Teterboro Users Group Meeting
Go Around Decision-Making & Execution Project
Update / Next Steps

September 26th, 2018

Dr. Martin Smith, CEO Presage Group Inc.

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Outline:

- Description of the problem
- Project methodology
- Significant findings
- Main recommendations
  - Approach
  - Landing
- Operators experience

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FINAL REPORT TO FLIGHT SAFETY FOUNDATION

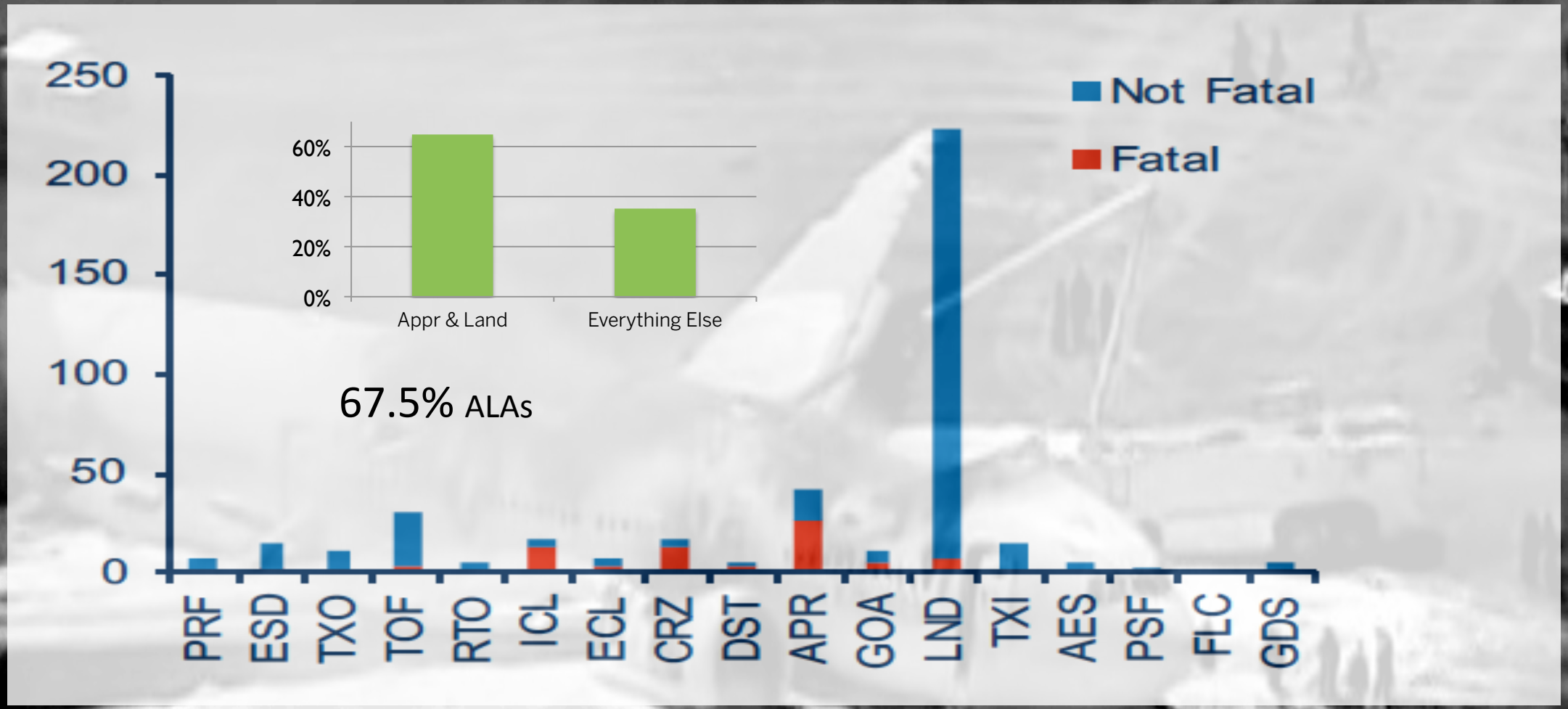
Go-Around Decision-Making and Execution Project

Tzvetomir Blajev, Eurocontrol
(Co-Chair and FSF European Advisory Committee Chair)

Capt. William Curtis, The Presage Group
(Co-Chair and FSF International Advisory Committee Chair)

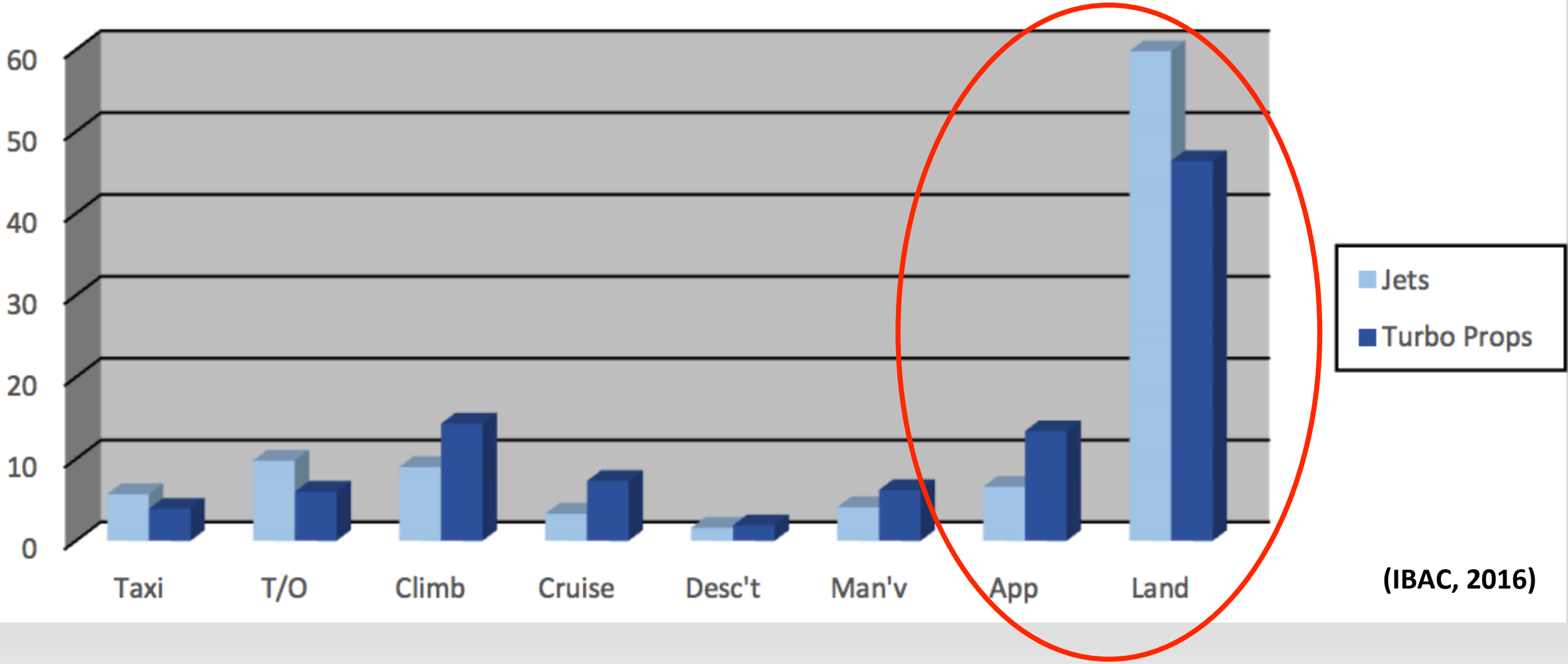
MARCH 2017

Accidents per Phase of Flight (2011-2015)



Source; IATA ACTF

Accident Summary by Phase of Flight 2011-2015



(IBAC, 2016)

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97%

Of Unstable Approaches
Continue to Land

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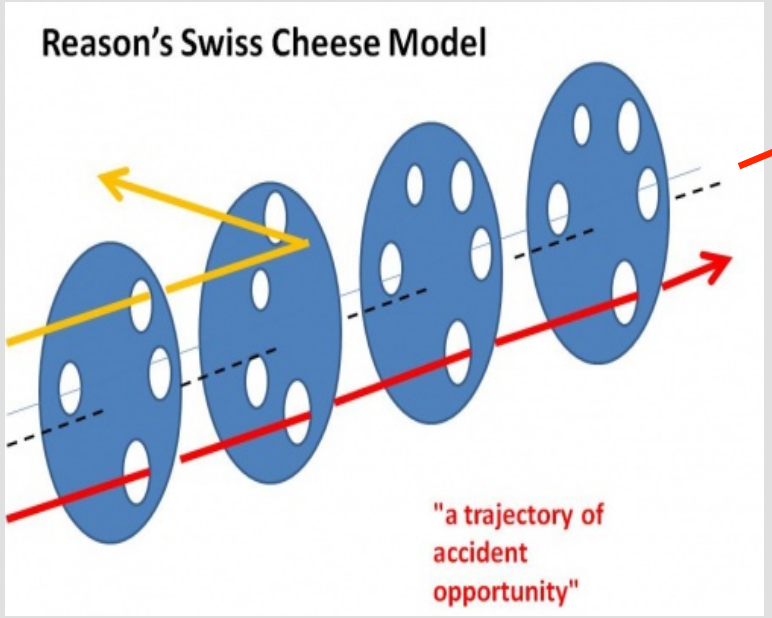
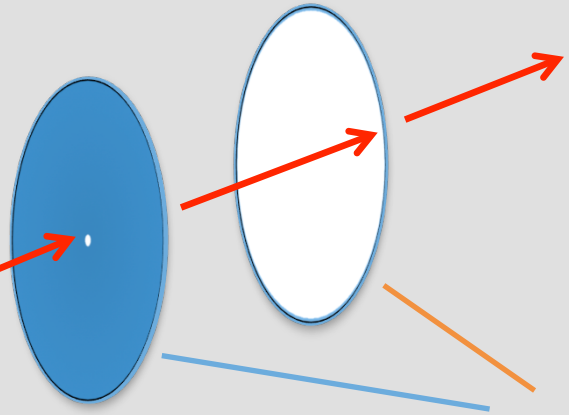
State of Industry GA Compliance Rate





<u>Stable Approach Defense</u>
97% Effective
What's the industry Goal?
How low is ALARP?
100%?

