Session 7

Pilot-oriented procedures and training

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Pilot-oriented Procedures and Training

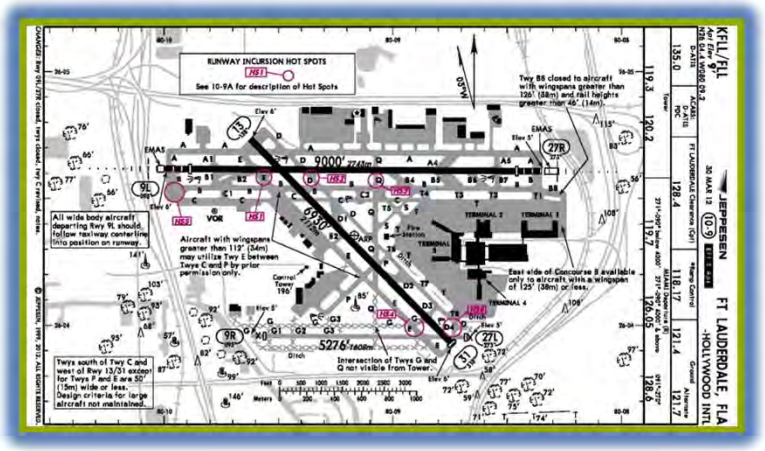
- Runway Incursion Risk Mitigation
  - Pilot 'Best Practices'
- Runway Excursion Risk Mitigation
  - Stabilized approach and landing
  - Landing on wet and contaminated runways
  - Air Carrier Self Audit Checklist

Pilot ‘Best Practices’

- Remember: over 80% of pilot- caused runway incursions occur during taxi to the departure runway

Pre-Flight Planning

- Review the appropriate airport diagrams. Review any Hot Spots identified on the diagram. Print a copy for use in the cockpit
- Review airfield NOTAMS and current ATIS for any taxiway closures, runway closures, construction activity, or other airfield specific risks
- Conduct an airport briefing before every operation



Taxi - Communication

- Use standard phraseology
- Listen before speaking
- Speak clearly and at a steady pace
- When in doubt, seek clarification
- Avoid non-essential communication
- Maintain sterile cockpit
- Be alert to similar call signs operating on the field

Taxi - Low Visibility

- Use all available technologies to maintain situational awareness on the ground
- Adhere to low visibility procedures, including enhanced crew coordination, when conditions require
- Realistic training for all low visibility operations

Pre Taxi

- Copy the taxi clearance, review the taxi route to the assigned runway prior to aircraft movement
- Review current ATIS for any taxiway closures, runway closures, construction activity, or other airfield risks
- Have the airport diagram out and available for immediate reference during taxi
- Manage the cockpit workload - define the role of each pilot
- Establish a ‘heads-up’, ‘eyes out’ policy for taxiing

During Taxi

- Minimize tasks to be performed when aircraft is moving these include:
  - FMS input
  - Weight & balance calculations
  - Delayed engine start
  - Briefings
- Maintain appropriate taxi speeds
- Prior to crossing any runway during taxi, ensure you have a clearance to cross
- Conduct "Clearing Turns" prior to entering ANY taxiway or runway
- STOP aircraft on the taxiway and request ATC clarification if there is confusion regarding aircraft position or taxi clearance

Line up / Takeoff

- If cleared to “line up and wait”, turn on all exterior lights except takeoff/landing lights
- If holding in position for more than 90 seconds, or if there is a potential conflict, contact tower
- When “cleared for takeoff”, turn on all exterior lights, including takeoff/landing lights
- An aircraft in takeoff position with takeoff/landing lights ON, indicates aircraft has received its takeoff clearance
- When assigned an intersection departure, state “intersection departure” at the end of the takeoff clearance read back

Landing

- Wait until you have exited the active runway and be sure of your taxi clearance prior to beginning after-landing checklist
- **REMEMBER: WHEN IN DOUBT, ASK!**

