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A CRITICAL REVIEW OF WORLD JET TRANSPORT SAFETY

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# **A Critical Review of World Jet Transport Safety**

by

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## **Abstract**

This thesis is intended to serve as a comprehensive introduction to world jet transport safety and aviation fire safety. Divided into six sections, this thesis contains: 1) a statistical review of overall levels of safety and risk assessment in world jet transportation, 2) a statistical breakdown of jet accidents occurring between 1970 and 1992 by accident type and cause, 3) a case review of major jet accidents involving fire, 4) a review of fire prevention and fire hardening measures in jet transport aircraft, 5) a review of fire management practices in world jet transport aviation, and 6) a comprehensive chronological summary of all world jet transport accidents occurring between 1970 and 1992.

Special emphasis is placed on fire safety, as statistics have shown that both in-flight and post-crash fires are among least survivable of all accident causes and are leaders in total fatalities. Included is an exhaustive review of aviation fire-fighting agents and equipment, as well as design parameters and equipment used for the fire hardening of jet aircraft. Finally, an economic analysis is included to illustrate the economic impact of fire safety measures.

Thesis Supervisor: Robert W. Simpson, Ph.D.  
Title: Professor of Aeronautics and Astronautics  
Director, MIT Flight Transportation Laboratory

# Foreword

This thesis is intended to shed some light on the basics of jet transport and aviation fire safety. It was inspired by two years of experience accumulated while participating in the development, testing, and demonstration of a line of advanced technology fire fighting and spill mitigation agents to local and federal authorities, defense establishments, and industry.

Those wishing to proceed with research in the fire safety field should note that many ideas about fire safety and fire-fighting are based on highly empirical data and personal experiences, generated and passed by word-of-mouth from generation to generation. As a result, it is of paramount importance that the researcher be extremely critical of all information obtained through discussion or communications with seemingly experienced individuals. There is no substitute for seeing test results, and even then, the researcher must be aware of the reasoning behind and conditions of the test.

It is the author's sincere hope that this thesis will serve to remove some of the guesswork for those trying to understand the basics of these areas and will help to provide a foundation for further work.

# Acknowledgments

First and foremost, I wish to acknowledge and extend my deepest gratitude and respect to Professor Robert W. Simpson, Director of the M.I.T. Flight Transportation Laboratory, for his kindness, support, interest, and above all, for his open-mindedness in allowing me to pursue my many areas of interest. I would also like to thank the many excellent professors who offered the support, advice, and instruction from which I have benefited so greatly over the past two years, most notably Professors Arnold Barnett, Peter Belobaba, and Amedeo Odoni. Special thanks to Prof. Dr. -Ing. Gunter Kappler of the Technische Universität München and Prof. Franz Brugelmanns of the von Karman Institute for Fluid Dynamics for their good example and support. Thanks to C. Y. Kimura for his contribution of the underlying data in this thesis.

For their encouragement and support, I wish to thank my many friends and family, both at and outside M.I.T. Very special thanks to Alina Fyros and family, Rudi and Nini Kagerer, Sonny, and Gunter for their love, warmth, and good humor in times of happiness and support in times of need.

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# **Chapter 1:**

## **Introduction**

### **1.1 Safety in World Jet Transportation**

Despite their seldom occurrence, aircraft accidents command a tremendous amount of notoriety, especially when the accidents involve fire. As a result, a significant effort is made by the aviation industry to reduce the risks associated with jet air transport. This thesis is intended to consider these safety measures, trends in their development, and to analyze their appropriateness and adequacy in light of commercial aviation's safety record since 1970. Further to this goal is the desire to identify weaknesses and insufficiencies in current research programs, so that such efforts may be redirected, yielding an overall improvement in commercial aviation safety.

### **1.2 Current Levels of Safety in World Jet Transportation and the Assessment of Risk**

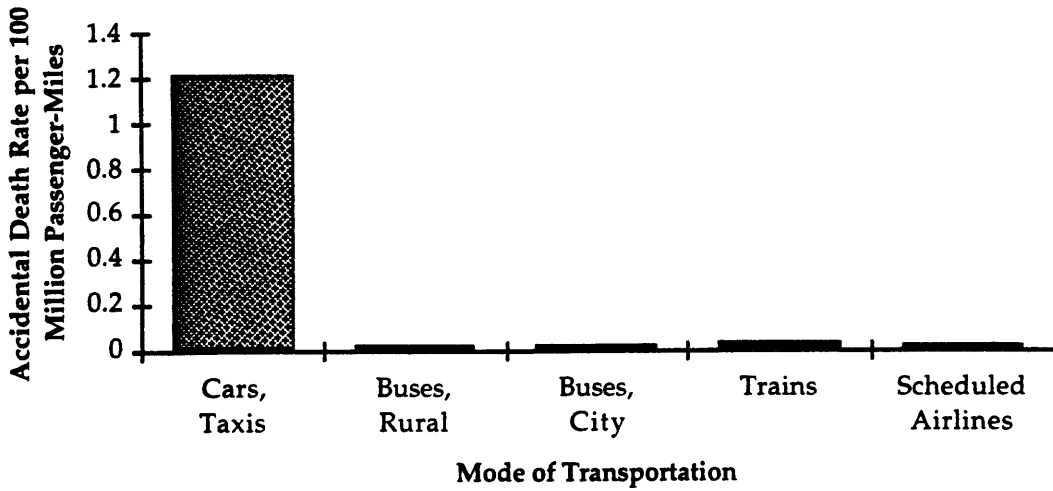
Aviation accidents tend to receive a disproportionate amount of notoriety resulting from their spectacular nature, as compared to their frequency of occurrence. In fact, one may contend that such attention is hardly appropriate considering that jet transport is far safer than most other common modes of transportation. Korenromp [1] has correlated the relative danger of several common human activities, as assessed in the Netherlands, and has shown that flying is substantially safer than driving an automobile,

when taken with respect to the number of casualties per hour of exposure. The results of this analysis are seen in Table 1.1.

**Table 1.1: The Danger of Several Common Transportation Activities [1]**

<b>Activity</b>	<b>Casualties Per 100 Million Hours of Exposure</b>
Public Transportation	10
Walking	30
Bicycling	30
<b>Civil Aviation</b>	<b>55</b>
Driving an automobile	65
Driving a moped	250
Driving a motorcycle	1400
Flying light aircraft	1300
Flying gliders	3000
Average lifetime fatal accident risk <sup>1</sup>	4
<sup>1</sup> Based on 75 year (650,000 hour) average human expected life span.	

Similarly, Figure 1.1 [2] compares accidental death rates for various forms of transportation. In both cases it is readily apparent that the risk of accidental death on a civil aircraft is extremely minute. Table 1.2. shows estimates for the risk of accidental death per passenger boarding for both U.S. domestic air carriers and first-world flag carriers during two adjacent time periods [3].



**Figure 1.1: Accidental Death Rate per 100 Million Passenger Miles by Mode of Transportation, United States, 1989-1992 [2]**

**Table 1.2: The Risk of Accidental Death per Flight for Two Groups of Airlines during Two Adjacent Time Intervals [3]**

Airline Group	Risk of Death per Flight	
	1977-86	1986-89
U. S. domestic jet carriers	1 in 6.8 million	1 in 9.2 million
First-world flag carriers	1 in 4.5 million	1 in 4.0 million
Combined Risk <sup>1</sup>	1 in 6.1 million	1 in 7.3 million

<sup>1</sup>The risk levels for the combined group are weighted averages of the two risk levels for the corresponding period. In accordance with their relative number of flights, the weighting factor is 0.8 for domestic jet airlines and 0.2 for first-world flag carriers.

To further substantiate the fact that a high degree of safety prevails in jet transportation, it is necessary to consider the degree of third party risk involved in aircraft operations. Here, third party risk refers to the potential for injury to individuals not being transported as a result of an aircraft accident. For example, third party risk comes into play when a crashing

aircraft, or parts thereof, impinge on a house, automobile, or bystander, thereby causing injury or death to occupants or inhabitants, as occurred in Lockerbie, Scotland in on December 21, 1988 and near Amsterdam on October 4, 1992. Third party risk is generally measured in annual fatalities. Estimated values for airports include 0.4 fatalities per annum for Los Angeles International Airport and 0.2 for nearby Burbank Airport, respectively [2].

Though airline safety far exceeds many other forms of transportation, airline accidents are generally of a spectacular nature, therefore making them prime candidates for exhaustive coverage by the press. Barnett [3] has correlated the amount of media coverage given to a number of important sources of mortality risk and has concluded that accidents involving commercial aircraft command nearly 65 times the coverage per thousand deaths than AIDS, a highly important and controversial topic, and nearly 650 times that of cancer. The results of this investigation are seen in Table 1.3.

**Table 1.3: Number of Headline Stories per Thousand U.S. Deaths for Six Sources of Mortality Risk, *New York Times* 10/01/88 - 09/30/89 [3]**

<b>Risk Source</b>	<b>Number of Stories</b>	<b>Stories per Thousand U.S. Deaths</b>
Cancer	7	0.02
Suicide	1	0.03
Automobiles*	4	0.08
Homicide	35	1.70
AIDS*	35	2.30
<b>Commercial Jets<sup>1</sup></b>	<b>51</b>	<b>138.20</b>

<sup>1</sup>Only those headline stories about cars and jets that pertained directly to mortality risk were correlated for this investigation.

Though it has been shown that flying is no more dangerous, and in many cases even safer, than many other activities, there are a number of reasons why improvement of aviation safety is a worthy pursuit. First, as aircraft become larger and air transport operations expand, there is a tendency for mishaps to occur on an extremely large scale. Though the crash of Pan American Flight 103 over Lockerbie was an isolated incident (as compared to the number of automobile accidents occurring in the whole of Scotland on the same day, for instance) it did result in the instantaneous death of 259 air travelers in the aircraft and 15 innocent bystanders on the ground. Second, considering the fact that airline passengers are not in control of their destinies in that they do not control their aircraft as they would their own automobiles adds a certain aura of innocence and helplessness to the victims' plights. Third, from an economic point of view, aviation accidents may have a strong monetary bearing owing to their negative effect on tourism due to fear of flying and reduced customer faith in the safety standards of a [national] air carrier, not to mention the direct costs associated with equipment loss, the cost of retrofitting programs to augment safety, and the settling of legal claims associated with personal and material loss. Based on these considerations, accidents of this magnitude and nature deserve and require special attention.



## **Chapter 2:**

### **Accidents in World Jet Transportation: 1970-1992**

#### **2.1 World Jet Transportation Safety Statistics**

Before identifying weaknesses in aviation safety efforts, it is first necessary to isolate risk factors in the transportation process. This may be done by reviewing jet transport accidents and safety statistics available from a number of sources. These sources include the U. S. National Transportation Safety Board (NTSB) [4], the U. S. Department of Energy (DOE) [5], U. S. Federal Aviation Administration (FAA) [6], the Boeing Aircraft Company (Boeing) [7], Flight Safety International Foundation [8], FLIGHT International Magazine [9], the Civil Aviation Authority of Great Britain (CAA) [10], and in some cases where fire is evident, the U. S. National Fire Protection Association (NFPA) [11]. General access to some of these resources is available through the Flight Safety Foundation in Arlington, Virginia. Information from these sources tends to include listings for accidents involving both general aviation and civil air transport aircraft dating as far back as 1946. The listings are generally made chronologically, by phase of flight, or by aircraft type. A recent work (1992) prepared under the auspices of the DOE by C. Y. Kimura [5] at the Lawrence Livermore National Laboratory (LLNL) has made a successful attempt to create a single comprehensive document incorporating and/organizing the data available on all civil aircraft accidents from the other sources mentioned as well as manufacturers records. This document has the advantage of accounting for international listings,

including accidents occurring in the former Soviet Union. In addition to jet transport accidents, Kimura's work contains listings of accidents involving all civil aircraft, e.g. 2-, 3-, and 4-engined pistonprops; and 2-, 3-, and 4-engined turboprops. Accidents are broken down chronologically, by phase of flight, aircraft type, and in a limited number of cases, by cause of accident. Kimura also supplies information related to aircraft manufacture and distribution. This work is updated continually and a third edition is currently being prepared.

## **2.2 Classification of Accidents and Risk in World Jet Transportation**

### **2.2.1 Accidents versus Incidents**

An aircraft in flight, like a submerged submarine, operates in a hostile environment, but as long as the aircraft remains intact and functions properly, and the conditions of the surrounding environment are not too severe, it will function safely. Deviations from safe operations may be classified either as accidents or incidents. In short, the NTSB and FAA define incidents and accidents in US NTSB Part 830 as follows [12]:

*“Aircraft accident’ means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage... where ‘serious injury’ means an injury which: (1) requires hospitalization..., (2) results in a bone fracture..., (3) causes severe hemorrhages..., (4) involves any internal organ..., (5) involves second or third degree burns or burns covering 5 percent of the body surface. ‘Substantial damage’ means damage which adversely affects the structural strength,*

*performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine damage [if only one] and bent props..., small holes and dents in the aircraft skin..., damage to wingtips, flaps, spoilers, etc..., and damage to landing gear and brakes are not considered substantial damage...”*

Incidents are defined as being occurrences where damage exists but is not considered “substantial” and related injuries are not considered “serious”, as defined above. One notes that the use of “major repair or replacement” in this definition does allow room for interpretation. This fact may be used by the FAA/NTSB depending on to what end a case is being investigated. In other words, federal investigators do have some latitude as to whether an aircraft accident is defined as such. For the purpose of this paper, the prerequisites for an accident are the loss of human life and/or loss of an aircraft. Here, loss of an aircraft can mean either total destruction or major damage leading to the aircraft being written-off as a loss by owners or insurers.

### **2.2.2 Defining Scope of Operations and Aircraft Class**

Accident reports and summaries are compiled by scope of operations or by the type of operator and are usually linked in some way to aircraft type or class. The different scopes of operation include jet transport operations, commercial operations (scheduled, non-scheduled, and charter), private operations, and military operations. Aircraft class definitions include 2-, 3-, and 4-engined jets; 2-, 3-, and 4-engined turboprops; 2-, 3-, and 4-engined pistonprops; business jets; and general aviation aircraft and are the basis for this thesis.

