



Air Navigation Service Provider (ANSP) Roles in Preventing Runway Excursions





Runway Safety Accident Data

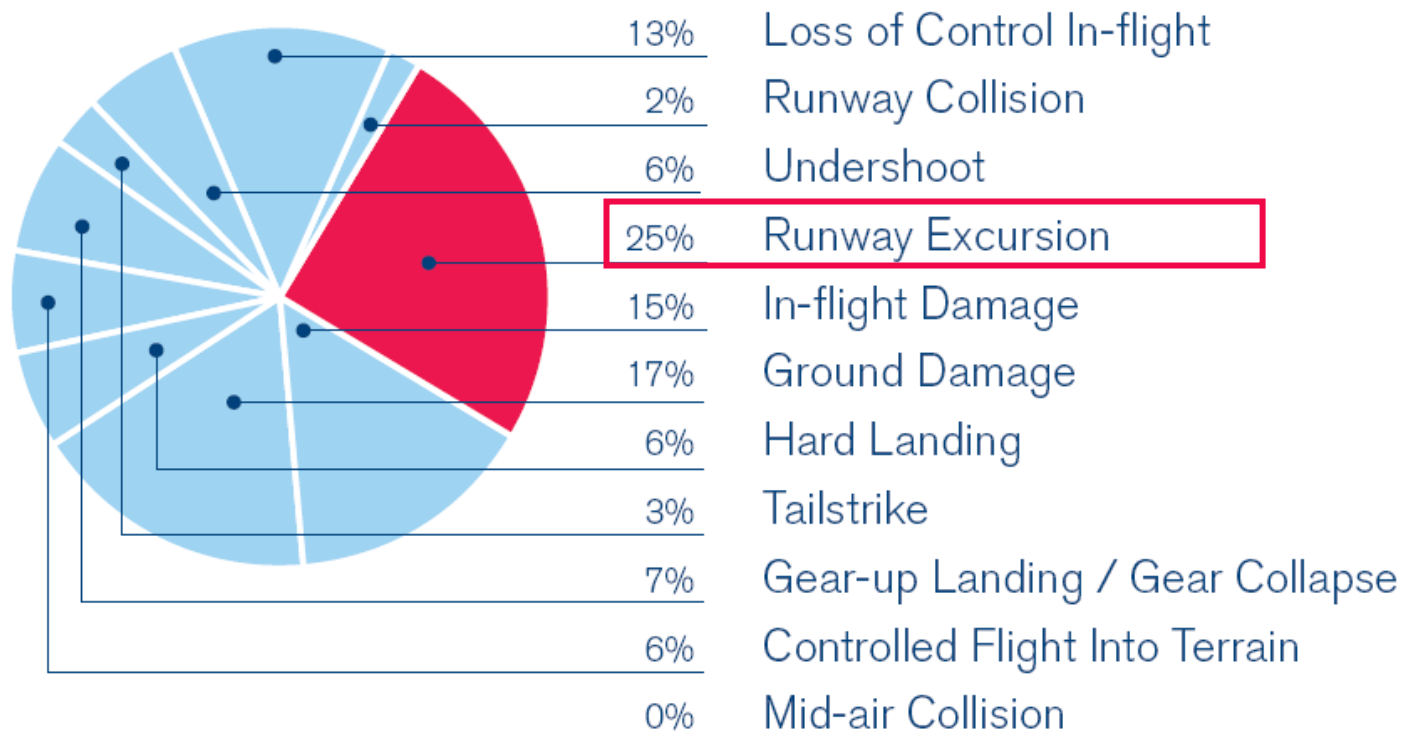
