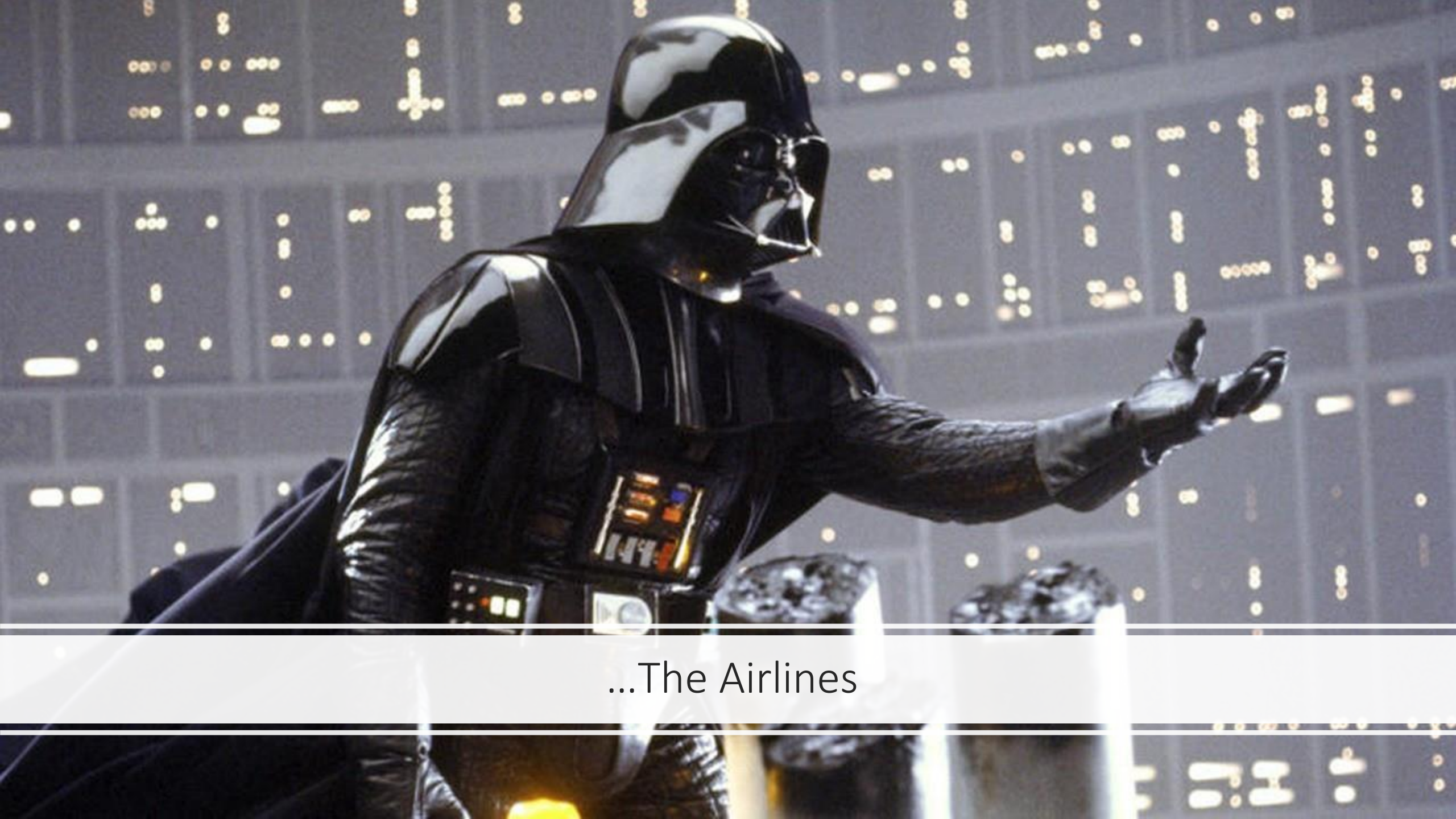
What They Don’t Teach You in Ground School

Did they talk about this in Basic Indoc?



