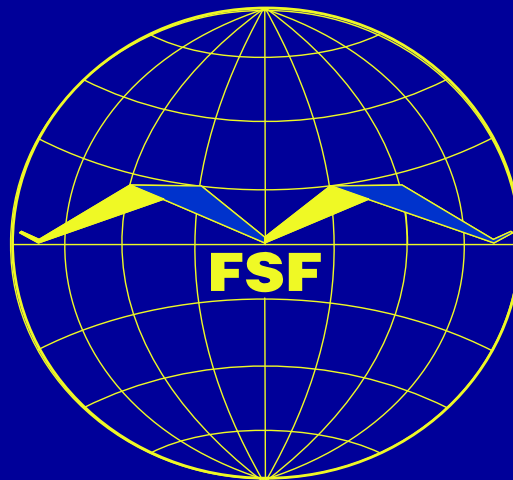


Aviation Safety 2007

The Year In Review



Bill Voss

President and CEO

Flight Safety Foundation

Aviation Safety - The Year In Review

Agenda

- **Turbojets**
 - Comercial
- **Turboprops**
- **Controlled Flight Into Terrain (CFIT)**
- **Approach and Landing**
- **Loss of Control**
- **Safety Challenges**

The Fleet - 2007

<u>Type</u>	<u>Western Built</u>	<u>Eastern Built</u>	<u>Total</u>
Turbojets	18,595	1,667	20,262
Turboprops	4,768	1,582	6,350
Business Jets			13,853

Accident Classifications

Major Accident:

An accident in which any of three conditions is met:

1. Aircraft Destroyed, or
2. Multiple Fatalities to Occupants, or
3. One Fatality and Aircraft Substantially Damaged

Major Accidents Commercial Jets 1 January to 31 December 2005

Date	Operator	Aircraft	Location	Phase	Fatal
8 January	Aerorepublica	MD-80	Cali, Colombia	Landing	0
3 February	Air West Cargo	IL-76	Khartoum	Approach	7
3 February	Kam Air	B737-200	Kabul, Afghanistan	Approach	106
19 March	Race Cargo Airline	B707-300	Entebbe, Uganda	Approach	0
23 March	Airline Transport	IL-76	Mwanza, Tanzania	Takeoff	8
7 April	ICARO Air	F-28	Coca, Equador	Landing	0
20 April	Saha Air	B707-300	Tehran, Iran	Landing	3
2 August	Air France	A-340	Toronto, Canada	Landing	0
14 August	HELIOS Airways	B737-300	Grammatikos, Greece	Climb	121
16 August	West Caribbean	MD-82	Machiques, Venezuela	Enroute	160
23 August	TANS Peru Airlines	B737-200	Pucallpa, Peru	Approach	45
5 Sept	Mandala Airlines	B737-200	Medan-Polonia, Indonesia	Takeoff	104
22 October	Bellview Airlines	B737-200	Lissa, Nigeria	Climb	117
11 November	Royal Airlines Cargo	IL-76	Khak-eShahidan, Afghanistan	Approach	8
8 December	Southwest Airlines	B-737-700	Chicago, Ill, USA	Landing	0
10 December	Sosoliso Airlines	DC-9	Port Harcourt, Nigeria	Approach	109

Source: Ascend

Controlled Flight Into Terrain (CFIT)

Loss of Control (LOC)

Major Accidents Commercial Jets 1 January to 31 December 2006

Date	Operator	Aircraft	Location	Phase	Fatal
8 February	UPS	DC-8F	Philadelphia, USA	Enroute	0
3 May	Armavia	A-320	Alder-Sochi, Russia	Approach	113
9 July	S7 Airlines	A-310	Irkutsk, Russia	Landing	126
22 August	Pulkovo Aviation	TU-154	Nr. Donetsk, Ukraine	Enroute	170
27 August	Comair	CRJ-100	Lexington, KY, USA	Takeoff	49
1 September	Iran Air Tours	TU-154	Mashhad, Iran	Landing	28
29 September	GOL	B-737	Sao Felix, Brazil	Enroute	154
3 October	Mandala Airlines	B-737	Tarakan, Indonesia	Landing	0
10 October	Atlantic Airways	BAE-146	Stord-Sorstokken, Norway	Landing	4
29 October	ADC Airlines	B-737	Abuja, Nigeria	Takeoff	96
18 November	Aerosucre Colombia	B-727	Bogota, Colombia	Approach	5