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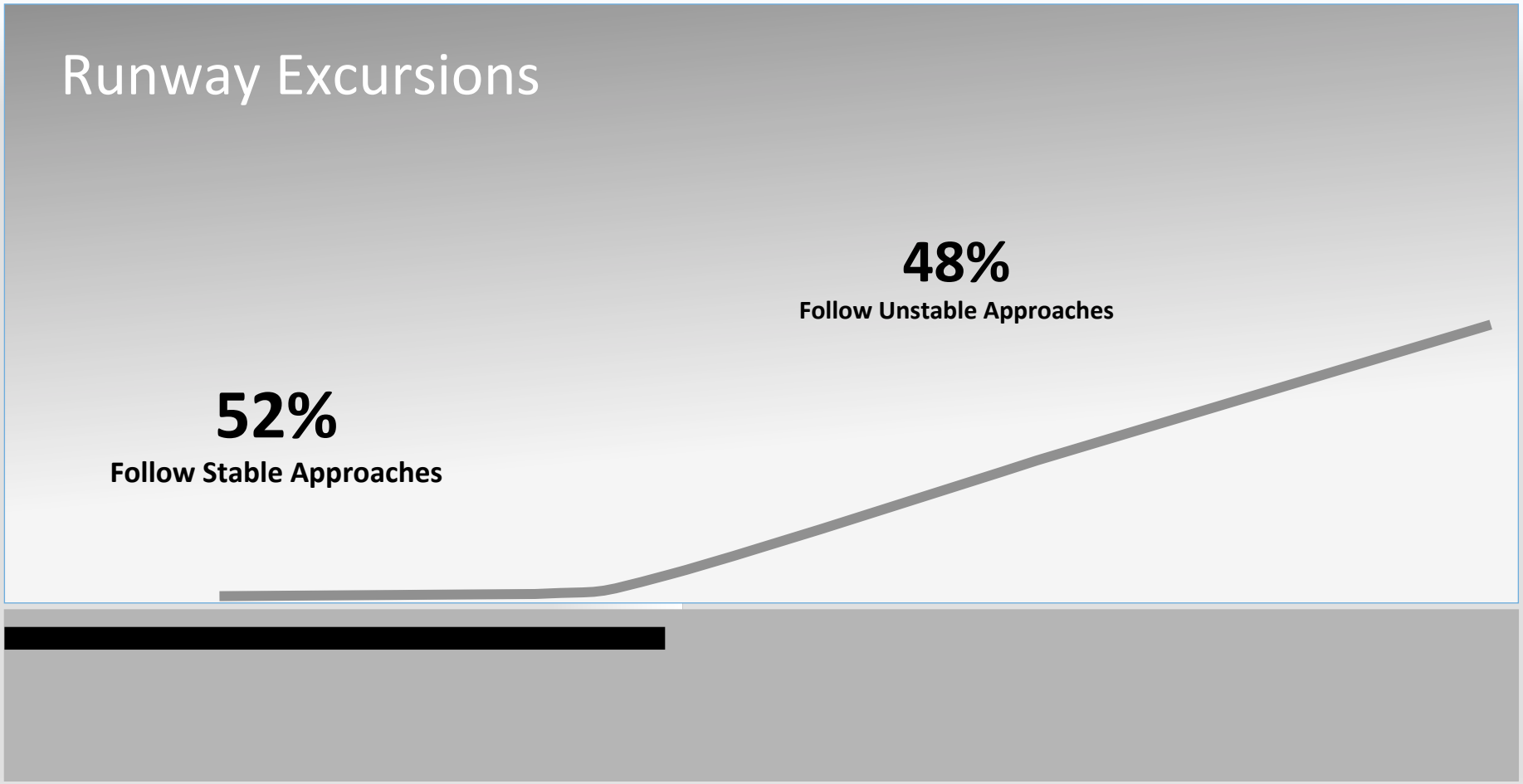
Why not just eliminate Unstable Approaches?



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FSF Study

~83% of approach and landing
accidents would have been eliminated
with the decision to go-around (FSF, Burin 2011)

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This is your meeting with the CEO discussing the flight operational risks to our C-level staff, employees & our valued customers:

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This is your meeting with the CEO discussing the flight operational risks to our C-level staff, employees & passengers:

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The Project

- Analyzed the psychology of non compliance, “why don’t we decide to go-around”
- Compared two populations: Go-around (GA) group vs. Continue Land group (CL)
- Evaluated the transfer of risk to the go-around
- Out of scope…solving unstabilized approaches – focus in on “what happens when the instability occurs”
- Global surveys conducted (pilots, managers)
  - 2380 pilots (33% of who went to site)
  - 128 managers (17% of who went to site)

…….what influences Decision Making

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Continued Research

- Over 10 airlines individually studied
- Another 11 are presently being assessed
- Same statistics

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How situational awareness plays a role in decision making

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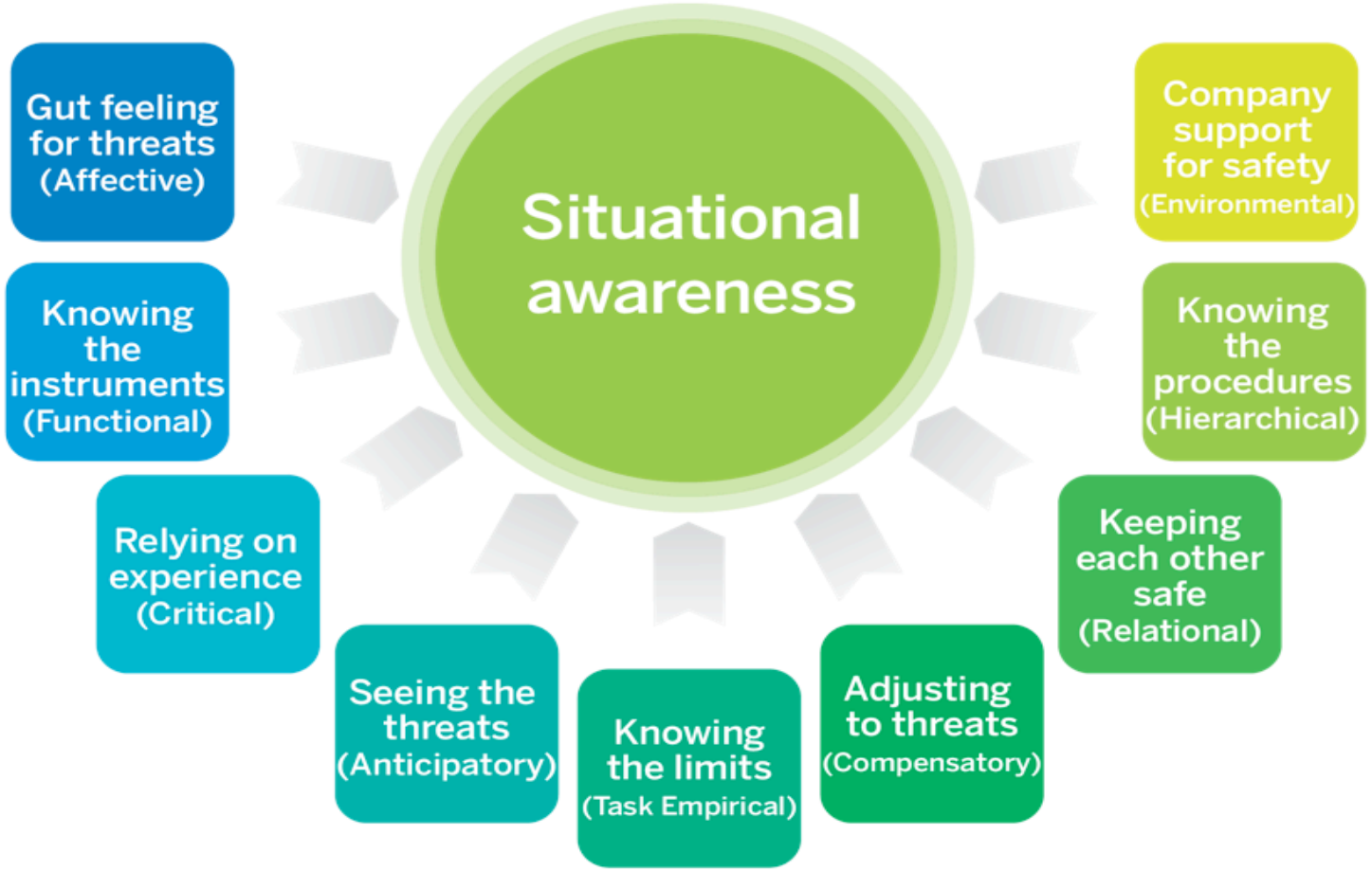
Breaking down situational awareness



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Project Findings & Recommendations

- 38 (statistically significant) findings between the GA and CL group
- 21 GA Decision Making recommendations
- 21 GA Execution recommendations

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VP Elect Pence 737 LGA Accident

Aviation Incident Final Report

The captain later stated that he had considered calling for a go-around before touchdown but the "moment had slipped past and it was too late." He said that "there was little time to verbalize it" and that he instructed the first officer to get the airplane on the ground rather than call for a go-around. He reported that, in hindsight, he should have called for a go-around the moment that he recognized the airplane was floating in the flare. The first officer said that he did not consider a go-around because he did not think that the situation was abnormal at that time.

Automatic terminal information service (ATIS) "Bravo" was current when the first officer, who was the pilot flying, began to brief the instrument landing system approach for runway 22. The ATIS indicated visibility 3 miles in rain, ceiling 1,500 ft broken, overcast at 2,200 ft, wind from 130° at 9 knots, and that braking action advisories were in effect. The approach briefing included the decision altitude and visibility for the approach and manual deployment of the speed brakes by the captain, with the captain stating "you're gonna do these. I'm gonna do this" to which the first officer replied "[that] is correct." (The airplane's automatic speed brake module had been deactivated 2 days before the incident and deferred in accordance with the

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Mapping of the Science

Recommendation	Situational Awareness Constructs Addressed	Findings Addressed	Strategies Addressed
DMR 1	C; 1, 2, 3, 4, 5, 6, 8, 9	DMMF; 1, 2	DMS; 1
DMR 2	C; 1, 2, 3, 4, 5, 6, 8, 9	DMMF; 1, 2	DMS; 1
DMR 3	C; 1, 2, 3, 4, 5, 6, 8, 9	DMMF; 1, 2	DMS; 1
DMR 4	C; 3, 6, 8, 9	DMMF; 1, 9, 11, 12, 13	DMS; 1, 3
DMR 5	C; 1, 2, 3, 4, 5, 6	DMMF; 1, 3, 4, 6, 8	DMS; 1
DMR 6	C; 2, 6, 8	DMMF; 1, 5, 6, 7, 8, 13, 14	DMS; 1
DMR 7	C; 2, 5, 8, 9	DMMF; 1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14	DMS; 1, 3
DMR 8	C; 4, 5, 9	DMMF; 1, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14	DMS; 1, 3
DMR 9	C; 5, 7, 9	DMMF; 7	DMS; 1, 3
DMR 10	C; 4, 6, 7	DMMF; 1, 2, 6, 7, 8, 9, 11, 12, 13	DMS; 3, 4
DMR 11	C; 2, 3, 4, 5, 7, 9	DMPF; 7, 12, 13, 18, 19	DMS; 5, 6
DMR 12	C; 2, 3, 4, 5, 7, 9	DMPF; 7, 12, 13, 18, 19	DMS; 5, 6
DMR 13	C; 1, 3, 4, 7, 8	DMPF; 1, 3, 14	DMS4
DMR 14	C; 1, 2, 3, 4, 6, 7	DMPF; 2	DMS; 4, 7
DMR 15	C; 1, 2, 3, 4, 6, 7, 8,	DMPF; 2, 3, 6, 7, 8, 9, 10, 11, 14, 16	DMS; 4, 7,
DMR 16	C; 3, 4, 7, 8, 9	DMPF; 5, 13, 14	DMS; 4
DMR 17	C; 3, 4, 7, 8, 9	DMPF; 5, 13, 14	DMS; 4
DMR 18	C; 1, 2, 3, 4, 5, 6, 7, 8, 9	DMPF; 14, 15, 17	DMS; 4
DMR 19	C; 1, 2, 4, 5	DMPF; 1, 2	DMS; 7
DMR 20	C; 1, 2, 4, 5	DMPF; 1, 2	DMS; 7