...The Airlines


USE FUEL PROCEDURE B
See NHA AOM - Fueling Manual
87-28-013-1
FUEL QTY
NO 1 TANK
NO 2 TANK
NO 3 TANK
FWD BOOST PUMPS
AFT BOOST PUMP
LOW PRESS
VALVE IN TRANSIT
OPEN
CLOSE
ENG 1
ENG 2
ENG 3
HYD BRAKE INTERCONNECT
ON
CLOSE
ENGINE VIBRATION
TEST
TURBINE INLET PICKUP
HIGH LOW FILTER
OIL QTY TEST
OIL FILTER BYPASS
PANEL FLUOR
CIRCUIT BREAKER
PANEL BACKGROUND
BRIGHT
OFF
GPWS
NORM
PHX 130.25
AMR 130.65
ELP 122.95
BAY 129.95
ATI 130.90
TEST
OXYGEN DILUTER
REGULATOR DEMAND
EMERGENCY
OXYGEN
FLOW SUPPLY
NORMAL
100%
SERVICE INTERPHONE
OXYGEN MASK MIKE
PUSH TO TALK
VHF NAV-1 VOICE RANGE
VHF NAV-2 VOICE RANGE
MKR
EMER
INT MIX
SEL
COMM RECS VHF-1 VHF-2
ADF VOICE RANGE
FUEL HEAT
ENG 1
ENG 2
ENG 3
ICING
VALVE
HYDRAULIC SYSTEM A
ENG 1 PUMP
ENG 2 PUMP
FLUID SHUTOFF
GRD INTERCONNECT
HYDRAULIC SYSTEM B
ELEC PUMP 1
ELEC PUMP 2
HYDRAULIC STANDBY SYSTEM
OVERHEAT
LOW LEVEL
LOW PRESS
