

Flight Safety Foundation

The CFIT and ALAR Challenge: Attacking the Killers in Aviation

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NTSB Cargo Safety Forum

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What is the Flight Safety Foundation ??

- **Independent**
- **Non-Profit**
- **International**

Founded in 1947

Goal:

**Make Flying Safer by
Reducing the Risk of
an Accident**

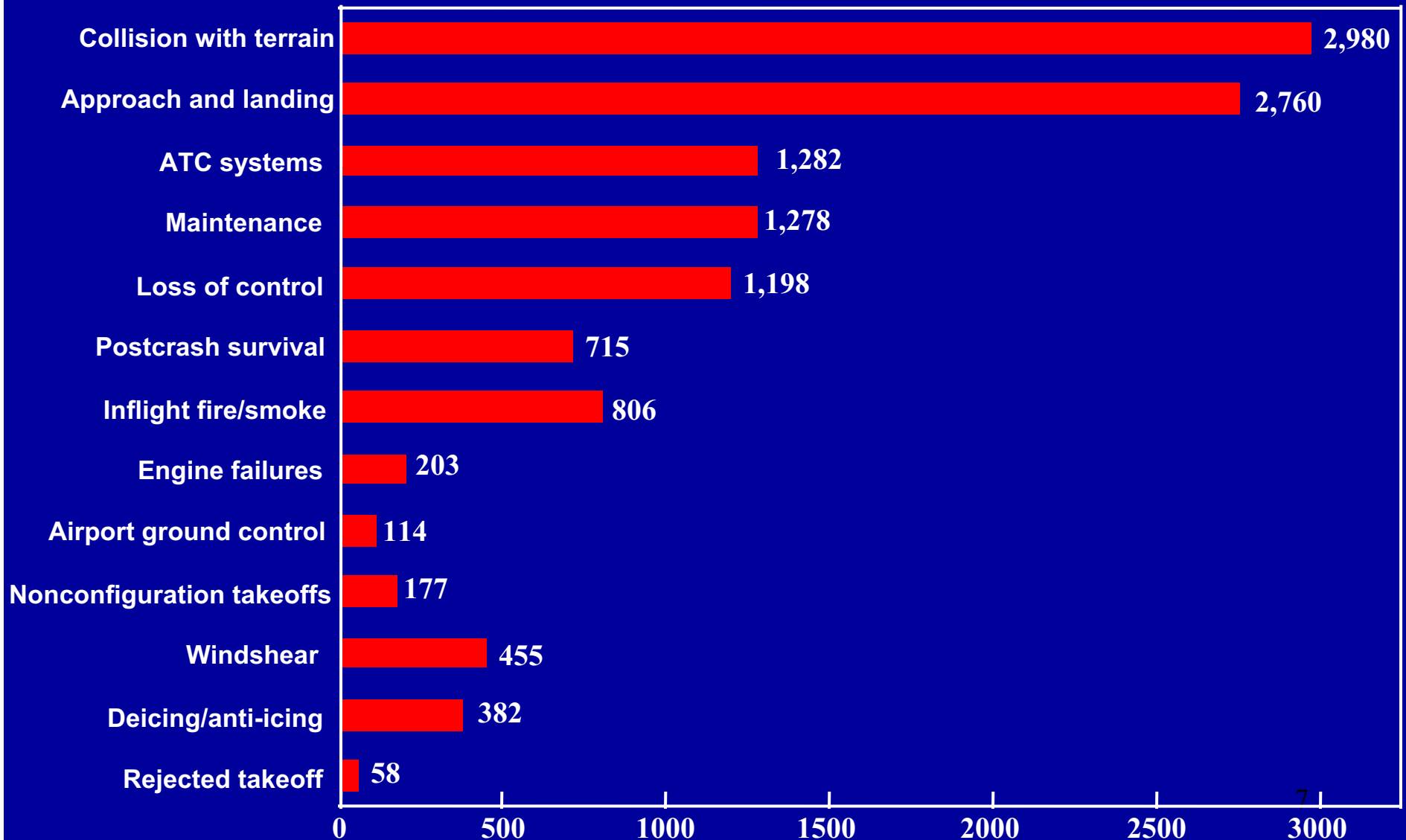
Prime Safety Concerns

- **CFIT**
- **Approach and landing**
- **Loss of control**
- **Human Factors**





Safety Fatality Data - Circa 1992