1995 – 2008

1,429 Total Accidents

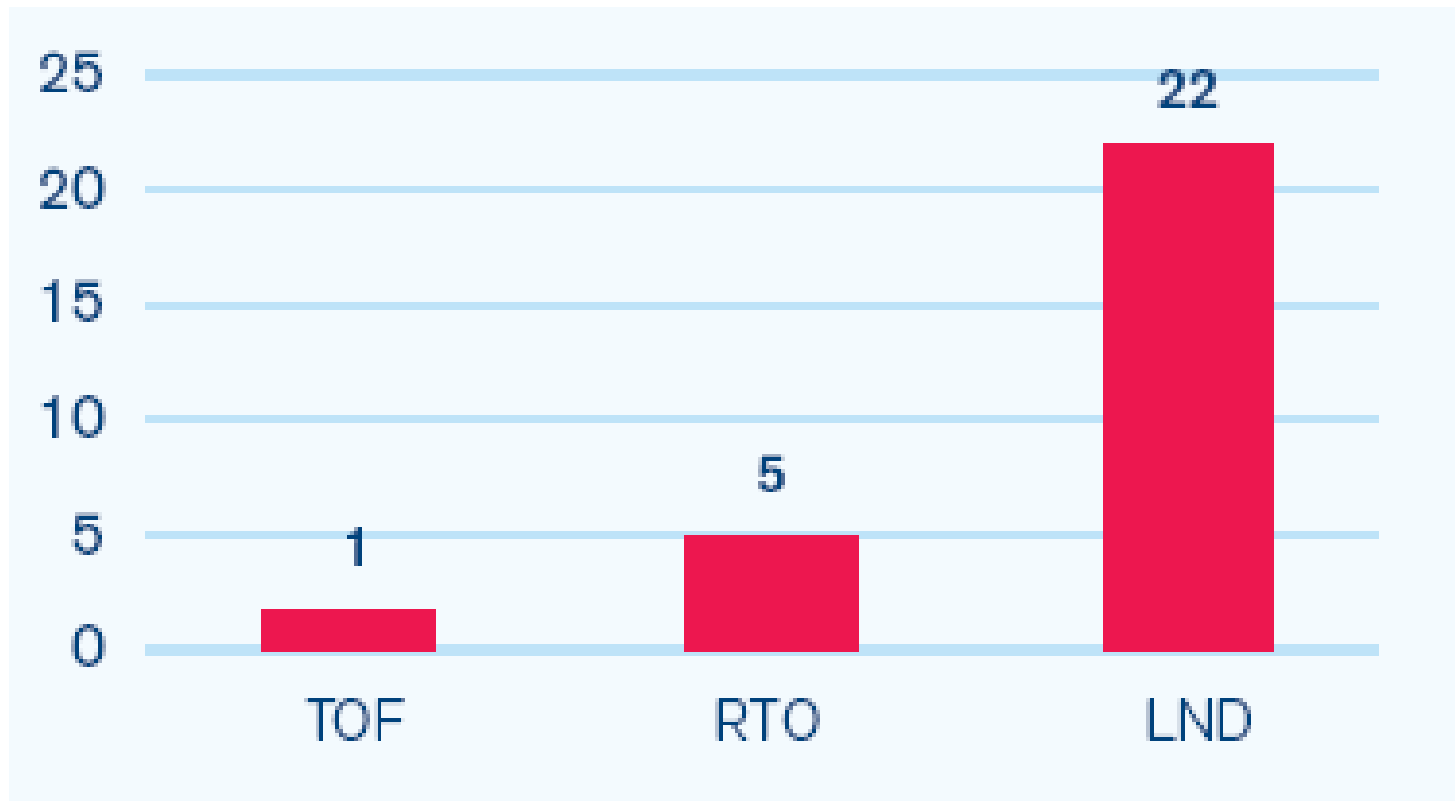
	<u>Number</u>	<u>Percent of Total</u>
Excursions:	417 (29.8/year)	29 %