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Priming the psychological pump

the

Readiness to Act

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Main Findings - Pilots

Psychology of Systemic and Chronic Non Compliance

- CL pilots scored lower on all SA components
- CL pilots communicate less during approach
- GA pilots reported by more than 4 times that someone in the flight deck prompted a go-around
- Pilots feel go-around criteria is unrealistic
- CL pilots feel discomfort in challenging other crew members
- Pilots - little disincentive for non compliance

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Main Findings – Managers

Psychology of Systemic and Chronic Non Compliance

- Management is disengaged from the issue
  - 55% stated they didn't know company's rate of compliance
- No agreement on the effectiveness of the policy
- Managers scored low on all SA components

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Recommendations:

- Re-Define Stable Approach and Go Around Requirements to be more relevant and manageable
  - Profile parameters (Approach + TDZ)
  - Energy Management parameters
  - Decision Point
  - Environmental variability

- Manage Policy Actively; tactically - day to day [pilot union involvement required?]

- Action programs for reliable execution of policy (flight Crews)
  - Develop automated stable approach monitor and alert systems
  - Develop ‘active’ communications procedures for each approach
  - Establish and publish safe landing guidelines in operations manuals
  - Develop SOPs to discuss instability factors during approach briefings prior to descent
  - Re-define the stable approach criteria and stable approach height(s).
  - Develop SOPs to state critical instability factors (briefly) just prior to approach commencement
  - Ensure UA and GA policies are clear, concise, and unambiguous, including follow up procedures for non-compliance
  - Separate the active ‘objective’ communications from the ‘decision’ communications
  - Avoid directive or suggestive calls that may compromise ongoing decision- making

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3 Legged Stool (Overview)

Effective
Go Around Policy

Awareness
Flight Crews

Manage the Policy
Managers

Policy
Believed In

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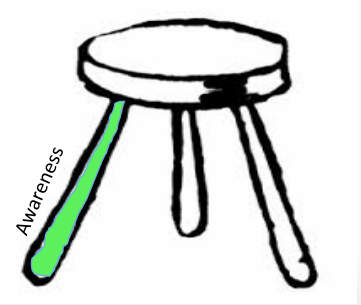
Awareness - Flight Crews



1. Install Stable Approach Monitoring & Alerting Systems
2. Active Communications during the Approach and Landing
3. Increase 'Failure to Go Around' and 'ALA' awareness
    1. Pre TOD briefing
    2. Pre Approach Briefing

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Pre Descent Approach and Landing, and Pre Approach Briefing Guidance Additions

Periodically (e.g. bi-monthly) the briefing should include overall ALA statistics;

- Industry ALA Statistics
  - ALA accidents make up approximately 65% of all accidents
  - Approximately only 3% of unstable approaches result in a go-around
  - More than 50% of runway excursions follow a stable approach
- Industry RE Statistics
  - 53% Veer Offs: 66% follow Stable approaches
    - [wind 40%] [cont. 39%],
  - 47% Overruns: 63% follow Unstable approaches
- Landing Distance Increase Rules of Thumb;
  - 250 feet/sec of floating
  - 300 feet/10 kts excess speed from Vref – dry runway
  - 500 feet/10 kts excess speed from Vref – wet runway
  - 200 feet/10 feet excess above 50 feet over threshold.

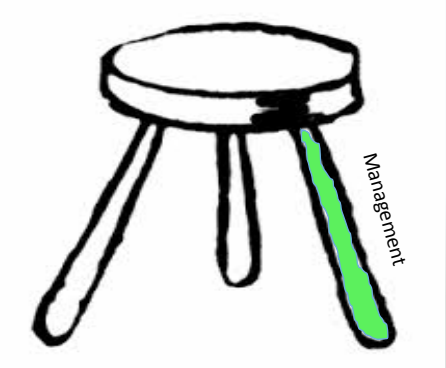
Pre TOD Briefing should include;

- Environmental ALA threats; contamination, crosswinds, tailwinds
- Go-around readiness; in addition to a normal go-around briefing heighten readiness should be discussed in the event of poor environmental conditions

Pre Approach Briefing;

- conduct a brief recap of current environmental threats, go-around readiness, and any adjustments to go-around policy procedures.

Management (process)



1. Active Oversight
    1. Increase go-around non-compliance awareness
    2. Set go-around compliance rate targets
    3. Investigate all unstable approaches and landings that continue

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Guidance

1. Redefine Approach Go-Around criteria
    1. Better match pilot & management views
    2. Closer to SAM Systems
    3. Safe
    4. Distinguished from Stable Approach Objective
    5. Include Active Communications
2. Enhance Landing Go-Around criteria
    1. Include Active communications

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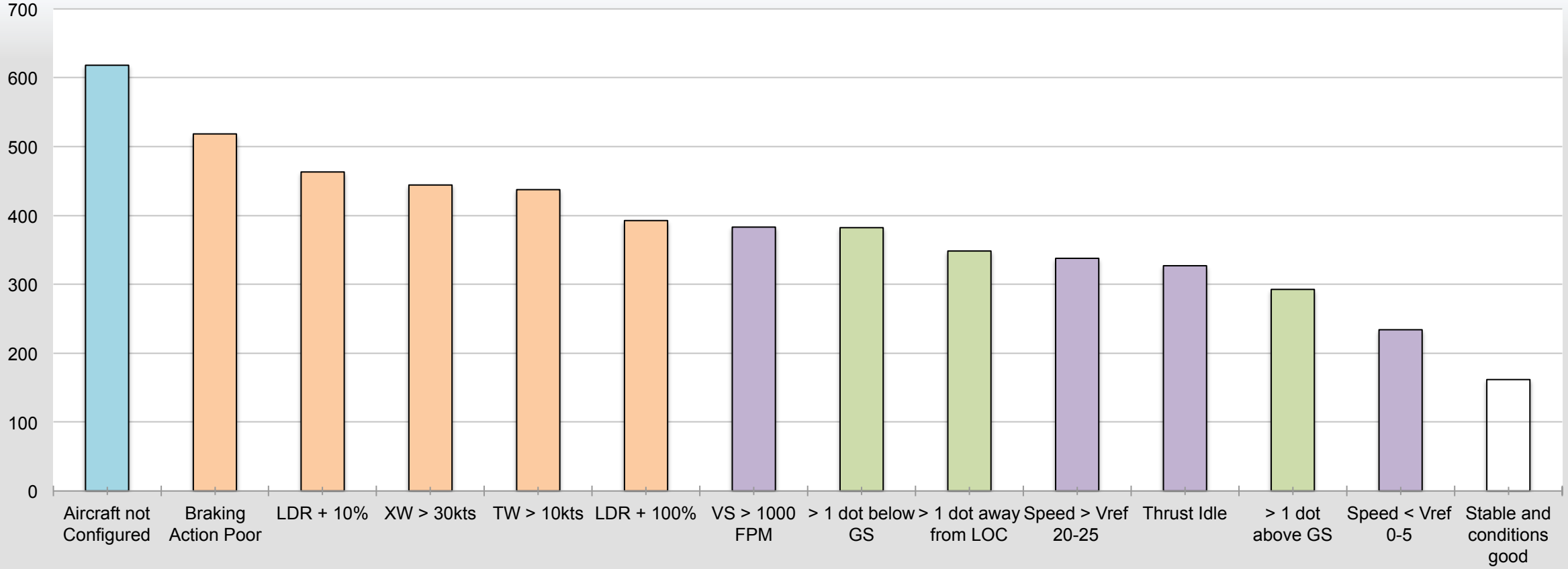
How Pilots see Go-Around Criteria



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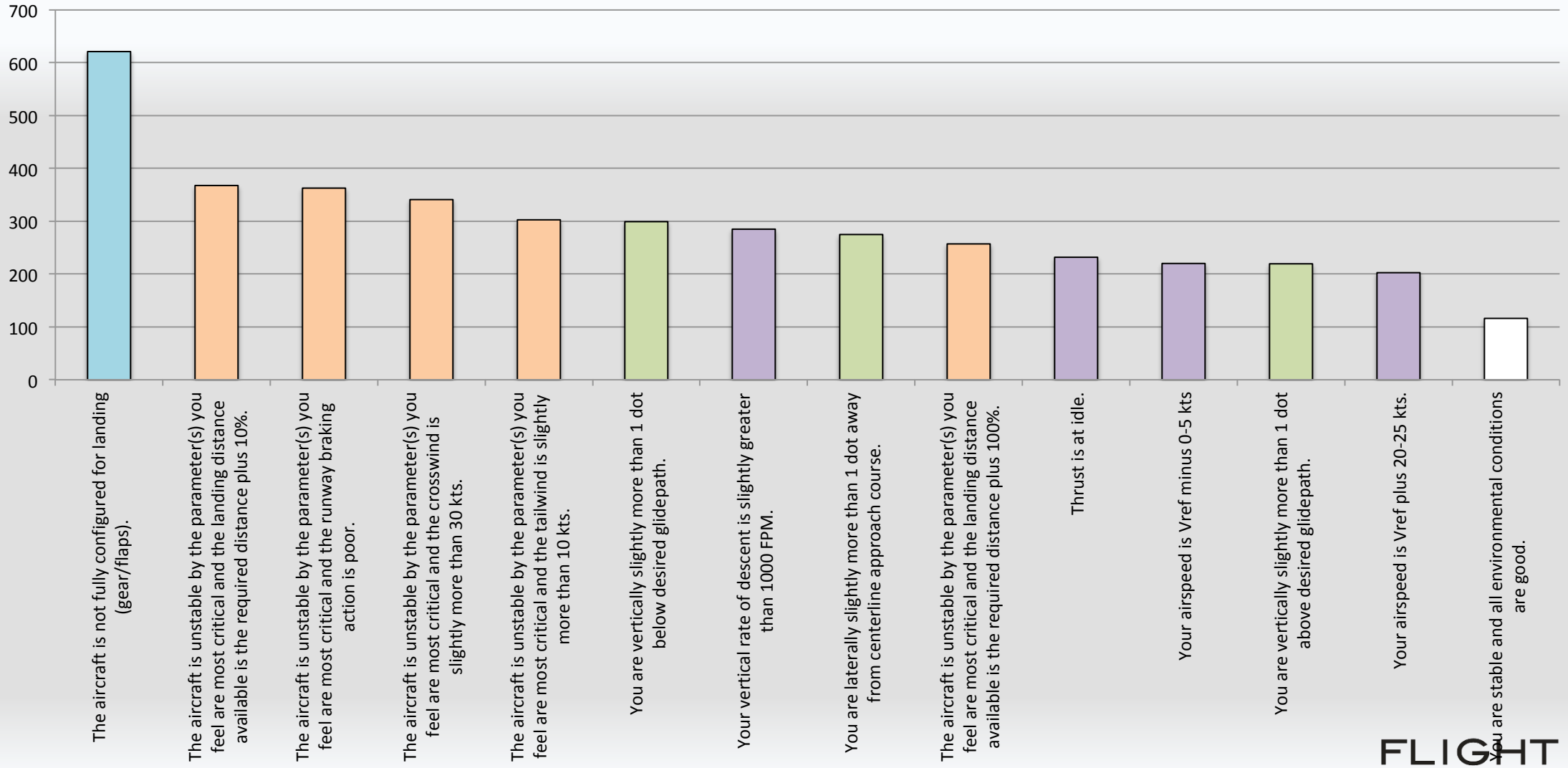
How Pilots see Go-Around Criteria – Turbo Prop