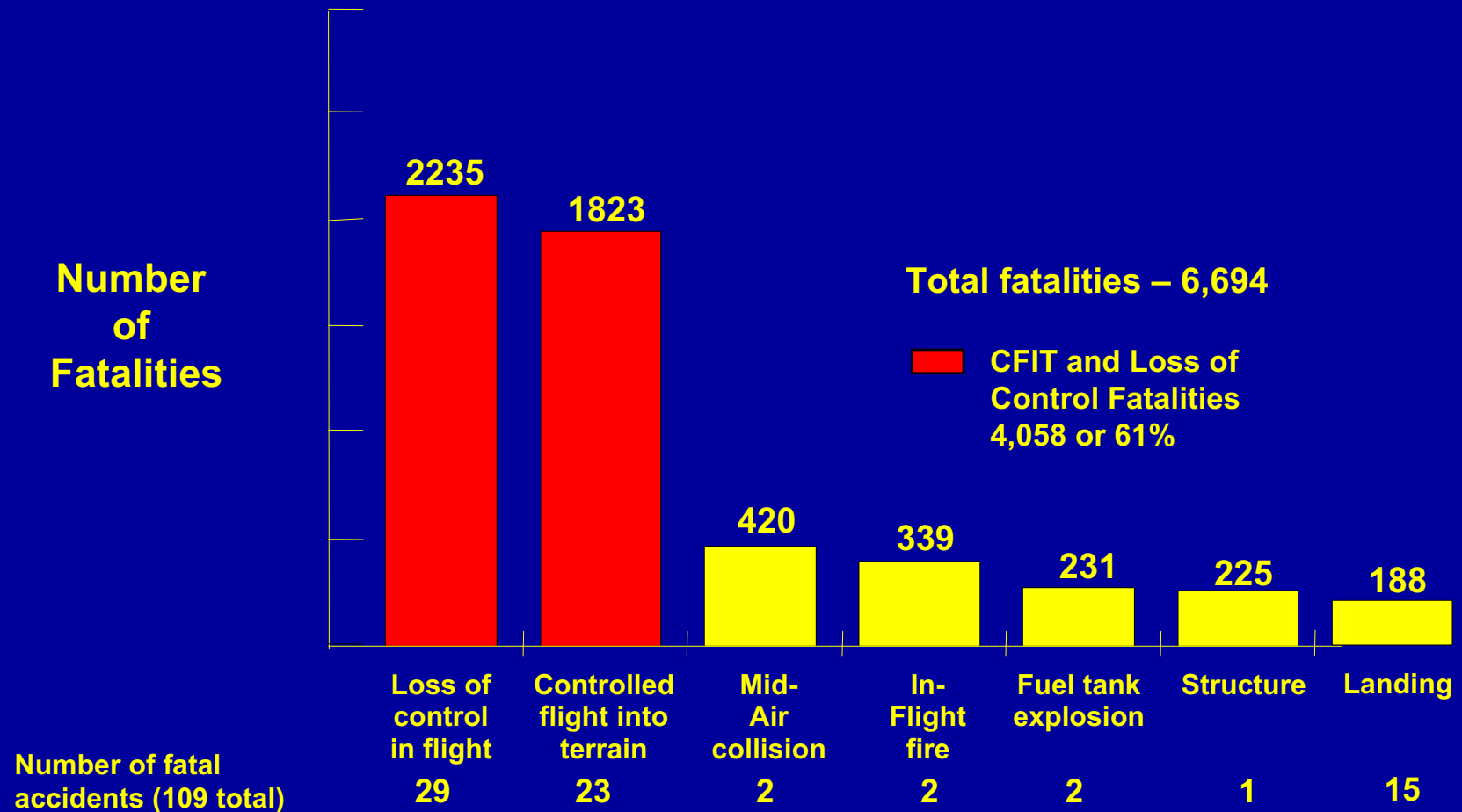




Somehow, Africans get their produce to market

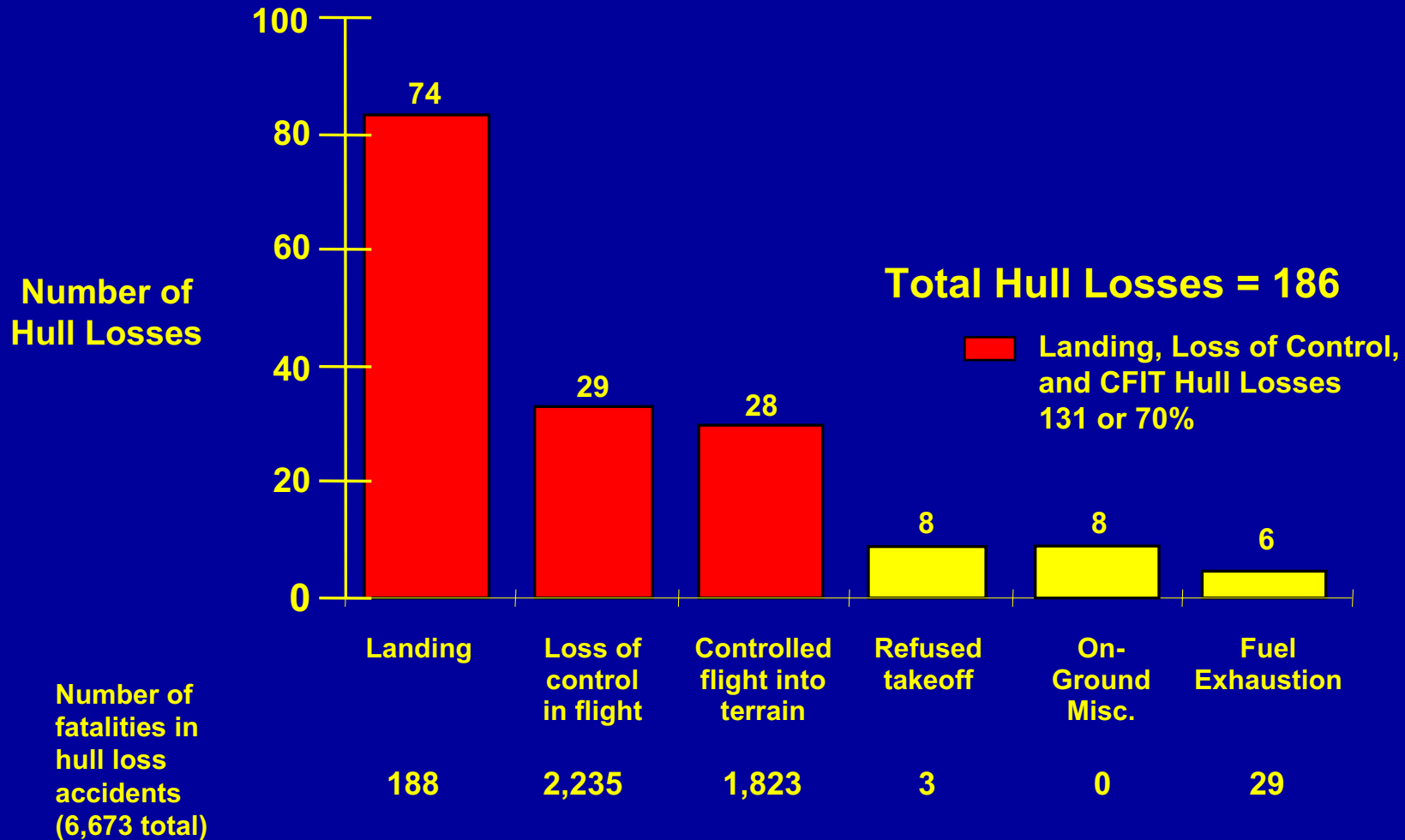
Worldwide Airline Fatalities

Classified by Accident Type 1994 – 2003



Worldwide Airline Hull Loss Accidents

Classified by Accident Type 1994 – 2003



Cargo Hull Loss Accidents

(>60,000 lbs, non-CIS) 2000 – 2003

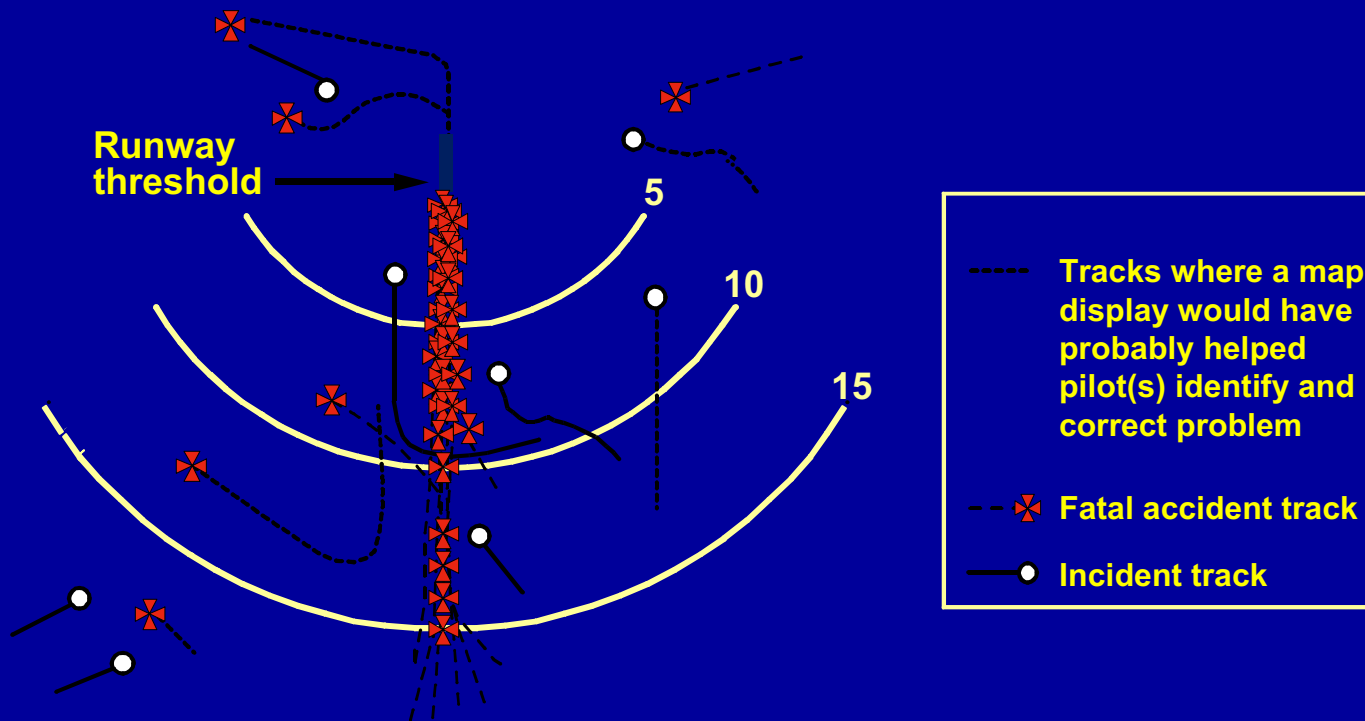
Source: Boeing

Date	Airline	Airplane Type	Accident Location	Total Fatal	Phase of Flight
2/3/2000	Trans Arabian Air Transport	707-	MWANZA, Tanzania	0	Final Approach
2/12/2000	Transafrik Int'l Airlines	727-82	LUANDA, Angola	0	Landing