Source: Ascend

Major Accidents Commercial Jets 1 January 2007 to 1 October 2007

Date	Operator	Aircraft	Location	Phase	Fatal
1 January	Adam Air	B-737	Sulawsui, Indonesia	Enroute	102
13 January	RPX Airlines	B-737	Kuching, Malaysia	Landing	0
13 February	Fort Aero	CRJ-100	Vnukovo, Russia	Takeoff	0
21 February	Adam Air	B-737	Surabaya, Indonesia	Landing	0
7 March	Garuda	B-737	Yogyakarta, Indonesia	Landing	22
17 March	UT Air	TU-134	Samara, Russia	Landing	6
5 May	Kenya Airways	B-737	Douala, Cameroon	Takeoff	114
20 May	Air Canada Jazz	CRJ-100	Toronto, Canada	Landing	0
28 June	TAAG Angola	B-737	M'Banza Congo, Angola	Landing	5
17 July	TAM	A-320	Congonhas, Brazil	Landing	187
17 July	AeroRepublica	EMB-190	Santa Marta, Colombia	Landing	0
20 August	China Airlines	B-737	Naha, Okinawa, Japan	Taxi	0
16 September	One-Two-Go Airline	MD-82	Phuket, Thailand	Landing	89

Source: Ascend

Major Accidents

Commercial Turboprops (> 14 seats)

1 January 2007 to 1 October 2007

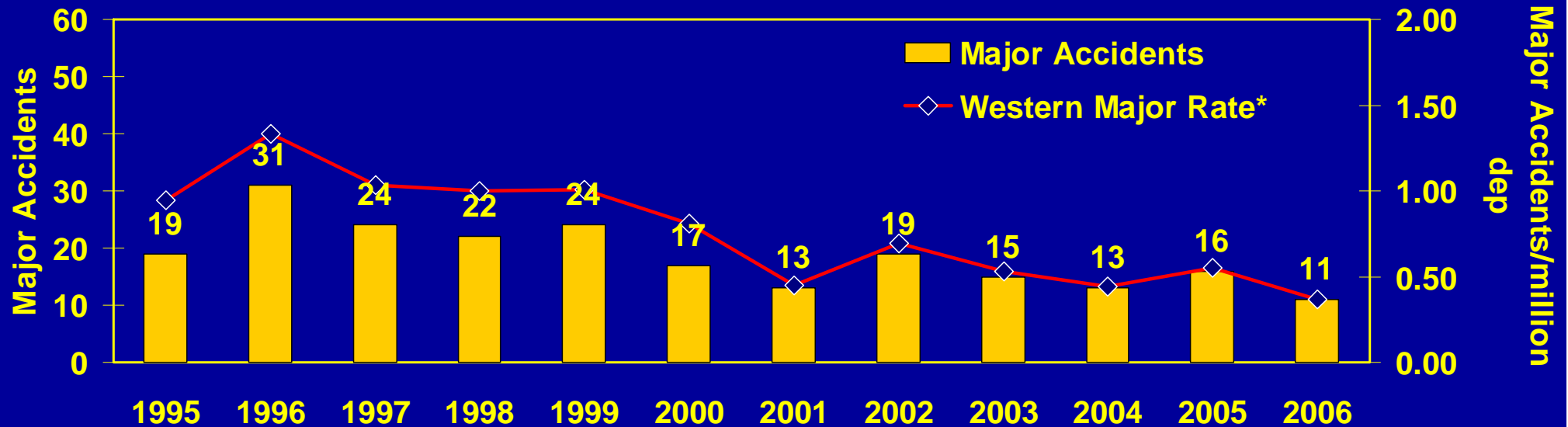
Date	Operator	Aircraft	Location	Phase	Fatal
9 January	Aeriantur-M Airlines	AN-26	Adana, Turkey	Approach	32
30 March	Airlink	EMB-110	New Britain, PNG	Descent	2
17 May	Safe Air Company	LET-410	Walikale, DRC	Climb	3
21 June	Karibu Airways	LET-410	Kamina, DRC	Climb	10
25 June	PMT Air	AN-24	Kompong, Cambodia	Approach	22
26 June	Business Aviation	LET-410	Brassaville, Congo	Enroute	0
1 July	Jet Airways	ATR-72	Indore, India	Landing	0
8 July	Laird Air	DHC-6	Muncho Lake, Canada	Climb	1
23 July	Djibouti Airways	AN-26	Dire Dawa, Ethiopia	Takeoff	1
29 July	ATRAN Cargo Airlines	AN-12	Domodedovo, Russia	Climb	7
9 August	Air Moorea	DHC-6	Moorea-Temae, Polynesia	Climb	20
12 August	Jeju Air	DH-8	Busan, Korea	Landing	0
22 August	SELVA Colombia	AN-26	Pasto, Colombia	Landing	0
22 August	Two Taxi Aereo	EMB-110	Reserve Academia, Brazil	Enroute	2
26 August	Great Lake Business	AN-32	Kogolo, DRC	Approach	14
7 September	Transavia Service	AN-12	Goma, DRC	Landing	8
24 September	Free Airlines	LET-410	Malemba Nkulu, DRC	Landing	1

