



IATA
Incident Review Meeting
IRM-09
Hong Kong, 26-27 October 2010

STEADES Current Status

- World's largest ASR database
- >105,000 ASRs annually
- With 4.5M annual sectors ,STEADES represents 28% of world's western built jet traffic

STEADES Participation
110+ airlines

Traffic	STEADES Sectors ('09)	% of world
A320 Family	734,000	12%
A330	138,000	27%
A340	55,000	28%
A380	8,600	100%
B777	129,000	37%
B737	828,000	23%
B747	163,000	26%



- Any language
- Over 600 incident categories



STEADES Analysis

➤ STEADES data is comprised of Air Safety Reports collected from over 110 participating airlines and submitted to IATA quarterly.

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STEADES Analysis: Cargo Smoke/Fire

➤ Database Query Criteria

➤ Date Range:

➤ Q1 2003 to Q1 2010 inclusive; AND

➤ Descriptors/Categories:

➤ “Smoke/Fumes – Hold”,

➤ “Fire False Warning – Hold”,

➤ “Fire Detection System – Hold

➤ “Fire/Sparks – Hold”

➤ “Fire Protection System – Hold”

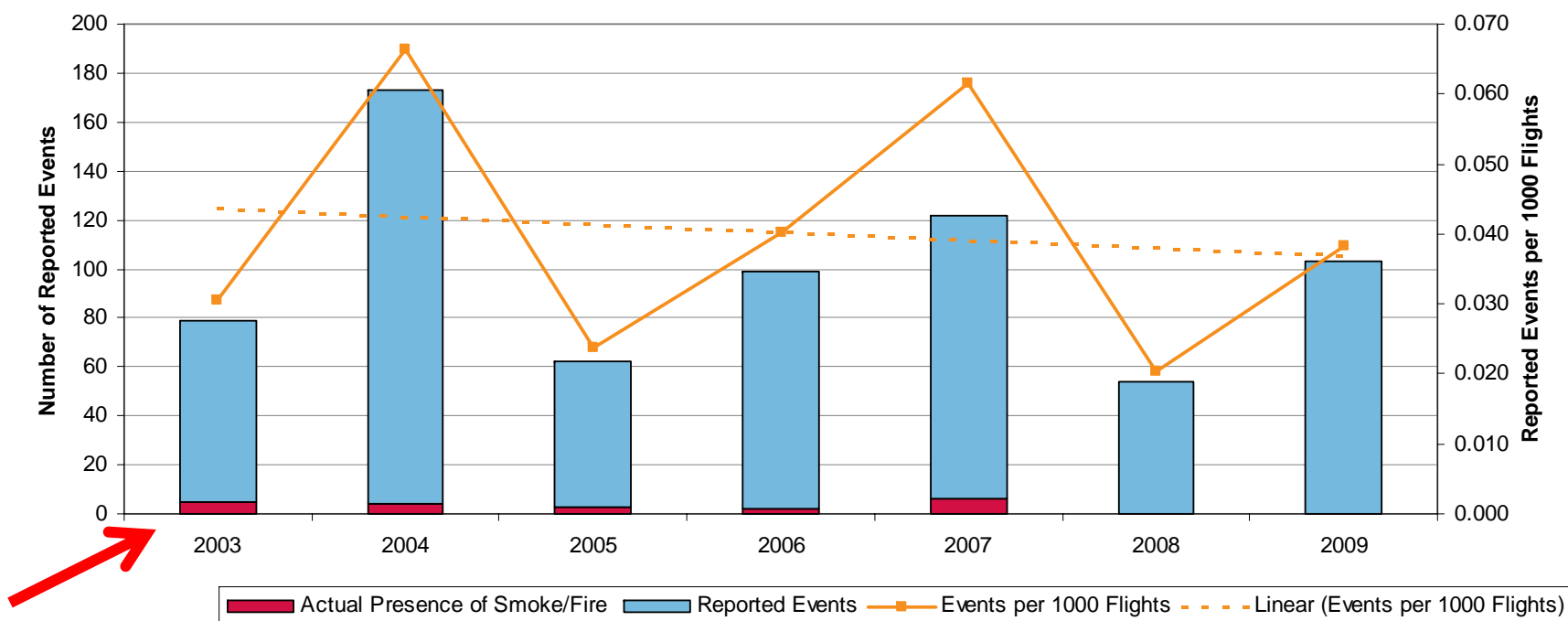
STEADES Analysis: Cargo Smoke/Fire

➤ Results

- 718 reports matching criteria (7 year timeframe)
- Approx. 0.039 per 1,000 sectors OR **1 event per 25,400 flights**
 - Industry (estimate): nearly 4 events each day (3 Ground, 1 Airborne) or 1,390/year
- **3% (20 events) confirmed actual presence of smoke or fire. (5 events airborne)**
 - Approx 0.0011 per 1,000 sectors or **1 event per 880,000 flights**
 - Industry (estimate): 1 event every 9 days
 - 4% (31 events) involved “non-normal” deplaning of passengers

Cargo Smoke/Fire Events - Trend

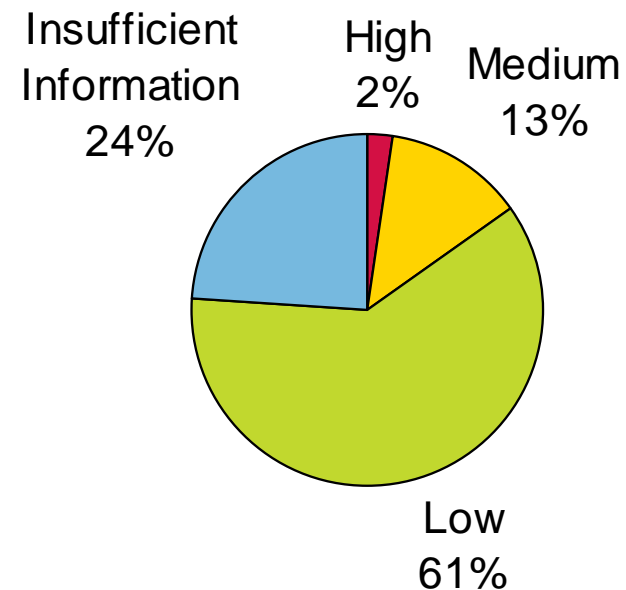
Reported Cargo Smoke / Fire Events



Last reported Cargo Smoke/Fire event where the presence of smoke/fire was confirmed occurred in Q3 2007.

Cargo Smoke/Fire Events - Risk

- 76% (546 events) included risk information
 - High: 16 events
 - Medium: 94 events
 - Low: 436 events



Note: The risk code assigned to an event is done at the airline. IATA does not validate incoming reports for risk assignment.



Cargo Smoke/Fire Events – Sampling of High Risk Events

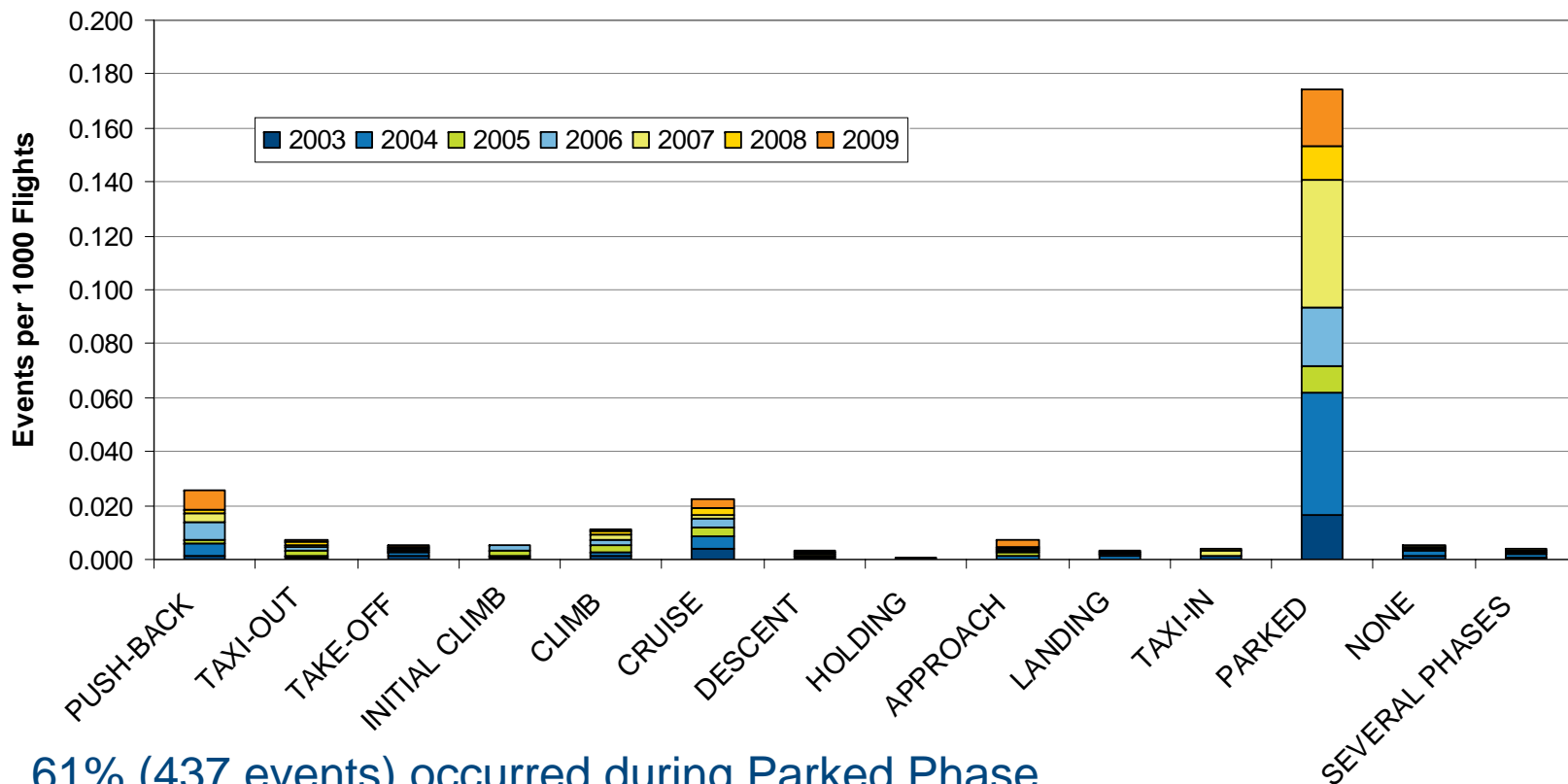
- *Translated: “Very heavy rain at BKO. Decided to hold at GATAM to calculate landing distance for wet runway. While waiting, FWD CARGO SMOKE alarm and LAND ASAP. Emergency checklist performed and declared MAYDAY. Immediate ILS 06. Visual at about 500 ft AGL. As soon as we vacated the runway, the airport fire service performed a visual inspection, nothing to report. Passengers deplaned. Inspection by a mechanic who explained that this is recurring item on this aircraft due to sensitivity of the smoke detectors.”*