Event	% of Events
Takeoff	21%
Landing	79%

Runway Excursions 2008



Excursions per Phase of Flight 2008

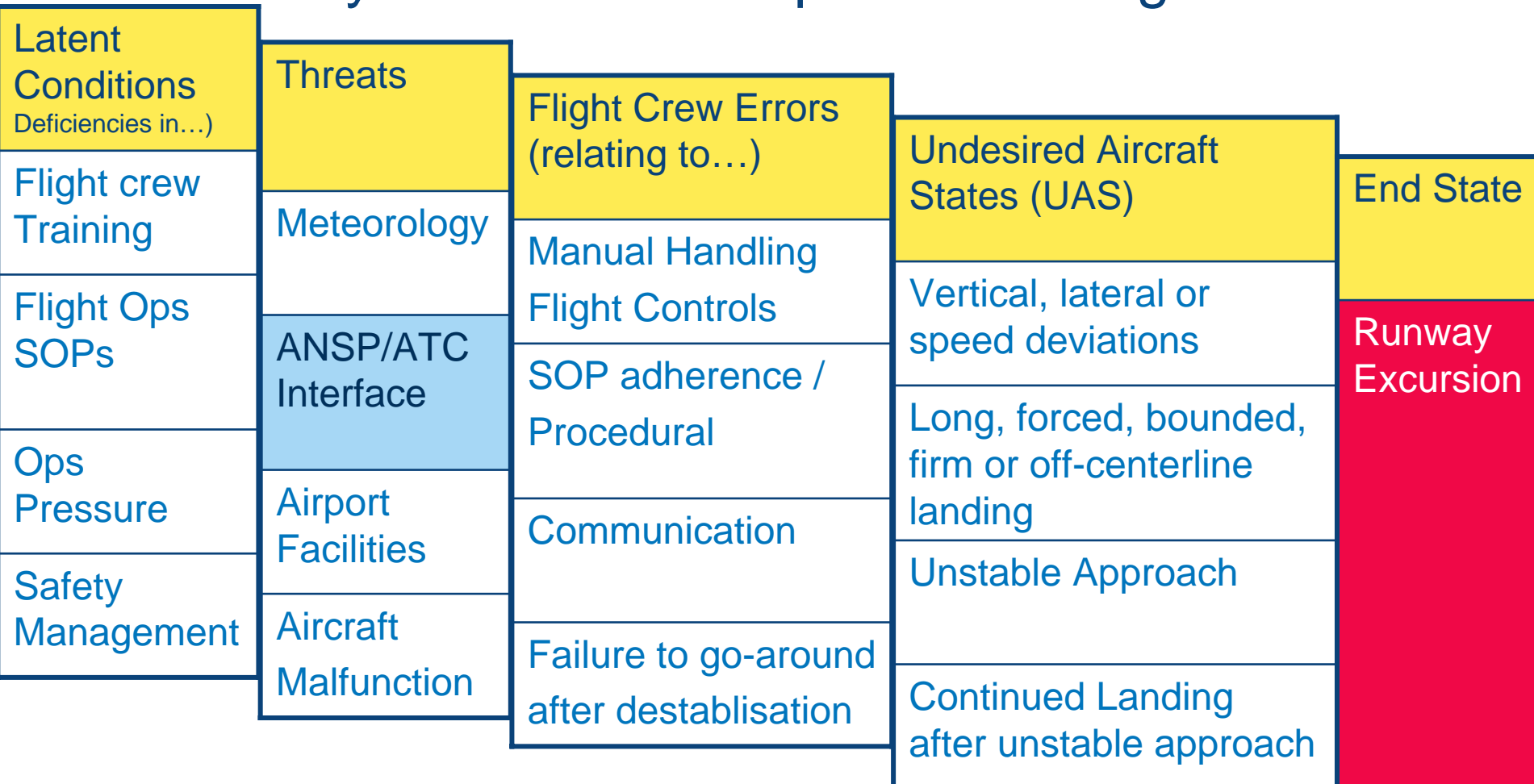


Runway Excursion- Operational Consequences

- Fatalities / Personal Injuries
- Hull Loss / Aircraft damage
- Runway closure / Passenger delay / Loss of public confidence

Avg. \$500 Million Per Year

Runway Excursions- Top Contributing Factors



Role of Airlines in Preventing Runway Excursions



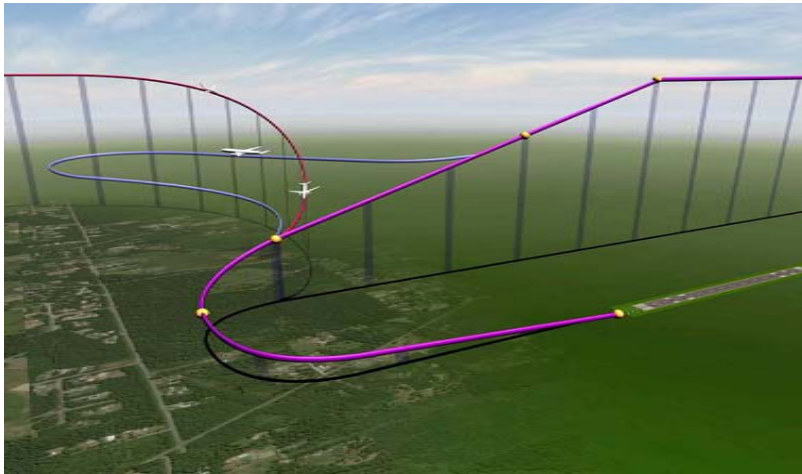
- Aircraft energy management
- Runway excursion awareness
- 'Go-around' decision making