Guidance material on preventing incursions

↗http://www.faa.gov/airports/runway_safety/pilots/

Runway Excursion Risk Mitigation

‘Best Practices’ for Stabilized approach and landing

Primary Landing Threats

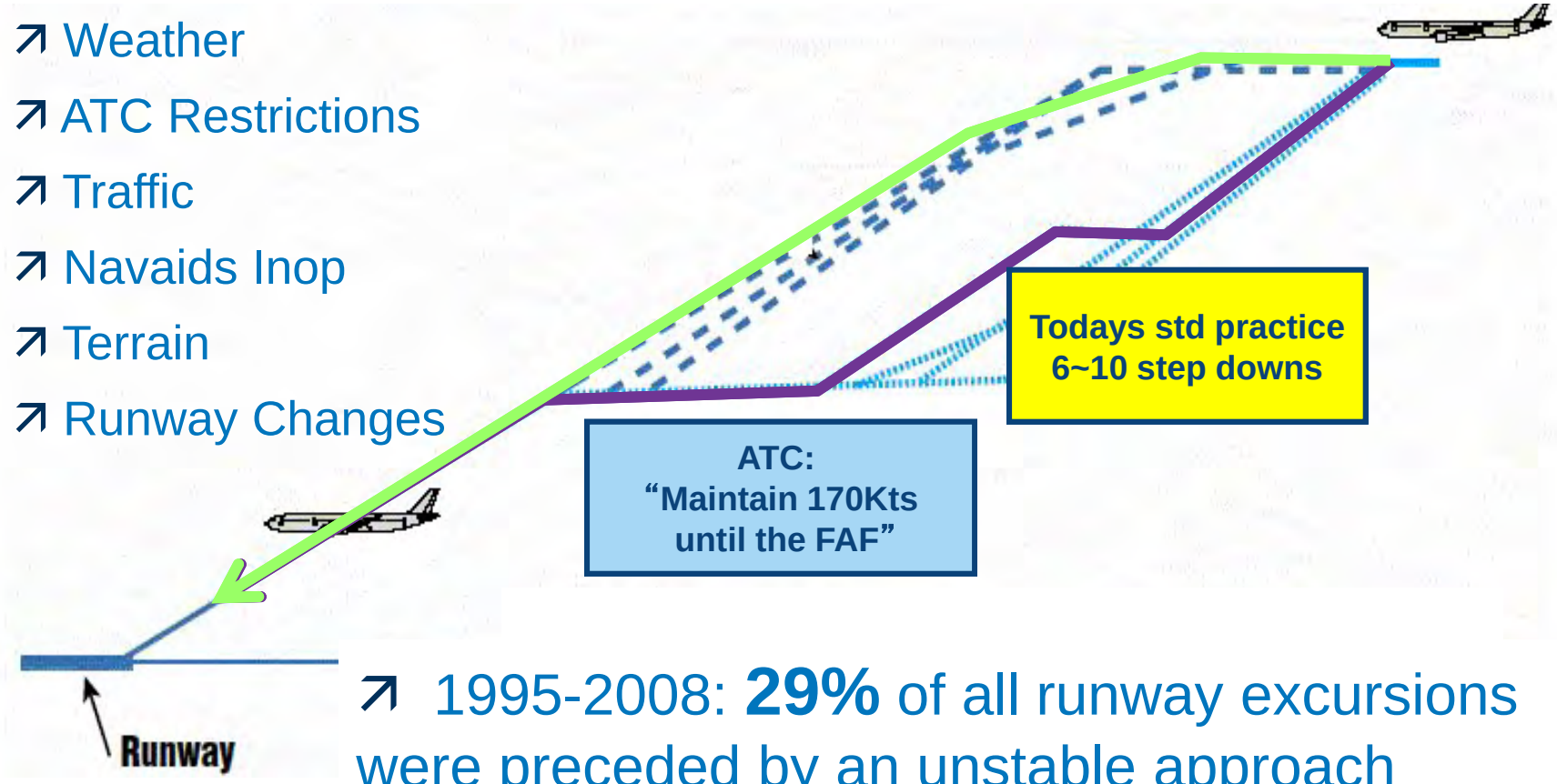
- Un-stabilized approaches
- Failure to make a go-around decision
- Abnormal touchdowns and pilot technique
- Contaminated runways and meteorological factors
- Landing performance calculation errors
- Mechanical malfunctions during landing
- Non-compliance with CRM and SOP

Un-Stabilized Approaches

- A stable approach is an essential element for a safe landing
- The typical chain of events includes:
  - A high and fast approach
  - A long/fast touchdown
  - A failure to recognize the need for a go-around