Cargo Smoke/Fire Events – Sampling of High Risk Events

- *B777 - “During cruise, the crew received a smoke warning indication for the bulk cargo hold. The fire extinguisher bottles were discharged and the fire indication went out, but returned after 5 minutes. The aircraft was diverted to an enroute airport where a safe overweight landing was performed. Inspection carried out found a smoking passenger bag.”*



Cargo Smoke/Fire Events — Flight Phase



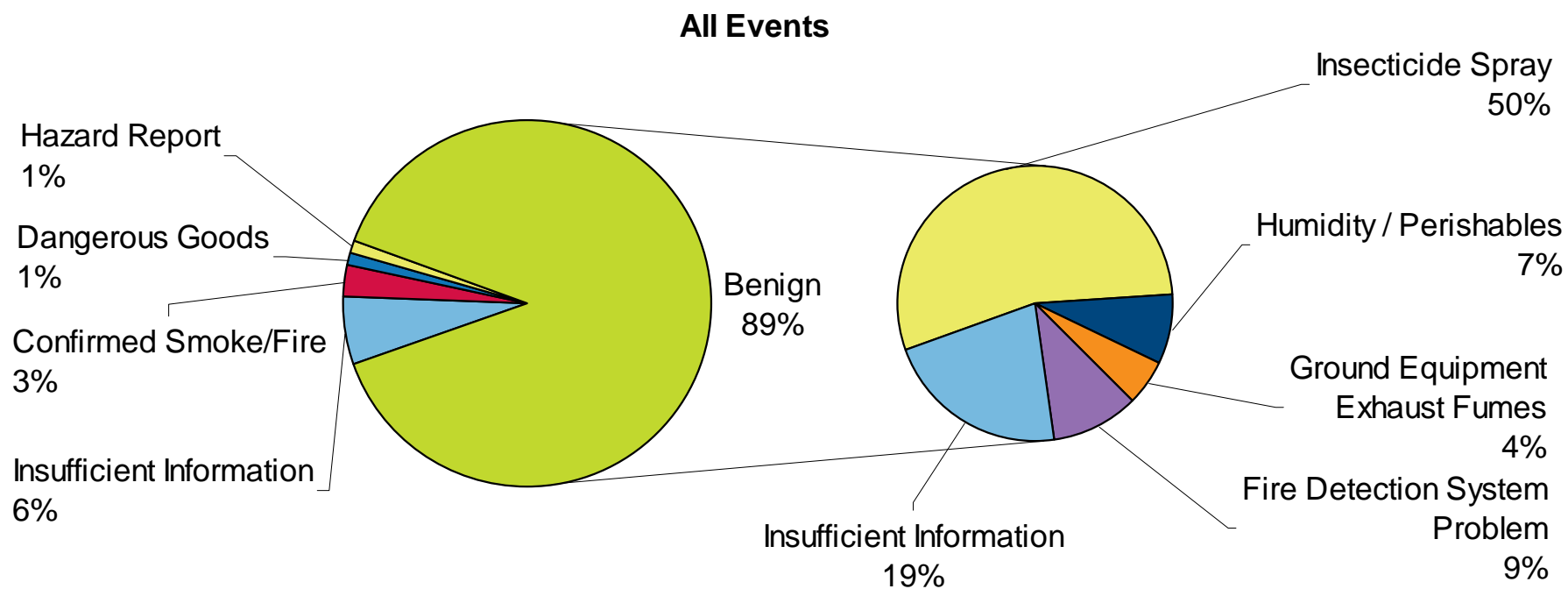
- 61% (437 events) occurred during Parked Phase
 - 7% (30 events) due to exhaust fumes from ground equipment vehicles
 - 66% (287 events) due to insecticide spray



Cargo Smoke/Fire

Drill-down on Actual Smoke/Fire Events
versus Benign Events

Cargo Smoke/Fire Events –





Cargo Smoke/Fire Events – Actual

Smoke/Fire Events

- Actual Smoke/Fire Events: 20 events
 - Power Drive Unit (PDU): 6 events
 - **Passenger Bag or Courier Material: 6 events**
 - Wires: 2 events
 - Found wire bundle damaged
 - Found wires cut and shorting-out, circuit breaker tripped
 - Failed electronic system: 1 event
 - Entertainment System: 1 event
 - Leaking Heat Exchanger: 1 event
 - Leaking oil pipe: 1 event
 - Insufficient Information: 2 events
- Last Actual Smoke/Fire Event reported in Q3 2007



Cargo Smoke/Fire

Drill-down on Airborne Events

Cargo Smoke/Fire Events – Airborne

- 166 events during airborne phases
 - Approx. 0.0089 per 1,000 sectors OR **1 event per 112,000 flights**
 - Industry (estimate):
 - Roughly 1 event per day somewhere in the world

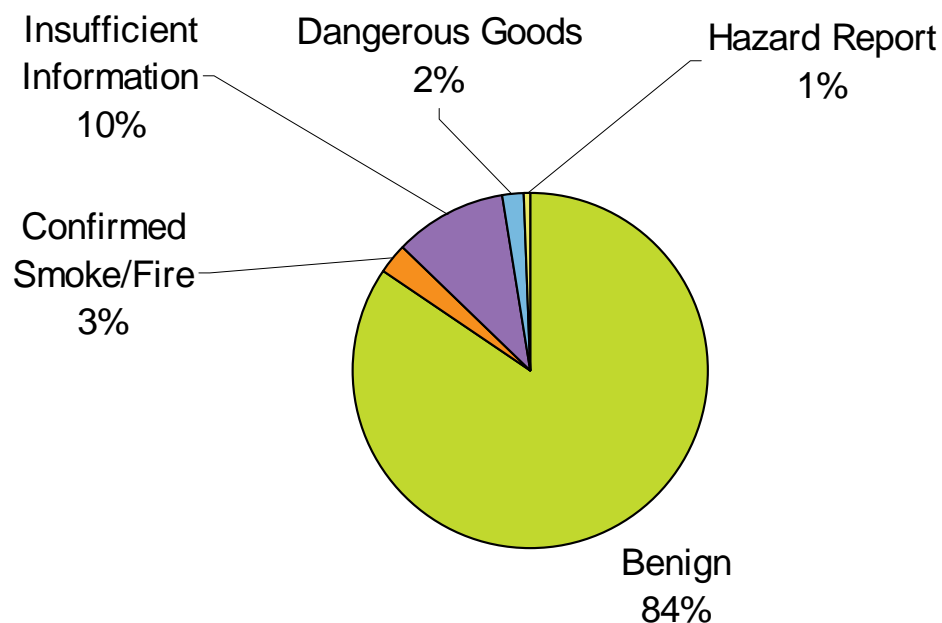
Cargo Smoke/Fire Events – Airborne

➤ Confirmed Cargo Smoke / Fire events:

➤ **3% (5 events) involved confirmed smoke or fire during airborne phases**

➤ 166 benign events mainly false warnings, problems with Smoke/Fire detection equipment, or humidity / perishables