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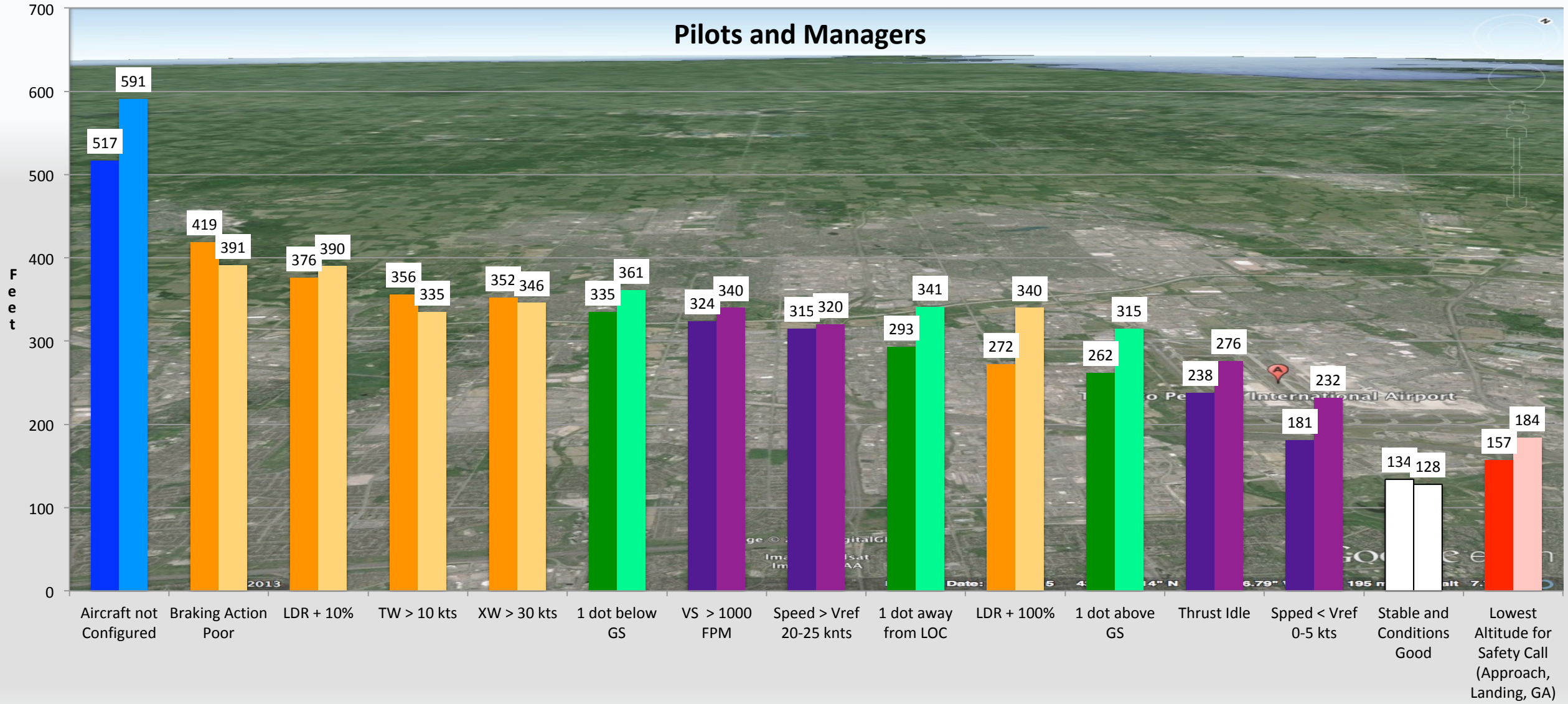
Pilots and Managers



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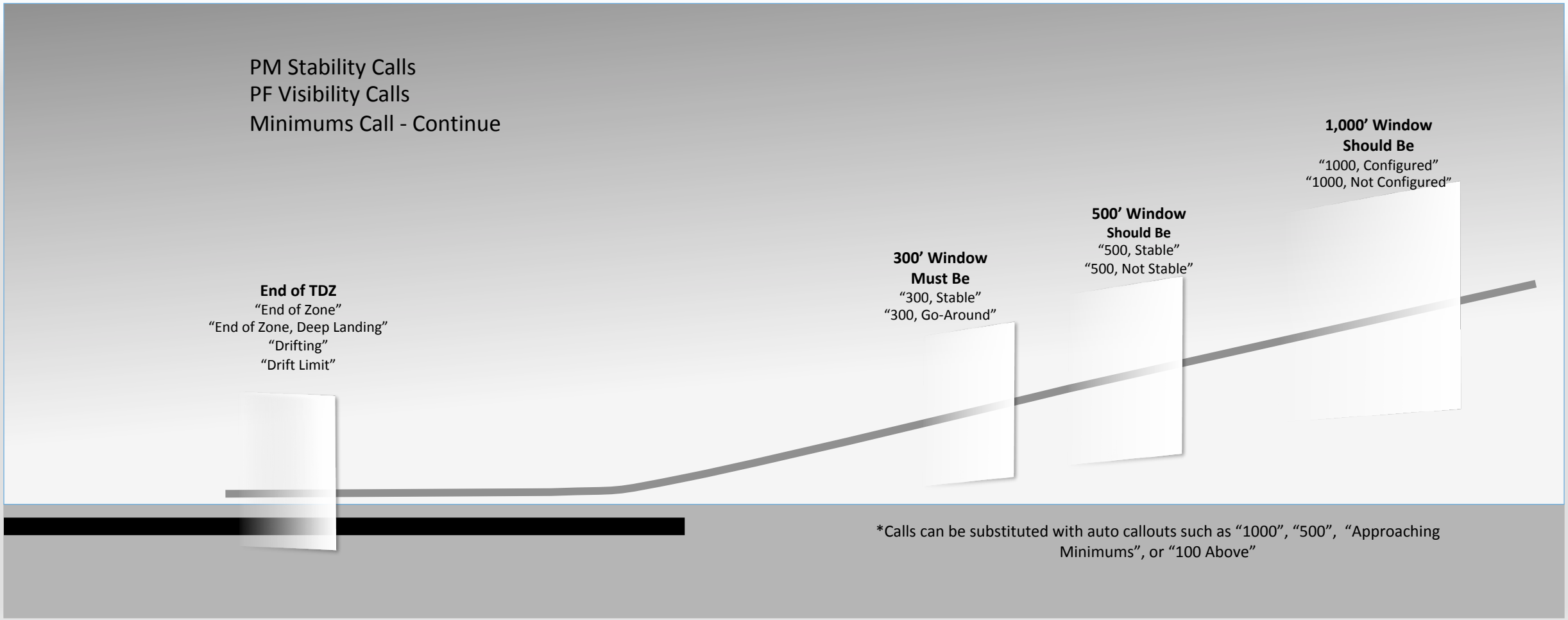
Tabled – Stable Approach & Go Around Elements



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Guidance Through the TDZ

- 40% of flight crews did not accurately know the TDZ markings
- Similar amount did not know the difference between ICAO and FAA markings

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FSF Safe Landing Guidelines

For the purpose of these guidelines the landing begins at the threshold to the aircraft reaches taxi speed.

1. Fly a stabilized approach.
2. Height at threshold crossing is 50 ft., if greater than 50 feet by approach profile design, additions should be made to the actual landing distance required
3. Speed at threshold crossing is not more than VREF + 10 kt indicated airspeed and not less than VREF.
4. Tail wind is no more than 10 kt for a non-contaminated runway, no more than 0 kt for a contaminated runway.
5. Touch down just beyond the touchdown aim point following a normal flare, and not beyond the touch down zone (TDZ). If not touched down within the TDZ (or revised touchdown limit point) - go-around.
6. Touchdown on the runway centerline with the main landing gear on both sides of (straddling) the runway centerline. If all main landing gear are on one side of the centerline – go-around
7. After touchdown, promptly transition to the desired deceleration configuration:
   - Brakes
   - Spoilers/speed brakes
   - Thrust reversers or equivalent (e.g., lift dump)

   Note: Once thrust reversers have been activated, a go-around is no longer an option.
8. Speed is less than 80 kt with 2,000 ft of runway remaining.