Source: Ascend

Major Accidents

Worldwide Commercial Jets

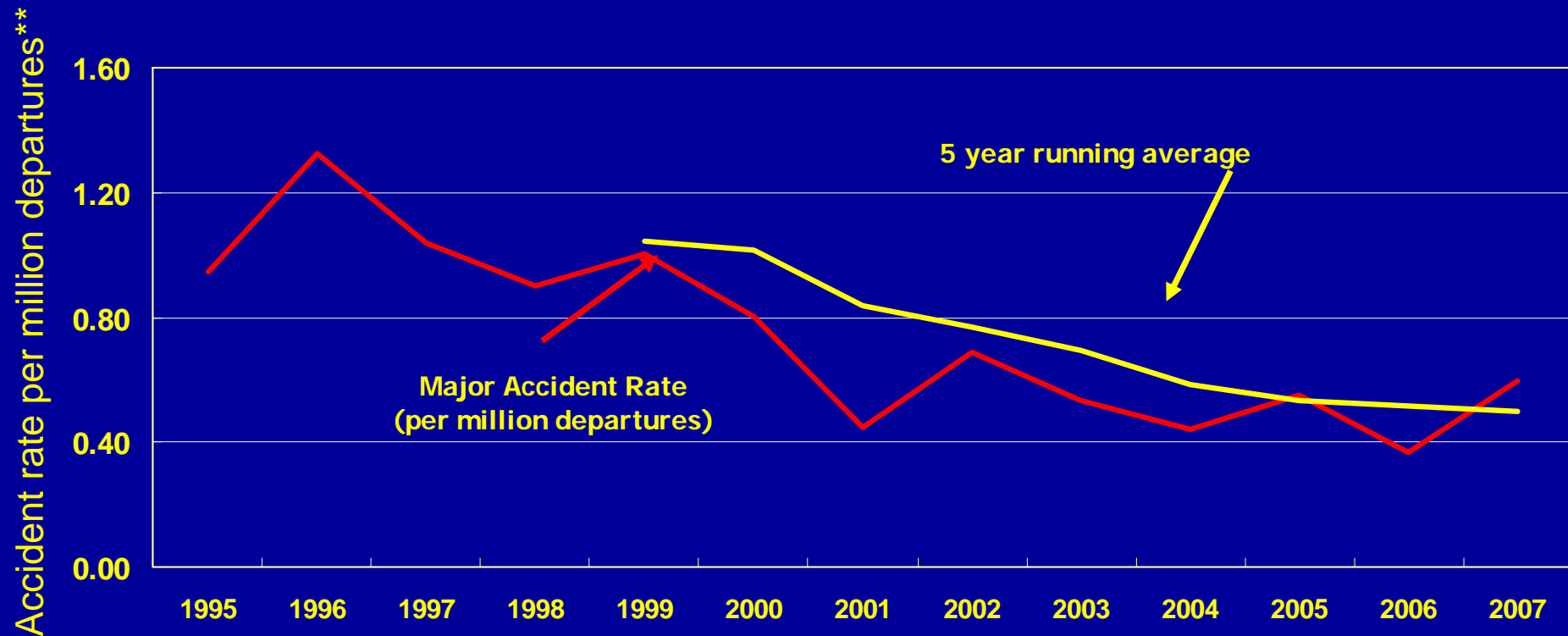
1993 – 2006



Source: Ascend

* Reliable worldwide departure/rate data not available for Eastern-Built Aircraft