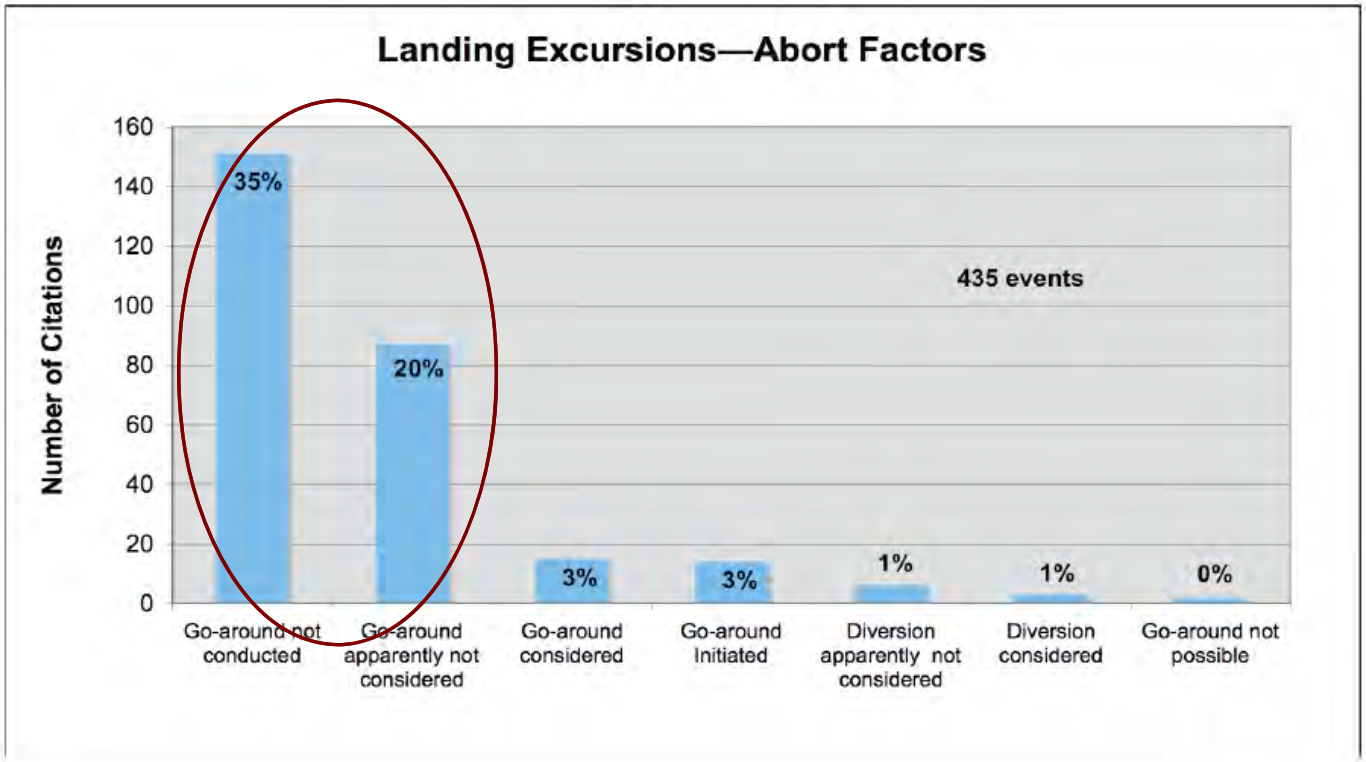
Challenges to Energy Management

- ↗ Weather
- ↗ ATC Restrictions
- ↗ Traffic
- ↗ Navaids Inop
- ↗ Terrain
- ↗ Runway Changes



↗ 1995-2008: **29%** of all runway excursions were preceded by an unstable approach

Runway Excursion vs Go-Around Decision



Abnormal Flare and Touchdowns

- Landings from stabilized approach can still result in a runway excursion

- Poor Flare Technique
- Touchdown off-center
- Pilot directional control
- Improper Crosswind Inputs
- Improper use of reverse thrust

‘Best Practices’

- Discuss the threats during the approach briefing
- Go around if you violate stabilized approach criteria
- Comply with company SOP regarding non-flying pilot go-around call outs
- Comply with the manufacturer’s recommended speed adjustments in gusty wind conditions
- Go-arounds should be considered as an option throughout the approach, flare, and touchdown
- Flight crew needs to be ready for mechanical malfunctions during landing – reversers / brakes / ground spoilers

‘Best Practices’ for Landing on Wet and Contaminated Runways

Contaminated Runway and Meteorological Factors

- Contaminated runway (wet or icy) is a contributing factor in 32% of excursions
- Wind can affect both directional control of the aircraft and deceleration performance
  - Cross winds were present in more than 67% of the landing excursions
  - Steady tailwinds occurred in more than 50% of all accidents
- The combination of a contaminated runway and a tailwind or crosswind is a major contributing factor in accidents