In general, jet transport operation comprises all non-piston and non-turboprop jet-powered operations, including business jets and, in some cases, military jets. Commercial jet operations usually include all non-piston and non-turboprop jet-powered operations, excluding business jets and military aircraft. The degree to which scheduled, non-scheduled, and charter services are covered depends on the scope of the specific report in question. Boeing accident reports are based on all aspects of commercial operations, including statistics by aircraft manufacturer. Contrary to most other sources, Boeing does not publish a database, only statistical summaries. For access to a specific data base, or information pertaining to specific scopes of accidents or incidents, it is necessary to turn to state sponsored agencies and/organizations. In the U. S. accidents are officially filed by the NTSB. Incidents, on the other hand, are filed with the FAA, though the FAA does also make some accident information available, depending on the circumstances.

For this report, only accident statistics will be considered and are based on the accident database published by the DOE [5].

### **2.2.3 Accidents by Stage of Flight**

Aircraft accidents are often classified by the stage of flight during which they occur. If we follow Kimura, there are 7 distinct phases of flight: Ground (G), Taxi, Take-Off (TO), Climb (C), "Cruise" or "En-Route" (ER), Landing Approach (LA), and Landing (L). Using this standard flight phase breakdown (G, Taxi, TO, C, ER, LA, and L) , the separate phases may be defined as follows:

Ground (G) - Accidents which occur on the ground before push-back or when the aircraft is not taxiing are referred to as ground accidents.

Taxi - Taxiing is defined as the period between push-back and commencement of the take-off roll or from the end of the landing roll until the aircraft reaches a parked position. Any other movement on the airport surface may also be considered as taxiing.

Take-Off (TO) - Take-off is defined as the period between the start of the take-off roll and the moment that the aircraft lifts off from the ground. Take-off typically accounts for approximately 1% of total block time.

Climb (C) - Climb follows take-off and ends when the initial cruising altitude is reached. Climb typically accounts for circa 14% of total block time.

En-Route (ER or Cruise) - This phase of flight comprises the period between achievement of initial cruising altitude and descent from final cruising altitude. The ER phase of flight typically accounts for about 60% of total block time.

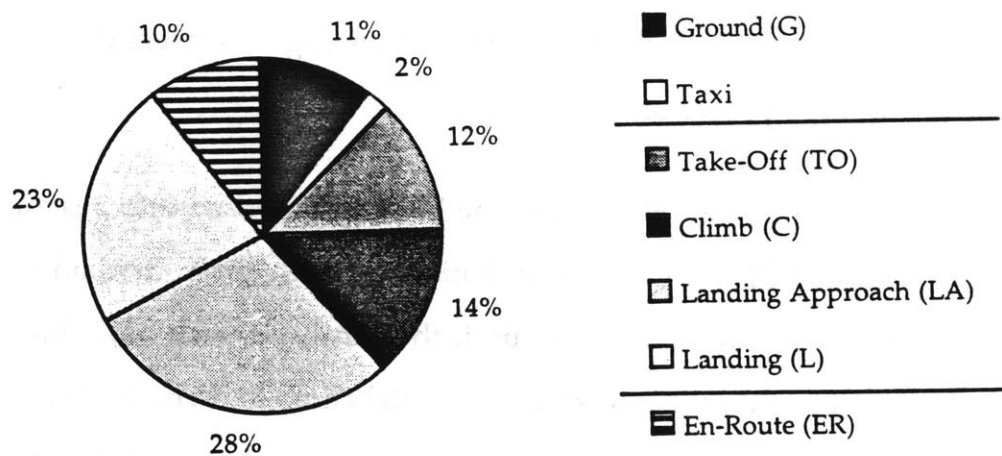
Landing Approach (LA or App.) - Landing approach covers the interval between departure from the final cruising altitude and the moment the aircraft touches the runway. Landing approach usually accounts for about 24% of total block time.

Landing (L) - The phase of flight between first runway contact and the end of roll-out. Similar to take-off, landing accounts for approximately 1% of total block time.

It should be mentioned that some ambiguity exists in the commonly used flight-phase breakdown listed above. More specifically, the various phases of lift-off and climb-out, as well as descent, initial-, and final approach are combined into two categories: Climb (C) and Landing Approach (LA), respectively. This becomes a problem when attempting to evaluate the proximity of an aircraft to the ground during an accident. For example, the LA designation could be used to classify the phase of flight for an accident occurring at Top-of-Descent (TOD) at 10,000 m/33,000 ft. with the same correctness as an aircraft that simply undershot the runway by a few hundred meters and crashed. Similarly, an accident involving an aircraft striking power lines immediately after take-off would be classified in the same way as another aircraft developing a decompression problem at the Top-of-Climb (TOC). This ambiguity may be attributable, in part, to the fact that execution of the various phases of climb and descent are highly subject to aircraft type and operational procedures.

Boeing, for example, breaks the landing approach into 3 segments: descent (from TOD until first aid), initial approach (from first aid until ILS acquisition), and final approach (until the runway threshold). Similarly, climb is broken into the two stages of initial climb and climb. Initial climb ends when the flaps are retracted and climb ends when cruising altitude is reached. For the purpose of this paper, Kimura's [5] classifications have been used.

Figure 2.1 gives a breakdown of world jet transport accidents occurring from 1970 through 1992 based on phase of flight [5]. During each of the segments of flight, there are a number of causes which may lead to eventual loss of life or aircraft damage. Included in the list of possible accident causes are weather, fire, collision with foreign objects, mechanical or electrical failure, structural failure, and human error, to name a few, most of which can occur in any of the 7 flight phases. It is interesting to note that 77% of all accidents occur during the critical phases of starting and ending a flight, i.e. take-off, climb, landing approach, and landing. Astonishingly, more accidents occur while aircraft are parked or taxiing on the ground (13% of total) than do while aircraft are en-route (10% of total). Further, twice as many accidents occur on landing compared to take-off (only 12% of all accidents occurred during take-off in comparison with 23% during landings). Appendix B gives a chronological listing of all jet transport accidents occurring between 1970 and 1992. Appendix C features these accidents sorted by phase of flight.



**Figure 2.1: Breakdown by Flight Phase of World Jet Transport Accidents 1970 - 1992 [5]**

#### 2.2.4 Accident Types

To aid analysis, aircraft accidents may be identified as being of two generic types: those occurring in free flight and those occurring close to the earth. While accidents occurring during the climb, cruise, and descent segments of flight generally comprise free-flight accidents, accidents occurring during take-off, initial climb-out, final approach, and landing may generally be referred to as "near-ground" accidents (i.e. occurring in proximity of the ground). In addition, accidents in both groups may further be defined as being in the presence or absence of fire. It is important to note that post-crash fires, as opposed to in-flight fires are not defined as a separate, generic type of aircraft accident, since they appear in the aftermath of the crash, which is due to other factors. Fire, however, can be a cause of fatalities to individuals who have survived the crash. The list of generic jet transport accident types is seen in Table 2.1.

What follows is an attempt to break down aircraft accidents occurring from 1970 through 1992 according to the basic types established in Table 2.1. The data for this analysis is based on DOE statistics prepared for the assessment of the third party risk of nuclear power plants with respect to aircraft accidents [6] and FLIGHT Magazine Annual Safety Reports [9]. In the statistics that follow, "total passengers" counts both passengers and crew. "Total fatalities" accounts for passengers, crew, and third party deaths. Further, the accident statistics issued by the NTSB count only those fatalities which occur within 7 days of the accidents. Those statistics used below consider all fatalities attributable to an accident, regardless of how long after the accident they occurred. (See Appendices for accident listings).



**Table 2.1: Generic Jet Transport Accident Types**

<b>Accident Type</b>	<b>Comments</b>
Bird-Strikes	→ Structural damage, engine failure, etc.
Collision: Mid-Air	→ Collision with another airborne object; mid-air collisions
Collision: CFIT	→ Collision with man-made or natural obstacles; controlled flight into terrain (CFIT)
Dangerous Weather	→ Fog, icing, lightning, wind shear, etc.
Decompression	→ Equipment malfunction, structural failure, etc.
Ditching	→ Equipment failure, fuel exhaustion
Failed Take-Off or Landing	→ Crew error, foreign object ingestion, etc.
Fuel Exhaustion	→ Ditching, ground impact
Ground Stationary Accidents	→ Hangar fires, stationary fires
Ground Taxiing Accidents	→ Crew error, ground traffic control error, etc.
In-Flight Explosion	→ Terrorism, missile strike, fire, etc.
In-Flight Fire	→ Engine, electrical, waste fires, etc.
Major Mechanical Failure	→ Avionics failure, engine failure, control failure, structural failure, etc.
Post-Crash Fire <sup>1</sup>	
Wake-Vortex Upset	→ Insufficient aircraft separation
<sup>1</sup> Usually occurs as a result of some other generic accident cause.	

### **2.3 Bird Strikes**

Bird strikes pose a major problem for large and small aircraft alike, not only during take-off, but during initial climb and final descent (or landing approach), as well. It is for this reason that the topic of bird-strikes warrants special attention. Bird flocks as well as single birds can impart serious damage on an aircraft breaking cockpit glass, bending propeller, fan, or compressor blades, or plugging cooling ports on engine cowlings, thereby robbing an

aircraft of control or precious climb power. As a result, major efforts have been placed on the ability to reduce their number of occurrence by relocating bird populations from airport and other critical areas using a number of techniques and by hardening windscreens, engines, and other critical structures to better survive the eventuality of a bird strike. Engine manufacturers are required to test their components' performance during birdstrikes. Despite these efforts, accidents due to birdstrikes have been occurring on the average of 0.34 per year, and have claimed 7 aircraft and 49 (17.3%) of 282 passengers between 1970 and 1992. Details of some recent accidents are seen in Table 2.2.

**Table 2.2: Four Major World Jet Transport Accidents Involving Bird Strikes 1970 - 1992 [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>1</sup>
09/15/88	Ethiopian AL	B737-260A	Bahar Dar, ETH	105	35
04/07/81	Private AC	Learjet 23	CIN, USA	2	1
06/14/75	H.S.A.C.	HS 123-600	Dunsfold, GBR	9	6
02/26/73	M.B.C.	Learjet 24	ATL, USA	7	7
Total				123	49
<sup>1</sup> Includes third party deaths.					

## 2.4 Collisions

### 2.4.1 Mid-Air Collisions

Though rare, mid-air collisions generally have catastrophic consequences. Of the 926 accidents involving jet transport aircraft that

occurred world-wide between 1970 and 1992, only 13 were classified by the DOE as mid-air collisions, which represents a mere 1.4% of all accidents during that period. However, 721 (68.9%) of the 1,047 passengers involved in these accidents were killed and 21 (80.7%) of the 26 involved aircraft were classified as destroyed. Mid-air collisions for jet aircraft have been occurring on the average of about 0.55 per year since 1970. All of the accidents listed were attributed to air traffic control error and, in some cases, pilot error as well. All cases occurred while the aircraft were in the climb, en-route, or landing approach segments of flight. The five most recent major accidents of this nature are seen in Table 2.3. The collision of the Pacific South West Airlines (PSA) B727-214 and a privately operated Cessna 172 on September 28, 1978 is of particular interest, as this accident was influential in hastening the deployment of the on-board Threat Alert and Collision Avoidance System (TCAS) which is intended to help prevent mid-air collisions by giving pilots warning of nearby aircraft based on transponder emissions. This system became required avionics for jet transport aircraft in the United States on January 1, 1994. See Appendix D for a complete listing of mid-air collisions.

**Table 2.3: Six Major World Jet Transport Accidents Involving Mid-Air Collisions 1970-1992<sup>1</sup> [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>2</sup>
08/23/86	AeroMexico	DC-9-32 <sup>3</sup>	El Cerritos	64	79
	Private AC	Piper 28 <sup>3</sup>	CA, USA	3	3
02/17/79	TMA	B707-321C	Taiwan	5	0
	Taiwan AF	F-5 <sup>3</sup>		1	1
09/28/78	P.S.A.	B727-214	San Diego	135	148
	Private AC	Cessna 172	CA, USA	2	2
09/10/76	Bresh AW	HS 121-36 <sup>3</sup>	Zagreb, YUG	63	63
	Inex Adna	DC-9-31 <sup>3</sup>		113	113
03/18/76	Cubana	DC-8-43	Havana, CUB	29	0
	Cubana	An-24V <sup>3</sup>		5	5
03/05/73	Iberia	DC-9-32 <sup>3</sup>	Nantes, FRA	68	68
	Spantax	CV 990-30A		108	0
Total				596	482
<sup>1</sup> Aeroflot aircraft not classified as civil aircraft in this analysis. <sup>2</sup> Includes third party deaths. <sup>3</sup> Aircraft destroyed as a result of the accident.					

#### 2.4.2 Collision with Man-Made Obstacles and Controlled Flight Into Terrain (CFIT)

Collision with man-made objects or natural obstacles is by far the greatest contributor to human and aircraft loss, mainly resulting from the fact that all climb and landing approach accidents usually fall into this category. An aircraft's close proximity to the ground during these phases of flight drastically reduces any margin for error, and the ultimate cause of death and/or aircraft destruction is usually ground impact and subsequent post-crash fire.

Collision with high ground, high buildings, antennae, and power lines, as well as over- and under-shooting approaches, mechanical failure, instrument failure, ILS failure, and crew error comprise some of the factors contributing to the long list of ground/object collision accidents throughout the analysis period. When considering CFIT, it is also necessary to distinguish cases where an en-route aircraft collides with an exceptionally high land mass (e.g. Himalayas, Andes, Rocky Mountains) as a result of unplanned altitude loss, navigational error, or some other misfortune. It is to be noted that the causes enumerated above overlap strongly with those mentioned later in Section 2.8 (Failed Take-Off's and Landings). This is attributable the fact that the success of take-off and climb, and landing approach and landing, respectively, are inseparably linked. In other words, a faulty approach may very well lead to a failed landing. Further, collision with a man-made object during final approach, for example, qualifies as both a CFIT and a failed landing.