2/16/2000	Emery Worldwide Airlines	DC-8-71F	SACRAMENTO, USA	3	Initial Climb
4/30/2000	Das Air Cargo	DC-10-30F	ENTEBBE, Uganda	0	Landing
6/26/2000	Yemenia	737-200	KHARTOUM, Sudan	0	Landing
9/21/2000	Republic of Togo	707-300B	NIAMEY, Niger	0	Initial Approach
1/31/2001	Lineas Aereas Suramericanas	Caravelle-10R	EL YOPAL, Colombia	1	Landing
3/7/2001	Skymaster Air Lines	707-300	SAO PAULO, Brazil	0	Landing
3/11/2001	Express One International	727-200	PONAPE, French Polynesia	0	Landing
3/23/2001	Luxor Air	707-300	MONROVIA, Liberia	0	Landing
4/4/2001	Fine Air	DC-8-62F	CALI, Colombia	2	Landing
5/10/2001	Angola Air Charter	727-100	NDJAJZ, Angola	0	Landing
11/27/2001	MK Airlines	747-200F	PORT HARCOURT, Nigeria	3	Landing
4/26/2002	Congo Airlines	707-300C	KINSHASA, Congo	0	Landing
7/1/2002	DHL Airways	757-200PF	UEBERLINGEN, Germany	71	Cruise
7/26/2002	FedEx	727- 200	TALLAHASSEE, USA	0	Final Approach
7/11/2003	Air Memphis	B707-320C	DHAKA, Bangladesh	0	Landing
12/18/2003	Lineas Aereas Suramericanas	DC-9-15F	MITU, Colombia	3	Descent
12/18/2003	FedEx	MD-10-10	MEMPHIS, USA	0	Landing



CFIT ALAs

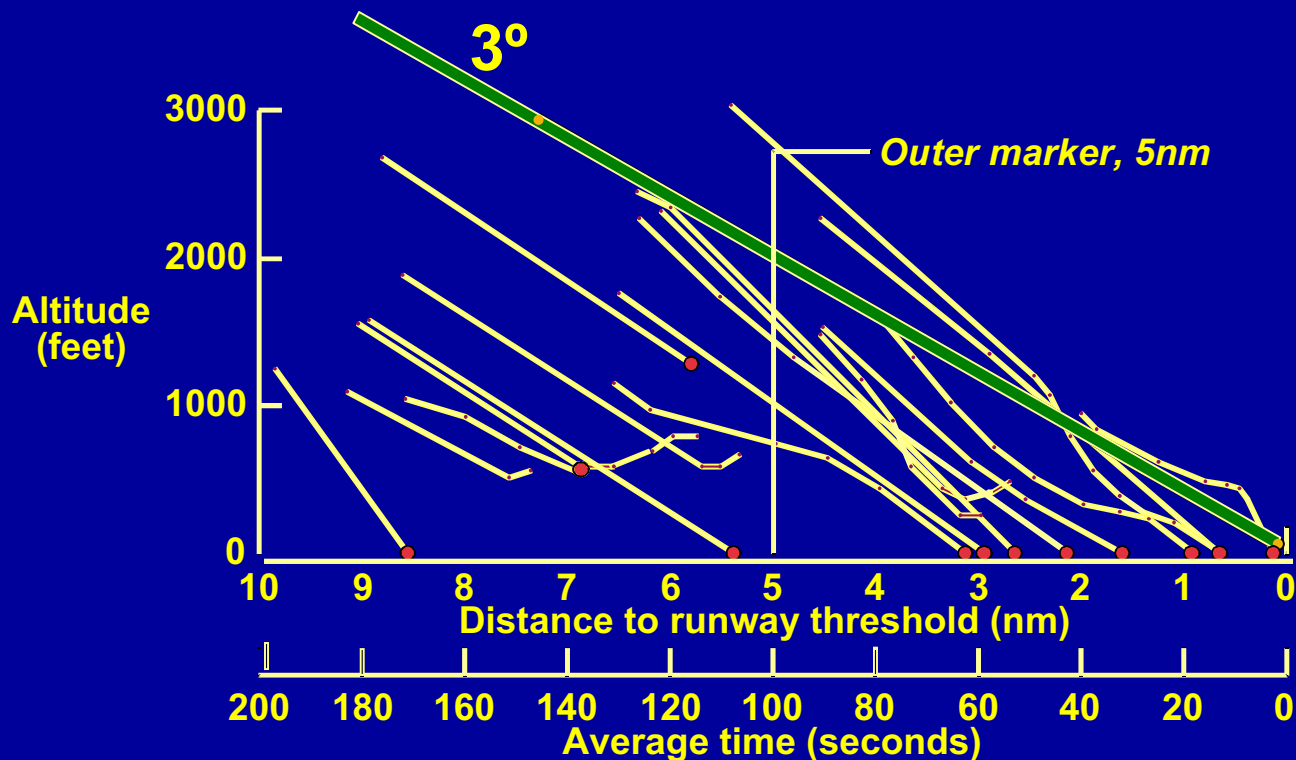
Map location of CFIT accidents/incidents
From runway threshold, 40 accidents/incidents