Major Accident Rate Western-Built Commercial Jets 1993 – 2007*

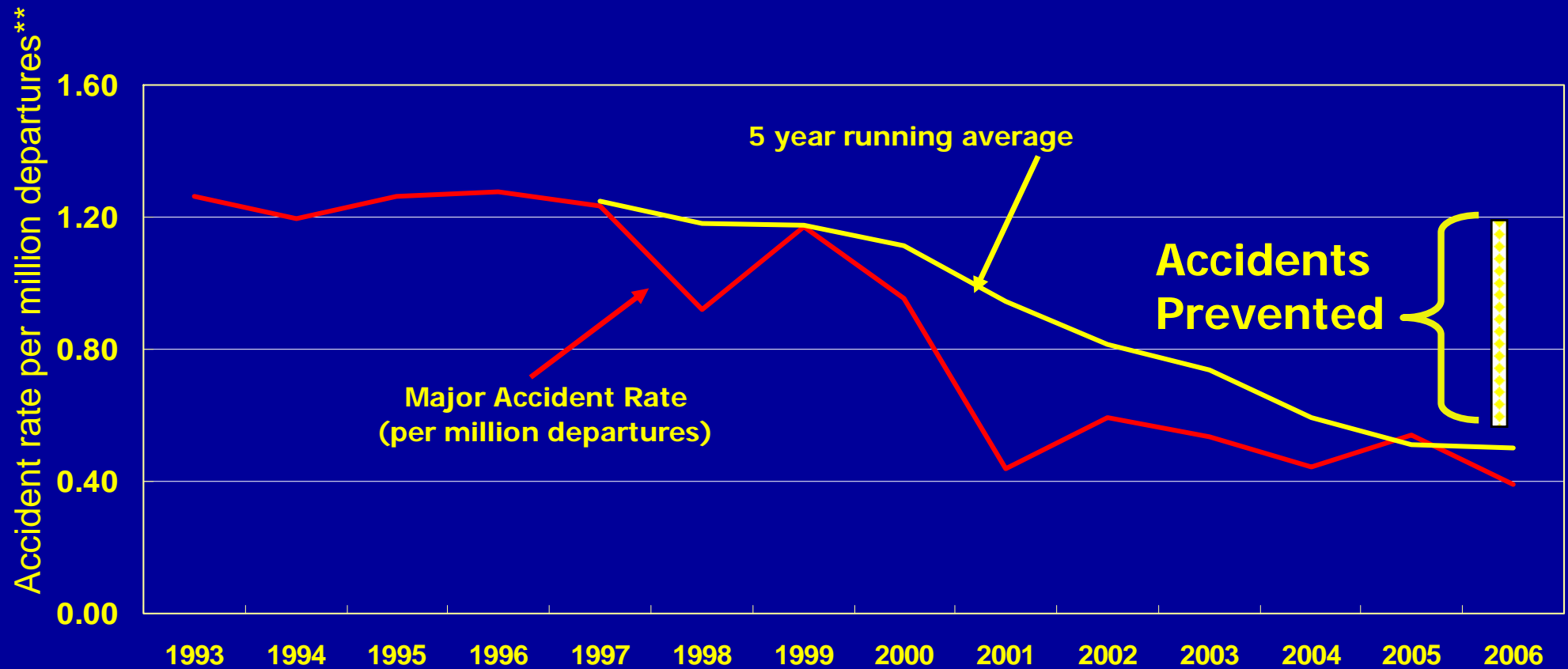


* 1 January through 1 October 2007

** Worldwide departure are estimated

Reliable total departure data not available for Eastern-Built Aircraft