SECONDARY MAIN LANDING GEAR
LH
RH
MAX TO 177.6
LDG 154.5
129.95
130.9
Bow
93028

Part 91 vs 135 vs 121 –
Different environments, different mindset?

So many variables in Business Aviation

Wanted: BA Pilot with these skills

- Software Programmer
- Psychologist
- Meteorologist
- Systems Analyst
- Emotional Intelligence
- Fortune Teller
- Public Relations Spinner
- Leadership abilities
- Ability to tolerate others while locked in a small room for thousands of hours

It's not just about flying an airplane

Unique Stressors for Business Aviation Pilots

Flight Coordinators/Schedulers/Flight Followers (Non Dispatchers!) Managers pushing grey areas of the rules

Line Coordination – after hours, snow removal, dirty airplanes, hangar stack, fuel orders, catering, stocking supplies

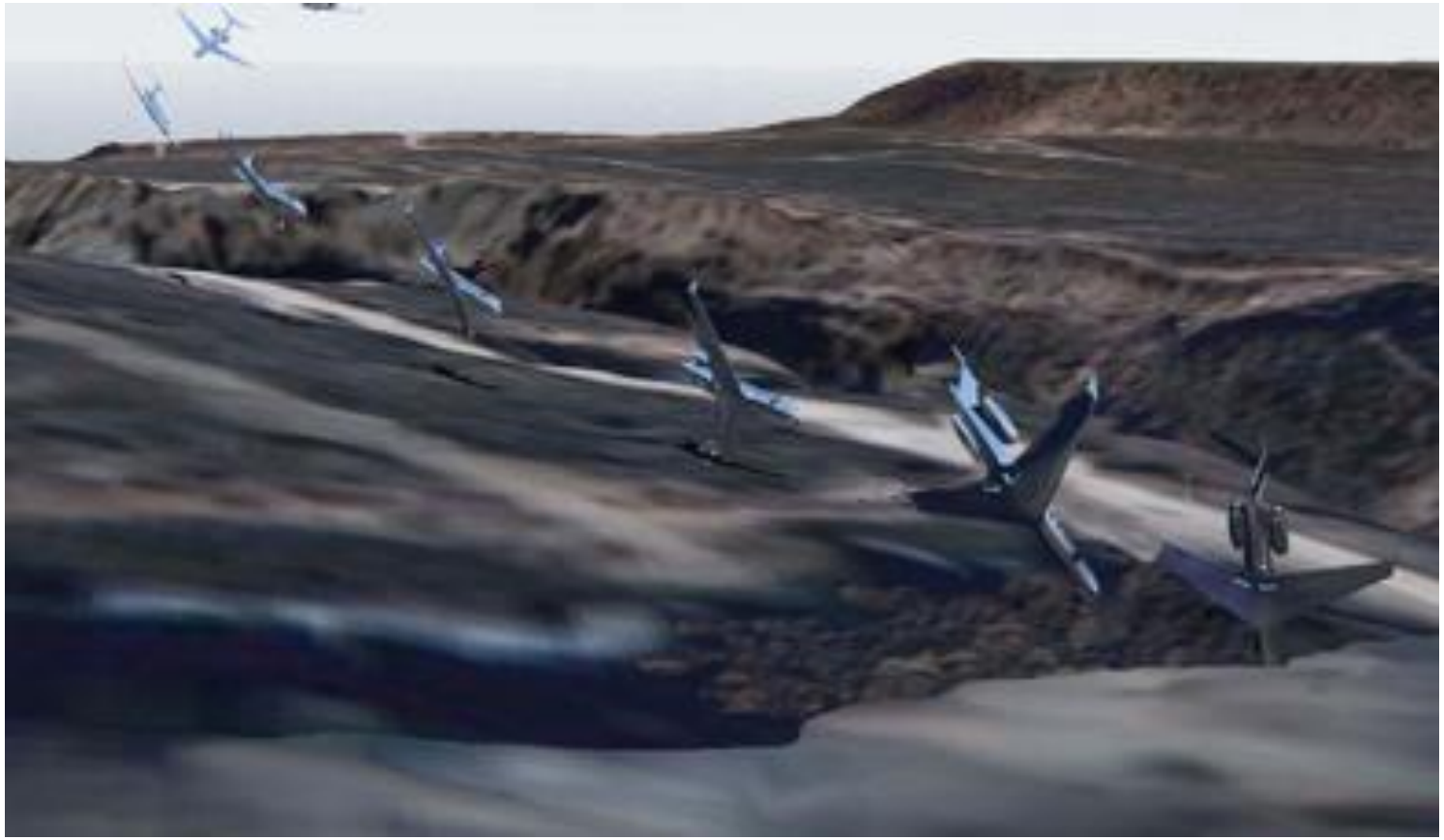
Maintenance – after hours, on the road, weekends, reoccurring mx items