Reviewing the data, one sees that 362 accidents fell into this category, claiming 13,931 (67.4%) lives and 334 (92.2%) aircraft. Based on the 20,651 passengers involved in these accidents, the survivability could be determined as 32.5%. Of the 362 accidents, 114 (31.4%) took place during climb.

## **2.5 Dangerous Weather**

Dangerous weather phenomena comprises clear air turbulence (CAT), fog, hail, icing conditions, lightning, thunderstorms, wind shear, etc. Between 1970 and 1992, bad weather was cited as a major contributor to the loss of over 84 aircraft in 101 accidents, which represents 10.9% of all accidents

during that period, where weather related accidents occurred at an average rate of 4.4 per year. As a result of these accidents 3,851 (42.5%) passengers, crew members, and third party members were killed. Seven of the more notable accidents are seen in Table 2.4.

Though typically incapable of causing major structural failure in aircraft, CAT does have the ability to cause drastic velocity changes at cruise, where accelerations of 0.5g or more have been noted. As a result, there is a need to minimize the number of loose objects within the fuselage, such as carry-on baggage and passengers to prevent injury to travelers. Here, it is important to provide prompt warning to passengers of such occurrences so that they may assume safe, seated positions in order to minimize injury.

**Table 2.4: Seven Major Weather-Related World Jet Transport Accidents 1970-1992<sup>1</sup> [5]**

Date	Operator	Aircraft <sup>1</sup>	Location	Total Pax	Total Fatalities <sup>2</sup>
12/20/92	Martinair	DC-10-30	Faro, POR <sup>3</sup>	340	54
07/31/92	Thai Int'l	A310-304	Katmandu, NEP <sup>3</sup>	113	113
03/22/92	US Air	F28-4000	LGA, USA <sup>4</sup>	51	27
03/03/91	United AL	B737-291	COS, USA <sup>3</sup>	25	25
08/02/85	Delta AL	L1011-385	DFW, USA <sup>5</sup>	135	63
07/09/82	Pan Am	B727-235	MSY, USA <sup>5</sup>	145	153
01/13/79	Air Florida	B737-222	DCA, USA <sup>4</sup>	79	78
<b>Total</b>				<b>888</b>	<b>513</b>
<sup>1</sup> Aircraft destroyed as a result of the accident. <sup>2</sup> Includes third party deaths. <sup>3</sup> Accidental cause: wind shear. <sup>4</sup> Accidental cause: icing, snow. <sup>5</sup> Accidental cause: microburst.					

## 2.6 Decompression

The ambient static air pressure at normal cruising altitude (9,000 m/ 30,000 ft) is approximately 30% of that at sea level. For this reason it is necessary to pressurize passenger cabins to a life supporting level. Generally speaking, passenger aircraft cabins are pressurized to 80% of barometric pressure at sea level. This condition of internal over-pressure presents an additional source of risk for passenger aviation. In the event that the aircraft skin is ruptured or fails structurally, rapid or explosive decompression could occur, resulting in loss of passengers or the aircraft as a whole. Korenromp [1] presents a scenario, where cabin perforation at cruising altitude resulting in complete decompression over a period of 10 seconds would create a pressure differential of 5 N/cm<sup>3</sup>. This pressure differential would, in turn, exert an approximate force of 30,000 N (circa 6500 lbs.) on a person of average size -- enough force to literally blow passengers out of the aircraft. Practical examples of this scenario have been noted on a number of occasions. For those passengers who remain in the aircraft cabin, rapidly plunging temperatures (ca. -51°C/-60 °F temperatures are typical at cruising altitude) and paucity of oxygen provide an untenable and life-threatening habitat. This scenario can only be avoided by means of a rapid emergency descent which could last as much as 10 minutes. In the event that explosive decompression occurs (i.e. massive structural failure), the structural integrity of the aircraft is compromised, often leading to loss of the aircraft and its passengers.

Between 1970 and 1992, only 8 specific cases of in-flight depressurization have occurred, resulting in the deaths of 33 passengers and the loss of two aircraft (Table 2.5). Decompression accounted for a mere 0.9%

of all accidents during the observation period. Clearly, decompression does not represent a major cause of accidental loss in jet transport. The 5 most recent cases of decompression are tabulated below. Here, one notes that over half of the cited depressurization cases have occurred in the latter part of the study period. This may be attributable to the fact that many of the world's first generation jet transport aircraft (i.e. B707-Series, B737-200s, DC-9-30s, etc.) are reaching the end of their structural fatigue lives and thus are more prone to structural failure and consequential in-flight decompression.

**Table 2.5: Five Recent Decompression-Related World Jet Transport Accidents 1970-1992<sup>1</sup> [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>2</sup>
03/09/89	Piedmont	B-737-201	Ohio, USA	76	1
02/24/89	United AL	B747-221	Hawaii, USA	335	9
04/28/88	Aloha AW	B737-297	Hawaii, USA	95	1
11/11/82	Arrow AW	B707-338C	Florida, USA	3	1
11/09/81	AeroMexico	DC-9-32 <sup>3</sup>	Mexico	18	18
Total				527	30
<sup>1</sup> Does not include decompression resulting from bombings, in-flight explosions, in-flight shootings, or other terrorist acts. <sup>2</sup> Includes third party deaths. <sup>3</sup> Aircraft destroyed as a result of the accident.					

## 2.7 Ditching

Ditching involves a controlled descent and attempted landing on water, in the event that a prepared landing facility is not available. The need to ditch is most often linked to fuel exhaustion during trans-oceanic flights. The prospects for survival when ditching are not very high. Impact with water at approach speeds may cause rapid failure of the fuselage structure.



Improper angle of attack or rough seas may also cause tumbling or cartwheeling of the aircraft on the water surface. An additional problem is posed in passenger operations occurring over open water such as flights over the North or South Pacific. Assuming that an aircraft successfully ditched in cold waters while enroute from North America to Europe, there still exists the problem of environmental exposure for the survivors of the crash. Without exposure gear, submerged persons will generally enter a critically hypothermic state within 2 to 5 minutes, making any prospects for rescue extremely remote. Similarly, in a warm water scenario such as the South Pacific, sharks can be a source of earnest concern if search and rescue (SAR) services are not close at hand. Seven accidents were recorded between 1970 and 1992, whereby all aircraft were lost, causing 87 (31.4%) fatalities out of 277 involved passengers. It is seen that the survivability (68.5%) of the recorded ditchings was high, owing to the fact that some of the ditchings occurred in shallow waters, lakes, and rivers. See Table 2.6.

**Table 2.6: Four Major World Jet Transport Accidents Involving Ditching 1970-1992 [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>1</sup>
09/11/90	Faucett Peru	B727-247	Nwfnland, CAN	16	16
02/09/82	Japan AL	DC-8-61	Tokyo, JPN	174	24
08/19/80	Aviaco	DC-8-52	Canary Is., SPN	10	10
12/18/77	SATA	SE210-10R	Madeira, POR	57	36
<b>Total</b>				<b>257</b>	<b>86</b>
<sup>1</sup> Includes third party deaths.					

## 2.8 Failed Take-Off or Landing

Failed take-off's and landings accounted for 34.1% of all accidents during the analysis period, averaging 13.7 per year. Of the 316 total accidents, 208 (65.8%) occurred during landing and 108 (33.2%) during take-off. Only 2,326 (15.4%) of the 15,087 passengers involved in these accidents actually perished, indicating a high degree of survivability for these types of accidents.

There are a number of primary causes of failed take-off's and landings. Among these are: crew error (i.e. landing at the wrong airport), engine failure (FOD-Foreign Object Damage, including bird-strikes), mechanical malfunctions, hard or fast landings resulting in structural failure (i.e. gear collapse), and over-running and under-shooting the runway. There are more things which can go wrong during landings, which account for the majority of these accidents (65.8% vs. 33.2%) -- take-off's can be aborted and indefinitely postponed, landings may not.

One major contributor to the lack of survivability in failed take-off and landing scenarios is the fact that the strength requirements specified in 1950's for cabin appointments are far below those levels which are survivable by humans. Ideally speaking, a modern passenger aircraft decelerating from an approach speed of 290 km/h (140 knots) in 1 second over a distance of 30 meters (ca. 100 ft) would undergo a deceleration of 6 g's. Practically speaking, due to the cartwheeling or rolling of the fuselage during a crash, peak accelerations in excess of 40 g's can be experienced. Surprisingly, though accelerations of this magnitude are survivable, the strength requirements for cabin furniture are typically only between 10% and 35% of survivable levels [1]. The result is that people and objects tend to move around the cabin with

high velocity during a crash, thereby increasing the risk of injury. To counter this phenomena, strength requirements were raised by the FAA in 1990. However, since no aircraft is "impact-proof", as there will always be structural deformations of the cabin floor and walls, it is clear that there will always be some room for improvement with regard to increasing safety during these stages of flight.

Owing to the plethora of causes of failed take-off's and landings, it is impossible to segregate and prepare an abridged list of more "meaningful" accidents. See Appendix C (World Jet Transport Accidents by Phase of Flight) for a listing of failed take-off's and landings.

## **2.9 Fuel Exhaustion**

Fuel exhaustion poses an obvious hazard in jet transport, even though a modern jet transport aircraft is capable of sustaining a reasonable gliding descent in the event that its powerplants are not functioning. In fact, a typical transport aircraft has a glide ratio of between 12:1 and 20:1. This translates to an approximate gliding range of 160 km (100 miles) or more when starting at cruising altitude, theoretically enabling it to reach an airport and perform a safe landing, at least under ideal conditions [13]. In practice, however, this is not always the case and loss of life was evident in 6 of the 7 fuel exhaustion-related accidents which occurred between 1970 and 1992. These accidents are seen in Table 2.7, where one notes that, surprisingly, a majority of these accidents have occurred in the last 10 years, usually to third-world carriers flying first generation aircraft. One also notes that the survivability of this type of accident is a relatively high 68.4% based on the analysis period, though

the aircraft were lost in 100% of the cases. Many fuel exhaustion cases result in ditching of the aircraft on water.

**Table 2.7: Six Major World Jet Transport Accidents Involving Fuel Exhaustion 1970-1992 [5]**

<b>Date</b>	<b>Operator</b>	<b>Aircraft<sup>2</sup></b>	<b>Location</b>	<b>Total Pax</b>	<b>Total Fatalities<sup>1</sup></b>
09/11/90	Faucett Peru	B-727-247	Nwfnland, CAN	16	16
01/25/90	Avianca	B707-321B	Long Island, USA	161	73
12/14/88	Air Nigeria	B707-351C	Luxor, EGY	8	13
12/28/78	United AL	DC-8-61	Portland, OR,USA	189	10
12/02/77	Balkan Bulg.	Tu-154A	Benghazi, LIB	165	59
01/14/76	U. S.-FAA	Sabreliner	Recife, BRA	3	1
<b>Total</b>				<b>542</b>	<b>172</b>
<sup>1</sup> Includes third party deaths.					
<sup>2</sup> Aircraft destroyed as a result of the accident.					

## 2.10 Ground Stationary Accidents

Ground and hangar fires (which comprise virtually all ground stationary accidents), while not necessarily a major threat to life, have claimed a substantial number of aircraft. Between 1970 and 1992, 15 ground and hangar fires were recorded, destroying 9 aircraft and claiming a single life. Five of the more notable accidents are seen in Table 2.8. Fires of this type may be caused by fuel spillage, electrical fires, mechanical failure, as well as a host of industrial-type accidents. The main concern, here, is for the aircraft involved and the risk posed by involving surrounding objects of high value. The greatest concern of all is that such an incident could involve large

amounts of fuel on the airport surface. See Appendix C (World Jet Transport Accidents by Phase of Flight) for a complete listing of ground accidents.

**Table 2.8: Five Major World Jet Transport Accidents Involving Ground Fires 1970-1992<sup>1</sup> [5]**

Date	Operator	Aircraft	Location	A/C	Total Fatalities <sup>2</sup>
06/28/91	LTU	L1011-385-1	DUS, FRG	Des.	0
10/14/89	Delta AL	B727-232	SLC, USA	Maj.	0
03/16/85	U.T.A.	B747-383	CDG, USA	Maj.	0
06/02/82	Air Canada	DC-9-32	YUL, CAN	Des.	0
01/07/80	ALITALIA	DC-9-32	FCO, ITA	Des.	0
Total					0
<sup>1</sup> Does not include military or terrorist actions.					
<sup>2</sup> Includes third party deaths.					

## 2.11 Ground Taxiing Accidents

Ground taxiing accidents comprise those accidents which occur through misdirection of aircraft on the airport surface and are usually attributable to ground traffic control or crew errors. A typical accident of this nature would involve one aircraft taxiing onto an active runway and being hit by another landing or starting aircraft. Ground taxiing accidents are particularly disconcerting since many aircraft operated on the airport surface are fully fueled and large fires may result. Fourteen taxiing accidents occurred during the analysis period, destroying 16 aircraft and killing 745 (44.8%) of the 1662 involved passengers. Five of these accidents are seen in Table 2.9. (See

Appendix C: World Jet Transport Accidents by Phase of Flight for a complete listing of accidents occurring while taxiing).

**Table 2.9: Five Major World Jet Transport Ground Taxiing Accidents 1970-1992 [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>1</sup>
02/01/91	US Air	B737-387	LAX, USA	89	22
	Sky West	SA227 AC		12	12
12/03/90	Northwest	DC-9-14	DET, USA	44	8
	Northwest	B727-251		156	0
12/07/83	Iberia	B727-256	MAD, SPN	93	51
	Aviaco	DC-9-32		42	42
03/27/77	Pan Am	B747-121	Canary Is., SPN	378	335
	KLM	B747-206B		248	248
12/20/72	N. Central	DC-9-31	ORD, USA	45	10
	Delta AL	CV880-22-2		88	0
Total				1195	728
<sup>1</sup> Includes third party deaths.					