Prior to approach

- Brief the threats; in adverse weather or runway conditions, be ready and prepared to make a go-around
- Be aware of all factors used in calculating landing performance (i.e, whether reverse thrust is used; consider loss of reverse)
- Request the best runway for the existing conditions
- Optimize the use of aircraft stopping capabilities (i.e., auto brakes, maximum flap settings, auto ground spoilers, etc)

During approach and landing

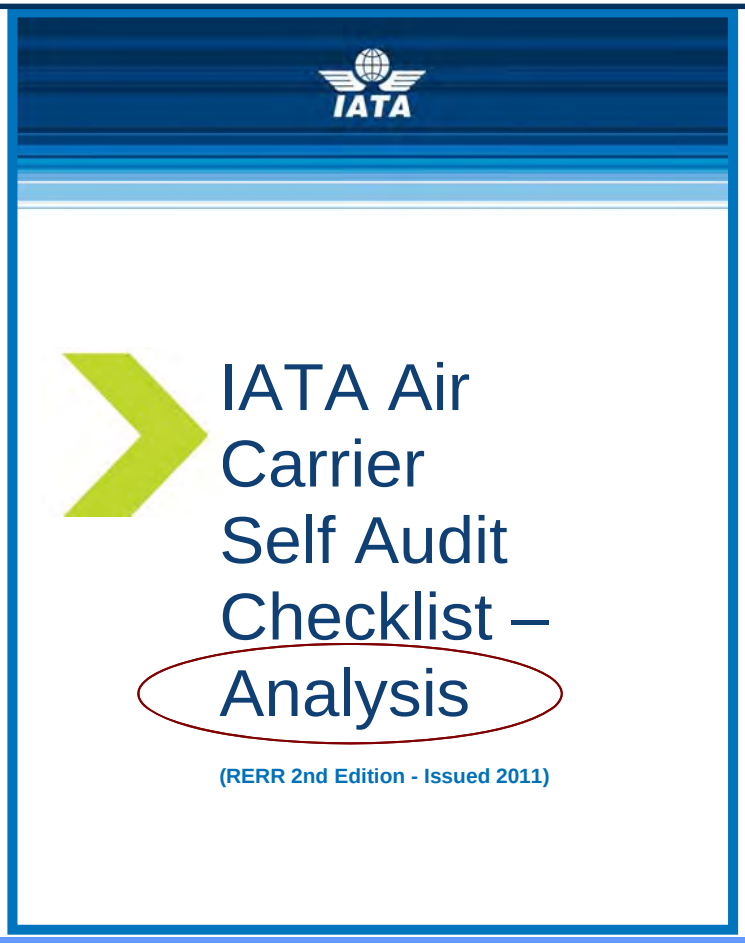
- Do not exceed V_{TH} (Runway Threshold Speed) plus wind additives at the runway threshold
- Do not perform a long flare
- Do not allow the aircraft to drift during the flare
- Maintain required crosswind control inputs
- Touch down firmly and do not allow the aircraft to bounce
- Keep the aircraft centerline aligned with the runway centerline
- Go-around any time significant deviations are recognized during the flare and touchdown

On roll out

- Apply maximum reverse thrust as soon as possible after main gear touchdown
- Be prepared to deploy ground spoilers manually if automatic deployment does not occur.
- Get the nose of the aircraft down quickly. Do not attempt to hold the nose off for aerodynamic braking
- Anti-skid braking should be applied steadily to full pedal deflection; Do not modulate brake pressure
- Continue maximum braking until at slow speed; do not delay deceleration

Air Carrier Self Audit Checklist

- Developed by IATA
- Based on FSF ‘Reducing the Risk of Runway Excursions Report’
- Industry best practices to mitigate excursions
- Designed for operators to evaluate training and operational policies and procedures



