500005 - **Runway Overrun Prevention (available in myTechCare Flight Operations > Videos > Phenom 100/300)**

Video NLIR - **No Landing is Routine (available in myTechCare Flight Operations > Videos)**

THANK YOU

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