In most of the CFIT accidents, the airplane was lined up with the runway.

CFIT ALAs

Vertical profile of some CFIT accidents/incidents



There was a lack of vertical situation awareness



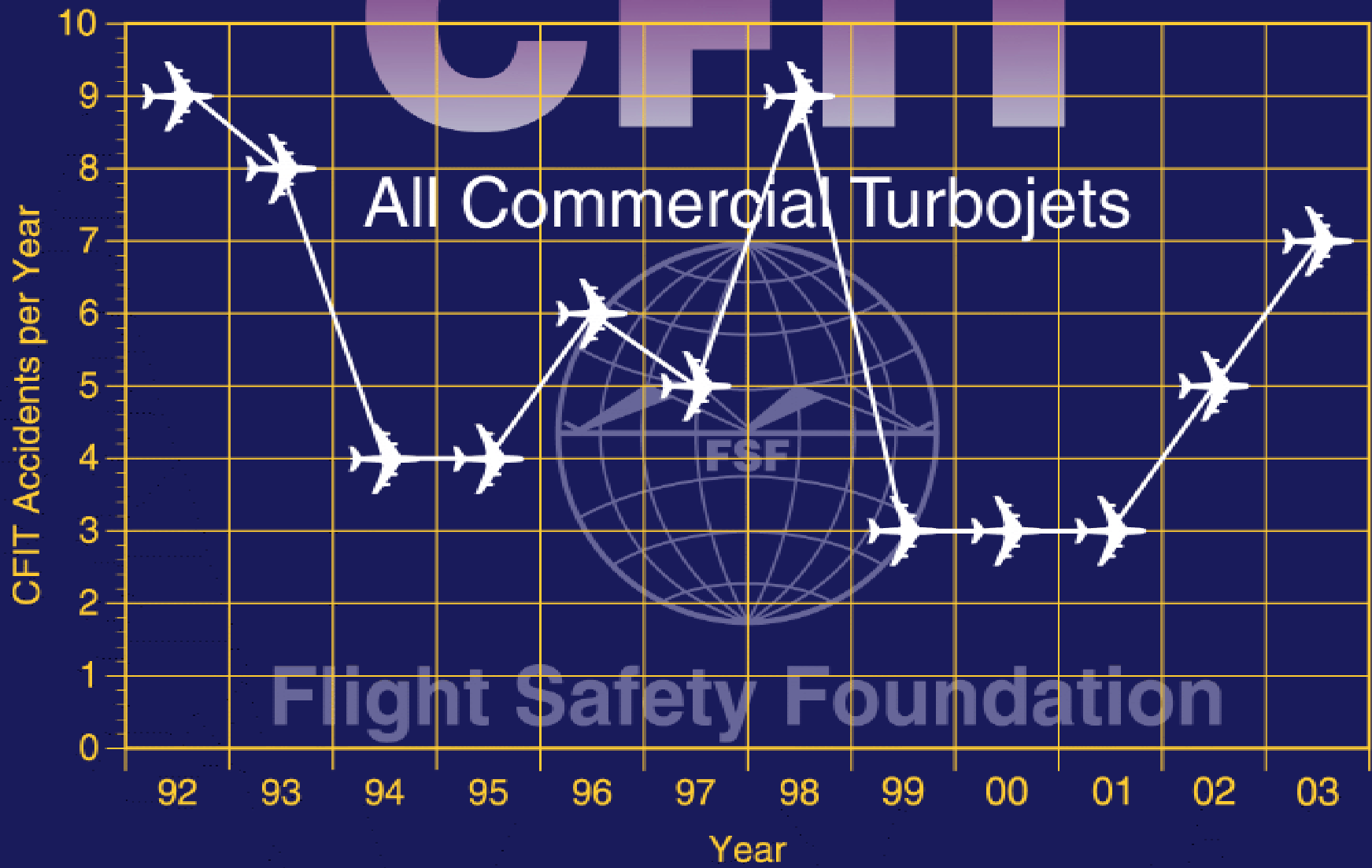
CFIT Products



Over 3000 packages distributed



CFIT



Flight Safety Foundation

CFIT Accidents

**Worldwide Commercial Jets (>60,000 lbs, non-CIS)
25 November 2001 to 1 September 2002**

Date	Operator	Aircraft	Location	Phase of Flight	Total Fatal