Role of Airports in Preventing Runway Excursions



- Runway Surface Design
- Runway Condition Reporting
- Post Accident Survivability
 - Engineered Materials Arresting Systems (EMAS)

Role of ANSPs in Preventing Runway Excursions



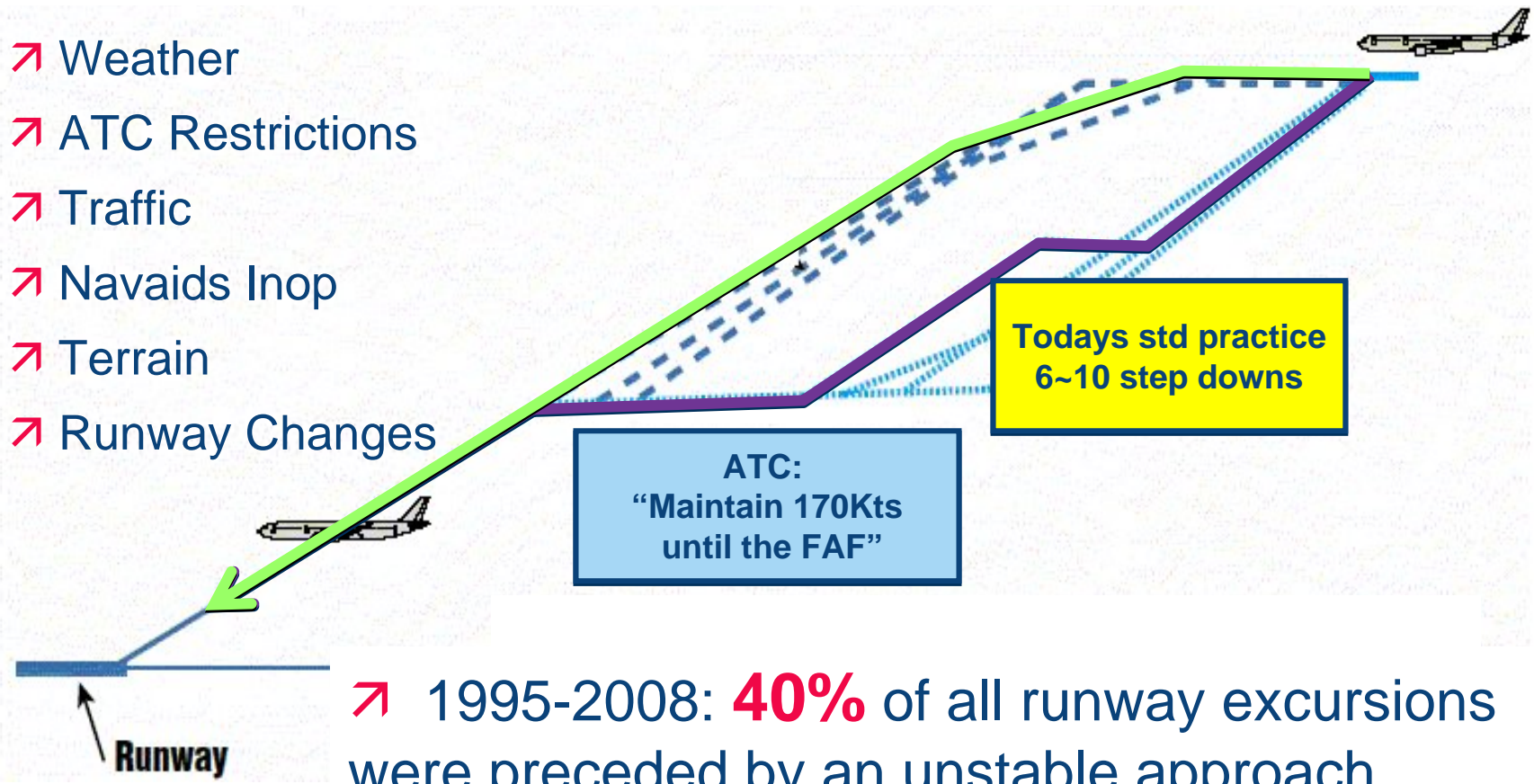
- Aircraft Energy Management
 - Stabilized approaches
- Infrastructure enhancement

Aircraft Energy Management

- Runway excursions result from a failure to properly manage or control the energy of the aircraft
- Proper energy management starts at top of descent, and should lead to a stable approach and a safe landing
- Airspace flow management affects aircraft energy management