Major Accident Rate Western-Built Commercial Jets 1993 – 2006





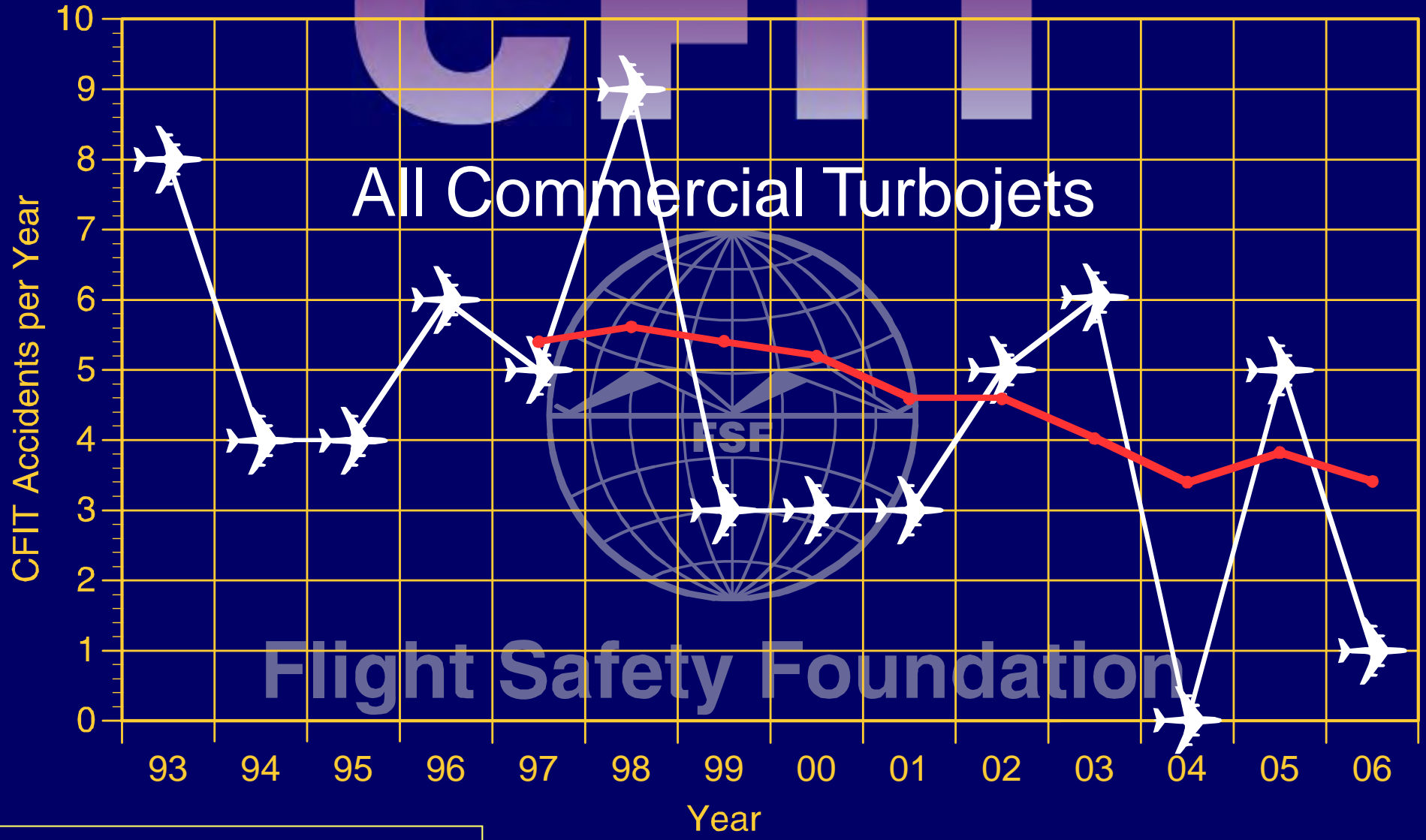
Controlled Flight into Terrain Major Accidents

Commercial Jets

1 January through 1 October 2007

Date	Operator	Aircraft	Location	Phase	Fatal
17 March	UT Air	TU-134	Samara, Russia	Landing	6