25 Nov	Crossair	RJ-100	Zurich, Switzerland	Approach	24
27 Nov	MK Airlines	B747-200F	Port Harcourt, Nigeria	Approach	1
28 Jan	TAME	B727-100	Ipiales, Colombia	Approach	92
15 Apr	Air China	B767-200	Pusan, South Korea	Approach	128
7 May	Egyptair	B737-500	Tunis, Tunisia	Approach	14
26 July	Federal Express	B727-200F	Tallahassee, Fl, USA	Approach	0

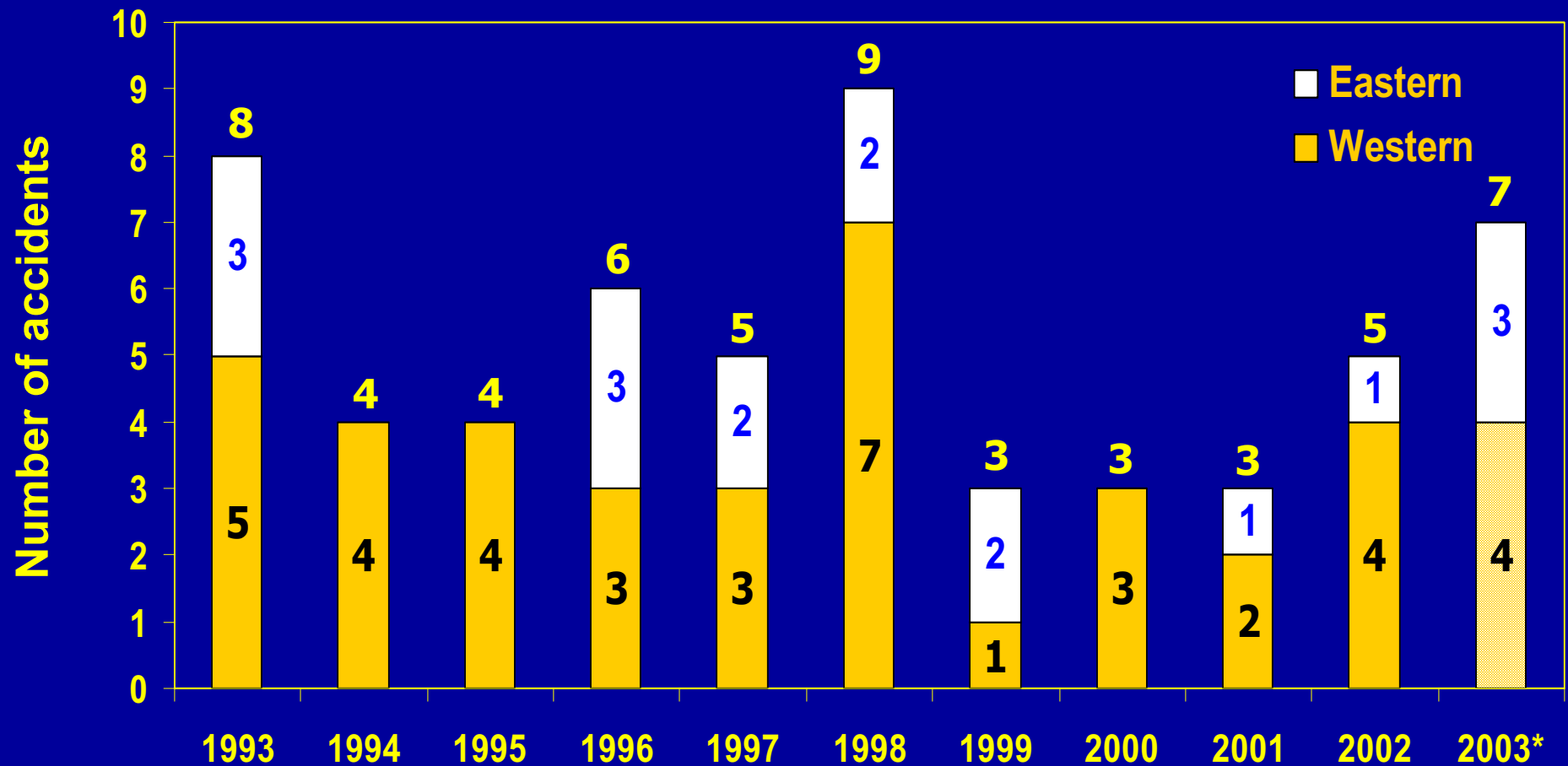
**6 Commercial Jet CFIT Accidents
In 8 Months !**