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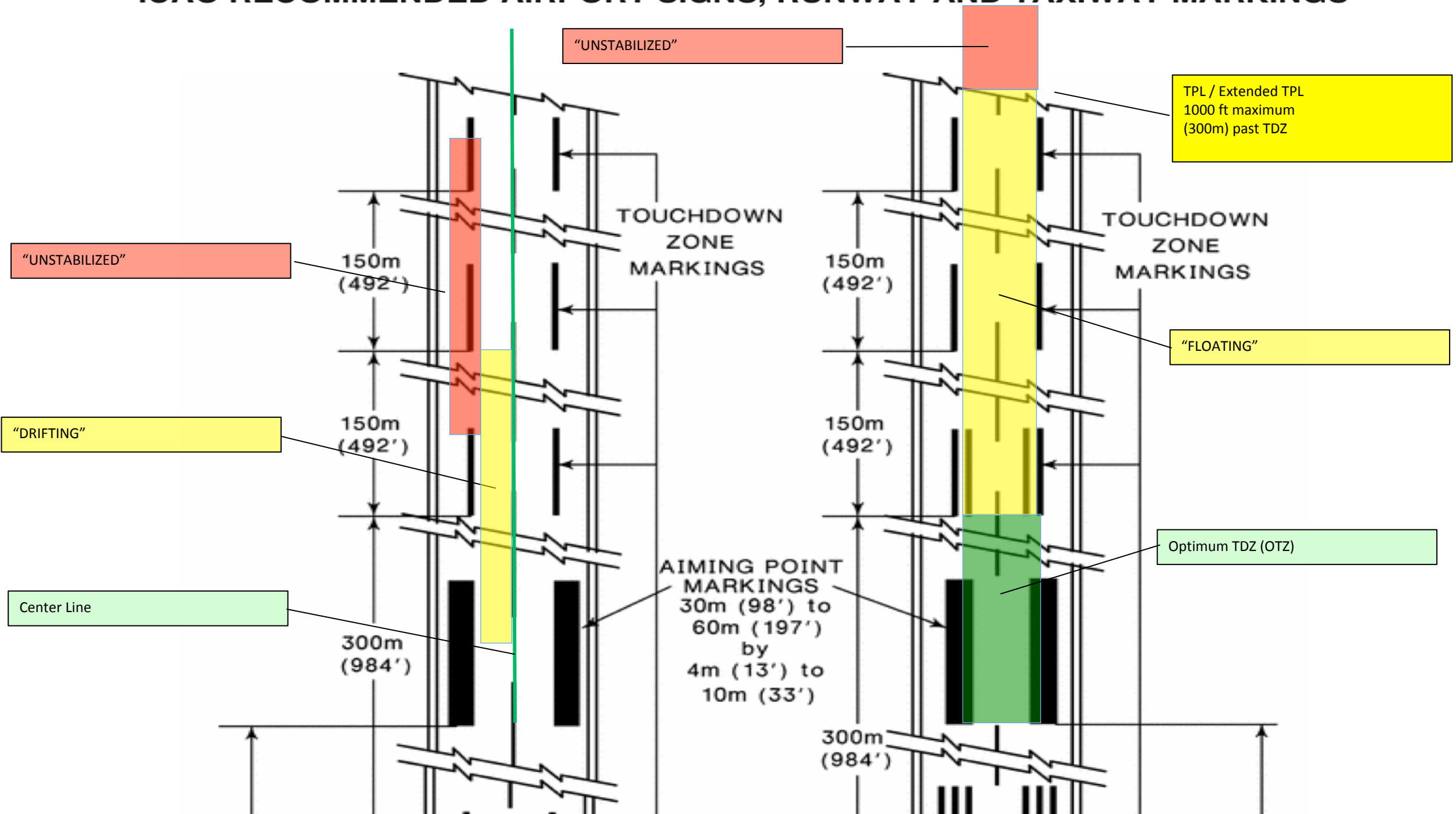
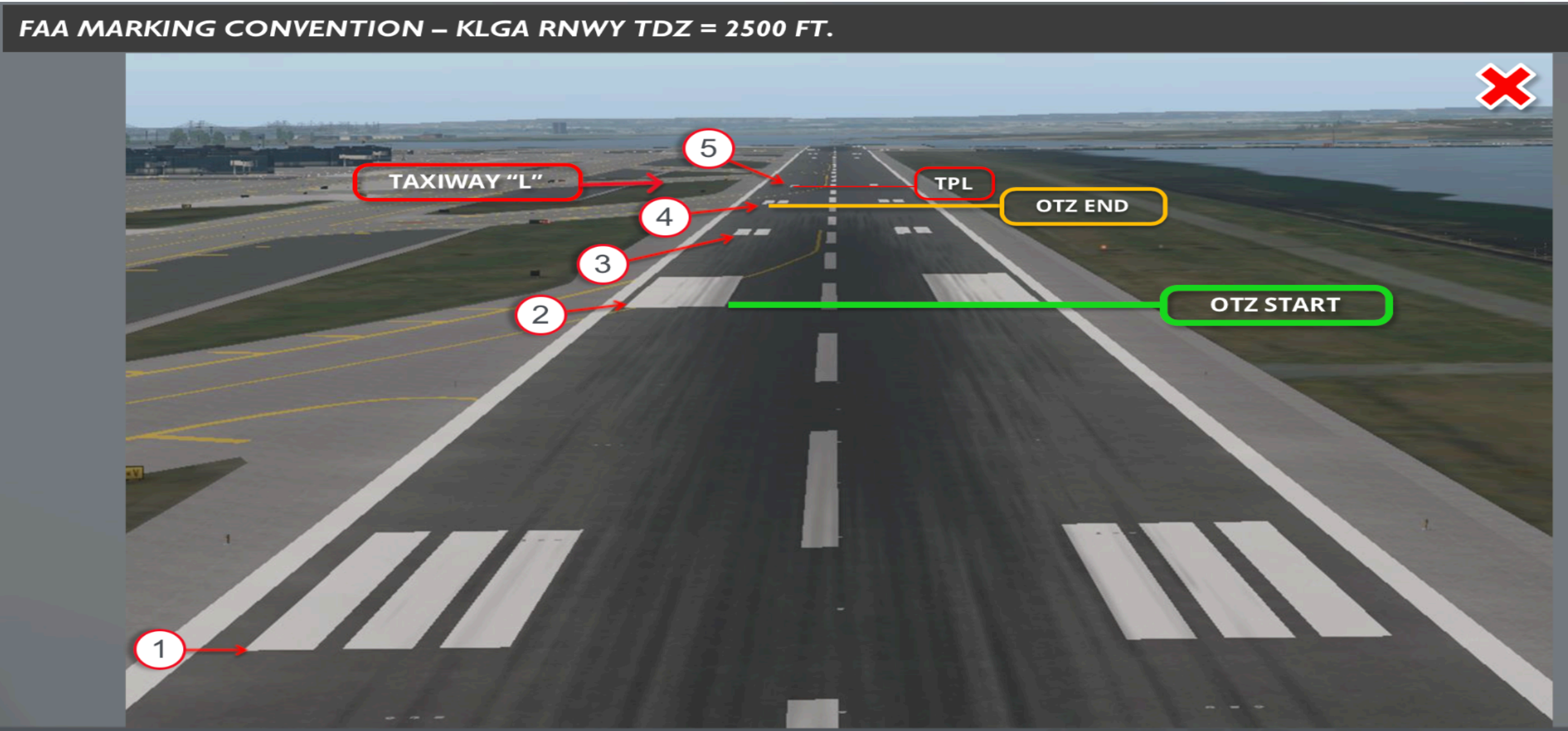
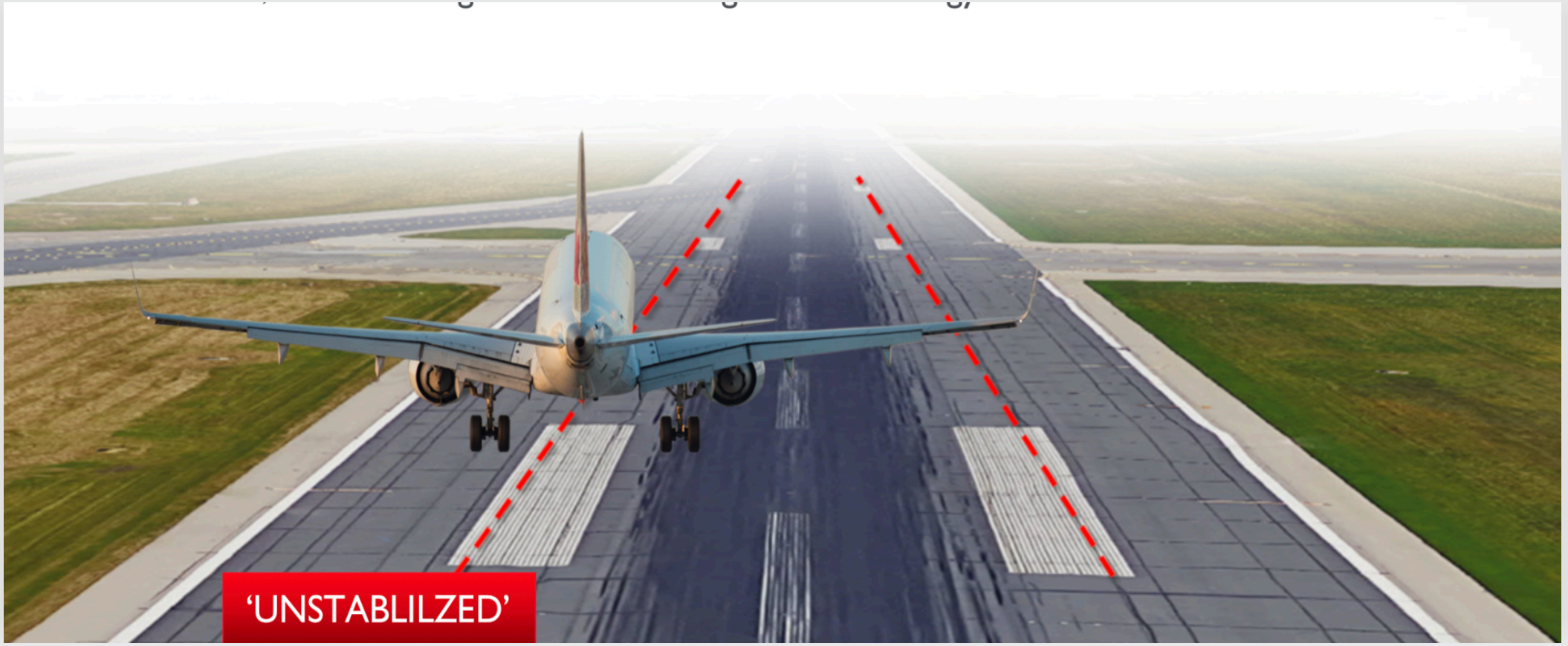
ICAO RECOMMENDED AIRPORT SIGNS, RUNWAY AND TAXIWAY MARKINGS



What is your Touchdown Point Limit?



What about your Lateral Touchdown Point Limit?



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Transfer of Risk; Approach and Landing – to Go Around?