## 2.12 In-Flight Explosion

Traditionally, in flight explosions have been attributable to freak accidents such as lightning strikes or collision with airborne debris. Today, however, the majority of in-flight explosions are the result of premeditated military or terrorist acts. Though beyond the main scope of this paper, since death caused by willful destruction of aircraft aloft or on the ground hardly constitutes an accidental occurrence, a cursory review of in-flight explosions

is made here for comparison with other accident causes. Six of the more recent major explosion related jet transport accidents are listed in Table 2.10.

**Table 2.10: Six Recent Explosion-Related World Jet Transport Accidents  
1970-1992<sup>1</sup> [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>2</sup>
10/02/90	Iraqi AW	Il-76 <sup>3</sup>	Kuwait, KUW	126	126
11/27/89	Avianca	B727-21 <sup>4</sup>	Bogata, COL	107	110
09/19/89	UTA	DC-10-30 <sup>4</sup>	Tenéré, NGR	171	171
12/21/88	Pan Am	B747-121 <sup>4</sup>	Lockerbie, GBR	259	274
07/04/88	Iran Air	A300-B2 <sup>3</sup>	Persian Gulf	290	290
09/01/83	Korean AL	B747-230B <sup>3</sup>	Aral Sea	269	269
Total				1222	1240
<sup>1</sup> Includes accidental and willfully generated explosions.					
<sup>2</sup> Includes third party deaths.					
<sup>3</sup> Externally produced explosions (i.e. missile strikes).					
<sup>4</sup> On-board explosion.					

Throughout the past 23 years ending in 1992, there were 31 explosion-related in-flight civil aircraft incidents, occurring on an average of 1.35 per year and destroying 26 aircraft. An overwhelming number of these incidents were military or terrorist related and consequently claimed 2,751 lives. These incidents involved 3,477 passengers and accounted for 3.3% of all accidents during the period of interest. Typical sources of explosions include bombs hidden in baggage, surface-to-air missiles (SAM), and air-to-air missiles. These statistics show that, in most cases, where explosions are evident, the results are fatal. During the observation period, nearly 84% of involved aircraft were destroyed and 79.1% of the passengers killed.

## 2.13 In-Flight Fire

In-flight fires are a relatively common occurrence stemming from electrical fires, fires in waste bins, lavatories, engines, cargo holds, and fires involving hot landing gear components, to name a few. In 1989 it was estimated [1] that in the U.S. as many as 500 to 600 incidents of in-flight fire occur per year. In-flight fires are of great concern for a number of reasons. First, aircraft are extremely fire sensitive as their structures are not highly fire resistant. That is, an aircraft skin which is fabricated to a large extent out of 2024-T4 aluminum alloy [13] melts at between 660 °C and 677 °C (1220 °F and 1250 °F) [14]. A typical free-burning fire involving JP-4 jet fuel may burn in excess of 670 °C (1200 °F) [15]. In addition, large aircraft carry vast amounts of highly combustible fuel, flammable metals such as titanium and magnesium, flammable plastics, and electrical insulation which make them a severe fire hazard. The new Boeing B777-200 has a maximum fuel capacity of 119,612 liters (31,560 U. S. Gallons). A fully-loaded Boeing B747-400 can carry as much as 216,850 liters (57,220 U. S. Gallons) of jet fuel [16]. Second, toxic emissions, heat generation, and cabin oxygen depletion from burning aircraft components can rapidly degrade human survivability within the passenger compartment. Third, the way aircraft are constructed often makes it difficult to locate a fire and consequently to direct in-flight fire-fighting efforts. As a result, inaccessible, low-level, smoldering fires may occur between partitions and cabin walls producing excessive amounts of smoke and a severe backdraft [explosion] risk in the event that a fresh supply of oxygen is provided.

Despite the high rate of annual in-flight fires, only a small percentage result in major accidents where loss of life or loss of an aircraft occurs.



However, those that do generally have catastrophic results. From 1970 to 1992, 1,551 (87.8%) of the 1,767 passengers involved in in-flight fires perished and 21 (87.5%) of the 24 aircraft were lost, some before reaching an emergency landing location.

**Table 2.11: Eight Major World Jet Transport Accidents Involving In-Flight Fire 1970-1992 [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>1</sup>
07/11/91	Nigeria AW	DC-8-61	Jeddah, SAR	261	261
11/28/87	S.A.A.L.	B747-244B	Indian Ocean	160	160
06/02/83	Air Canada	DC-9-32	CIN, USA	45	23
08/19/80	Saudia	L1011-200	Riyadh, SAR	301	301
11/26/79	PIA	B707-340C	Jeddah, SAR	156	156
01/03/76	Aeroflot	Tu-134	Moscow, USSR	87	87
07/11/73	VARIG	B707-345C	Orly, FRA	134	123
08/14/72	Interflug	Il-62	Berlin, GDR	156	156
Total				1,300	1,267
<sup>1</sup> Includes third party deaths.					

Amazingly, in two cases, the first involving a Saudia L1011 in Riyadh and the second involving a Air Canada DC-9-32 at Cincinnati International Airport, the majority of fatalities occurred after the aircraft made safe landings and were attempting to taxi or commence evacuation procedures. (See complete listing of in-flight fires is seen in Appendix E).

## 2.14 Major Mechanical Failure

During the observation period 60 (76.9%) aircraft were destroyed in 78 accidents involving major mechanical failure. Of the 7,802 passengers in

these accidents, 3,429 (44.0%) were killed. Included in the list of major mechanical failures are engine failure, avionics (instrument) failure, landing gear failure, brake failure, tire failure, failure of control surfaces, hydraulic failure, mechanical failure, thrust reverser failure, fatigue and structural failure. Engine failures incurred by bird strikes, engine fires, and damage incurred by weather or crew error (i.e. hard landings, overshooting the runway, etc.) are not considered here. Eight of the more notable world jet transport accidents involving major mechanical failure are seen in Table 2.12.

**Table 2.12: Eight Major World Jet Transport Accidents Involving Major mechanical failure 1970-1992 [5]**

Date	Operator	Aircraft	Location	Total Pax	Total Fatalities <sup>1</sup>
10/04/92	EL AL	B747-258F	Amsterdam, NTL	4	51
07/11/91	Nigerian AW	DC-8-61	Jeddah, SAR	261	261
05/26/91	Lauda Air	B767-329ER	Thailand	223	223
07/19/89	United AL	DC-10-10	Sioux City, IA USA	296	111
02/24/89	United AL	B747-121	Pacific Ocean, HI USA	355	9
08/12/85	Japan AL	B747SP-46	Mt. Ogura, JPN	524	520
05/25/79	American AL	DC-10-10	ORD, USA	272	274
07/05/70	Air Canada	DC-8-63	Toronto, CAN	109	109
<b>Total</b>				<b>2,044</b>	<b>1,558</b>
<sup>1</sup> Includes third party deaths.					

## 2.15 Post-Crash Fires

As mentioned in Section 2.2, post-crash fires do not represent a distinct accident cause, but rather are the ultimate consequence of many other

accidental causes and occur in over 40% of fatal aircraft accidents [17]. By far the greatest contributor to post-crash fires is the close proximity of large quantities of fuel to hot aircraft parts and energized electrical systems. Post-crash fires are generally large and highly destructive. Aircraft structural components are, by nature, not highly fire resistant and burn-through of the aircraft skin can occur in less than a minute. Within only a few additional minutes (2 to 3), the internal components of the aircraft reach combustion temperature and ignite spontaneously with explosive force. This phenomena is known as flash-over and presents an extreme threat to life. At the time of flash-over, it may be assumed that little or nothing can be done to save the aircraft and/or passengers remaining within the fuselage. For this reason, it is imperative that rapid evacuation take place. Current FAA regulations stipulate that a full passenger aircraft be able to be completely evacuated in 90 seconds from one side of the aircraft using half of the total exits [18]. The assumption here is that one side of the aircraft is engulfed in flames, therefore requiring evacuation from the other side of the fuselage before burn-through occurs. In many accidents this may not be true.

Of late, several systems and programs have been developed to study the possibility of increasing the survivability of post crash fires. Among these are cabin misting systems, fire hardening, and the distribution of smokehoods. These are discussed in later chapters.

## **2.16 Wake-Vortex Upset**

Lately, wake-vortex upset has become a major topic in aviation safety. Induced vortices shed in the wakes of heavy jet aircraft pose a major problem

for smaller aircraft which follow, especially in vicinity of the ground (i.e. near airports). As a result, wake-vortex phenomena has become a major topic in the determination of air traffic control spacing, and consequently airport traffic capacity. In order to simplify the spacing process, aircraft are allotted to a "weight class" (e.g. Small (S), Large (L), Heavy (H)) based, in part, on the degree to which they produce hazardous vortices. The wake-vortex topic has received a great amount of notoriety of late, owing to the fact that some aircraft listed in the large weight class, more specifically the Boeing 757, have been involved in a number of incidents which suggest that their classification should be changed as a safety measure.

During the analysis period, there were only 4 accidents attributable to wake-vortex interference, though the number of incidents was far greater (Table 2.13). The NTSB had 59 reports of wake-vortex upset between 1982 and 1989, averaging more than 7 incidents per year [19]. Between 1970 and 1992, 3 out of 4 aircraft involved in wake-vortice accidents were destroyed, killing 19 (82.6%) of the 23 passengers involved. As expected, most of these accidents involved smaller jet aircraft on landing approach. To date, none have occurred in scheduled service by the major western air carriers. In addition to safety concerns, wake-vortex phenomena has far-reaching monetary implications. If the wake-vortex problem can be brought under control, safety separations could be reduced, thereby increasing airport operational capacity and reducing the current costs of congestion at major airports. See Appendix F.

**Table 2.13: Four Major Jet Transport Accidents Involving Wake-Vortex Interference [5]**

<b>Date</b>	<b>Operator</b>	<b>Aircraft</b>	<b>Location</b>	<b>Total Pax</b>	<b>Total Fatalities<sup>1</sup></b>
01/16/87	Aeroflot	Yak-40	Tashkent, USSR	9	9
06/09/80	Midwest AC	SE-210-VIR	ATL, USA	4	0
01/19/79	Massey-Ferg.	Learjet 25D	DET, USA	6	6
05/30/72	Delta AL	DC-9-14	DFW, USA	4	4
<b>Total</b>				<b>23</b>	<b>19</b>
<sup>1</sup> Includes third party deaths.					

## **2.17 Summary and Ranking of Jet Transport Accident Survivability and Fatality Tolls**

Table 2.14 gives a ranking of accident survivability (inverse fatality rate) based on accidental cause for the period of 1970 to 1992, where accident survivability is calculated by taking the ratio of surviving passengers and crew to total passengers and crew involved throughout the analysis interval. Here, it is seen that the most dangerous (i.e. least survivable) jet transport accident is one which involves in-flight fire. Based on these statistics, a passenger involved in this type of accident has an 87.8% chance of perishing. The least life threatening of all accident causes are ground fires, since passengers are often not present. The average fatality risk presented by the accident causes listed above is 44.2%. Based on these statistics, it is desirable to consider jet transport fire safety in depth.

**Table 2.14: Ranking of World Jet Transport Accident Passenger/Crew Survivability Based on Accident Cause 1970-1992**

Rank <sup>1</sup>	Accident Cause	Total Fatalities <sup>2</sup>	Survivability	Aircraft Involved	Aircraft Destroyed
1	In-Flight Fire	1,551	12.2%	24	87.5%
2	Wake-Vortex Upset	19	17.4%	4	75.0%
3	In-Flight Explosion	2,751	20.9%	31	83.9%
4	Collision: Mid-Air	721	31.1%	13	80.7%
5	Collision: CFIT	13,931	32.5%	362	92.3%
6	Ground Taxiing Accidents	745	55.2%	14	57.1%
9	Major Mechanical Failure	3,429	56.0%	78	76.9%
10	Dangerous Weather	3,851	57.5%	101	83.2%
11	Ditching	110	67.7%	8	100.0%
12	Fuel Exhaustion	172	68.4%	7	100.0%
13	Bird-Strikes	49	82.6%	8	87.5%
14	Failed Take-Off or Landing	2,326	84.5%	316	65.1%
13	Decompression	33	95.4%	8	25.0%
14	Ground Stationary Accidents	1	≈100.0%	15	60.0%
%Ave		n/a	55.8%	n/a	76.8%
Tot.		29,689	n/a	989	n/a

<sup>1</sup>Based on survivability.  
<sup>2</sup>Includes third party deaths.

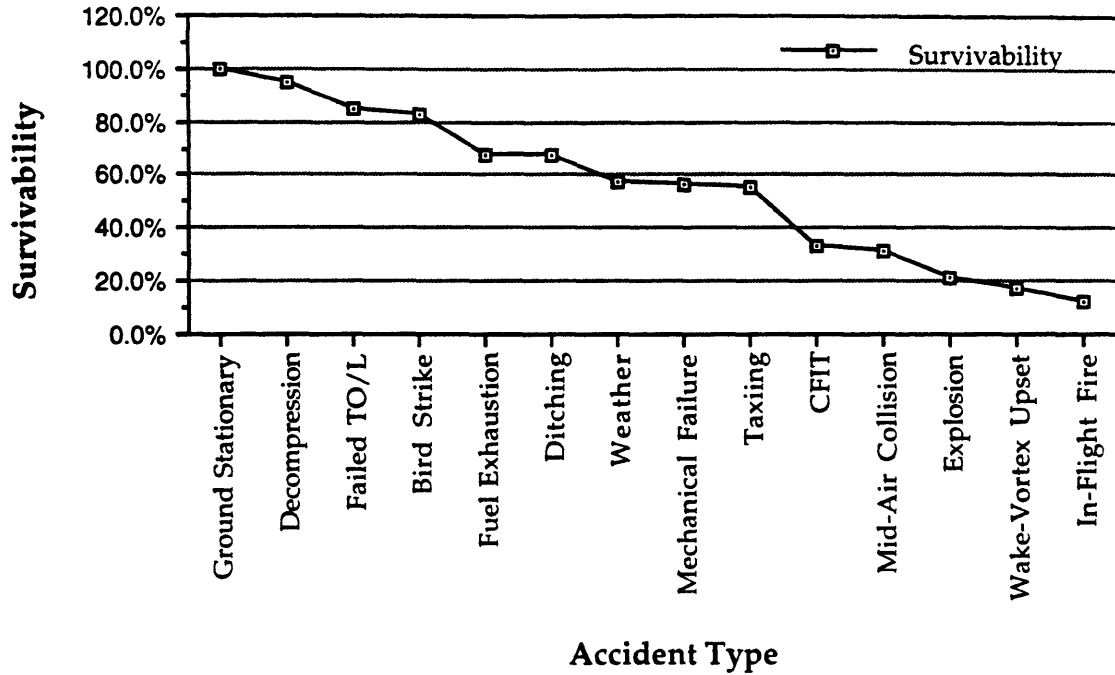
Table 2.15 reaffirms the importance of improvements in jet transport fire safety, as in-flight fire ranked in the top six accidental causes based on total fatalities. Here, one notes that fire, a very specific cause of accident, ranks only behind those accidental causes having a multiple number of causes (i.e. a failed take-off of landing could have a great number of very

different causes, whereas an in-flight fire is usually attributable to only 2 or 3 causes). (See specific descriptions of accidental causes for details).