CFIT



All Commercial Turbojets

Flight Safety Foundation

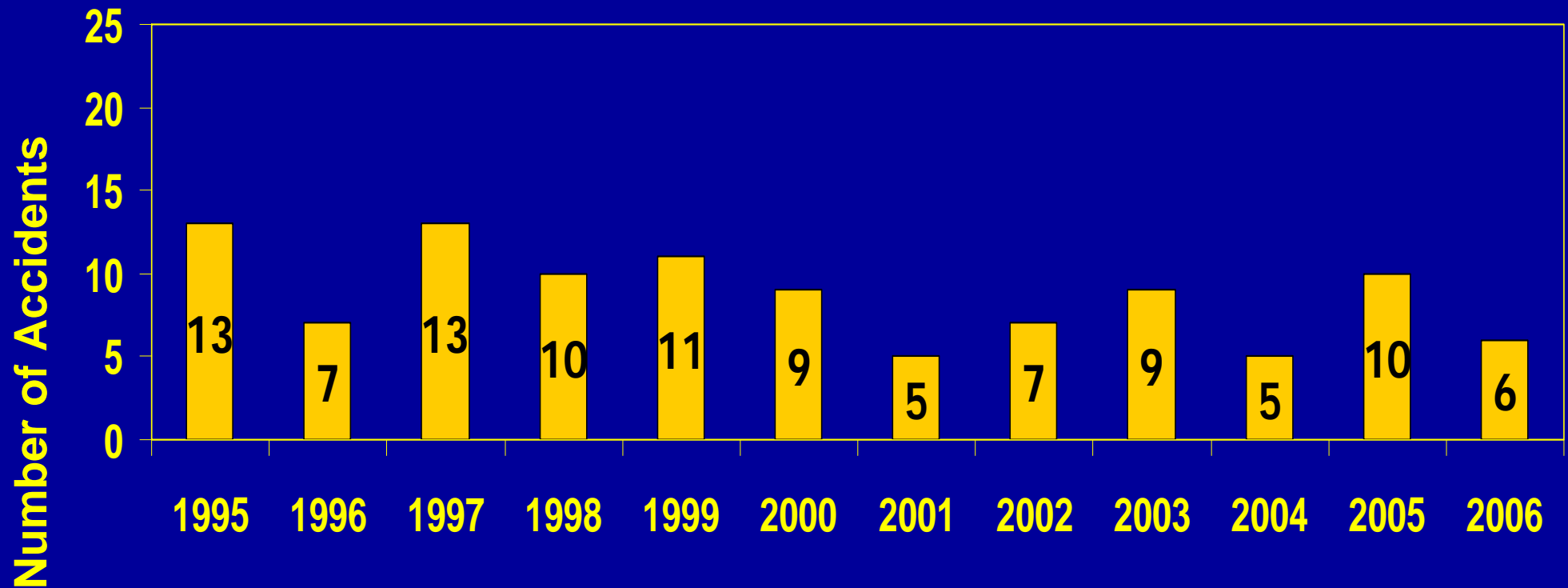
— 5 Year Running Average

Approach and Landing Major Accidents Commercial Jets

1 January through 1 October 2007

Date	Operator	Aircraft	Location	Phase	Fatal
13 January	RPX Airlines	B-737	Kuching, Malaysia	Landing	0
21 February	Adam Air	B-737	Surabaya, indonesia	Landing	0
7 March	Garuda	B-737	Yogyakarta, Indonesia	Landing	22
17 March	UT Air	TU-134	Samara, Russia	Landing	6
20 May	Air Canada Jazz	CRJ-100	Toronto, Canada	Landing	0
28 June	TAAG Angola	B-737	M'Banza Congo, Angola	Landing	5
17 July	TAM	A-320	Congonhnas, Brazil	Landing	187
17 July	AeroRepublica	EMB-190	Santa Marta, Colombia	Landing	0
16 September	One-Two-Go	MD-82	Phuket, Thailand	Landing	89