Passengers – Direct relationship with pax, schedules, running late, CEO onboard, high maintenance passengers

Peripheral People – these people can bring a company to its knees but we don't give much thought in hiring and paying these people!



One Big Difference



Passenger Pressure in the Cockpit

- Aspen
- 15 pax + 2 pilots + 1 FA
- LAX –ASE
- Client paid for big, expensive dinner party
- ETA 10 min before sunset
- Passenger in cockpit jumpseat
- Client heard captain discussed diverting so they called the aircraft charter dept to tell the captain “the airplane was not going to be redirected”

NBAA | BACE®
OCTOBER 22-24, 2019 · LAS VEGAS, NV

NBAA Top Safety Issues for 2019

- Loss of Control Inflight
- Runway Excursions
- CFIT
- Ground Operation and Handling Incidents
- Single Pilot Operations (no, not a pilot dating app)
- Automated Safety Data Sharing Effort
- Automation Mismanagement

First, What Can We Do About This?

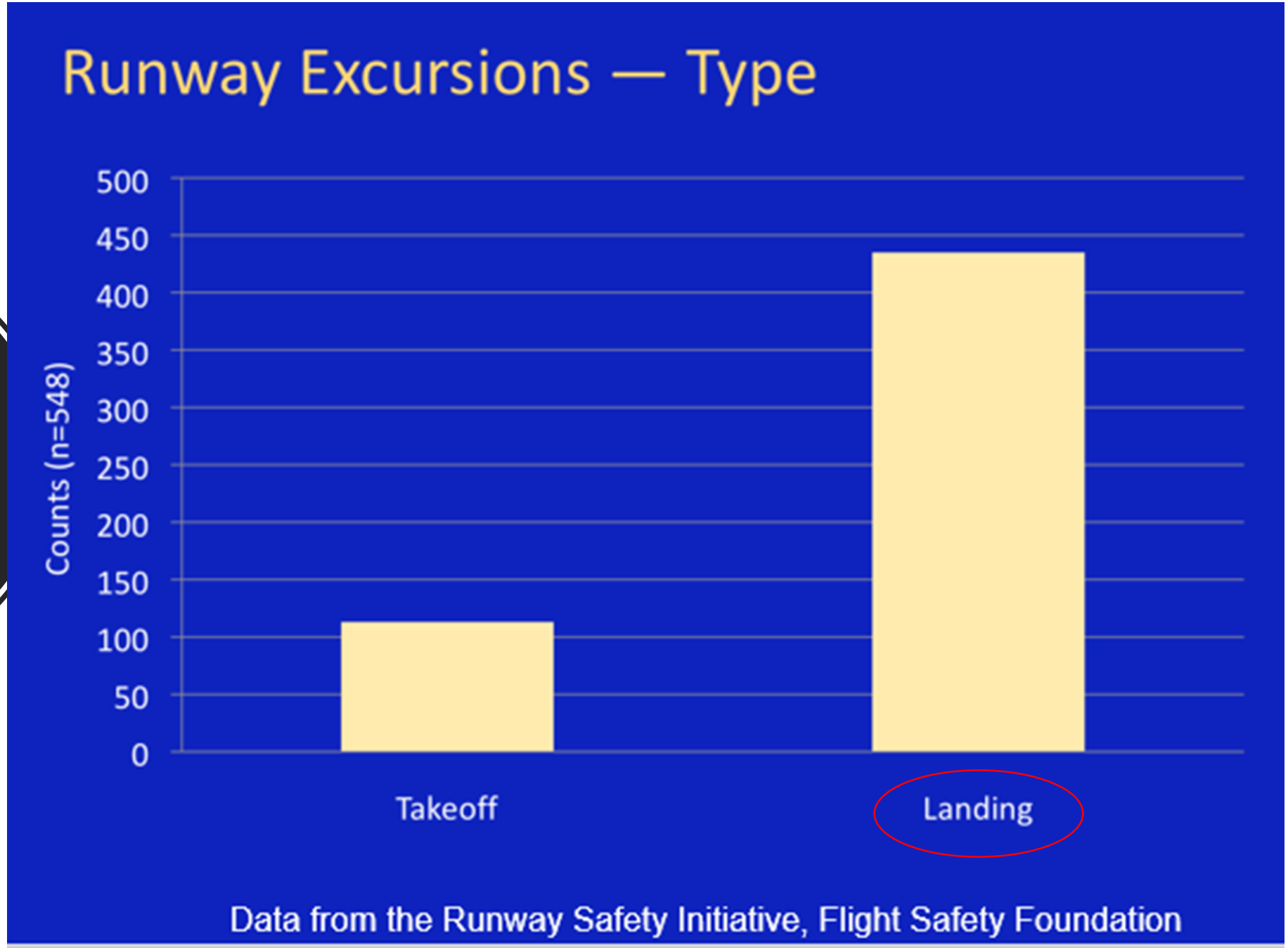
First, understand the pilot brain

- Drexel University Study
- Sim vs Real Life (fear based)
- **As the task becomes a learned trait, the brain is able to spread its resources out across other areas**
- If you have great raw pilot skill, muscle memory allows you to perform your task while dealing with an anomaly
- Industry needs to create FAIL SAFE DECISION MAKING