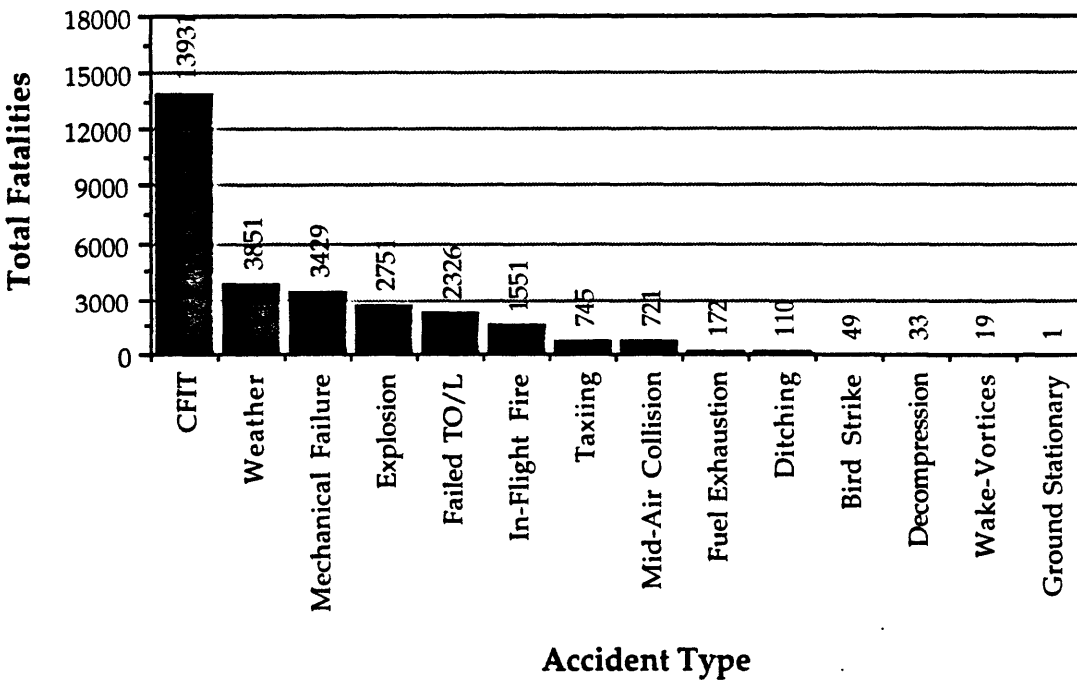
Considering the specific nature of in-flight fires and the number of deaths they caused, our concern for minimizing their frequency of occurrence and severity is justified.

**Table 2.15: Ranking of World Jet Transport Accident Fatality Rates Based on Accident Cause 1970-1992**

Rank <sup>1</sup>	Accident Cause	Total Fatalities <sup>2</sup>	Survivability	Aircraft Involved	Aircraft Destroyed
1	Collision: CFIT	13,931	32.5%	362	92.3%
2	Dangerous Weather	3,851	57.5%	101	83.2%
3	Major Mechanical Failure	3,429	56.0%	78	76.9%
4	In-Flight Explosion	2,751	20.9%	31	83.9%
5	Failed Take-Off or Landing	2,326	84.5%	316	65.1%
6	In-Flight Fire	1,551	12.2%	24	87.5%
7	Ground Taxiing Accidents	745	55.2%	14	57.1%
8	Collision: Mid-Air	721	31.1%	13	80.7%
9	Fuel Exhaustion	172	68.4%	7	100.0%
10	Ditching	110	67.7%	8	100.0%
11	Bird-Strikes	49	82.6%	8	87.5%
12	Decompression	33	95.4%	8	25%
13	Wake-Vortex Upset	19	17.4%	4	75.0%
14	Ground Stationary Accidents	1	≈100.0%	15	60.0%
%Ave		n/a	55.8%	n/a	76.8%
Tot.		29,698	n/a	989	n/a
<sup>1</sup> Based on number of fatalities.					
<sup>2</sup> Includes third party deaths.					



**Figure 2.2: Ranking of World Jet Transport Accidents by Survivability Based on Accident Type 1970-1992**



**Figure 2.3: Ranking of World Jet Transport Accidents by Fatality Rate Based on Accident Type 1970-1992**



## **Chapter 3:**

### **Case Review of Major World Jet Transport Accidents Involving Fire: 1970 - 1992**

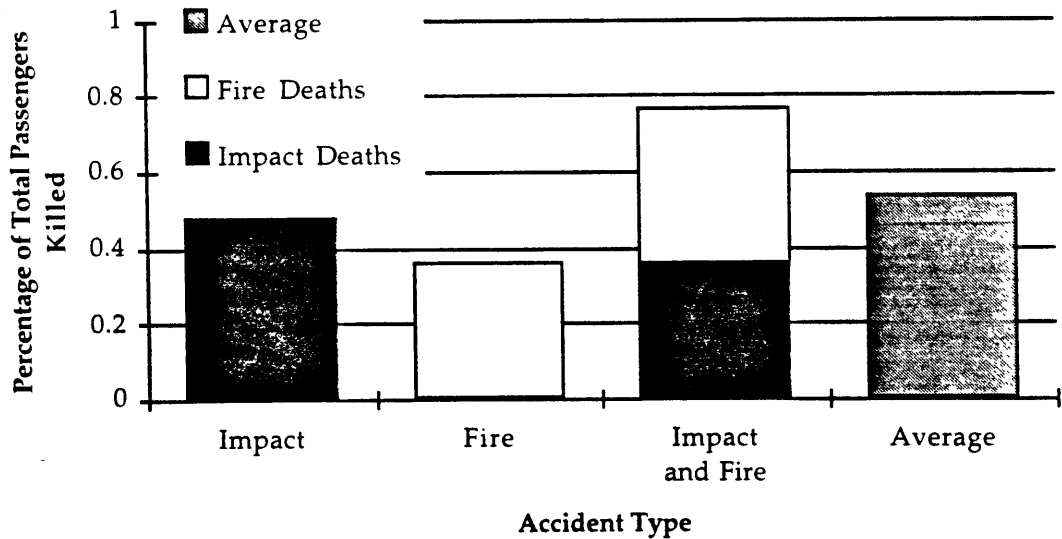
#### **3.1 Overview**

This chapter will take a closer look at number of world jet transport accidents involving fire in order to understand how severe the fire hazard in jet transport actually is. The main questions to be posed are as follows: how does fire rate as a hazard when compared to the risks posed in a situation involving a crash? and in cases where fire is prevalent, what factors are of main concern? The latter question will be approached through a number of specific case studies.

#### **3.2 Cause of Death in Jet Aviation Accidents Since 1970**

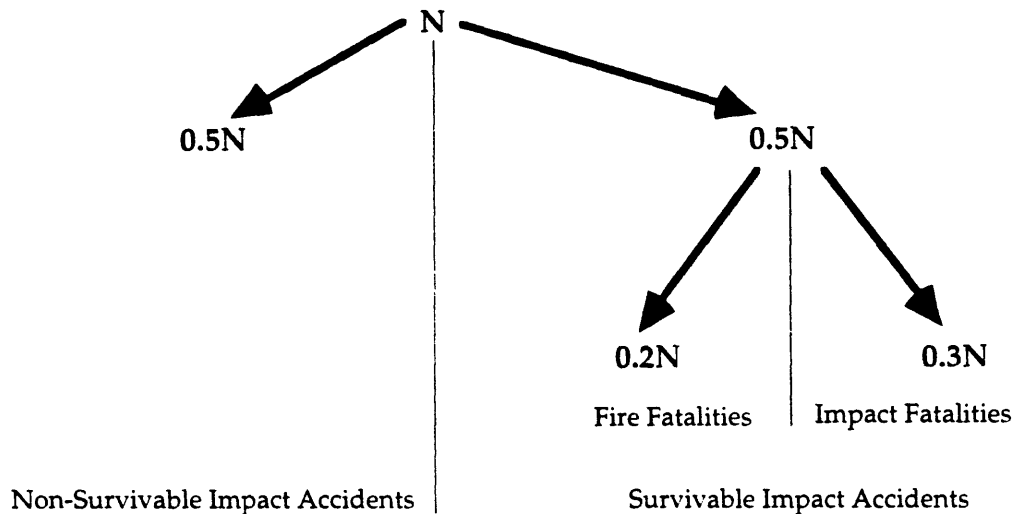
Taylor [17] has compiled a breakdown of cause of death in jet transport accidents for those accidents occurring between 1954 and 1989 in which the true cause of death could be clearly determined. It is assumed that there are 3 major types of accidents in air transport resulting in aircraft destruction or death: impact, fire, or a combination of the two, where fire is preceded by impact. Observing the period from 1970 (Table 3.1), one sees that accidents involving fire in the absence of a crash are more survivable (36.1% fatalities) than those accidents involving only impact fatalities (47.9% fatalities). This makes sense if one considers the fact that both in-flight and ground fires require some time

to become fully established, thereby creating a warning and the possibility for response and evacuation. In those accidents in which both impact and fire casualties are prevalent, there is an increase in the death-by-fire mortality rate (41.3%) which is attributable to the fact that injuries inflicted upon impact hamper passengers' abilities to escape a subsequent fire hazard. It is also noted that in accidents producing both impact and fire casualties, the percentage of impact casualties is lower (35.6%) than in impact-only cases. This may be attributable to the fact that accidents involving massive impact tend to kill all of the passengers before fire becomes a consideration, whereby all victims become "impact fatalities". Another consideration may be that the destruction caused in high-impact accidents makes it difficult to determine true cause of death. In such cases, the cause of death is listed in a separate category as "unknown", thereby skewing statistics toward less violent crashes where fire is the main killer.



**Figure 3.1: Breakdown of World Jet Transport Accident Fatality Rates Based on Accident Type 1970 - 1989 [17]**

With respect to the overall breakdown of aggregate annual jet transport fatalities,  $N$ , the FAA [20] has determined that there was an even split between the number of fatalities in survivable and non-survivable crashes in the U. S. between 1981 and 1990. This approximation correlates well with the world jet transport data collected by Taylor, as seen in Figure 3.1. Further, of the 50% of fatalities occurring in survivable crashes, 30% of the fatalities are attributable to impact and 20% with fire. Once again, this information correlates well with Taylor's data. The FAA's breakdown is seen in Figure 3.2.



$N$  = Average Annual Jet Transport Crash Fatalities

**Figure 3.2: Composition of U.S. Jet Transport Fatalities 1981-1990 [20]**

### 3.3 Air Transport Fire Accident Case Studies

In order to take a closer look at fire related world jet transport accidents, it is valuable to consider specific cases in addition to the aggregate data

provided by statistics. There are a number of jet transport accidents and incidents which may be considered as landmark cases in that they were in some way instrumental in directing safety efforts. These cases are seen in Table 3.1 and described in detail below; they represent an overview of the works prepared by Hill [21] of the FAA and Tucker [22] of the Canadian Aviation Safety Board (CASB).

**Table 3.1: Jet Transportation Accidents Involving Fire 1980 - 1989 [21]**

Date	Operator	Aircraft	Relation to Transport Safety
08/19/80	Saudia	L1011-200	Led to cargo rule changes
11/19/80	Korean Airlines	B747-2B5B	Review of cabin materials fire
09/13/82	Spantax	DC-10-30CF	Review of evacuation and cabin materials fire
06/02/83	Air Canada	DC-9-32	Led to wide-reaching cabin safety rule changes
09/23/83	Gulf Air	B737-2P6	Review of the problem of incendiaries
03/16/85	UTA <sup>1</sup>	B747-3B3	Review of cargo compartment seams, fasteners, joints, and rapid fire involvement
08/22/85	British Air Tours	B737-236	Research into smokehoods and cabin misting systems
08/10/86	ATA <sup>1</sup>	DC-10-40	Review of cargo compartment seams, fasteners, joints, and solid oxygen systems
11/28/87	South African	B-747-244B	Proposed rule change for Class-B (Combi) cargo compartments
08/31/88	Delta AL	B727-232	First aircraft, involved in a survivable accident with post-crash fire, equipped with fire blocked seats
<sup>1</sup> Classified as incidents by the NTSB and FAA			

### **3.3.1 Saudia In-Flight Cargo Compartment Fire (08/19/80)**

On August 19, 1980, a cockpit warning light indicated a cargo fire on a Saudia Lockheed-L1011 shortly after departure from Riyadh. Though the exact cause of the fire remains unknown, it has been surmised that a lit cigarette or matches left in a bag stored in the C-3 belly compartment ignited, setting off the cargo compartment smoke detector, thereby warning the crew. The smoldering fire which ensued produced smoke which drifted through floor grills into the aft cabin. As the smoke became more dense, it became noticeable to passengers in the aft cabin. Provisions were made for a return and emergency landing at Riyadh. The dense smoke saturated the smoke detectors, causing them to malfunction and switch the cockpit smoke warning lights off, thereby confusing the crew as to the actual conditions which existed below decks.