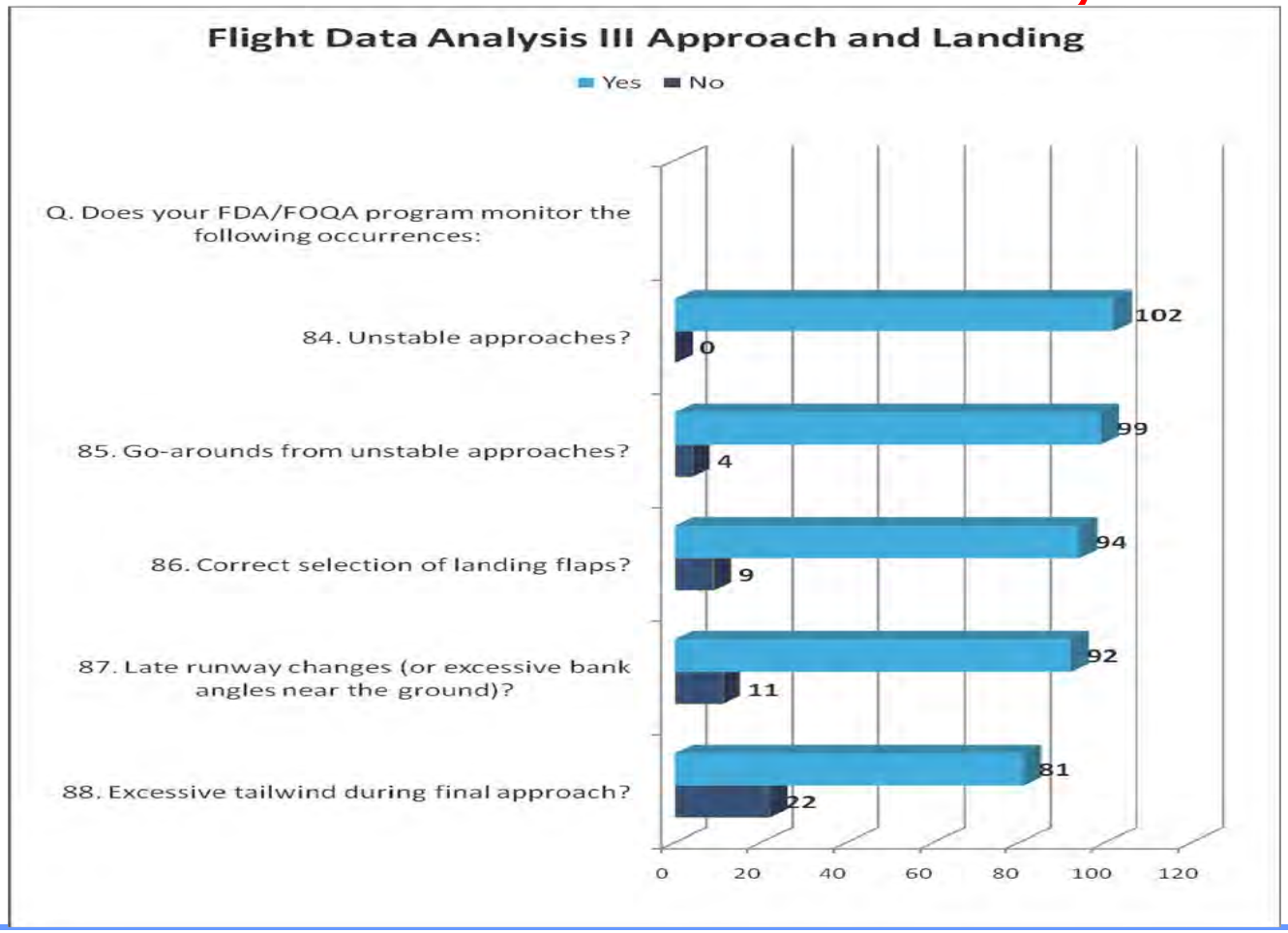
Survey and Analysis

- Conducted 2009 -2010
- 210 carriers requested /120 responded
- 98 Questions covering:
  - Aircraft performance
  - Takeoff and landing procedures
  - Contaminated Runway procedures
  - Use of deceleration devices
  - Go-around policies
  - Flight Data Analysis

Air Carrier Self Audit Checklist - Snapshot

Landing FDA Monitoring			
	• Does your FDA/FOQA program monitor the following occurrences:		
	Risk Factor to be analyzed or self audit question to be answered	**Answer**	**Status of implementation**
87.	• Late runway changes (or excessive bank angles near the ground)?	☐ Yes ☐ No	
88.	• Excessive tailwind during final approach?	☐ Yes ☐ No	
89.	• Excessive airspeed at touchdown?	☐ Yes ☐ No	
90.	• Touchdown point (also known as deep landings) monitoring (i.e., where on the runway the aircraft touches down)?	☐ Yes ☐ No	

Air Carrier Self Audit Checklist Survey - Snapshot



Runway Excursion Risk Reduction (RERR) Toolkit – 2nd Edition

- RERR 2nd edition is available for public on http://gsic.iata.org

Conclusion

Runway incursions and excursions can be prevented through training, awareness of the threats, and by applying good judgment to reduce risk.