Controlled Flight into Terrain Hull Loss Accidents Worldwide Commercial Jet Airplanes (> 60,000 lbs) 1 January through 1 October 2003

Date	Operator	Aircraft	Location	Phase of Flight	Total Fatal
8 Jan	Turkish Airlines	Avro RJ100	Diyarbakir, Turkey	Approach	75
8 Jan	TANS	F28	Chachapoyas, Peru	Approach	46
26 Jan	VASP	B737-200	Rio Branco, Brazil	Approach	0
31 Jan	Euro Asia Aviation	IL-76	Baucau, East Timor	Approach	6
19 Feb	Iranian Revolutionary Guard	IL-76	Sirach Mts, Iran	Descent	276
26 May	UM Air	Yak-42D	Nr. Macka, Turkey	Approach	74
22 Jun	Brit Air	CRJ-100	Brest, France	Approach	1

**7 Commercial Jet CFIT Accidents
In 6 Months !**

Controlled Flight into Terrain Hull Loss Accidents Worldwide Commercial Jet Airplanes (> 60,000 lbs) 1993 - 2003



Source: Honeywell (Don Bateman), Boeing, Russian Federation IAC

* As of 24 July 2003







FSF ALAR Report



ALAR Conclusions

- E SOP**
- E Missed Approach**
- E Unstable Approaches**
- E Communications**
- E Environment**
- E Radio Altimeter**
- E Safety Data Monitoring**
- E Information Sharing**

Top 5 ALA Types

- E **CFIT (includes landing short)**
- E **Loss of Control**
- E **Landing overrun**
- E **Runway excursion**
- E **Non-stabilized approach**









Interesting ALA Facts

- **The ALA rate for cargo, ferry, and positioning flights (no pax) is 8 times higher than the rate for pax flights**
- **The accident risk is 5 times greater for commercial aircraft flying a non-precision approach compared with those flying a precision approach**
- **Approach and landing (from outer marker in to landing) comprise 4% of the flight time, yet account for 45% of the hull losses**





Flight Safety Foundation

ALAR

W
WINDOWS



M
MACINTOSH

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Microsoft
PowerPoint



Approach-and-landing Accident Reduction

Tool Kit

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Official Release v. 3.0

Tool Kit Contents

- **34 Briefing Notes**
- **PowerPoint Briefs (with speaker notes)**
- **Videos on ALA and CFIT**
- **Reference Material (over 2,600 pages)**
- **Links to ALA data sites**
- **SOP Template**
- **CFIT and ALA Awareness Checklists**
- **Risk Reduction Guide**



ALAR Regional Team Leaders



ALAR Tool Kit Workshops

<u>Location</u>	<u>Host/Region</u>	<u>Date</u>
Miami	PAAST/Latin America	Nov 2000
Mexico City	MASAir/Latin America	Jun 2001
Bangkok	AAPA/Asia-Pacific	Sept 2001
Nairobi	AFRASCO/Africa	Nov 2001
Johannesburg	SAA/South Africa	Nov 2001
Cairo	ICAO/AACO Middle East	Mar 2002
Reykjavik	Iceland FSF/Icelandair	May 2002
Perth	ASFA/ Australia	Sept 2002
Melbourne	ASFA/Australia	Sept 2002
Beijing	CAAC/China	Sept 2002
Dakar	ASECNA/IATA/ W. Africa	May 2003
Moscow	FSFI/Russia	July 2003
Brussels	Eurocontrol/ERA/Europe	Dec 2003
Dubai	Emirates /Middle East	Feb 2004
Bahrain	Gulf Air/Middle East	Feb 2004

Tool Kit Distribution

• FSF	2,400	• ALPA	100
• Boeing	875	• ICAO	10,000
• Airbus	2,200	• FAA	4,000
• SAAB	60	• IATA	800
• Dassault	400	• Air Safety Australia	150
• Gulfstream	1,000	• Flight Safety Intl	600
• BAE Systems	350	• Friendship Fund	2,500
• Fairchild-Dornier	150	• Bahrain Royal Flight	300
• NBAA	300	• Aer Lingus	450
• Mexican Pilots(ASPA)	1,000	• Emirates	900
• German Airline Pilots	35	• Korean Air	100
		• Gulf Air	550

Total: 29,540



Hull Loss Accidents

Worldwide Commercial Jets (>60,000 lbs)