Challenges to Energy Management

- Weather
- ATC Restrictions
- Traffic
- Nav aids Inop
- Terrain
- Runway Changes



➤ 1995-2008: **40%** of all runway excursions were preceded by an unstable approach

Stabilized Approach- Definition

Approach Gates- Stabilization Heights

FSF- Recommended Minimum

Meteorological Conditions	Height above Airfield Elevation
IMC	1000 ft
VMC	500 ft

Many airlines use 1,500 ft minimum approach gate

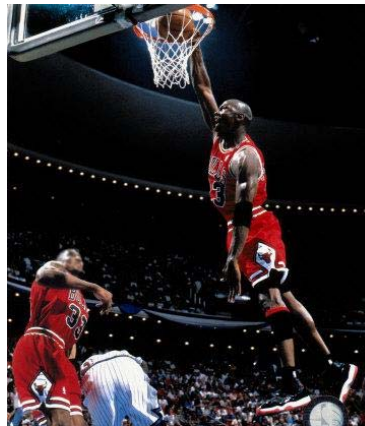
Criteria

- Correct lateral and vertical flight path
- Only small changes in heading and pitch required to maintain flight path
- Desired landing configuration
- Power is stabilized- aircraft is trimmed to maintain the target final approach speed on the desired glide path
- Landing checklist accomplished as well as any required specific briefing

Reported Air Traffic Services Threats

From Landing Accident/Incident Reports

- Lack of knowledge on stabilized approach criteria
 - Delays and/or intermediate level-offs during descent
 - Failure to allow aircraft to reduce speed on the approach
 - Vectoring the aircraft to final approach high of glide path
 - Failure to descend aircraft appropriately for the approach



Avoid the Slam Dunk!

Reported Air Traffic Services Threats

From Landing Accident/Incident Reports

- Clearance to the ILS with no glide slope available
- Inaccurate meteorological information
- Changing the runway late on approach
- Failure to select appropriate runway based on the wind
- Misinterpretation of the runway condition reports

IATA STEADES Analysis 2005-2008

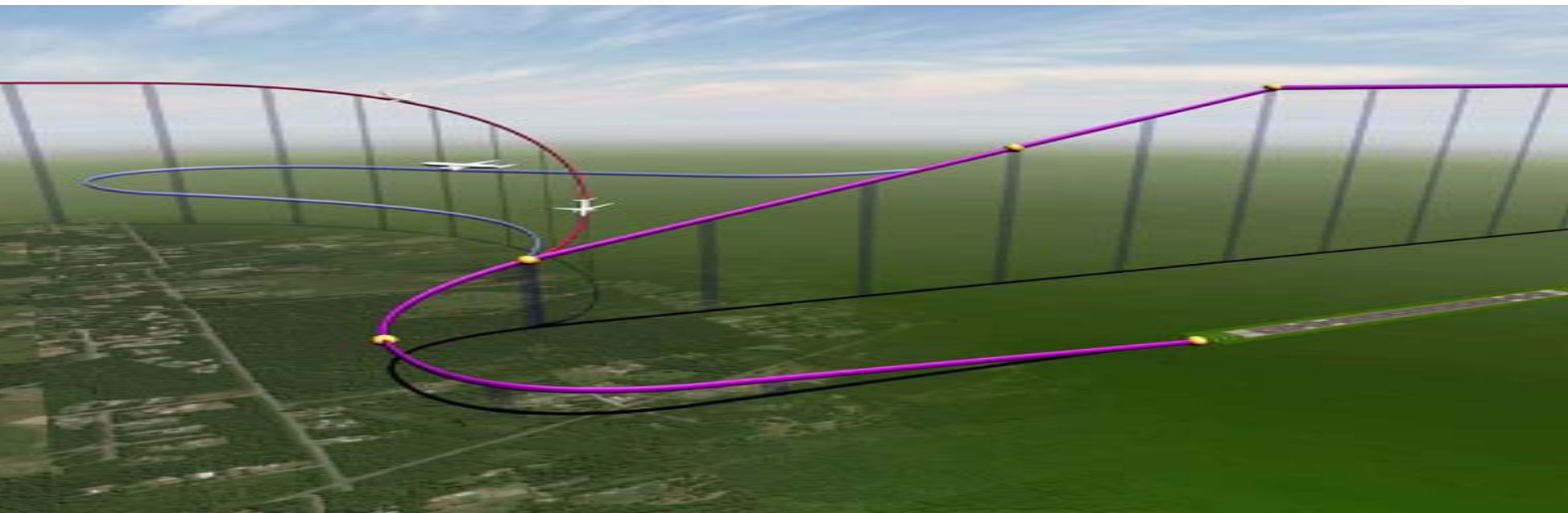
- 239 Long and/or Off-Centerline Landing Safety Reports
 - **31%** noted a threat from Air Traffic Services