Why We Do Aviation Safety Workshops – Scenarios create muscle memory

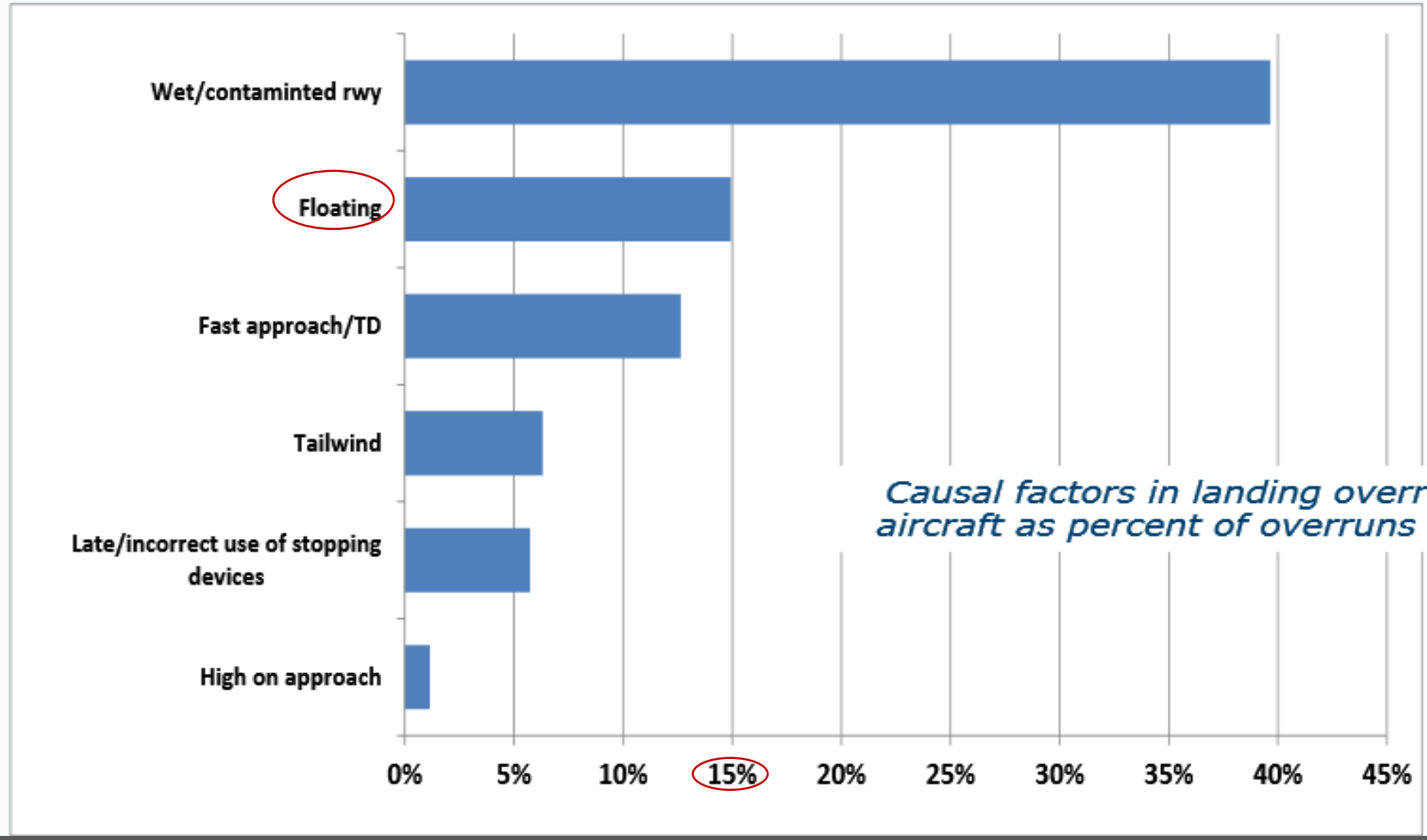
- Create Pilot Muscle Memory
- Enforce pure, core pilot skills
- Humans have the ability to create muscle memory by just imaging scenarios
- It's why we do repetition in the simulator and recurrent ground school
- <u>Your reflex in a future situation will be made based on the thought patterns formed right now</u>
- What reflex does your flight crew have?

Break it Down



NLR Air Transport Safety Institute
Research & Consultancy

Landing overrun causal factors business operations



Causal factors in landing overruns with business aircraft as percent of overruns with known causes

Top 10 Reasons Why it Happens
Not usually taught in ground school.

1. Lack of Flight Discipline = unstable approach
2. Actual Runway Conditions vs Anticipated (ATIS vs Reality)
3. Runway not grooved, might have made a difference? (hydroplaning)
4. Tailwind – why? Followers? If they can do it, I can too
5. Landing Technique – Floating, Vref++, CEO 15% greaser!
6. Anti-skid use, not understanding. Anti-skid characteristics?
7. Actual Wind at moment of touchdown not the same as ATIS
8. Following another aircraft in
9. Empty Leg. There's a reason why FRAT/risk is higher
10. Pressure to get there

One Solution: Better info to pilots about runway condition

- FAA created a workgroup called: The Takeoff and Landing Performance Assessment Aviation Rulemaking Committee (TALPA ARC) 2015.
- FAR AIM 135.385 – still influencing the industry
- Runway Condition Codes
- SAFO 19001 – March 2019
- Landing Performance Assessments at the Time of Arrival. Advisory performance data.
- Considering factors that cannot be predicted during preflight!

What's the code!?

Is a Rwy CC 6 good or bad?

Can you go with 2?

How about a 3?

How about a 4/2/4?