1 January to 1 December 2003

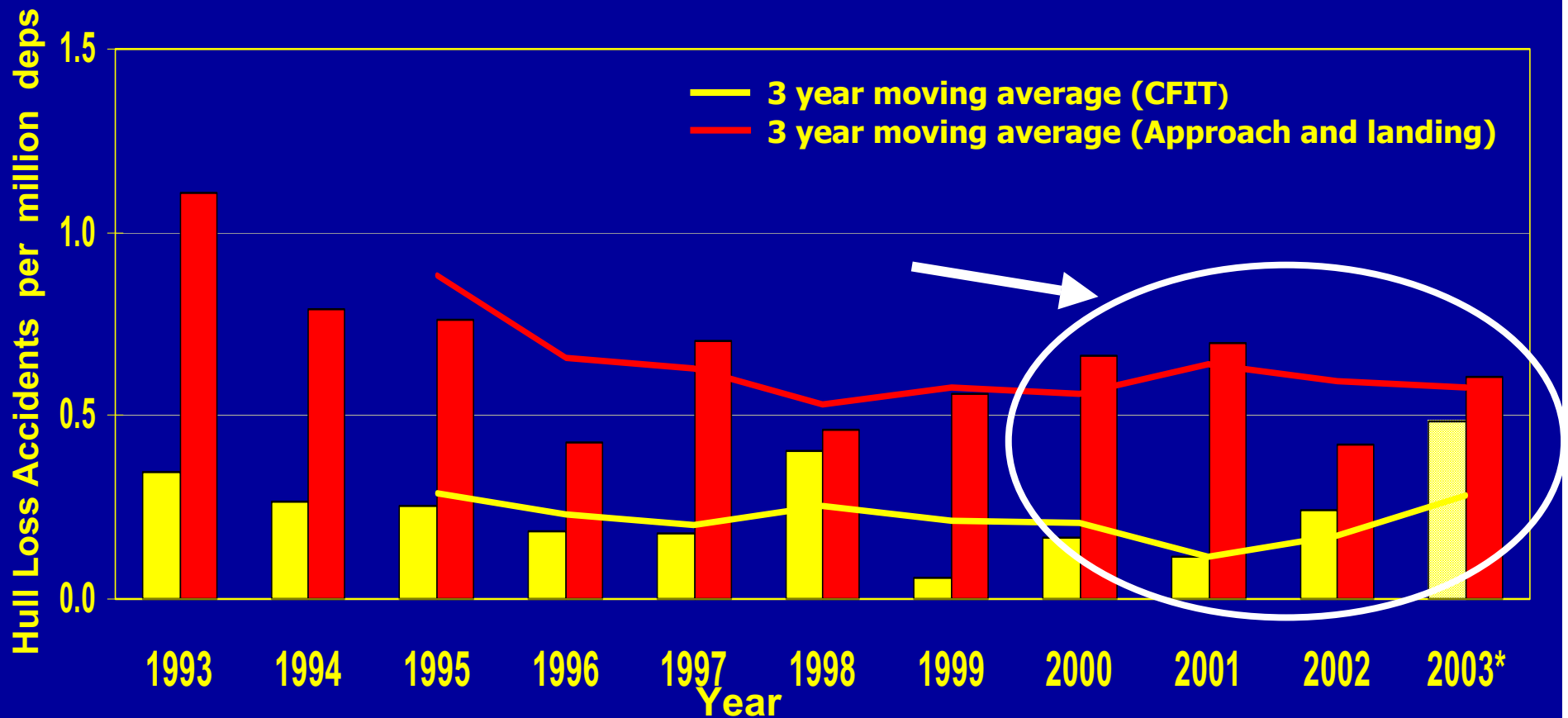
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26 Jan	VASP	B737-200	Rio Branco, Brazil	Approach	0
31 Jan	Euro Asia Aviation	IL-76	Baucau, East Timor	Approach	6
19 Feb	Iranian Revolutionary Guard	IL-76	Sirach Mts, Iran	Descent	276
6 Mar	Air Algerie	B737-200	Tamanrasset, Algeria	Climb	103
18 Apr	Wetrafa Airlift	DC-9	Brazzaville, Congo	Landing	0
26 May	UM Air	Yak-42D	Nr. Macka, Turkey	Approach	75
22 Jun	Brit Air	CRJ-100	Brest, France	Approach	1
8 Jul	Sudan Airways	B737-200	Port Sudan, Sudan	Approach	116
11 Jul	Air Memphis	B707-320C	Dhaka, Bangladesh	Takeoff	0
7 Dec	East African Safari	F28	Lokichoggio, Kenya	Landing	0
18 Dec	FedEx	DC-10	Memphis, USA	Landing	0
18 Dec	LA Suramericans	DC-9	Colombia	Descent	3
19 Dec	Air Gabon	B 737	Libreville, Gabon	Landing	0
25 Dec	UTA	B 727	Cotonou, Benin	Takeoff	140

Source: Boeing, Airclaims

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

Western-Built Worldwide Commercial Jet Airplanes (>60,000 lbs)

■ CFIT accident rate
■ Approach and landing accident rate



Source: Boeing, AvSoft

NOTE: Worldwide departure data not available for Eastern-Built Aircraft



Making Flying Safer By Reducing The Risk of an Accident