Airborne Events





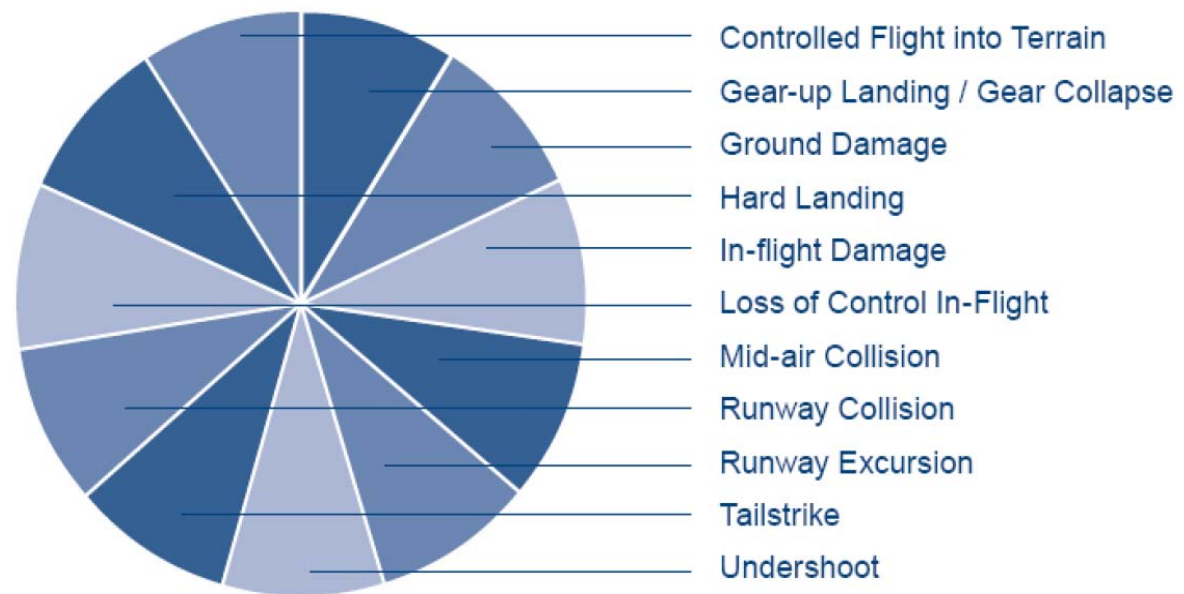
Cargo Smoke/Fire Events – Airborne

➤ Sample narrative

- B777- “On arrival and during unloading of the bulk cargo bay, a courier bag was found to have suffered heat damage. The outer cover was melted through and the cardboard box contents showed signs of scorching. Ground staff stated that *the bag was located above the marked limit* and was found in contact with the hold ceiling, covering a hold lighting unit. Engineering have completed installation of modification kits to adapt the hold lighting to a lower wattage system...”

STEADES Analysis for IRM

- Goal: introduce each section (accident category) at IRM with high level analysis of accident category precursors found in STEADES.





Events with potential for or resulting in a
Mid-air Collision



Mid-Air Collision Extract from Safety Report 2009:

➤ None in Safety Report 2009

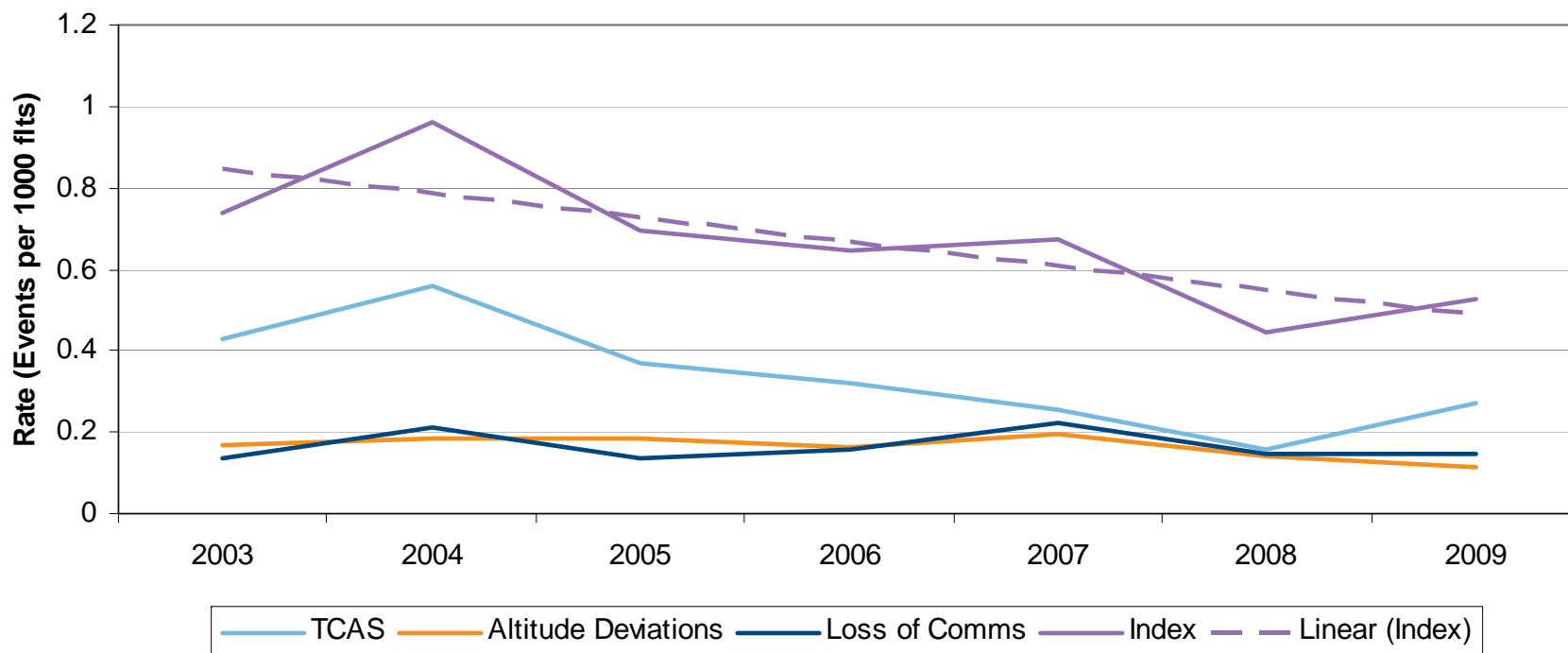
Mid-Air Collision Precursors from STEADES:

- UAS:
 - TCAS ← Drill down
 - Altitude Deviation ← Drill down
 - Lateral Deviation
- Errors:
 - Flight Crew Manual Handling
 - Flight Crew Auto Handling
 - Flight Crew Mis-selection
 - Checklist / SOP use
 - Insufficient crew rest
- Threats:
 - Auto Flight (defects / failures with autopilot, uncommanded pitch/roll, roll/pitch exceedence...)
 - Instrument failures
 - Loss of Comms ← Drill down
 - Pressurization failures / problems
 - Navigation System failures
 - Meteorological (fog...)



Mid-Air Collision Precursors from STEADES:

Mid-Air Collision Precursors

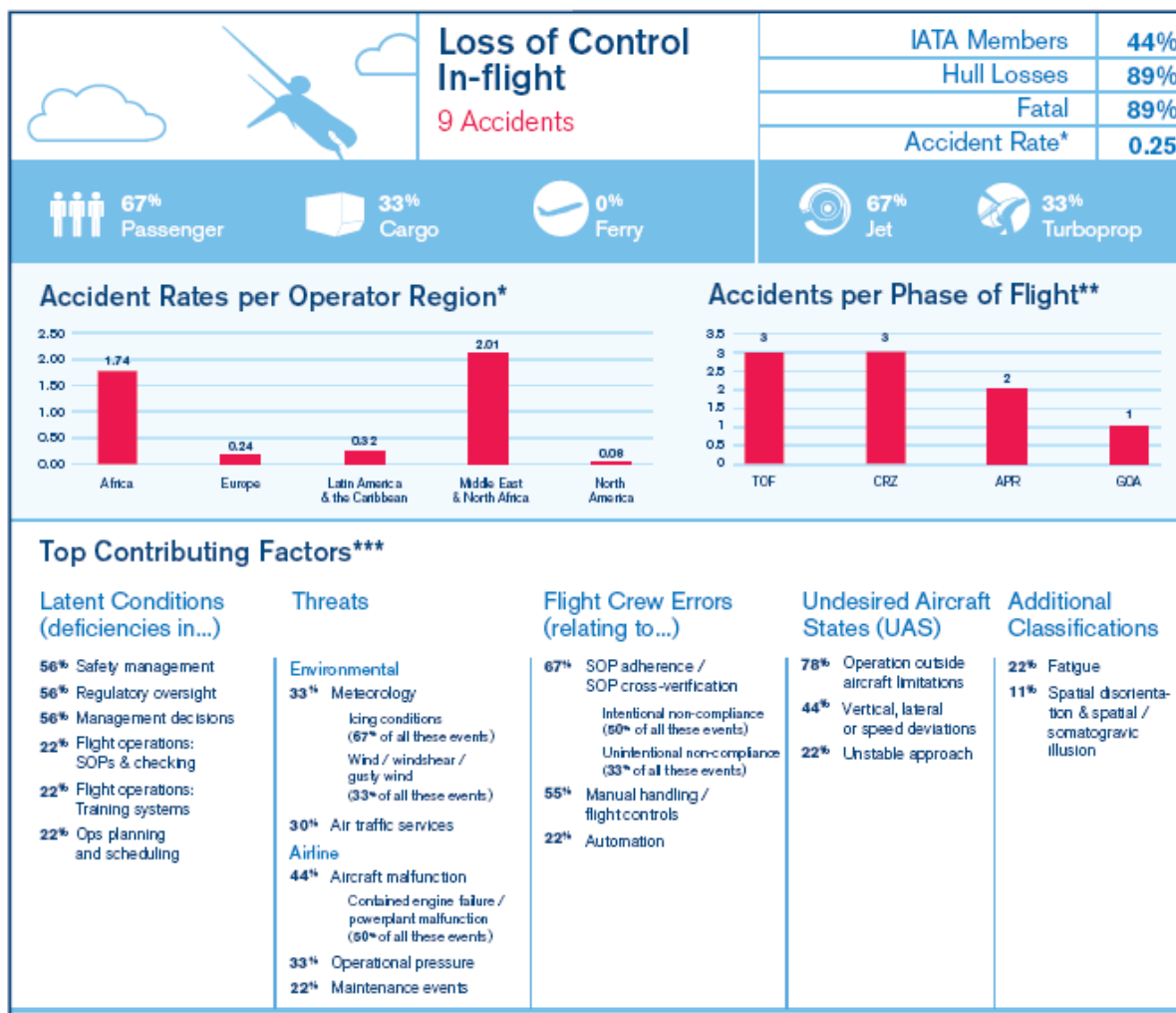




Events with potential for or resulting in a
Loss of Control



Loss of Control In-flight Extract from Safety Report 2009:



Loss of Control In-flight Precursors from STEADES:

➤ UAS:

- Aircraft Limit Exceedence
- Unstable Approach
- Temporary Loss of Control
- Avoidance Manoeuvre
- Stall Warning/Alpha protection
- Fuel imbalance
- Aircraft out of trim

← Drill down

← Drill down

➤ Errors:

- Flight Crew Manual Handling
- Flight Crew Auto Handling
- Configuration warnings (Flaps)

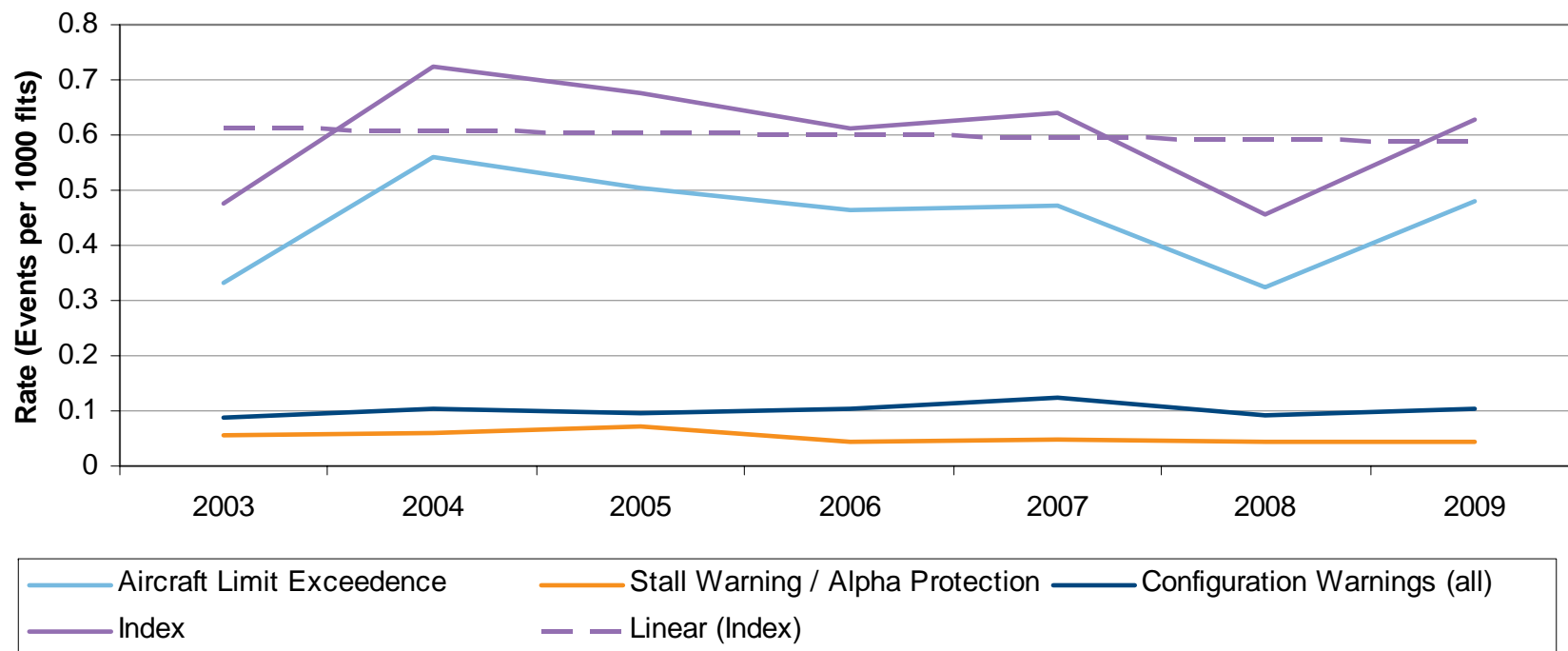
← Drill down

➤ Threats:

- Flight Controls (defects with Trim, Flaps, Rudder...)
- Auto Flight (defects / failures with autopilot, uncommanded pitch/roll, roll/pitch exceedence...)
- Bidstrike
- Environmental (volcanic ash, animal strike...) Meteorological (turbulence, windshear, crosswind...)
- Fuel (failure of crossfeeds, booster pumps, contamination...)
- Ice / Rain Protection (failure of anti/de icing)
- Instrument failures
- Damage to structures (wings, fuselage, fin...)
- Documentation (error with fuel plan)

Loss of Control Precursors from STEADES:

Loss of Control Precursors

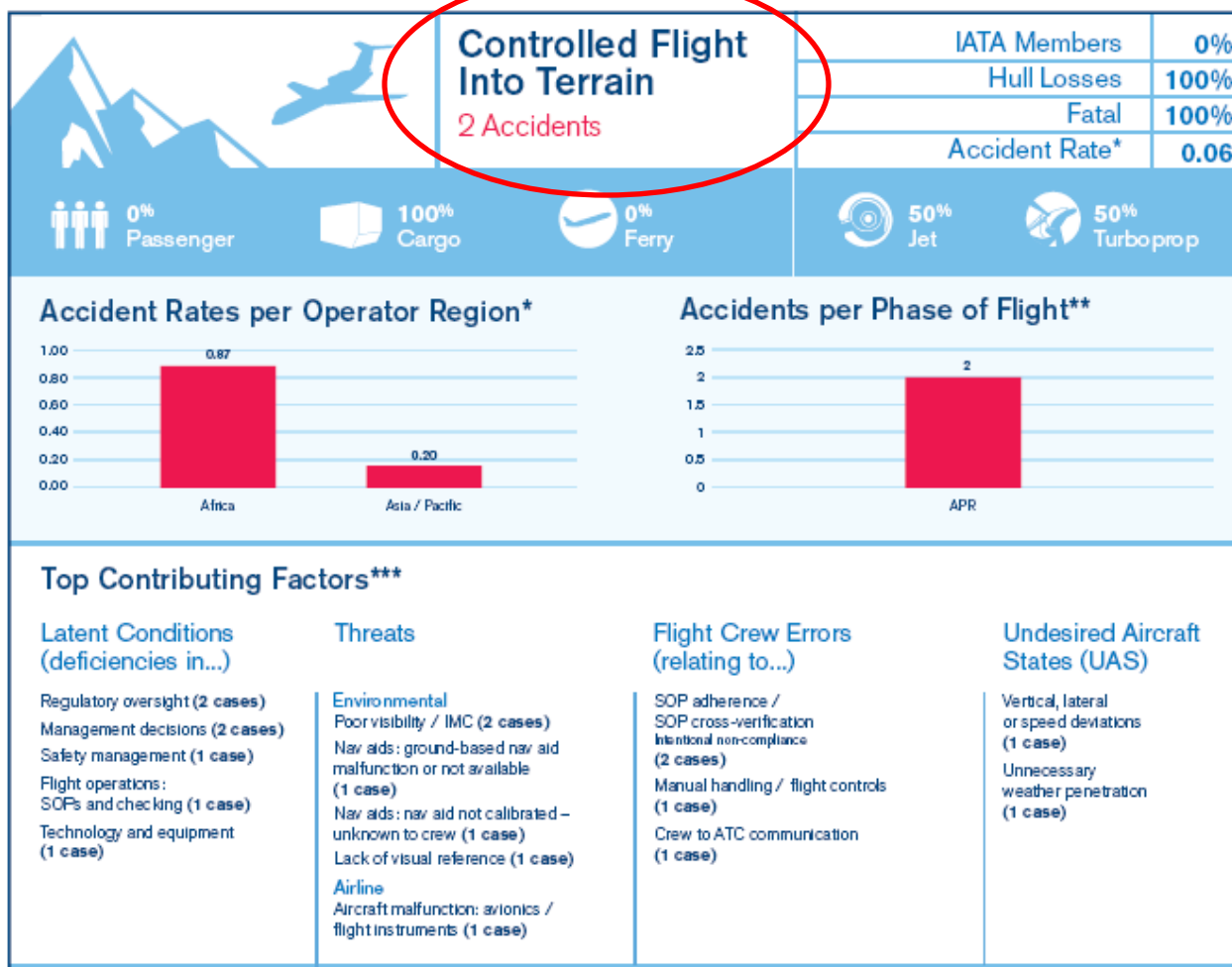




**Events with potential for or resulting in a
CFIT**





CFIT **Extract from Safety Report 2009:**




CFIT Precursors from STEADES:


➤ UAS:

- Unstable Approach 
- Aircraft out of trim 
- EGPWS warnings

➤ Errors:

- Flight Crew Manual Handling
- Flight Crew Auto Handling
- Flight Crew Mis-selection 
- Checklist / SOP use
- Insufficient crew rest

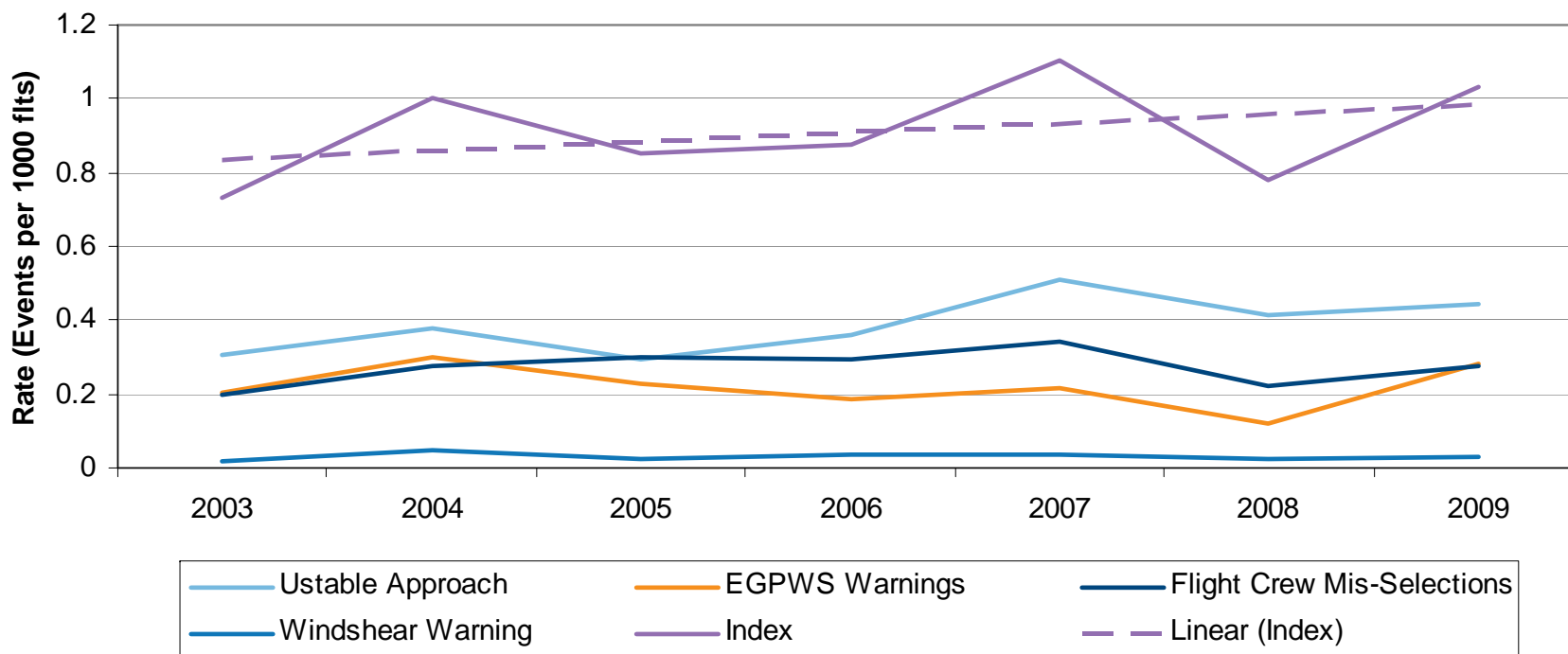
➤ Threats:

- Auto Flight (defects / failures with autopilot, uncommanded pitch/roll, roll/pitch exceedence...)
- Instrument failures
- Pressurization failures / problems
- Navigation System failures
- Meteorological (fog...)
- Windshear 



CFIT Precursors from STEADES:

CFIT Precursors





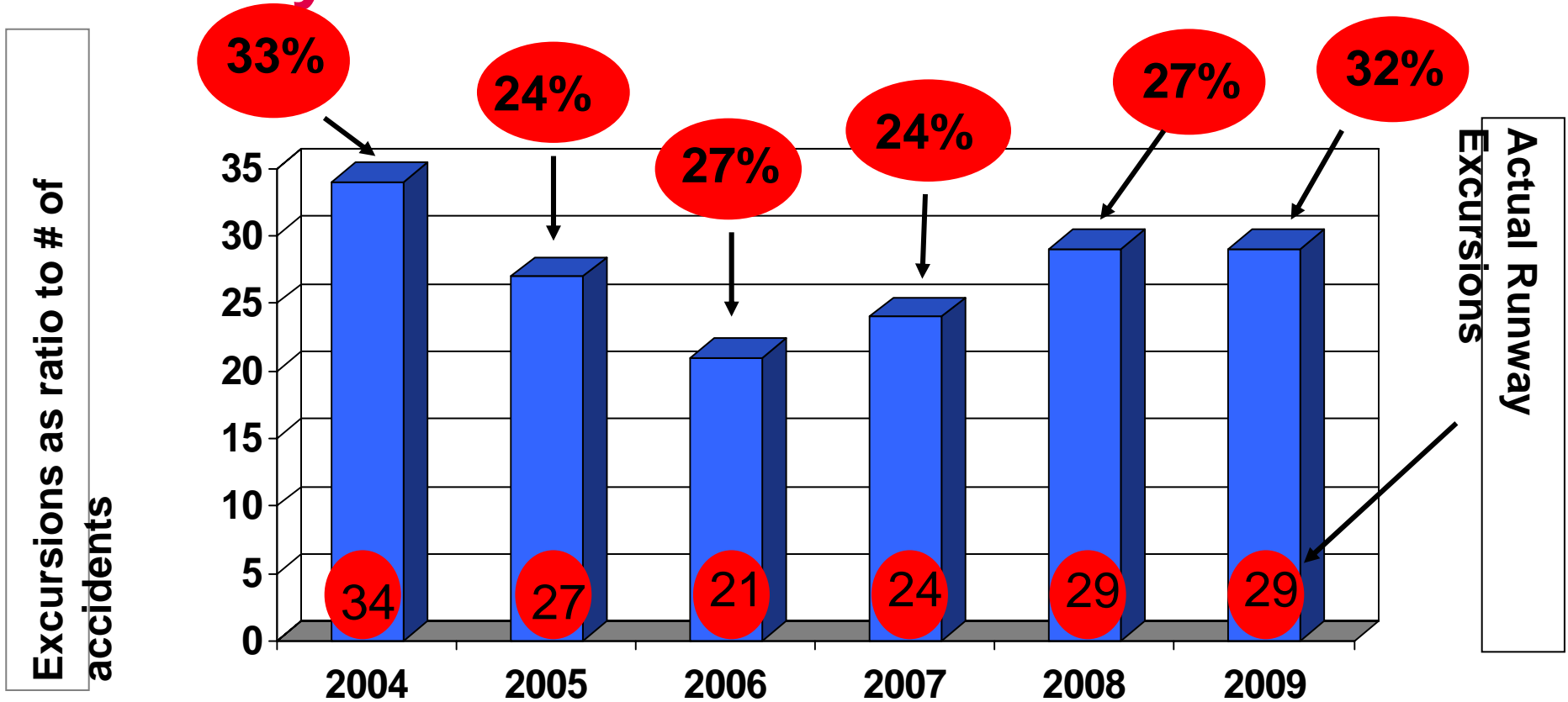
5 CFIT Accidents classified by ACTF (193 fatalities) in 2010

➤ Aviastar-TU	(0)	Mar 22
➤ Pamir Airways	(38)	May 17
➤ Aero Service (Congo Brazzaville)	(9)	June 19
➤ Air Blue	(146)	July 28
➤ National Air Cargo	(0)	Oct 12