Runway Condition Assessment Matrix (RCAM)

Assessment Criteria		Downgrade Assessment Criteria		
Runway Condition Description	Code	Mu (μ) [1]	Vehicle Deceleration or Directional Control Observation	Pilot Reported Braking Action
• Dry	6	40 or Higher	—	—
• Frost • Wet (Includes damp and 1/8 inch depth or less of water) ***1/8 inch (3mm) depth or less of:*** • Slush • Dry Snow • Wet Snow	5	39 to 30	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	29 to 21	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 1/8 inch depth 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
Greater than 1/8 inch depth of: • Water • Slush	2		Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice [2] • Water on top of Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	0	20 or Lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

PIREP: Braking Action Reports

Does your FOM/GOM state go/no go?

Is it different for takeoff and landing?

Rate your date with the runway

OLD	NEW
GOOD	GOOD
	GOOD TO MEDIUM
FAIR	MEDIUM
	MEDIUM TO POOR
POOR	POOR

December 2018 to March 2019

10 BA Runway Excursions in 4 months

4 in one week:

1. Beechjet. RwyCC **3/3/2**
2. Citation 550. Wet, non grooved. METAR 24014G35 4 SM +RA
3. Lear 35. RwyCC **1/1/1**
4. King Air 300 (takeoff) RwyCC **1/1/1**

The language 135.385 - 60% Rule

- No person operating a turbine engine powered large transport category airplane may take off that airplane unless its weight on arrival, allowing for normal consumption of fuel and oil in flight would allow a full stop landing at the intended destination airport within 60% of the effective length of each runway

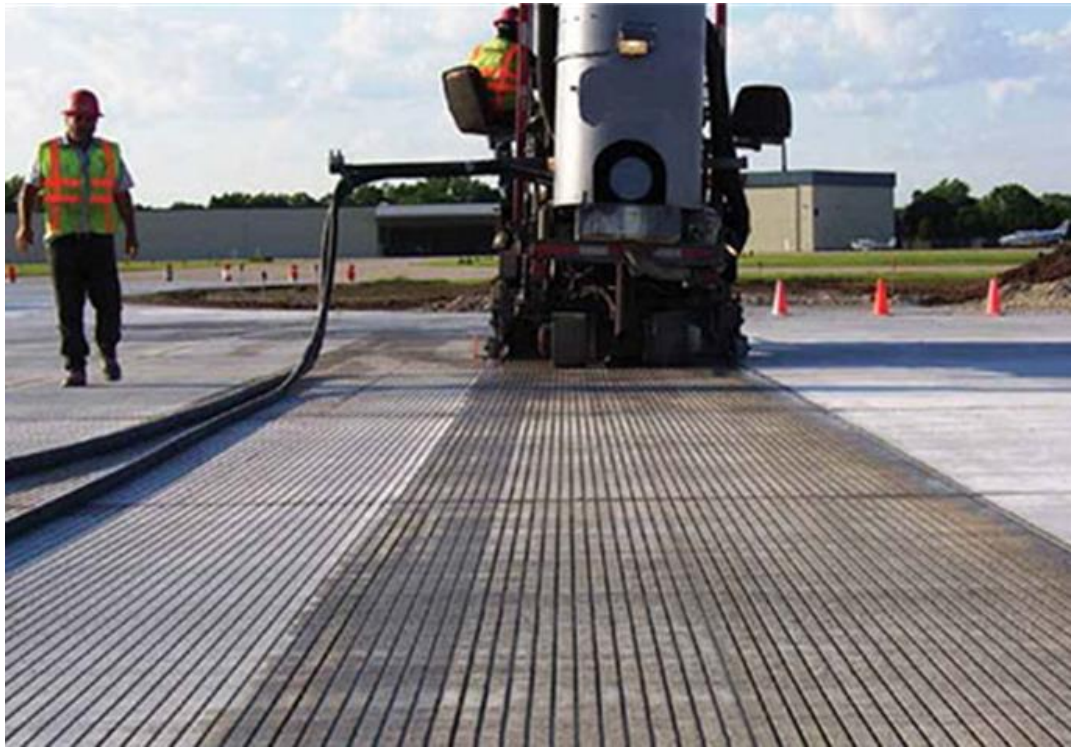
Just add water

- FAR 135.385 (d) requires that whenever the destination runway is forecast to be wet or slippery at the time of arrival, 15% will be added to the required effective length for landing on a dry runway for preflight planning purposes.
- OR - You must add 15% to the 135 landing distance calculation when the visibility is less than 3/4 mile or RVR 4000.
- These calculations are not cumulative; so if the destination runway is forecast to be wet or slippery OR if the visibility is less than 3/4 mile or 4000 RVR, add 15% to your preflight 135 landing distance requirements.