Stabilized Approaches- ANSP Role

- Controllers and pilots have a shared responsibility for safety
- The requirement to position aircraft so that a safe approach and landing is possible is overriding
- Understand the pilots' working environments and constraints
- Pass the pilots timely and accurate information that will help them to make the correct landing decision
- Altitude and/or speed restrictions should be limited

Infrastructure Enhancement

- PBN / APV implementation
- Continuous Descent Operations
- Trajectory- Based Operations



Safety benefits of PBN

- Vertically Guided Final Approaches
 - Stabilized approaches
 - Laterally Guided Missed Approaches
 - Increased Situational Awareness for flight crews
 - CFIT Reduction
 - More precise course guidance for terrain-impacted terminal areas
 - PBN promises to increase capacity / enhance safety
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- IATA / ICAO Global PBN Task Force Created
 - Provide tools and enablers to enhance regional efforts
 - Accelerate and harmonize global implementation

Airlines continue to acquire more capable avionics ATM systems need to keep pace



FREINS DE PARKING - Appuyez sur ; pour relâcher.

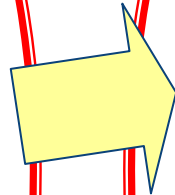
The Paradigm Shift

Past



Procedural

Estimate the current and planned a/c positions

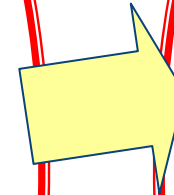


Today

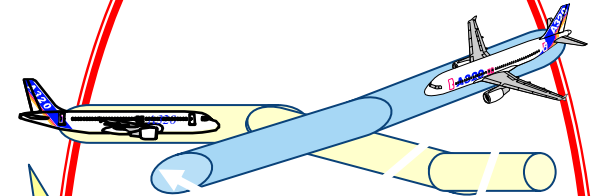


Radar

Know the current and estimate planned a/c positions



Future

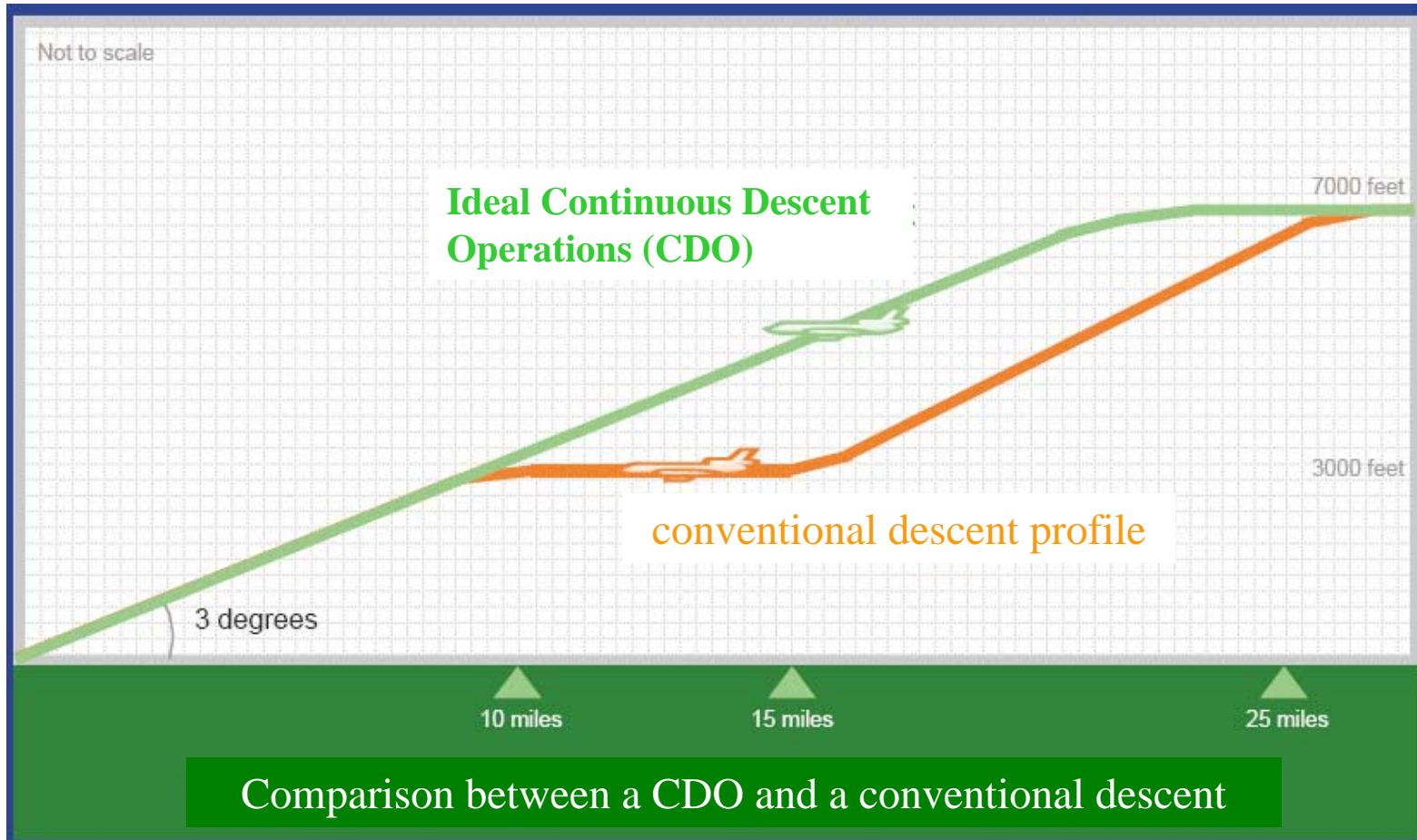


Trajectory

Know & share the current and planned a/c positions

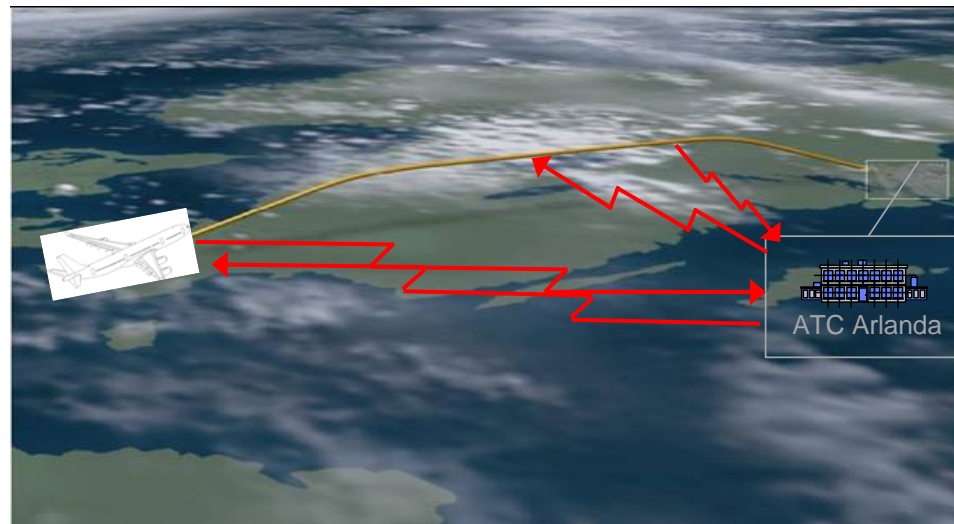


Continuous Descent Operations




Trajectory-Based Operations

- Four-dimensional trajectory (4DT)
- “Open-ended” flight maneuvers (vectoring) reduce predictability
- “Closed” trajectory-based maneuvers improve predictability
- Key element for the USA’s **NEXGEN** and Europe’s **SESAR**



RUNWAY SAFETY – EVERYONE'S RESPONSIBILITY

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- A background image showing a sunset over a runway. The sun is low on the horizon, casting a warm glow. In the foreground, the runway lights are visible, including a prominent red cross-shaped light. The sky is a mix of orange, red, and dark blue.
- Takeoff and landing...places the greatest demands on the man and the machine while operating within the most unforgiving environment
 - Runway safety can be improved...it demands
 - Dialogue
 - Education
 - Working together will expedite the journey to a more safe, efficient and reliable aviation industry



-to represent, lead and serve the airline industry-