Dilemma…

- We want flight crews to follow GA Policies
- We don’t want to have a go-around for every unstable approach
- Can’t have both…

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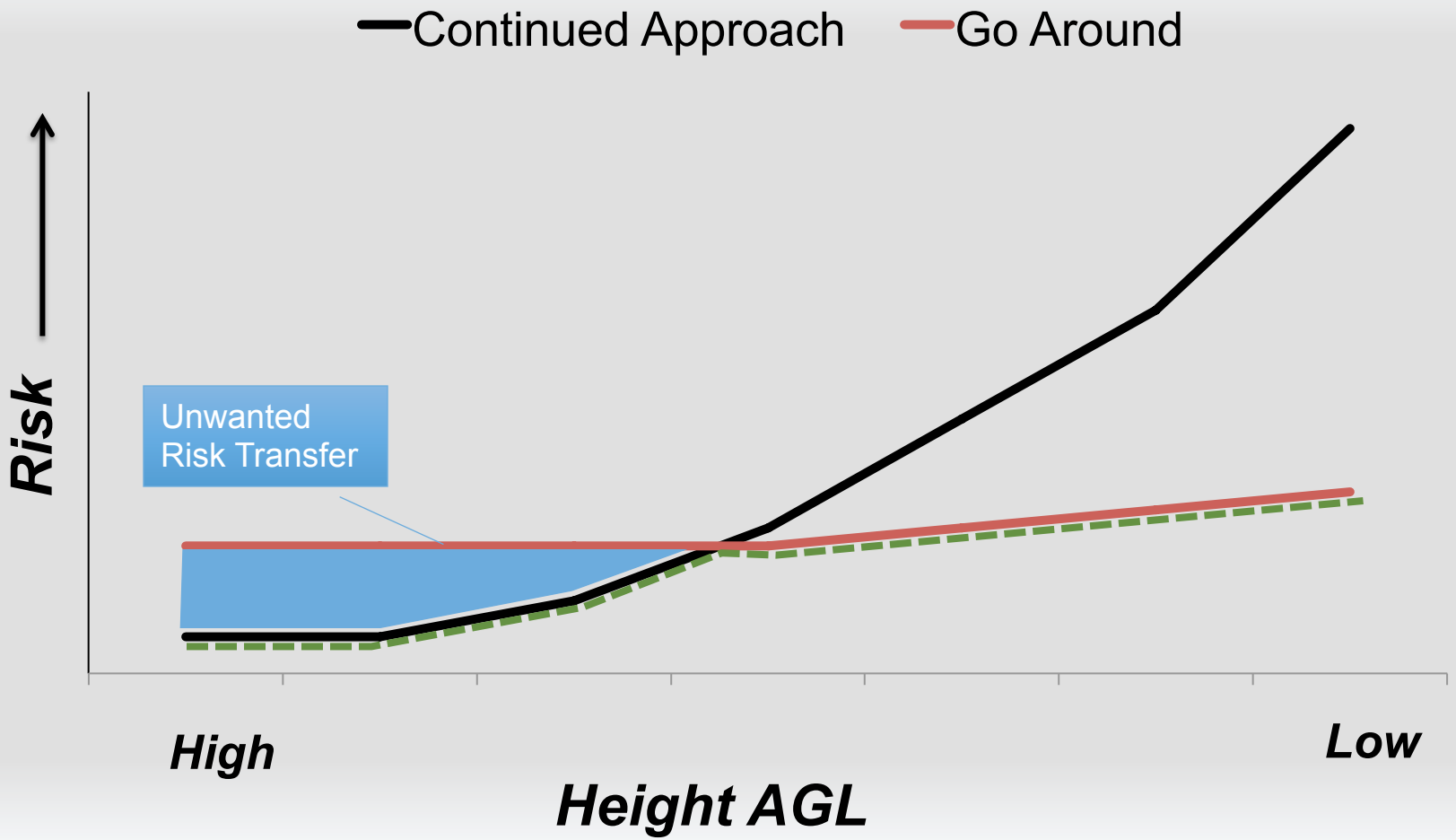
Continued Approach / Go Around Risk Relationship



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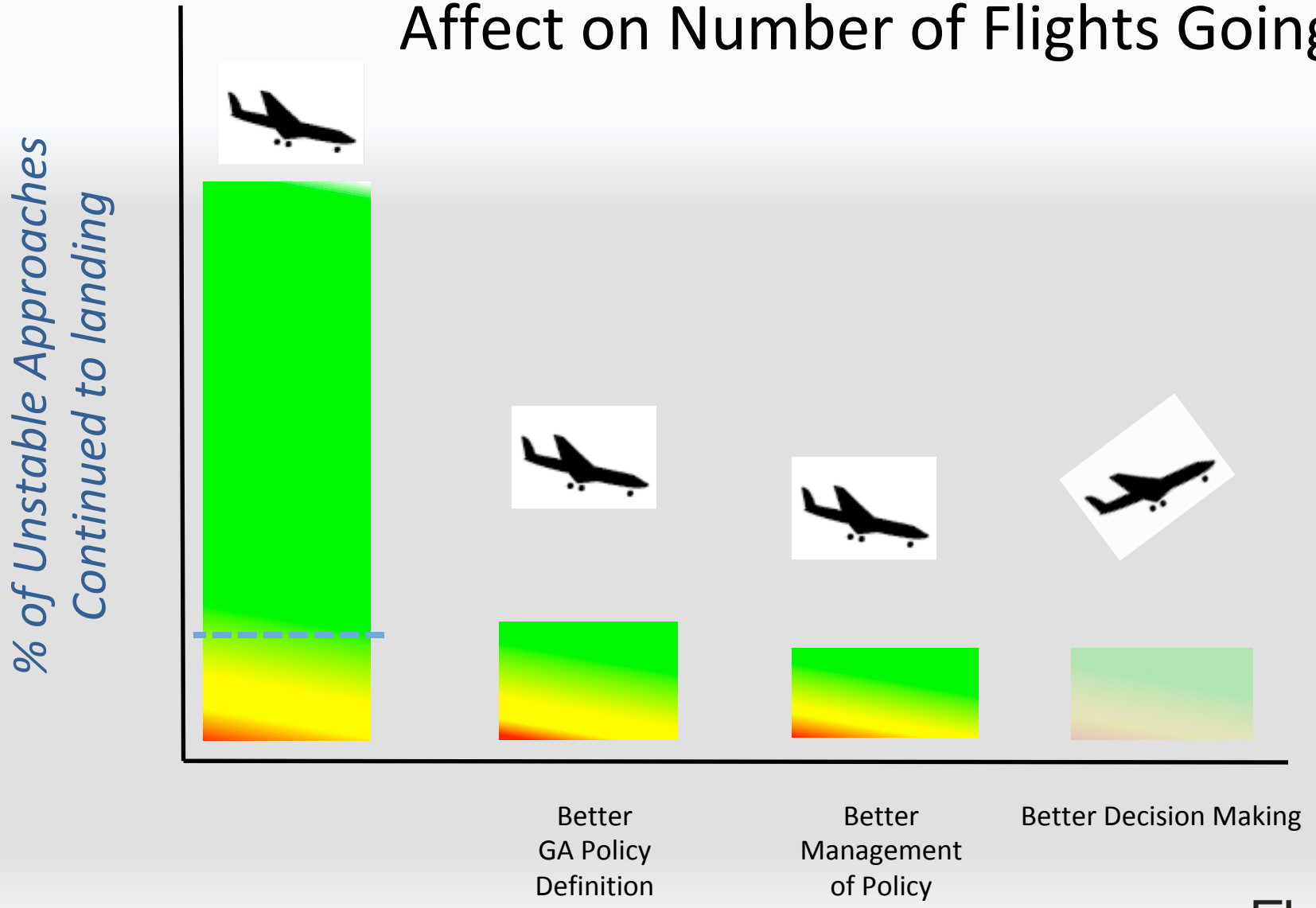
Affect on Number of Flights Going Around



Mitigation

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Operator Experience

- International airline
- Regional / International airline

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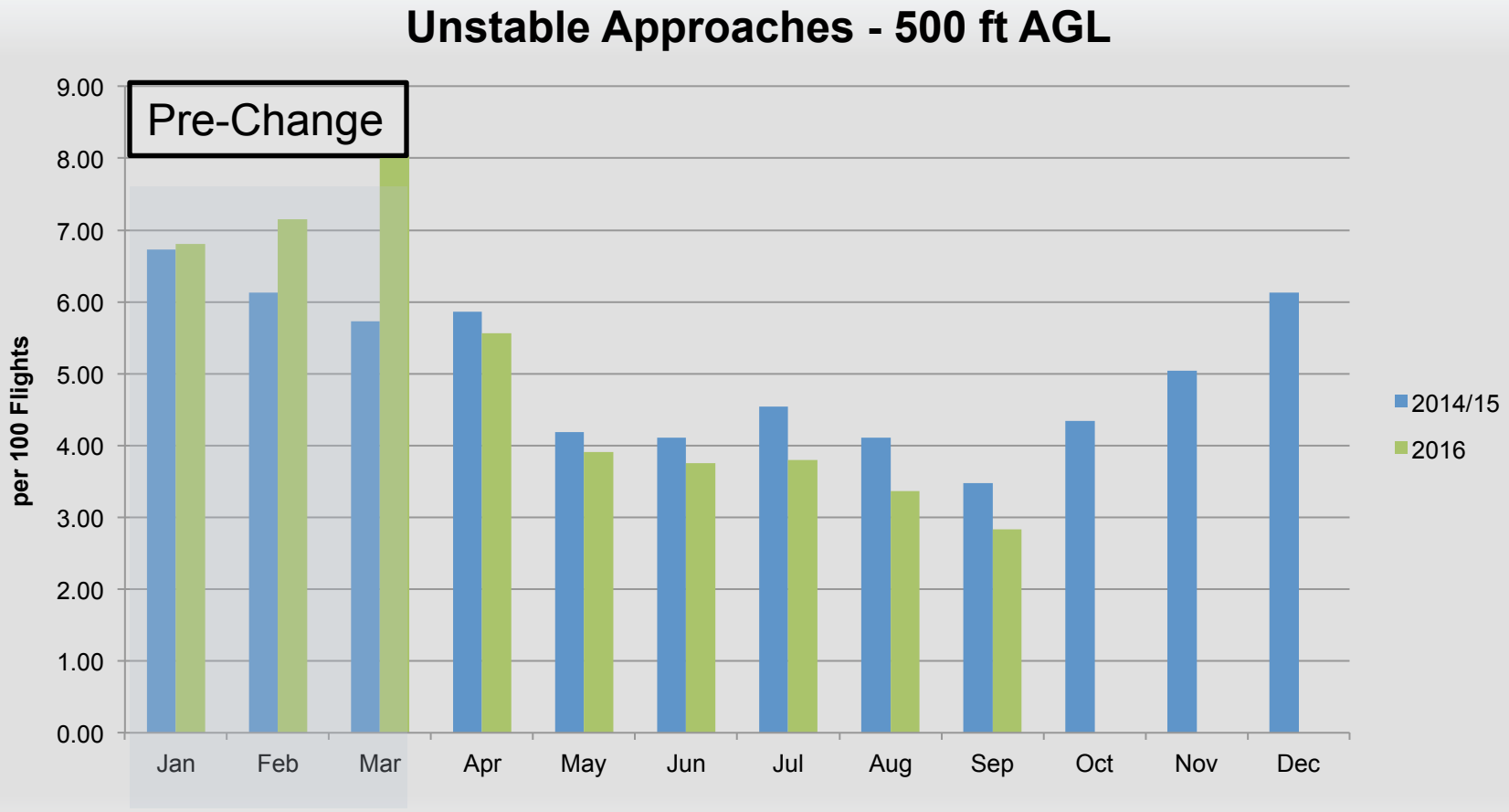
Airline Experience – 6 months