Events with potential for or resulting in a
Runway Excursion

Runway Excursions 2004 - 2009

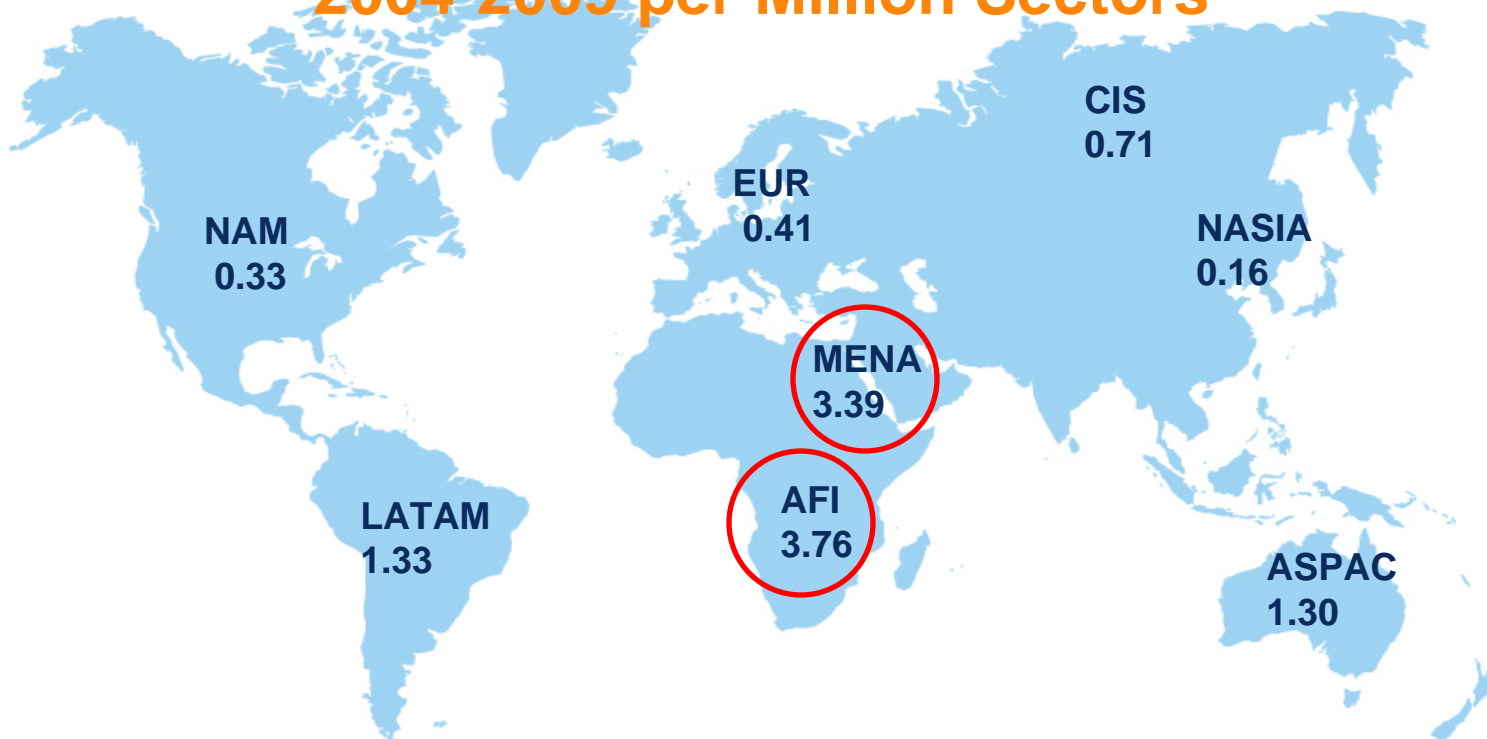


The % is relative to the total number of accidents during that year

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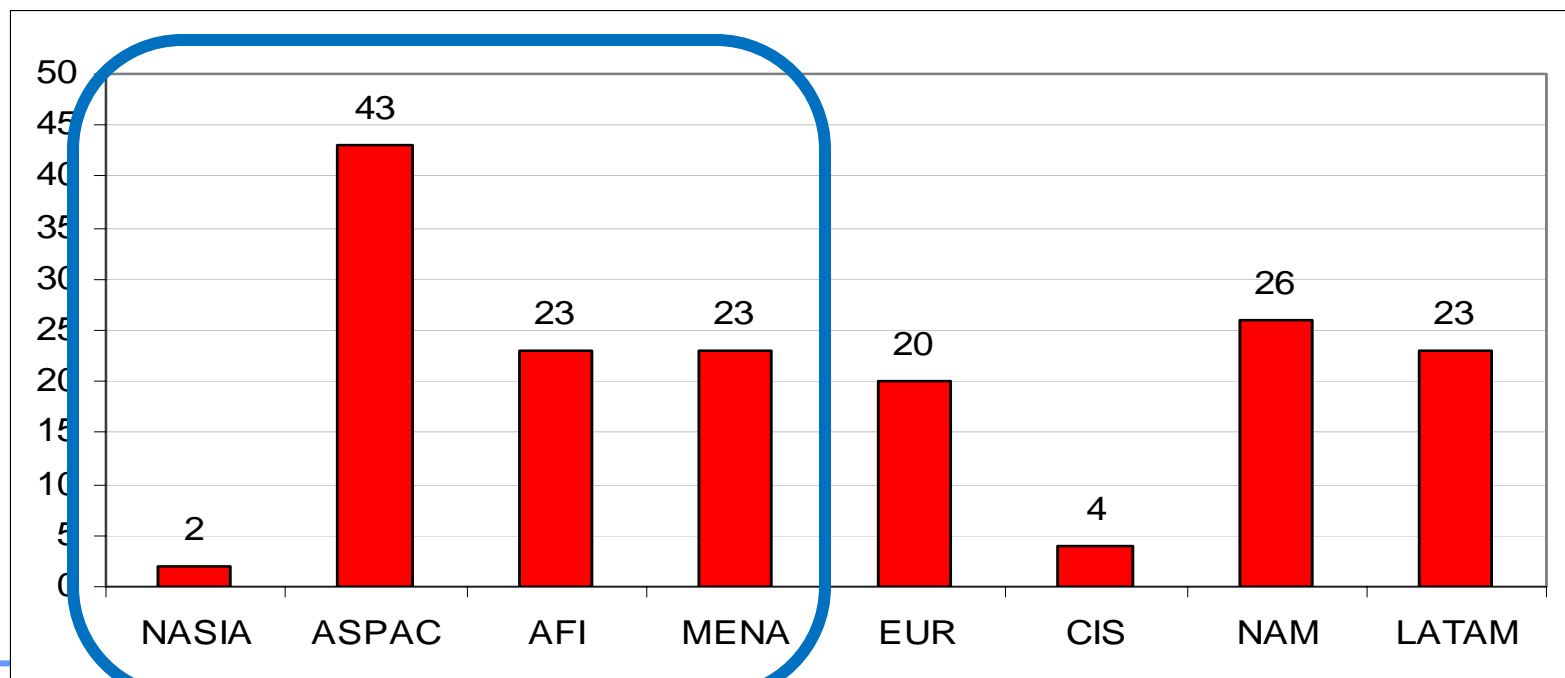
Runway Excursions (Rates)