Approach and Landing Major Accidents Commercial Jet Airplanes 1993 Through 2006

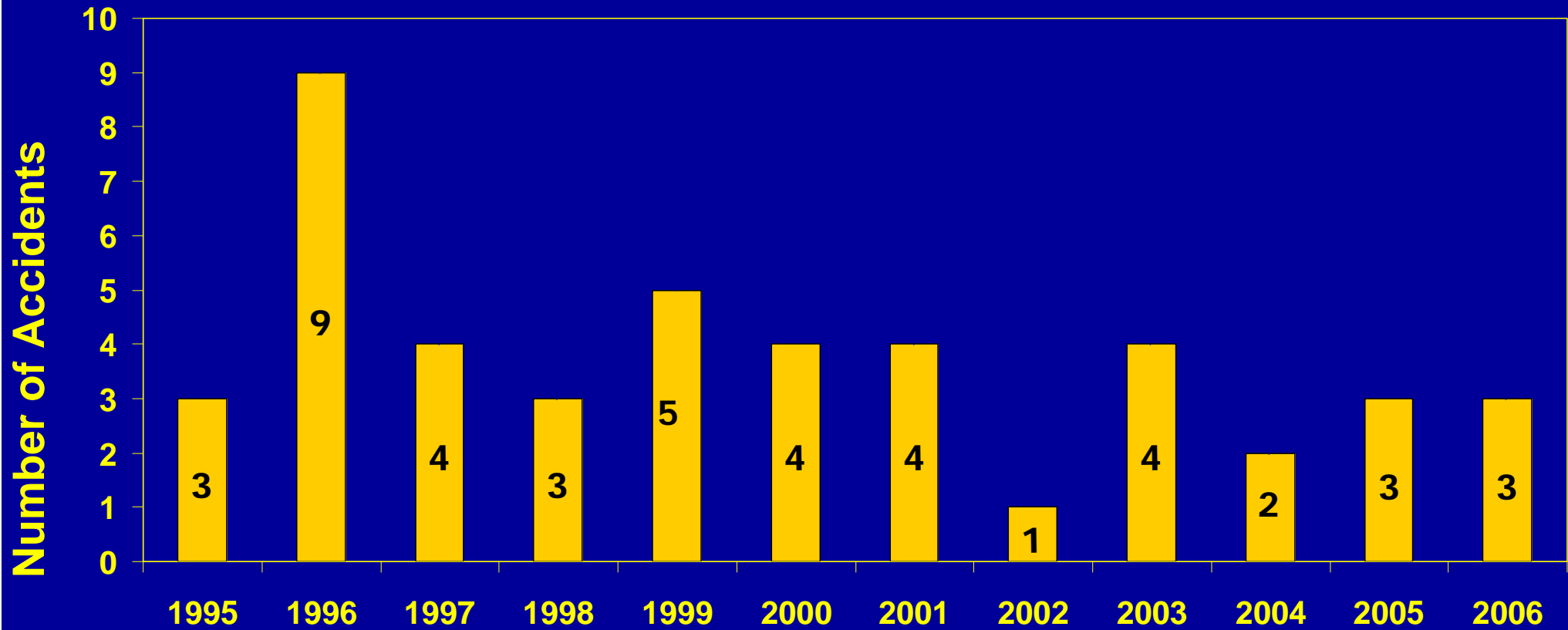


Loss of Control Major Accidents Commercial Jets

1 January through 1 October 2007

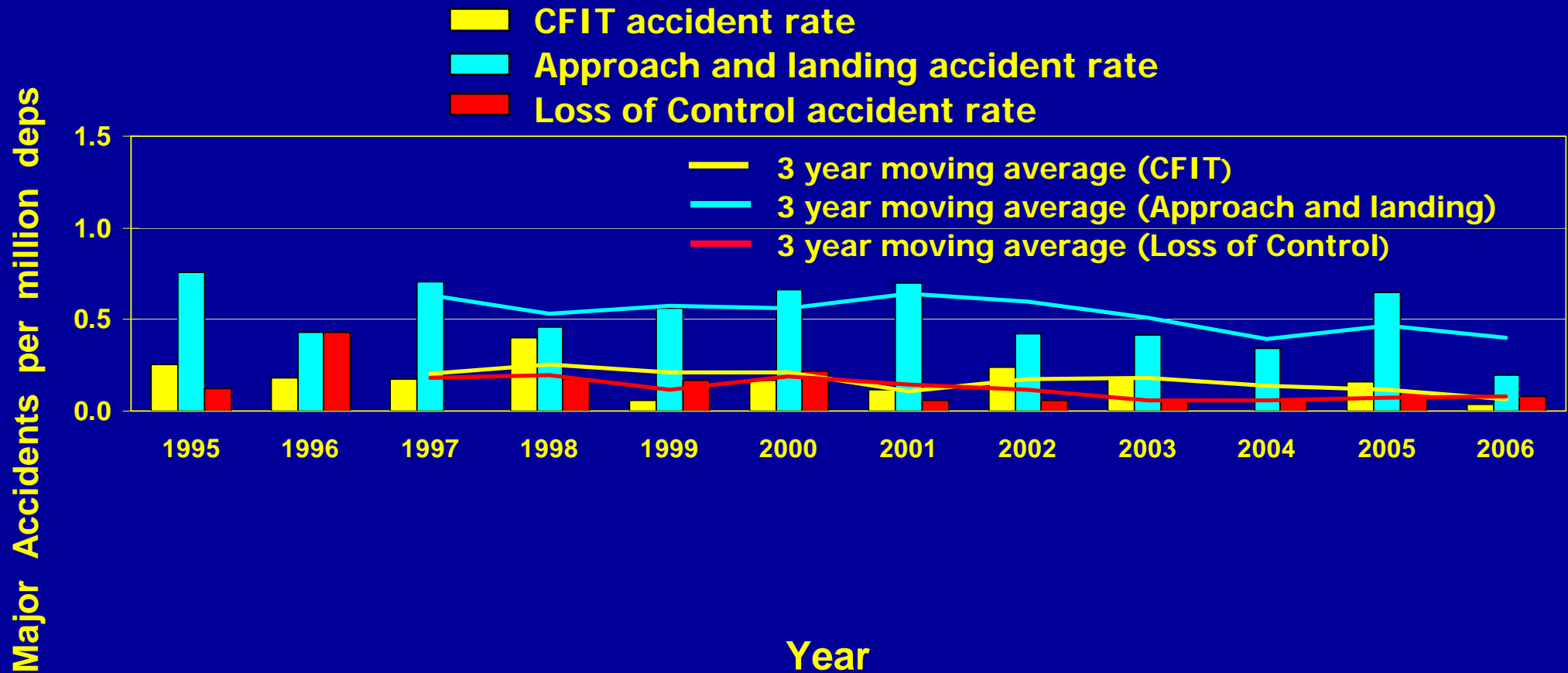
Date	Operator	Aircraft	Location	Phase	Fatal
13 February	Fort Aero	CRJ-100	Vnukovo, Russia	Takeoff	0
5 May	Kenya Airways	B-737	Douala, Cameroon	Climb	114