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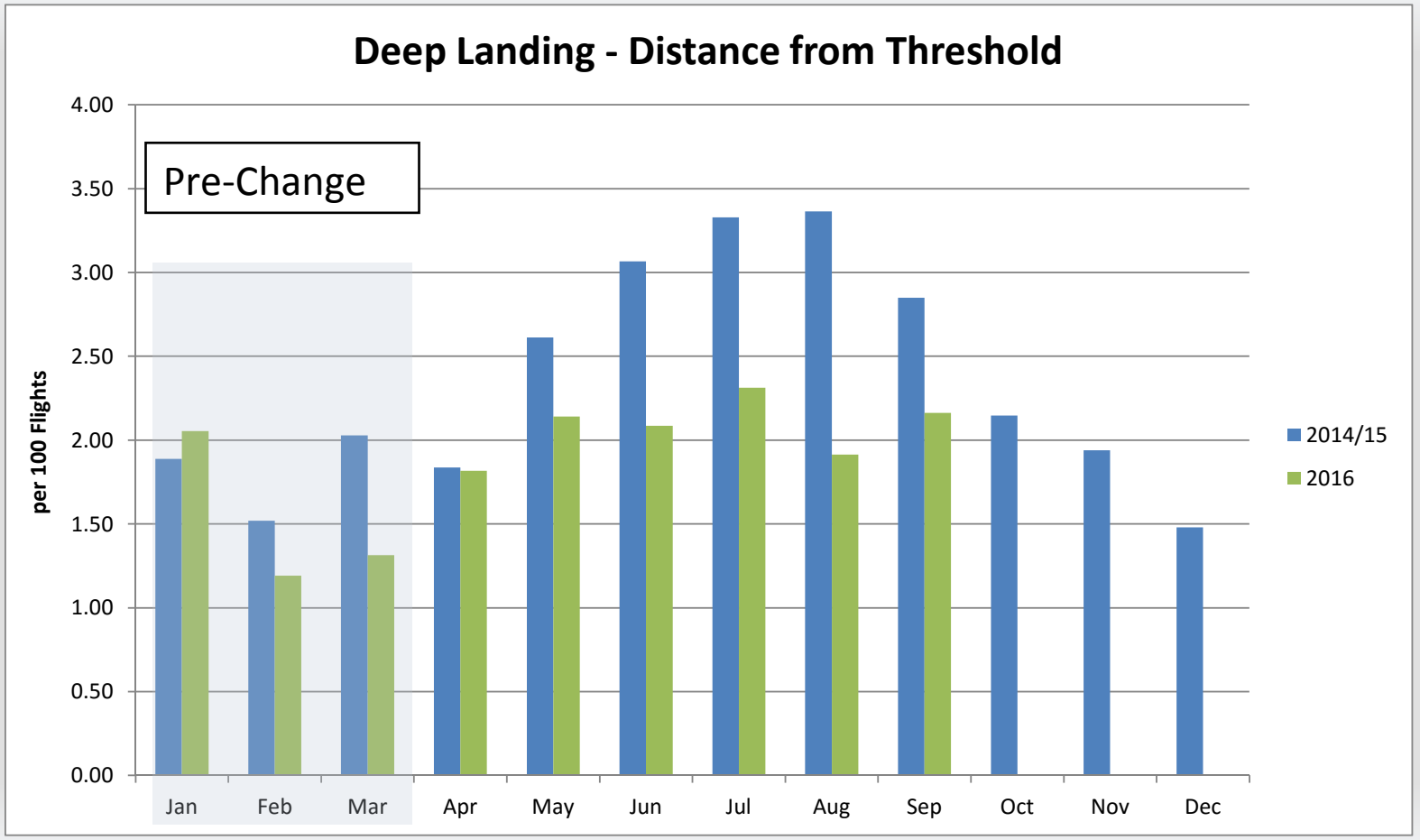
Airline Experience – 6 months



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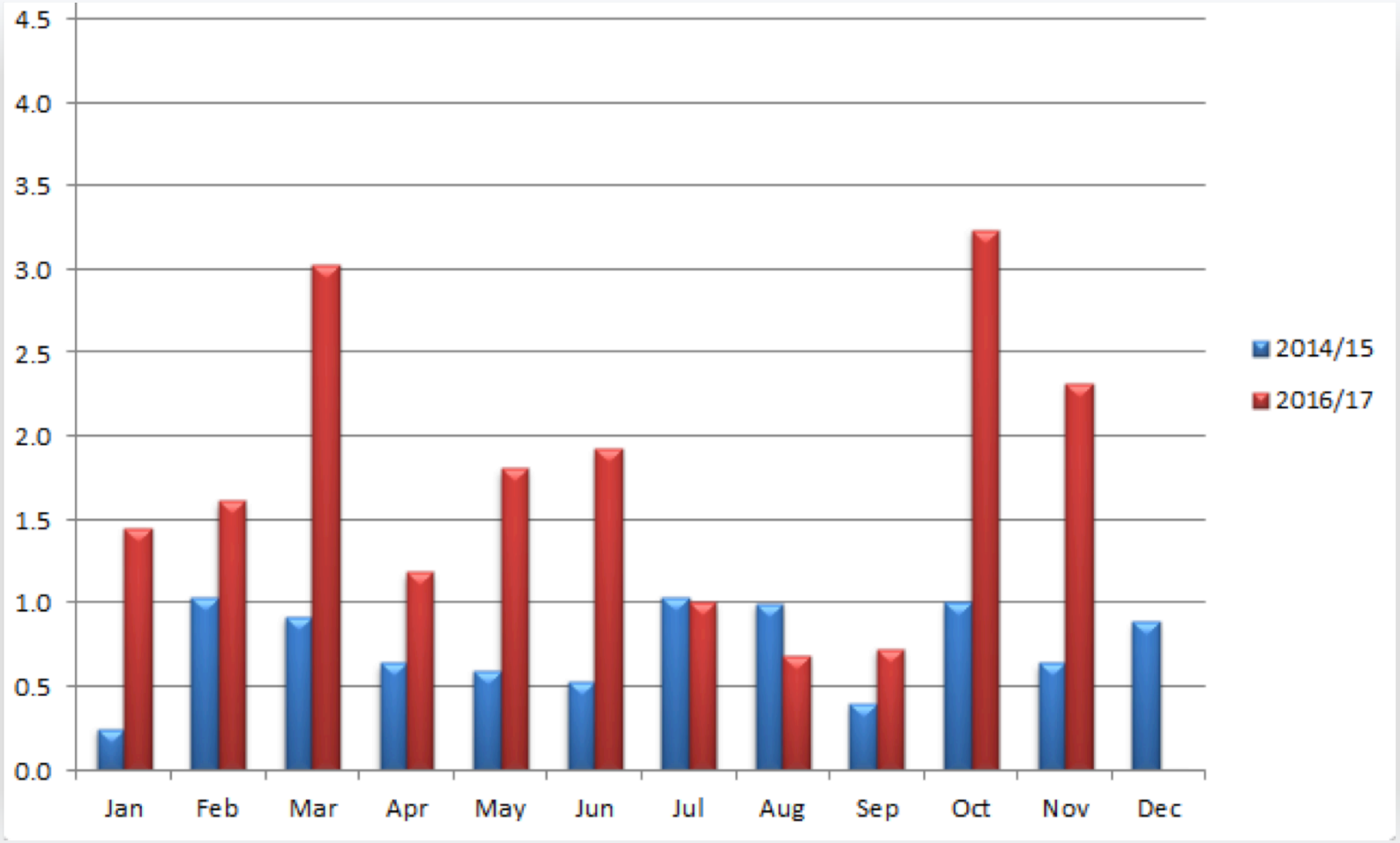
Go Around Rate from < 100’ Rad Alt



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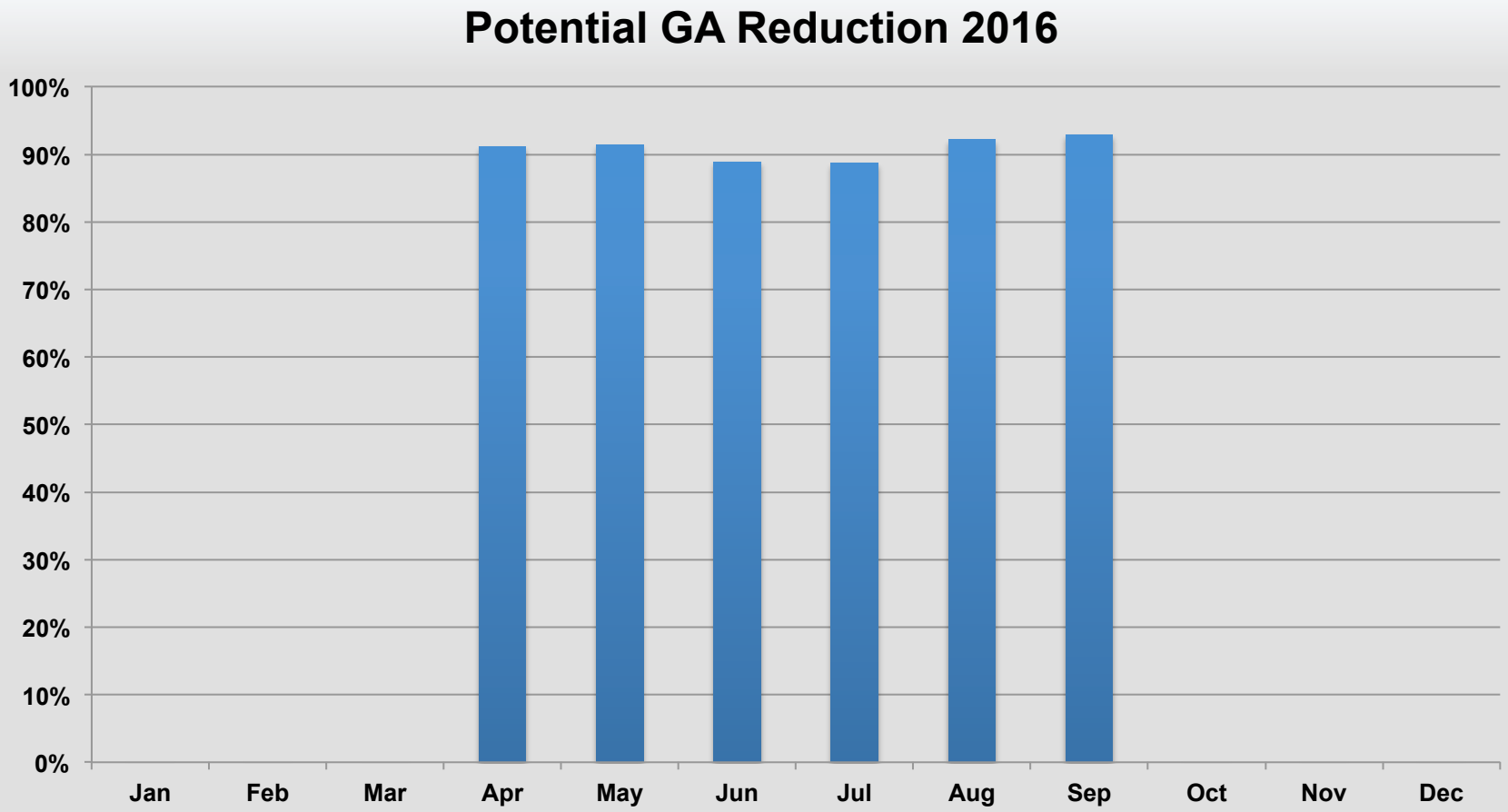
Potential GA Reduction 2016