Contrary to the information supplied by the cockpit fire indicators, the fire progressed to the point where the cargo compartment lining material had burned through, allowing the fire to impinge on the aft passenger floor. Passengers seated aft in the cabin were moved forward. As the aircraft made its final approach, the fire burned through the aft passenger floor sections, allowing smoke and flames to enter the passenger compartment. During this period an attempt was made by crew members to suppress the fire using hand-held fire extinguishers. Because most of the smoke was concentrated at the rear of the aircraft and there were no warnings in the cockpit, the crew underestimated the gravity of the problem and did not don smoke masks. As the aircraft contacted the runway, the seats above the C-3 compartment ignited, rapidly spreading flames and filling the cabin with hot, noxious gases. The rising hot gases sufficiently heated cabin materials to the flash-over point

(spontaneous combustion from heat) before the evacuation was commenced. By nature of the flash-over, the cabin burst into flames which rapidly killed all 301 passengers and crew. It should be noted that not all of the passengers burned to death. Rapid local oxygen depletion and toxic emissions are characteristic of flashover, meaning that many of the forward passengers were asphyxiated.

The Saudia accident brought 2 important points to light. First, it brought about changes in regulations concerning cargo compartment safety and fire protection [23]. Second, the fact that the fire flashed-over in such a short time showed a practical need for fire blocking in the passenger compartment. Tests completed after the disaster showed that flash-over could have been prevented had the seats been fire-blocked.

### **3.3.2 Korean Air Lines (KAL) Post-Crash Fire (11/19/80)**

On November 19, 1980, a landing gear collapse following a short landing at Seoul-Kimpo International Airport caused the deaths of 15 (9 passengers and 6 crew members) of the 208 passengers and 18 crew members aboard. Apparently, the collapsed gear ruptured a cargo compartment. As the aircraft slid approximately 2,300 meters (ca. 7,000 feet) down the runway, sparks ignited spilled hydraulic fluid and the contents of the cargo compartment. The resulting fire proceeded to rupture the cargo liner and passenger compartment in the same manner as occurred in the Saudia in-flight fire mentioned in Section 3.3.1. In this case, however, flash-over did not occur before the majority of the passengers could be evacuated.

Astonishingly, the fuel cells were not ruptured during this accident, preventing the remaining on-board fuel supply from becoming involved. Instead, the real hazard was burning cabin materials. According to Hill [21], this accident was instrumental in convincing people that fuel fires were not the dominating factor in aircraft fire fatalities, but rather that internal fires were a major concern which required attention.

### **3.3.3 Spantax Post-Crash Fire (10/13/82)**

The aborted take-off of a Spantax DC-10-30CF in Malaga, Spain caused the right wing to be torn off as the aircraft overran the runway and slid into an adjacent field. Spilled fuel from the torn wing cell surrounded the aft section of the fuselage, ignited, and proceeded to burn through the already ruptured fuselage, igniting cabin materials, and killing 51 of the 393 passengers.

Two major issues were raised by the Spantax fire. First, it became apparent that emotional trauma of the passengers and congestion in the aisles (i.e. carry-on baggage, injured parties, debris, etc.) can seriously impede evacuation efforts. Second, it became clear that Airport Rescue and Fire Fighting (ARFF) units not only have to combat exterior fuel and combustible metal fires around the exterior of the aircraft, but must be equipped to cope with interior fires as well, if they are to save passengers' lives in a post-crash fire scenario. Interestingly, in this case, the fuselage was not destroyed from the outside-in by the exterior fires which could be controlled by the ARFF units, but rather from the inside-out by the uncontrolled internal fires.

### **3.3.4 Air Canada In-Flight Lavatory Fire (06/02/83)**

Another land-mark in-flight fire case occurred on June 2, 1983 aboard an Air Canada DC-9-32. Heavy cabin smoke emanating from the left rear lavatory was reported in-flight, which ultimately resulted in flash-over shortly after an emergency landing at Cincinnati Airport. Half of the 46 people aboard succumbed to the smoke and flames [22].

Though the source of ignition was never determined, it is assumed that the fire was electrical in nature or the consequence of a discarded cigarette in the lavatory. Regardless, this accident was the focus of major regulatory change in the United States, the first of which was mandatory installation of smoke detectors in all lavatories, installation of fixed extinguishing systems in waste bins, and the requirement of at least 2 on-board portable Halon fire extinguishers [24]. In addition to these measures, there was increased pressure to develop and adopt floor proximity lighting systems [25] to aid escape in cabins filled with dense smoke and fire-blocked seating to reduce smoke emissions and the potential for flashover [26].

### **3.3.5 Gulf Air In-Flight Cargo Compartment Fire (09/23/83)**

A suspected incendiary device exploding in the forward cargo hold of a Gulf Air B737-2P6 near Abu Dhabi on September 23, 1983 was blamed for the desert crash of the aircraft and consequent deaths of the 107 passengers and 5 crew members on-board. Investigation showed that, while the explosion did not cause severe structural damage, it did affect engine control [6] and cause a fire which entered the passenger cabin.



In light of the Gulf Air crash, interest in cargo compartment fire detection and containment systems has been intensified. An additional question has been raised with regard to defining a reasonable and attainable degree of fire safety on jet transport cargo compartments.

### **3.3.6 Union de Transport Ariennes (UTA) Ground Cargo Compartment Fire (03/16/85)**

On March 16, 1985, a UTA B747-3B3 freighter undergoing maintenance at Paris- Charles de Gaulle (CDG) fell victim to a ground fire of unknown origin in the forward cargo compartment. Fueled by oil soaked rags and cleaning solvent, the fire progressed to destroy the cargo compartment liner, spreading to the passenger cabin above through ventilation grilles, despite attempts of ground personnel to fight the high-intensity fire with portable fire extinguishers. Not until the fire destroyed the main and upper deck passenger compartments was the fire extinguished by ARFF units.

Of primary interest in the aftermath of the fire was the fact that the fire had effectively destroyed the cargo liner's seams, joints, and fasteners, thereby collapsing the liner and allowing the fire to move to other parts of the aircraft through adjacent floor grills. It was also noted that the flammable backing used on thermal insulation also provided a vehicle for fire to spread. As a result, the UTA ground fire was a great influence on the inclusion of seams, joints, and fasteners in the new testing criteria for Class-C and -D compartments.

### **3.3.7 British Air Tours Post-Crash Fire (08/22/85)**

An engine fire on-board a British Air Tours B737-236 caused an aborted take-off during departure from Manchester Ringway International Airport, U.K. on August 22, 1985. Ruptured wing tanks resulting from the aborted take-off spilled large amounts of fuel which pooled around the stopped aircraft and subsequently ignited on hot engine parts. The massive fire which ensued quickly enveloped the cabin killing 53 passengers and 2 crewmembers of the 137 (131 passengers and 6 crewmembers) on-board [6].

The British Air Tours B737 accident had a profound effect on jet transport safety efforts. While other accidents initiated or ultimately led to rule changes, this event gave way to safety innovation efforts and multi-national testing programs -- more specifically research and development of passenger smokehoods and cabin-misting systems. These projects are discussed in detail in the chapters which follow.

### **3.3.8 American Transport (ATA) Ground Cargo Compartment Fire (08/10/86)**

Similar to the UTA B747 ground fire of the previous year, this fire occurred in an ATA DC-10-40 while service crews were cleaning the forward cargo compartment. The fire was initiated when a solid oxygen generator, inadvertently activated by maintenance crews, contacted and ignited some plastic bubble wrap. Similar to the UTA accident, the fire destroyed seals, joints, and fasteners, allowing the cargo liner to fall and the fire to egress to the passenger cabin through floor grilles, destroying the aircraft. This duplication of the UTA accident served to intensify efforts to increase the

standards for joints, seams, and fasteners used in cargo compartments, in addition to a review of safety associated with solid oxygen generators.

### **3.3.9 South African Airlines (SAA) In-Flight Cargo Fire (11/28/87)**

On November 28, 1987, a SAA B747-244B Combi was lost due to an in-flight fire over the Indian Ocean. Initial investigations of the accident have resulted in the hypothesis that a fire had occurred and burned out of control in the aft cargo section of the aircraft. Though still ongoing, the investigation of this accident has resulted in a Notice of Proposed Rule Making (NPRM) by the FAA [27], requiring improvements in Class-B compartment fire safety provisions.

### **3.3.10 Delta Airlines Post-Crash Fire (08/31/88)**

As a result of a crash on take-off from Dallas-Fort Worth International Airport, a Delta B727-232 became involved in massive post-crash fire which killed 13 (9 passengers and 4 crewmembers) of the 104 aboard (97 passengers and 7 crewmembers) [6]. Having slid to a stop approximately 900 meters/3,000 feet from the end of the runway after attempting to take-off using a wrong wing-flap configuration, the aircraft broke into three sections. Pooled fuel from the right wing, which had been ripped away, ignited, enveloping the aft section and killing those within. Two additional passengers in the rear of the mid-section were also killed before the remaining passengers were evacuated and ARFF crews began to cope with the problem.

The Delta crash was one of great interest since it was the first jet transport crash with post-crash fire that involved an aircraft with fire-blocked seats. Studies have shown that the implementation of fire-blocking in the

seats actually allowed those involved in the accident an additional 1 minute 30 seconds of evacuation time. This figure is based on the actual evacuation duration of 4 minutes 20 seconds (from ARFF reports) and the 2 minute 50 second projected survival time of the same scenario in the absence of fire-blocked seats (from previous experience). The FAA has estimated that fire-blocking of the seats saved as many as 37 lives in this accident. Interestingly, survivors of the crash reported that they had not used the emergency floor lighting while egressing the aircraft.

### **3.4 Conclusions**

Reviewing these cases R. G. Hill [21] of the FAA Fire Safety Branch concluded that there are a number of improvements to be made in both the in-flight and post-crash aspects of jet aviation fire safety. With regard to in-flight fires, one must consider that most in-flight fires occur in hidden areas (behind sidewalls, above ceilings, and in lavatories). Thus, there is a need for improved materials and provisions for protection of the crew and passengers from smoke and noxious gases. These improvements should come in the form of fire retardant construction materials, smoke venting, and smoke-hoods.

With regard to post-crash fires, more provisions have to be made to protect passengers from the danger of external fires. This may be accomplished by preventing fuel from entering the passenger cabin, installing cabin fire suppression systems, fire hardening of the fuselage, and improving evacuation techniques.

## **Chapter 4:**

### **Fire Prevention and Fire Hardening of Jet Transport Aircraft**

#### **4.1 Overview**

Without a doubt, the best way to improve fire safety is to prevent the occurrence of fire altogether. In general, the improvement of an aircraft's ability to withstand the onset and spread of fire is referred to as "fire hardening". There are 3 components to fire hardening: implementation of a fire sensitive design [28], utilization of fire resistant material during aircraft construction, and the inclusion of provisions for fire detection and in-flight fire management. Each of these areas is discussed in the sections that follow.

#### **4.2 Designing for Fire**

##### **4.2.1 General Approaches**

Adopting a fire sensitive design means choosing an aircraft design which minimizes the areas of the aircraft in which fire may be initiated, creating an environment which hampers the spread of flame, and providing crash protection and protection from external fires (i.e. post-crash fires). Typical examples of fire sensitive design include the sealing of waste bins to prevent fires developing as a result of discarded flammables (i.e. cigars, cigarettes, matches, etc.), sealing of lavatory compartments for similar reasons

(see Section 3.3.4 Air Canada In-Flight Lavatory Fire), implementation of cargo compartment seals to prevent fire spread (see Section 3.3.9 South African Airlines In-Flight Cargo Compartment Fire), and self-sealing ducts and ventilation grilles to prevent flame spread [28]. To protect from external fires, insulation of cabin walls with heat- and radiation-damming materials should be implemented, thereby increasing passenger survival and evacuation times.

#### **4.2.2 Numerical Methods**

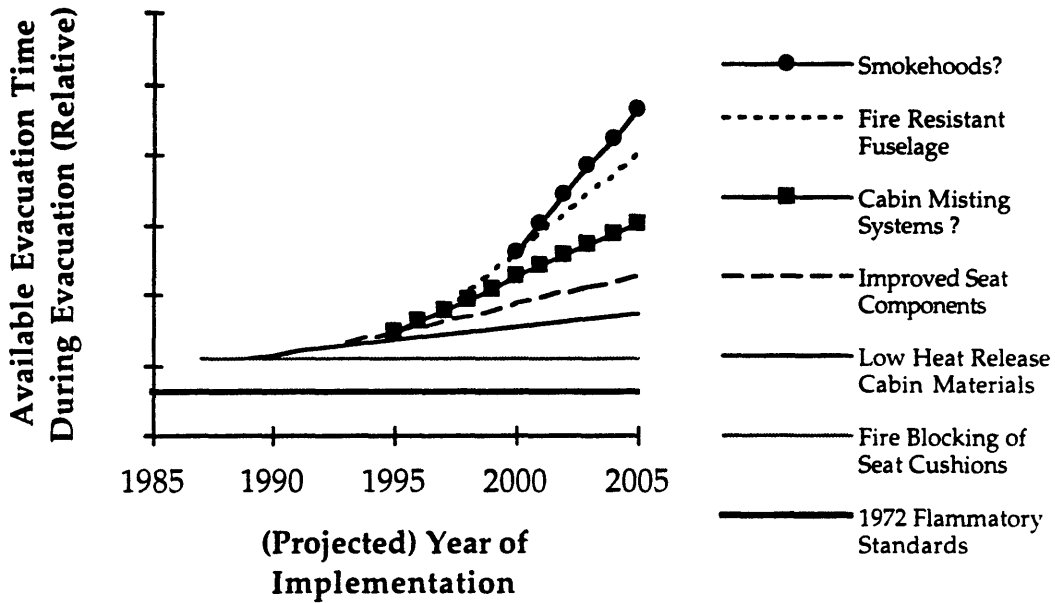
The advent of numerical methods, more specifically computational fluid dynamics techniques (CFD), has added a whole new dimension to the design and evaluation of aircraft cabins, and the evaluation of fire risk. Currently, there are a number of systems available around the world for use in designing and evaluating aircraft cabin designs. These include the FAA DACFIR system from the U.S. [29], the VULCAIN System for Fire Risk Analysis within Complex Industrial Environments from BERTIN & Cie in France [30], and the EXODUS Evacuation Modeling System for Mass Transport Vehicles prepared by the Centre for Numeric Modeling and Process Analysis at the University of Greenwich in the U.K. [31, 32]. These modeling systems tend to be detailed and comprehensive. The EXODUS system, for example, comprises 5 models: a passenger movement model, a passenger behavior model, a passenger physical attribute model, an atmospheric and physical hazard model, and a toxicity model which accounts for the presence of noxious combustion gases during a fire scenario. This particular system has been tested with real data from the Cranfield Institute of Technology, providing promising results. The University of Greenwich has ongoing work with regard to the simulation of egress under hazardous and non-hazardous

conditions, compartment fire simulations, two-phase fire-sprinkler simulations, and aircraft fire field models [33]. Other modeling work is also being done at the Cranfield Institute of Technology in the U. K. [35], Thames Polytechnic and the National Technical University of Athens (PHEONICS System) [29 and 35], Sandia National Laboratories/Norwegian Institute of Technology's SINTEF Field Model [29], as well as the Fire Science Centre at the University of New Brunswick in Canada [36].