Loss of Control Major Accidents Commercial Jets 1993 through 2006



Worldwide CFIT, Approach and Landing, and Loss of Control Major Accidents

Western-Built Worldwide Commercial Jet Airplanes



** Reliable Worldwide departure/rate data not available for Eastern-Built Aircraft

Runway



Safety

Participants

- EASA
- CANSO
- IFALPA
- FAA
- LVNL
- Boeing
- DGAC France
- Flight Safety Foundation
- IFATCA
- NLR
- Airbus
- Embraer
- ACI
- IATA
- ERA
- Eurocontrol
- AAPA
- US NTSB
- AEA

Runway Safety Issues

- **Runway Incursions**
- **Runway Excursions**
- **Runway Confusion**

Runway Incursions

- **Part of the new breed of safety challenge**
 - **Not a lot of accidents**
 - **Numerous Incidents**
- **Basic Risk Management:**
Risk = (Probability) X (Severity)

Preliminary Accident Data

1995 – 2006

1,270 Total Accidents

	<u>Number</u>	<u>Percent of Total</u>
Incursions:	10 (.8/year)	.8%
Excursions:	374 (31.2/year)	29.4%
Confusion:	4 (.3/year)	.3%

Preliminary Data

2002 – 2006

(fatal accidents)

512 Total Accidents

(134 fatal accidents/3,944 fatalities)

	<u>Number (Fatalities)</u>	<u>% of Total Acc/% fatal accidents</u> <u>% total fatalities</u>
Incursions:	3 (17)	.6%/3.7%/.4%
Excursions:	13 (283)	2.5%/9.7%/7.1%
Confusion:	1 (49)	.2%/ .7%/1.2%

Runway Safety Products Catalog



Runway Safety Products Catalog

Runway Incursion:

<u>Product Title</u>	<u>Originator</u>	<u>Type Product</u>	<u>Target Audience</u>
1. ICAO Runway Safety Toolkit	ICAO	CD and web	Aircrew, Airports, ATM, Management
2. Runway and Surface Safety	FAA	CD and web	Flight Instructors Pilot Examiners
3. Taxi 101	FAA	CD and web	Maintenance personnel
4. Runway Incursion Prevention Program	FAA, ACI, IATA, PAAST	CD and web	Aircrew, Airports, ATM
5. European Action Plan for the Prevention of Runway Incursions	Eurocontrol et al	CD and web	Aircrews, Airports, ATM Vehicle drivers
6. Runway Incursion Joint Safety Analysis and Implementation Team Reports	FAA (CAST)	CD	Aircrews, Airports, ATM
7. FAA Runway Safety Website	FAA	Web site	Aircrews, ATM, Vehicle Drivers
8. Enhanced Taxiway Centerline	FAA	CD and web	Aircrews, ATM, Airports
9. AOPA Runway Safety Course	FAA, AOPA	Web site	General Aviation Pilots
10. ALPA Runway Safety Course	FAA, ALPA	Web site	Aircrews
11. ACI Airside Safety Handbook	ACI	Handbook	Airports
12. Sporty's Pilot Guide to Runway Safety	Sporty's	CD	General Aviation Pilots

Runway Safety Products Catalog

Runway Excursion

<u>Product Title</u>	<u>Originator</u>	<u>Type Product</u>	<u>Target Audience</u>
1. ALAR Tool Kit	Flight Safety Foundation	CD	Aircrews, ATM, Airports
2. Managing Threats and Errors During Approach and Landing: How to avoid a Runway Overrun	Flight Safety Foundation	Web	Aircrews
3. Takeoff Safety Training Aid	FAA	CD and web	Aircrews

Runway Safety Products Catalog

Runway Confusion: ???????????? (Many Runway Incursion Products may be applicable here)

Aviation Safety 2007

- Overall safety performance for commercial jets remains excellent, but not as good as 2006
- Commercial jet loss of control and Turboprop CFIT accidents dominate the fatality numbers
- Over 50% of all major accidents still happen during approach and landing
- The challenge of reducing the risk in all aspects of runway safety is significant

FSF Goal: Make Aviation Safer by reducing the Risk of an Accident