Part 91 Operators – Do You Add a Factor?

- Risk management decision for you to make

Don’t forget the taxiway and ramp…



Groovy. Is Your Runway?
We’re finding out surface friction is vastly improved on grooved runways

GRVD

Check Chart Supplement

DENVER

CENTENNIAL (APA)(KAPA) 15 SE UTC–7(–6DT) N39°34.21′ W104°50.96′
5885 B S4 **FUEL** 100LL, JET A OX 1, 2 TPA—6885(1000) NOTAM FILE APA
RWY 17L–35R: H10001X100 (ASPH–GRVD) S–56, D–75, 2S–95 MIRL
RWY 17L: PAPI(P4L)—GA 3.0° TCH 47′. 0.9% up.
RWY 35R: MALSR. PAPI(P4L)—GA 3.0° TCH 45′. Bldg. Rgt tfc. 0.9% down.
RWY 17R–35L: H7001X77 (ASPH–GRVD) S–30 MIRL 0.9% up S
RWY 17R: REIL. PAPI(P4L)—GA 3.0° TCH 41′. Rgt tfc.
RWY 35L: REIL. PAPI(P4R)—GA 3.0° TCH 37′. Ground.
RWY 10–28: H4800X75 (ASPH) S–12.5 MIRL 0.6% up W
RWY 28: REIL. PAPI(P2L)—GA 3.0° TCH 41′. Ground.

Got EMAS?

- No matter what we do, excursions are going to happen, so what can we do to save lives?
- Engineered Materials Arrestor System
- Water, highways, cliffs, etc.
- Crushable cellular cement
- The FAA found that pilots are trying to avoid the EMAS and steer to the grass sides in low-energy events in order not to make the news!

EMAS – 14 uses involving 407 people

EMAS Arrestments

Date	Crew and Passengers	Incident
May 1999	30	A Saab 340 commuter aircraft overran the runway at JFK Airport in New York
May 2003	3	A Gemini Cargo MD-11 overran the runway at JFK Airport in New York
January 2005	3	A Boeing 747 overran the runway at JFK Airport in New York
July 2006	5	A Mystere Falcon 900 overran the runway at Greenville Downtown Airport in South Carolina
July 2008	145	An Airbus A320 overran the runway at Chicago O'Hare Airport in Chicago, IL
January 2010	34	A Bombardier CRJ-200 regional jet overran the runway at Yeager Airport in Charleston, WVA
October 2010	10	A G-4 Gulfstream overran the runway at Teterboro Airport in Teterboro, NJ
November 2011	5	A Cessna Citation II overran the runway at Key West International Airport in Key West, FL
October 2013	8	A Cessna 680 Citation overran the runway at Palm Beach International in West Palm Beach, FL
January 2016	2	A Falcon 20 overran the runway at Chicago Executive Airport in Chicago, IL
October 2016	37	A Boeing 737 overran the runway at LaGuardia Airport in Flushing, NY
April 2017	2	A Cessna 750 Citation overran the runway at Bob Hope Airport in Burbank, CA
February 2018	4	A Beech Jet 400A overran the runway at Burke Lakefront Airport in Cleveland, OH
December 2018	117	A Boeing 737 overran the runway at Bob Hope Airport in Burbank, CA

They did NOT Brief EMAS

Individual blocks can be replaced

Reason for overrun are the same, results are different

Originally designed based on weight - Major Airports 25, 000 lbs.

But weight is changing to help BA aircraft

Phenom 100 EMAS – February 27 2019 Kansas City

Solution: Scenario Based Training

- More What If?
- Create better reflex, pilot muscle memory
- The Burt Anderson method. What, no checklist?!
- eLearning to include a scenario that can be discussed during recurrent ground training session

Your Takeaways

- Peripheral People are more important to your flight department than you might realize
- Shine light on the gray areas. What is your company policy on Runway Codes, specifically. Is 3/3/2 a go or no go?
- Grooved runway – use it as a factor not to land (not an excuse to give it a try)
- Include mention of EMAS in approach briefings
- Include Scenario Based Training – Basic Indoc, ground school, eLearning, simulator training

Questions?

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