### **4.3 Jet Transport Aircraft Interior Construction**

The prime concerns in the modifying of aircraft interiors are to minimize ignition and fire-spread characteristics, including heat, smoke, and toxic emissions, and to maximize passenger evacuation time. Currently, the FAA required design evacuation time standard as specified in CFR 14 Part 25.803 is 90 seconds [18] based on an approximated time-to-flashover in a fire event. Clearly, anything which can be done to delay flashover in the cabin and increase passenger evacuation time will have a life-saving benefit in survivable jet transport crashes. Improvements include fire blocking layers on seats, low heat release cabin materials, improved seat components, cabin water spray systems, fire resistant fuselages, and possibly smokehoods. The controversies surrounding cabin misting systems and smokehoods will be discussed in a following chapter. Figure 4.1 [20] gives a qualitative description of projected evacuation time increases achievable through implementation of these improvements. Here one notes that seat blocking, to be discussed in a later section, has been instrumental in raising evacuation time in in-flight fire situations and survivable crashes. The improvement is nearly two-fold with respect to 1972 jet transport flammability standards. In addition to

protecting passenger compartments, there is also concern regarding the fire-hardness of cargo liners below decks as well as main deck cargo in combi aircraft.



**Figure 4.1: Projected Improvements in Available Passenger Evacuation Time Based on Implementation of Various Safety Improvements [20]**

#### 4.4 Cabin Materials

Flammability requirements for aircraft interior materials were specified in the U. S. as early as 1953 and were based on simple tests where vertical or inclined strips of the material in question were subjected to a Bunsen burner flame for some period. These requirements were upgraded in 1967 to add the requirement of material self-extinguishment upon removal of the fire source. The early 1970's marked the inclusion an additional set of requirements, mainly involving time limits on specimen self-extinguishment. By 1979,



industry had already established an additional set of self-imposed standards aimed primarily at reduction of smoke and toxic emissions from burning materials.

Since the early 1980's, most notably after the Air Canada accident of June 2, 1983, there has been a renewed thrust to improve fire safety in jet transports through changes in materials used in the construction of aircraft interiors. In 1985 the FAA issued a Notice of Proposed Rule-Making (NPRM 85-10) for improved flammability standards of materials (i.e. paneling and liners) used in crew and passenger compartments. These new standards were based, in part, to new test apparatus developed by Ohio State University for the measurement of peak heat release and smoke emissions from burning cabin materials. It should be recognized that industry was also instrumental in developing test criteria for cabin materials, most notably Factory Mutual Research Corporation, a research subsidiary of Factory Mutual Insurance, which has been a major proponent of fire research since the late 1800's [37, 38]. From NPRM 85-10 evolved a new set of requirements for interior materials, commonly known as "100/100" and "65/65" standards. The 100/100 standards, which were ratified on August 20, 1988, required the replacement of all cabin materials having a total heat release in 2 minutes in excess of 100 kW·min/m<sup>2</sup> and a maximum peak heat release of 100 kW/m<sup>2</sup> "...upon the first substantially complete replacement of the cabin interior... [after the ratification date]". In addition, the materials were required to pass a Smoke Emissions Test as defined by ASTM F814 as well as the FAA Vertical Bunsen Burner Test as defined in FAR 25.853(a). It is interesting to note that Airbus Industries had actually adopted similar standards (ATS 1000.001) for construction of the A310 in 1981 before the FAA's adoption of the 100/100

rule. Following ratification of the 100/100 rule, provisions were made to decrease the total and maximum heat allowances to 65 kW·min/m<sup>2</sup> and 65 kW/m<sup>2</sup>, respectively, by August 20, 1990. An additional stipulation called for an maximum smoke emission density, D<sub>s</sub>, of 200 after 4 minutes. [39]. These requirements remain in effect today.

In order to meet the 100/100 rule, it was necessary to change the materials used in cabin construction. Most notable was the replacement of epoxy, kevlar, and polyester with phenols. See Table 4.1 for examples of the changes made.

**Table 4.1: Cabin Material Changes Instituted to Meet FAA “100/100” Rules of August 20, 1988 [39]**

<b>Non-compliant with 100/100 Rule</b>	<b>Compliant with 100/100 Rule</b>
Epoxy/Kevlar Sandwich Panels with Decorative Laminates	→ Phenolic/Glass Sandwich Panel with Decorative Laminate
Epoxy/Kevlar Sandwich Panel with Grosspoint Decorative	→ Phenolic/Glass Sandwich Panel with Replin/PBI
Polycarbonate Integral Color	→ Polyetherimide (Ultem) Painted Finish
Dado Carpet	→ LW40 PBI Replin Backed with Nomex Felt
Polyester/Glass Laminates	→ Phenolic/Glass Laminates

This thrust for improved aircraft fire safety was further augmented, in the U. S. at least, by ratification of the Aviation Safety Research Act of 1988 (Public Law 100-591), an amendment to Section 312 of the earlier Federal Aviation Act of 1958 which compelled the FAA to “... undertake of supervise research to develop technologies... [for the purpose of minimizing in-flight and post-crash fire hazards]” [29].

As a final remark, other passenger seat components have also come under scrutiny during the past years as proposals have been made to replace aluminum structural components with composite materials, which may add to the fire risk presented by rubbers, foams, and plastics used in seat cushions, armrests, etc. [24 and 40].

#### **4.5 Fire blocking of Passenger Seat Cushions**

Owing to their abundance in aircraft cabins, unprotected polyurethane foam seat cushions present a serious fire hazard. Burning foam is of particular concern because of the fact that, once ignited, it burns with great intensity and tends to flow as a liquid, thereby spreading the fire to nearby objects. The high level of heat generation and toxic smoke emissions also pose major problems by providing for flash-over of non-adjacent materials and poisoning of the cabin inhabitants, respectively.

In order to mitigate these factors, it has been proposed to replace the polyurethane foams with less flammable polyimide or neoprene foams. Unfortunately, polyimide foams are extremely stiff and brittle and are unable to meet any reasonable standards for comfort or durability. The other alternative, neoprene foams, have an extremely high density (as much as 130 kg/m<sup>3</sup> or 8 lbs/ft<sup>3</sup>), making them too heavy for widespread use in aircraft cabins, though they are occasionally used for flight attendants' seats. The use of spray-on flame retardants has also been considered and though they are capable of surviving the vertical Bunsen burner flammability test prescribed in U. S. Federal Aviation Regulation (FAR) 25.853, they cannot withstand the heat flux generated in full-scale scenarios, more specifically the FAA's

Kerosene Burner Test established in 1985 under FAR 25.853(c) [23 and 39]. This test subjects an entire seat to direct flames produce by a modified 11-inch diameter kerosene heater not dissimilar to those used for home heating. The intent is to simulate a post-crash fire where one side of the aircraft is engulfed in flames, thereby transmitting large amounts of heat through the fuselage and wall panels to adjacent seats. By FAR 25.853(c) one side of the seat is subjected to 2 minutes of direct flames burning at 1000 °C to 1078 °C and radiant heat intensity of approximately 11.5 W/cm<sup>2</sup> . After removal of the flame, the seats must retain more than 90% of their original weight and the maximum burn length must not exceed 43 cm.

To solve this problem, a solution where the existing polyurethane cushions are wrapped in some non-flammable “fire-blocking” material before being inserted in their covers has been adopted. Examples of materials which may be used of fire blocking include PBI felts, woven carbon fiber fabrics, woven PBI/Nomex fiber fabrics, woven PBI/Kevlar fiber fabrics. Less hazardous foams are also in use. These include fire resistant polyurethane foams and Mezoprotect FR™. Some fire resistant neoprene and silicone foams are also used for special applications.

In this author's experience, having visited the Fire Safety Section of the FAA Technical Center in Atlantic City, NJ, the Kerosene Burner Test is extremely effective at demonstrating the value of fire blocking seat cushions. In a comparative test it was seen that an unprotected cushion with standard wool cover was completely engulfed in fire in less than 10 seconds after exposure to the kerosene burner flame, decidedly failing the test. A similar cushion having a wool cover impregnated with a high quality mineral-based flame retardant withstood approximately 120 seconds of exposure, also failing

the test, albeit by a narrower margin. A final cushion utilizing a PBI-Kevlar fire blocking layer began to show signs of significant breakdown after only the 120 second flame exposure limit had been exceeded.

#### **4.6 Fire Resistant Fuselages**

The fuselage and passenger windows, fabricated of aluminum alloys and acrylic, respectively, are not highly fire resistant. Aluminum alloys can melt within a minute [29] in post-crash fire scenarios and acrylic windows are subject to melting and burning. Burning paints and sealants tend to exaggerate the situation. To help reduce fire sensitivity in these areas, it has been proposed [20] that intumescent paints and sealants be employed, which foam and expand, creating a layer of fire retarding material on the skin of the aircraft. As titanium alloys become more widely used, actual burn-through becomes less of a problem due to titanium's high temperature resistance. However its high rate of conduction does reinforce the need for heat and fire damming intumescent coatings or some other means of providing a thermal barrier. To reduce the risk associated with acrylic windows, it has been suggested that passenger window shades be fabricated from some heat and radiation resistant material to provide protection after the windows have failed.

A potential second level of protection lies in the space between the fuselage skin and cabin paneling, where acoustic and thermal insulation are generally found. Though this area is not commonly designed with fire hardening in mind, it is conceivable that these spaces be used for installation of fire and high-heat insulating materials. Once again, radiation reflective

materials and intumescent coatings in this area could greatly improve fire hardness of an aircraft.

#### **4.7 Cargo Lining Materials**

Aircraft cargo and baggage compartments are classified from "A" to "E" depending on their size and function. The fire safety requirements for these compartments are not all the same, as is seen in Table 4.2 [13 and 40]. Most belly (lower deck) compartments are classified as Class-C or Class-D compartments. The smaller Class-D compartments are not required to have smoke or fire suppression systems, but rather depend on exhaustion of available oxygen to starve a potential fire before it can spread. This system, however, depends greatly on the cargo liner's ability to resist burn-through and remain intact, thereby preventing the entrainment of a fresh air supply which could feed or rekindle the fire. Burn-through of cabin liners has been cited in a number of cases discussed in Chapter 3, namely the accidents involving Saudia, Gulf Air, UTA, and ATA.

In contrast to Class-D compartments, Class-C compartments are required to have fire detection and suppression systems, in addition to the ability to control air flow to the compartment. At the same time that new test criteria were specified for cabin materials in 1985, changes were also made to increase the level of realism of the tests used to evaluate cargo lining materials. Here, the standard Bunsen burner tests were replaced by a test where sidewall and ceiling liners were simultaneously subjected to 1700 °F, 8.0 BTU/ft<sup>2</sup>, for 5 minutes. The requirements for passing the test stipulate that no burn-through may occur and that the temperature 4 inches above the

ceiling liner may not exceed 400 °F. Of the 400 materials tested for use in cabin liners only 20, composed mainly of fiberglass and phenolic, epoxy, or polyester resins were able to meet both test criteria [39].

**Table 4.2: Jet Transport Cargo Compartment Classification and Fire Safety Provisions [13, 40]**

Class	Specifications	Fire Safety Provisions
A	Cargo or baggage; presence of fire easily detectable; easily accessed during flight	Easy access during flight
B	Cargo or baggage; Easy access for fire-fighting with a portable fire extinguisher during flight	Smoke or fire detectors with cockpit warning
C	Cargo or baggage; not accessible during flight	Fire resistant liner; smoke or fire detectors with cockpit warning; fire suppression system; control of ventilation
D	Cargo or baggage; Volume $\leq 1000$ ft <sup>3</sup> ; fire completely confined, cannot endanger aircraft	Fire resistant containment system; control of ventilation
E	Cargo (Freighter) Aircraft Only; crew emergency exits accessible at all times.	Fire resistant liner; smoke or fire detectors with cockpit warning; fire suppression system; control of ventilation

#### 4.8 Advanced Fuels and Anti-Misting agents

By far the greatest fire risk in the jet transportation environment is the large quantity of highly combustible fuel. As mentioned in Chapter 1, a large jet aircraft may carry hundreds of thousands of liters jet fuel. Therefore, it has been of interest to devise a way to make fuels “less dangerous” without adversely affecting their combustion performance in aircraft engines. It

should be mentioned that these attempts are often combined with, or balanced against, efforts aimed at developing cleaner and more efficient fuels.