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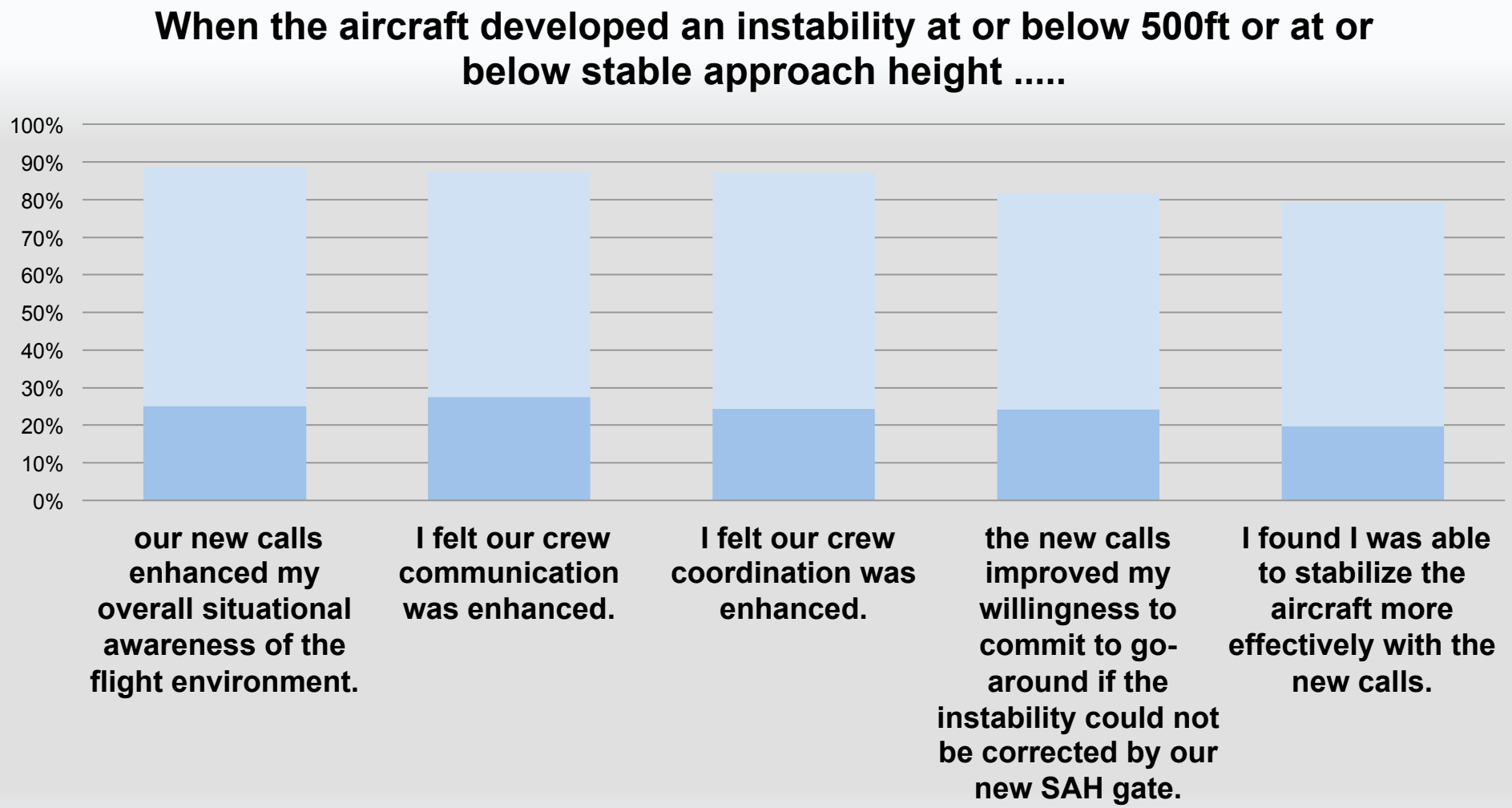
Results – Impact on Psychology



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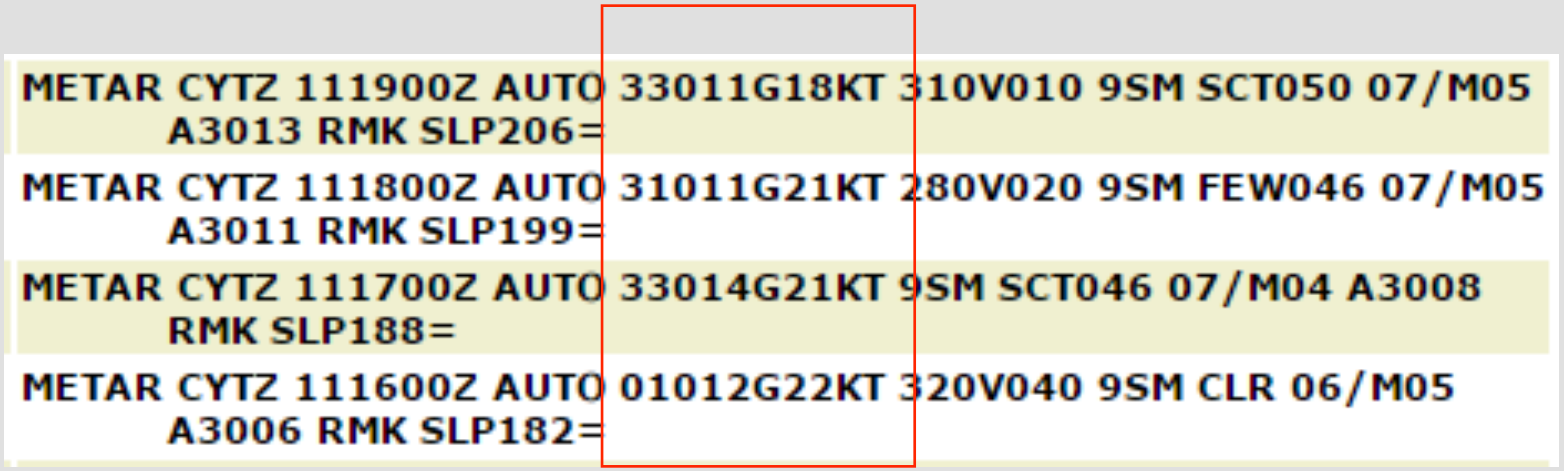
Message from the FDM Manager…

- Of anecdotal interest, on 11NOV2016, **5** aircraft initiated go-arounds in the flare at YTZ. METARs for this period...



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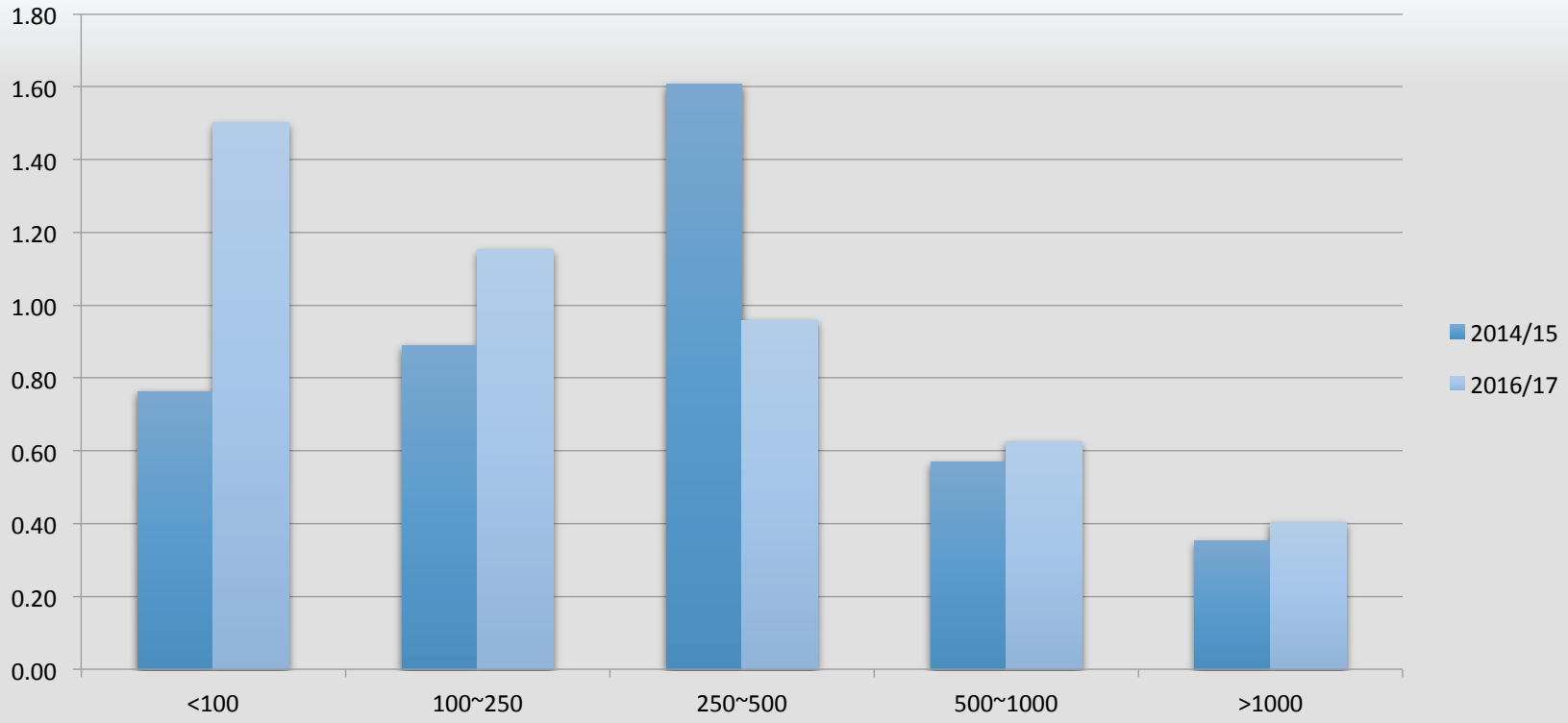
Data – Where do the Go-Arounds Occur?



- Go Arounds from being unstable are still happing at all points 1000'AGL and below
- The increase of go arounds at 100'AGL implies that the procedure is working – **fewer unnecessary go-arounds**

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"There is no other single decision that can have as much impact on accident reduction today as the decision to go-around"

Cpt. Bill Curtis
Chair, FSF IAC
Co-Chair, FSF GADM&E Project

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Thank you

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