2004-2009 per Million Sectors



Based on region of operator

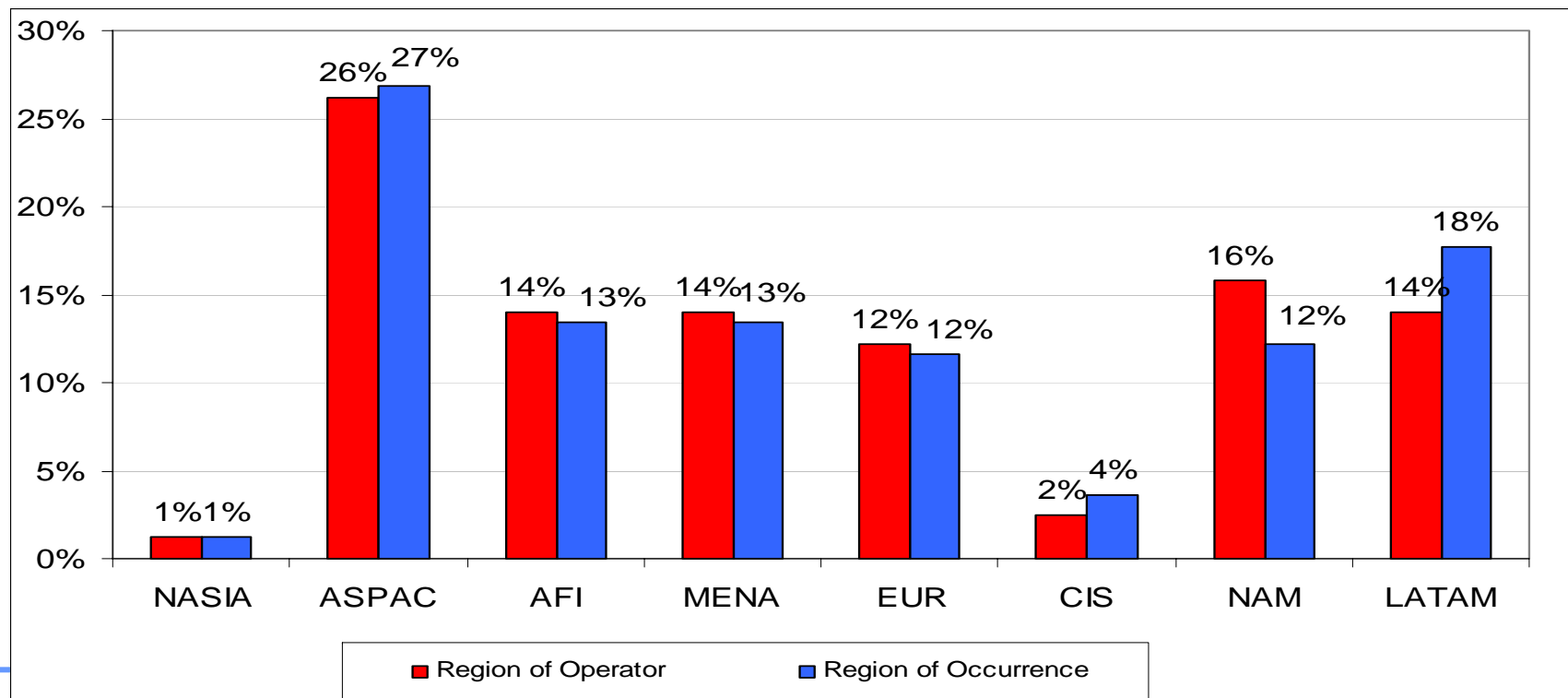
Runway Excursions - Regional Occurrences 2004-2009 accident count



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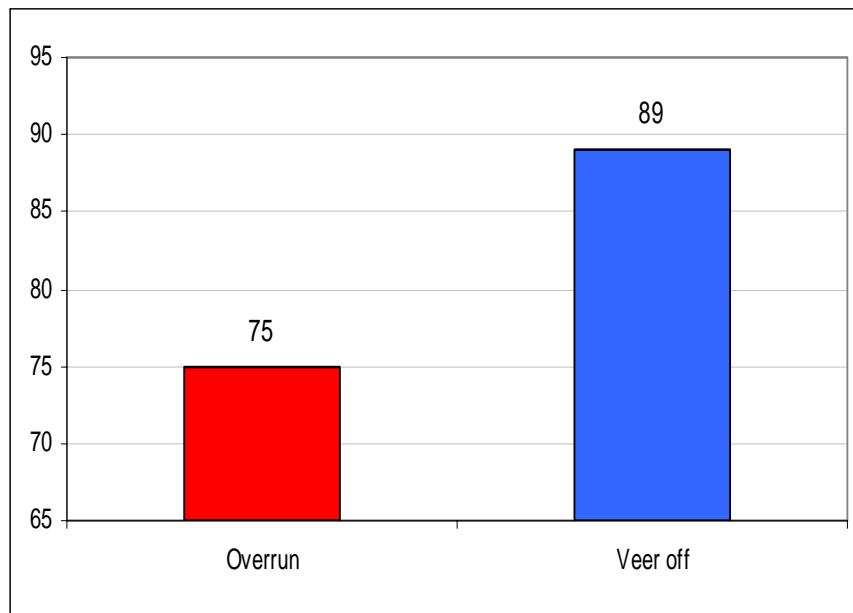
Runway Excursions - Regional Occurrences

Region of Operator Vs. Occurrence

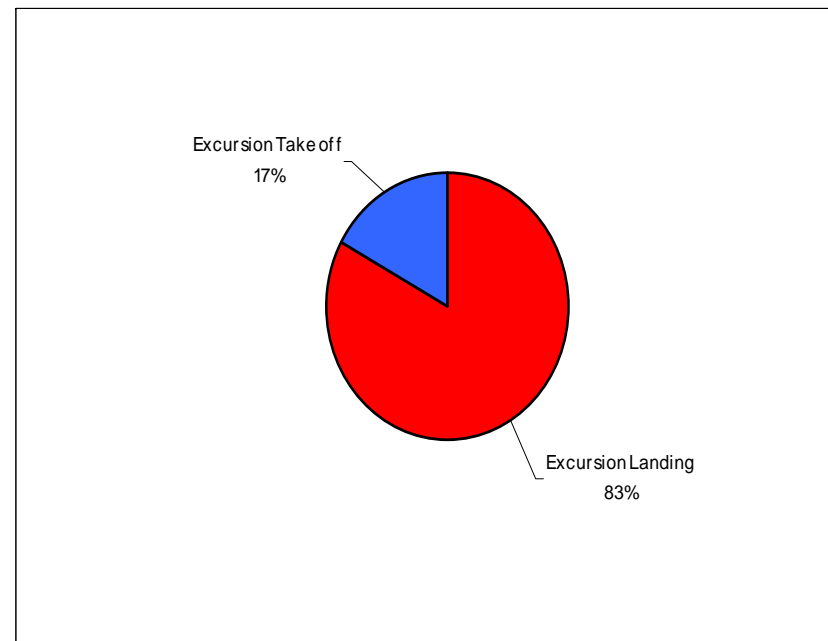


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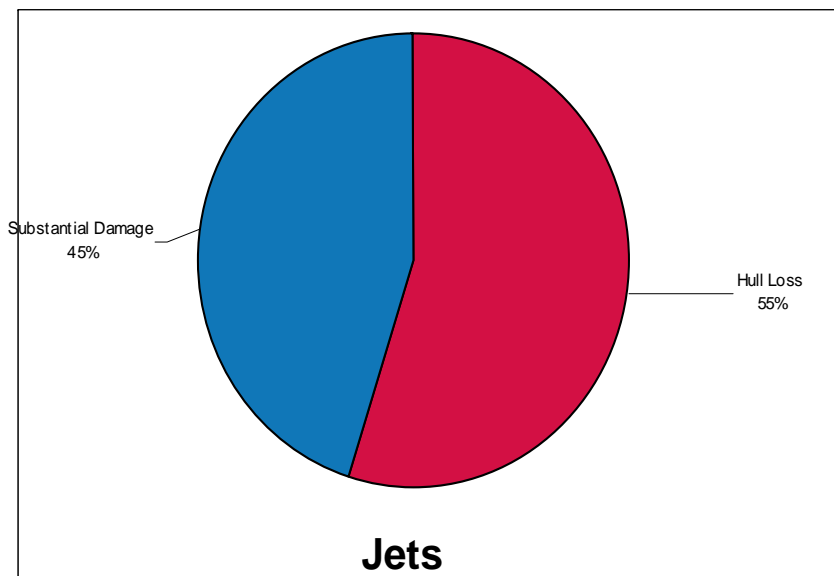
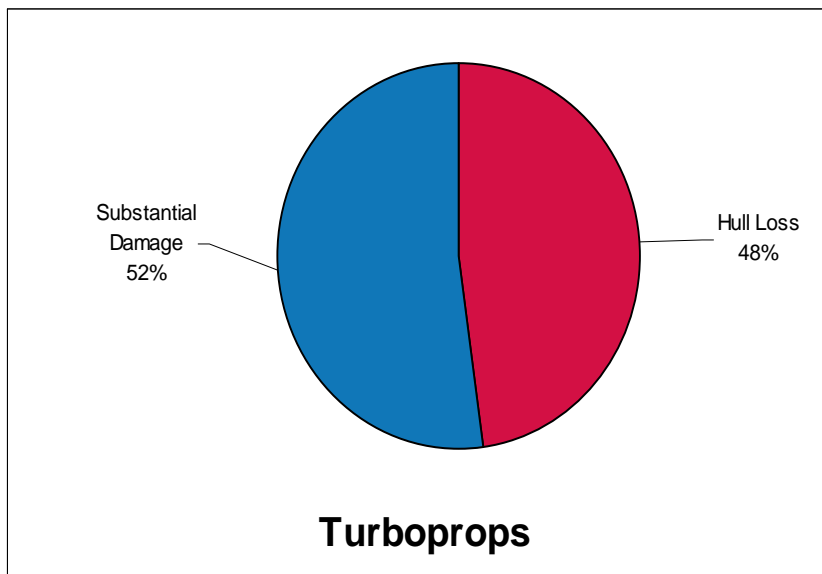
Overrun vs. Veer off



Take off vs. Landing

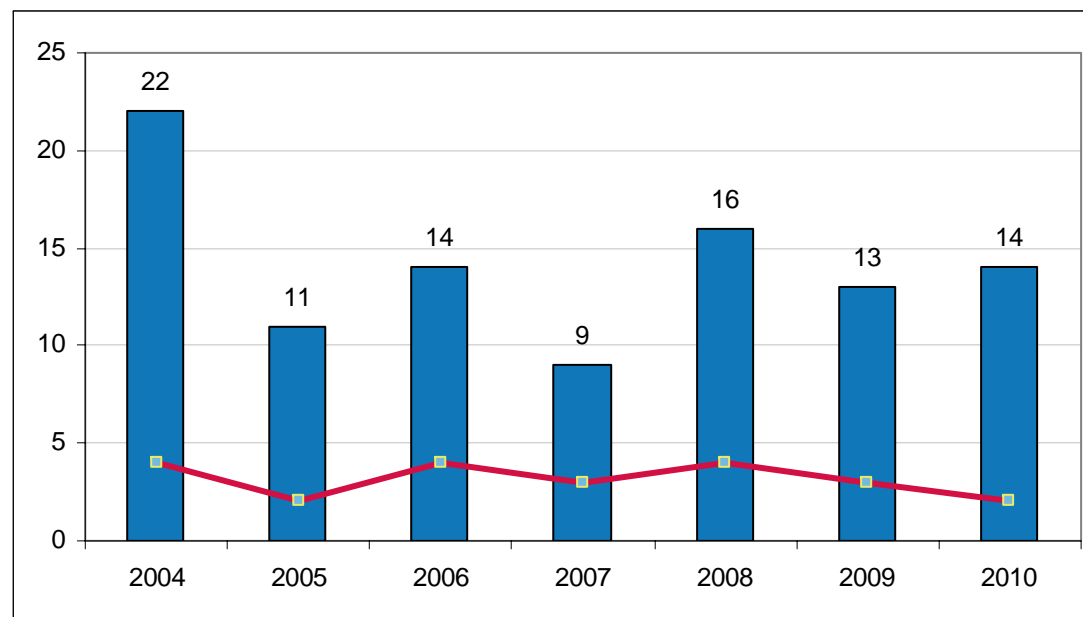


Turboprops vs. Jets Substantial Damage and Hull Loss



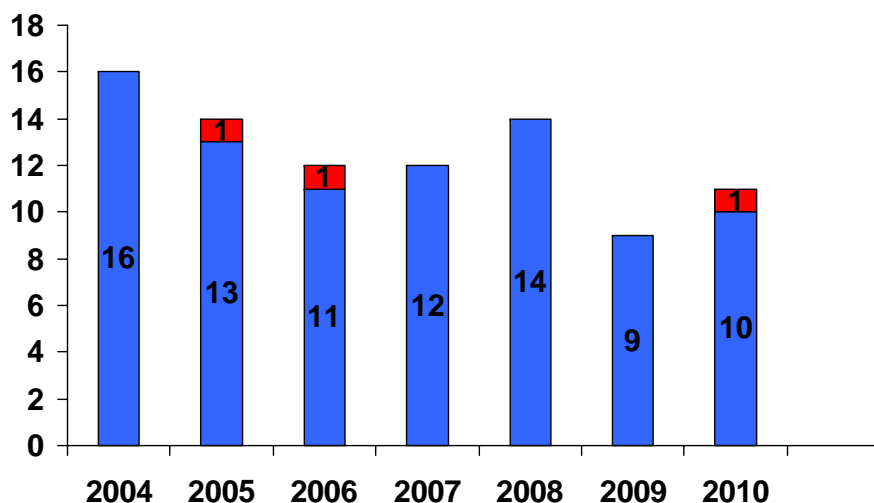
2010 Runway Excursion Accidents (Till Sep 2010) accident data

- Year to September, there have been 77 events
 - 26 Accidents
 - 200 fatalities
 - 51 other Runway Excursion Incidents (known)
 - Ratio is 26/77 (34 %)



EMAS Arrests vs. Overrun Accidents (2004-2010) accident data

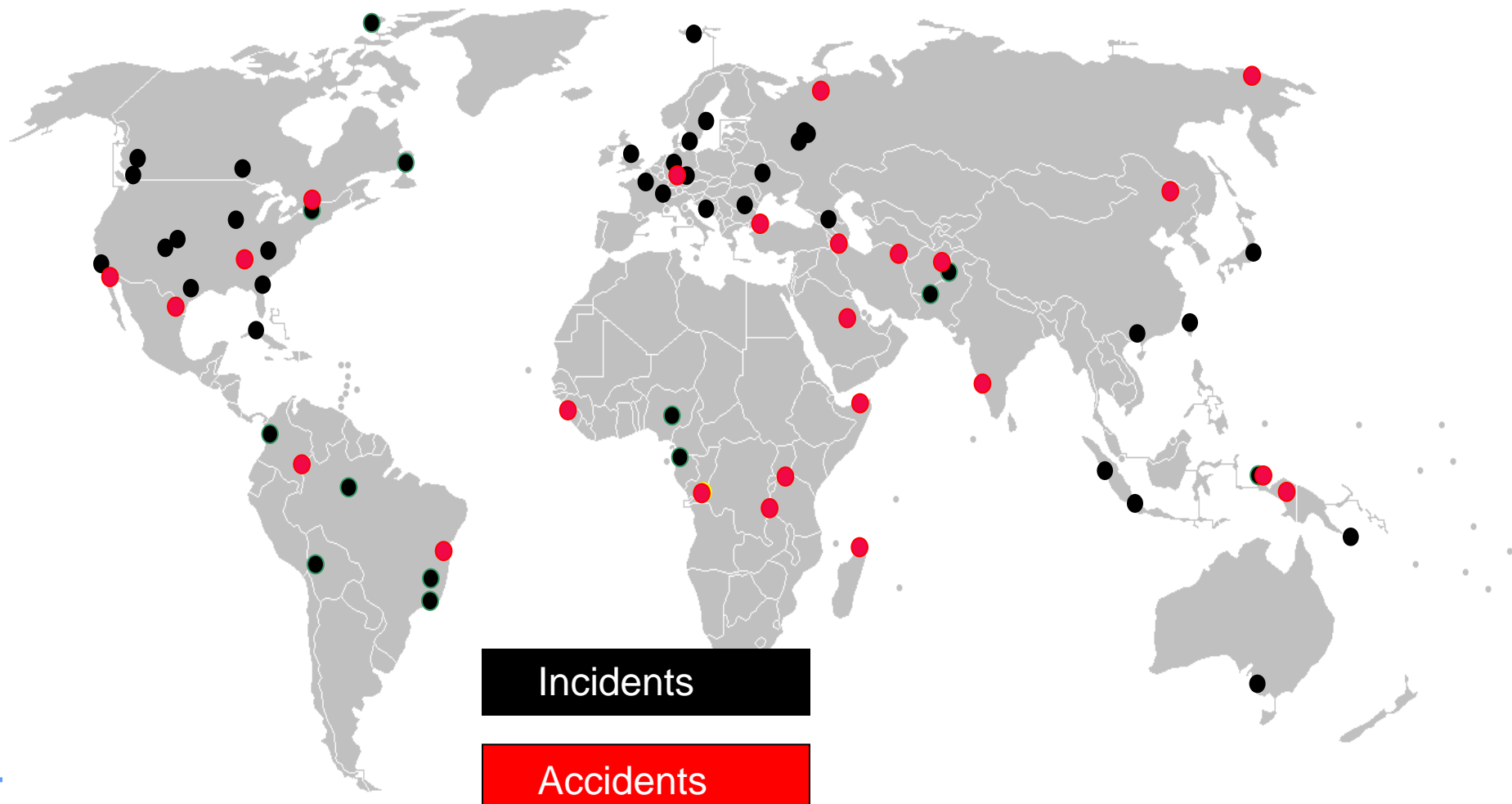
- To date, there have been five incidents where the technology has worked successfully to arrest aircraft which overrun the runway and in several cases has prevented injury to passengers and damage to the aircraft
- From 2004- Sep 2010, a total of 3 accidents were arrested by EMAS



Overrun accidents

EMAS Saves

2010 Runway Excursion (thru Sept 2010)



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2010 STEADES Analysis published

Topic	Origin of Request	Type	Timeline	Status
1. Airport Markings Deficiencies	IRM/SG 2009	Mini	May 2010	Published
2. South Atlantic ATM Events	Airline requests	Mini	May 2010	Published
3. ATM Events at Toronto	Airline requests	Mini	July 2010	Published
4. ATM Events in Philippines	Airline requests	Mini	Sept 2010	Published
5. Anti/De Icing Events	Airline requests	Mini	Oct 2010	Published

2010 Analysis scheduled

Topic	Origin of Request	Type	Timeline	Status
6. Turbulence Injuries	Cabin Safety TF	Mini	Oct 2010	In progress
7. Medical Diversions	Cabin Safety TF	Mini	Oct 2010	In progress
8. Cargo Door Indications	Airline requests	Mini	Nov 2010	In progress
9. Airport Markings/construction	IRM/SG 2010	In-depth	Nov 2010	In progress
10. Cargo Smoke/Fire Warnings	Airline Requests	In-depth	Oct 2010	In progress
11. Foreign Object Damage	Airline Request	In-depth	Oct 2010	In progress
12. NOTAM Issues	IRM/SG 2010	In-depth	Nov 2010	In progress
13. Unstable approach	Customer survey	In-depth	Dec 2010	In progress



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