Aviation fuels may be divided into three basic groups: gasoline fuels (i.e. gasoline, Avgas) for piston engine use, kerosenic fuels (i.e. Jet A, Jet A-1, JP-5, JP-6) for turbine engines, and mixed kerosene/gasoline fuels (i.e. Jet B, JP-4), also for turbine powerplants. The advent of turbine fuels having compositions higher in aromatic content than traditionally used Jet A (i.e. mixed fuels) has been a matter of some controversy, owing to their lower flashpoint, ignition temperature, and extended explosive limits, and increased flame-spread properties, despite their cleaner burning characteristics and improved flow in aircraft fuel systems at low temperatures. Since the flashpoint (i.e. the temperature at which enough evaporation occurs to produce flash in the presence of sparks or flames) and ignition temperature (i.e. temperature at which sustained combustion occurs spontaneously) are lower than that of Jet A, these fuels are inherently more dangerous by being ignitable at lower temperatures. Increased risk also stems from the wider range of explosive limits. The Upper Explosive Limit (UEL) and Lower Explosive Limit (LEL) define the maximum and minimum percentages, respectively, of fuel vapor in air necessary to support combustion. The combination of these factors result in fuels which are more easily ignitable and have a more rapid rate of flame spread; in fact, over 7 times that of kerosenic fuels. Flashpoint, ignition temperatures, explosive limits, and flame spread characteristics for a number of aviation fuels are seen in Table 4.3.

Despite these safety factors the newer fuels are more efficient, cleaner, and ozone friendly than earlier fuels, especially when used in concert with



recent technology power plants. To mitigate the fire risk associated with jet fuels (especially newer blends), extensive research has been done during the past 40 years to develop fuel stabilizing agents aimed at reducing the explosive nature of jet fuels in crash situations, thereby increasing passenger safety.

**Table 4.3: Basic Specifications and Burning Characteristics of Various Types of Fuel Used in Aviation [41]**

Fuel	Flashpoint [°C]	Ignition Temp [°C]	UEL/LEL [%]	Pool Rate of Flame Spread [m/min]	Application
Auto	-42	260			Piston Transp.
Avgas	-50	441 to 515	7.6/1.4	200 to 250	"
Jet A	37 to 51	227 to 246	0.6/4.9	≤ 30	Jet Transport
Jet A-1	"	"	"	"	"
JP-5	"	"	"	"	"
JP-6	"	"	"	"	"
Jet B	45 to 57	243 to 249	0.8/5.6	200 to 250	Jet Transport
JP-4	"	"	"	"	"

As early as the 1960's, attempts were made develop additives which could emulsify or gel the fuel in the wings of transport aircraft as a general means of storage or even as part of a pre-crash emergency procedure. As these efforts were not fruitful, renewed focus in the 1970's pointed towards development of high molecular weight polymer additives which could make spilling fuel less likely to form highly flammable aerosols. Though these additives did show striking initial successes in small- and intermediate-scale tests, large-scale experiments were complete failures [29]. Perhaps the most spectacular failure occurred in 1984 during a Controlled Impact

Demonstration (CID) of a Boeing B720, outfitted with the fuel stabilizing/anti-misting additive known as FM-9, at Edwards Air Force Base in California. The CID involved a simulated controlled, survivable “wheels-up” landing where the sliding aircraft then collided with a large stationary array of steel cutters designed to tear open the wing tanks, causing a full-scale post-crash fire. The test ended in total failure when one of the starboard engines collided with a cutter and exploded, igniting the surrounding mass of spraying fuel. Within 1 second of ignition, the resulting “fireball” had expanded to 14 meters (ca. 46 feet) in diameter and subsequently enveloped most of the fuselage before being extinguished shortly thereafter by ARFF crews [42]. Regardless of their effectiveness in some cases, almost all of the fuel stabilizing additives tested by the FAA have proven to be incompatible with aircraft fuel systems. The result is a fundamental need for extensive basic research aimed at understanding more about combustion processes and the physics of post-crash fires. Long-term research efforts should also be directed towards the development of alternative fuels [29].

#### **4.9 Economic Considerations of Fire Hardening**

When attempting to direct research, development, and implementation of safety improvements in the jet transport system, it is extremely important to take into account the cost-benefit analyses associated with each improvement. The cost of implementation of safety improvements may be broken into two main groups: fixed costs and variable costs. Fixed costs include research, development, and installation costs. Variable costs, on the other hand, include increased operating costs as a result of implementation of a safety improvement. Variable costs often come in the

form of increased fuel expenditure due to increased aircraft weight and can be quite substantial. Treloar [43] of British Aerospace has compared the total interior weights of comparable 70 seat jet transport aircraft and has shown that despite improvements in technology leading to development of lighter cabin components, these weight savings are being outpaced by increases in weight caused by the inclusion of fire blocking materials in the construction process (Table 4.4). In fact, Treloar shows that cabin interiors have actually increased in weight by 84%. If Treloar's estimates were overstated by a factor of 2 and the actual weight increase were only 42%, it would still translate into millions of additional liters of annual world jet fuel usage.

**Table 4.4: Representative Changes in Total Interior Weight for a 70-Seat Jet Transport Aircraft from 1960 to 1989 [43]**

Year	1960	1989
Total Weight of Fittings and Equipment, Including Cabin Windows [kg]	2,230	1,900
% Reduction in Total Weight from 1960 to 1989	---	15%
Weight of Non Combustible Materials [kg]	1,520	590
% of Total Weight	68%	31%
Weight of Combustible Materials [kg]	710	1,310
% of Total Weight	32%	69%
Increase in Weight of Combustible Materials from 1960 to 1989 [kg]	---	600
% Increase in Total Aircraft Interior Weight from 1960 to 1989	---	84%

The benefit side of the cost-benefit equation requires a close look at the number of annual deaths occurring as a result of some accidental cause or risk factor in jet transport. For example, since statistics show that in-flight failure of aircraft pressurization systems is not a cause of a large number of deaths, as

compared to Controlled Flight Into Terrain (see Chapter 2), investing massive amounts of money into improving pressurization systems would not be prudent. The second question to be asked is how many people, that would have otherwise perished, could be saved through development and implementation of a safety improvement. Once this is known the sensitive and philosophical question arises as to how much the life of an individual is worth. Though many would contend that a monetary value cannot be put on a life, this type of reasoning would require the endless pursuit of any and all safety improvements, no matter how minute, at any cost. Such a doctrine would, of course, be infeasible and unrealistic. As a result, regulatory bodies are compelled to put a discrete monetary value on human life. In 1974 the FAA recommended a figure of \$300,000 for each air carrier fatality and \$390,000 for each general aviation fatality, respectively, based on calculations from the former U. S. Civil Aeronautics Board (CAB) non-Warsaw Pact accident payments of the period 1966 to 1970. (Today these values are expected to be higher to account for inflation). Studies of compensation and willingness to pay indicate that society is willing to spend between \$100,000 and \$500,000 to avert a single premature death on a statistical basis [44]. Once these factors have been considered, as well as questions regarding acceptable levels of risk, the overall financial state of the industry, and expected developments in technology, it is possible to make decisions regarding the worthiness of pursuing a particular safety program.

## **Chapter 5:**

### **Fire Management in Jet Transportation**

#### **5.1 Overview**

Since it is not always possible to prevent fire, provisions must be made to reduce material and human loss when it occurs. Steps taken to control and extinguish fire, and to increase the survivability of fire are referred to as fire management. Fire management, as it refers to jet transports, includes detection equipment, on-board fire-fighting and suppression equipment, external fire-fighting and suppression equipment (ARFF Services), personal protective equipment, and evacuation/egress equipment. Specific examples of these types of equipment are discussed in the sections that follow.

#### **5.2 Cabin Water Spray Misting Systems**

Concurrent with the thrust made during the 1980's to develop improved cabin materials, proposals were made by the FAA as early as 1983 to evaluate the potential for an aircraft sprinkler system or, more accurately, "cabin misting system", based on the successful application of sprinklers worldwide in buildings and ships. It was hoped that such a system would help extend passenger evacuation times, especially in instances of post-crash fire.

The basic advantages of a cabin misting system are twofold. First, by filling an aircraft cabin with a fine mist of cool water during a fire scenario, it is possible to reduce and maintain a lower cabin temperature, thereby extending evacuation time by delaying the flashover of cabin materials. The water, having a high thermal capacity, acts as a heat-sink, absorbing radiated and convective heat from other cabin materials. It is important to note that although aircraft misting systems emulate common sprinklers, they do not produce a coarse spray of water, but rather a fine mist. Second, it is felt that a cabin water spray would be able to wash smoke and particulate matter from the air, helping to maintain visibility, filter toxins out of the air, and extend inhabitability of the cabin. A review of worldwide accidents involving fire deaths from 1966 through 1985 made by the British Civil Aviation Authority (CAA) concludes that an appreciable benefit could be realized through implementation of an on-board cabin misting system [45].

Currently, the FAA and CAA are involved in a two-phase joint program to develop and evaluate a prototype cabin misting system for both wide and narrow body jet transport aircraft. The foundation for this system was developed by Safety Aircraft and Vehicles Equipment (SAVE) in the United Kingdom and was initially tested on a Vickers VC-10 fuselage in 1987. The SAVE system for a narrow-body test consists of a matrix of 120 nozzles capable of discharging 72 gallons of water as a fine mist having a mean nominal droplet size of 100  $\mu\text{m}$  in 3 minutes. For wide-body tests, the number of nozzles was increased to 324 and the amount of water to 195 gallons. The total discharge time for both scenarios was the same. The first phase of this joint program, which has already been completed, involved a feasibility study of the SAVE system in light of its effectiveness in post-crash

fire scenarios, potential benefit in past accidents, and potential risk the system poses if discharged in flight. The second phase, currently underway, involves optimization of the system and minimization of its weight penalty [46].

Testing of the SAVE system, and variations thereof, has been conducted at the FAA Technical Center and has yielded promising results. During these full-scale tests, varying configurations (i.e. total water discharge and droplet size) of the SAVE system were tested in both narrow- (B707) and wide-body (DC-10) aircraft. Because the tests were completed within a building, it was possible to simulate zero-, moderate-, and high-wind scenarios with a high degree of repeatability using variable-speed fans. Fire was provided for using 8 ft by 10 ft pans of jet fuel located directly outside of Type-A openings located at the center of the 24 ft fuselage test sections. The use of a Type-A opening was intended to simulate an open exit or rupture in the fuselage resulting from a crash. The test duration was 7 minutes for the narrow-body tests and 5 minutes for the wide-body tests, respectively. Results of the preliminary tests are seen Table 5.1 [46].

Table 5.1 clearly shows the positive value of a cabin sprinkler system where an average improvement in survivability (i.e. survivable evacuation time,  $T_s$ ) of 40.3% was seen across all tests. Since the high-wind tests were determined to be unsurvivable under any conditions, one might contend that the actual improvement in survivability was 53.8%, based only on the survivable tests.

One major problem associated with cabin misting systems is the weight penalty associated with the water carriage. Based on the systems described above, the weight penalty for the water carriage alone would be 272 kg and 739

kg (600 lbs and 1,626 lbs) for each narrow- and wide-body aircraft, respectively. This is equivalent to 3 and 8 passengers, respectively.

**Table 5.1: Preliminary Test of the FAA-SAVE Cabin Misting System (CMS) on Wide-Body (DC-10) and Narrow-Body (B707) Fuselage Test Sections under Varying Wind Conditions (FAA Technical Center, Atlantic City, NJ, U.S.A.) [46].**

Wind	Configuration	T <sub>S, w/o CMS</sub> [s] <sup>1</sup>	T <sub>S, w/ CMS</sub> [s] <sup>2</sup>	%ΔT
None	Narrow-body	≈ 300	≈ 420	+40.0
Moderate	Narrow-body	≈ 165	≈ 300	+81.8
Moderate	Wide-body <sup>3</sup>	≈ 215	> 300	≥ +39.5
High	Narrow-body <sup>4</sup>	≤ 60	≤ 60	0.0
Average				+40.3
<sup>1</sup> T <sub>S, w/o CMS</sub> = Survivable evacuation time without cabin misting system in seconds. <sup>2</sup> T <sub>S, w/ CMS</sub> = Survivable evacuation time with cabin misting system in seconds. <sup>3</sup> Test terminated at T=300 s; fatal conditions not yet reached in CMS-equipped cabin. <sup>4</sup> Test terminated; scenario unsurvivable under any condition.				

A complete system including controls, nozzles, fittings, and piping could weigh many times this. The sheer weight of the water makes the SAVE system, as described above economically unfeasible, especially at a time when a large number of U. S. and world jet operators are posting significant financial losses. For this reason development has focused on water carriage reduction. Currently, the FAA is experimenting with the concept of “zoning” the SAVE system to deliver the water spray only to those areas where it is actually needed. In this way the required volume of water could be reduced by as much as 90%. Tests aimed at optimizing the mist droplet size, nozzle spray pattern, and discharge rate are also being conducted. Surprisingly, these continuing reduced water volume zoned-flow tests are providing results



even more impressive than the original tests involving the original SAVE cabin misting system.

Clearly, cabin misting systems are effective in extending evacuation times. Tests show that, in almost all cases, an extra 2 to 3 minutes of evacuation time can be gained through their implementation in both narrow- and wide-body aircraft. The remaining question is whether these systems can be made economically feasible. Zoning seems to offer a viable solution, though further work needs to be done. Acceptance of any CMS system may be dependent on the economic state of the airline industry as a whole. It will likely be easier to design these systems into new aircraft, perhaps integrating them with the existing water systems on board.

In order to alleviate the weight penalty problem associated with water carriage, SAVE has also proposed a "Tender System" [47]. This system would be identical to the on-board cabin misting system, but rather than having an on-board water supply, external coupling would be built into the exterior of the aircraft so that external water supplied by ARFF units could be utilized. An advantage of this system is that a typical ARFF crash truck may carry as much as 16,000 liters (ca. 4,000 U.S. Gallons) of water, making the supply essentially limitless for the cabin misting application. Problems do exist, however, with regard to the number and location of the external hose connections. In addition, it is questionable whether such connectors or the system as a whole would still be functioning in the event of a crash. Similarly, it is also not sure whether ARFF units would be able to reach the couplings soon enough to be of benefit, if any, in the event of a large fire enveloping a substantial portion of the aircraft.

### 5.3 Passenger Smokehoods

Fires involving plastics, hydrocarbon fuels (i.e. jet fuel), and other materials commonly found in the jet transport environment generate large amounts of smoke and noxious gases which present great dangers to passengers and crew members, alike. Among these toxic emissions are hydrogen cyanide (HCN), hydrogen chloride (HCl), hydrogen fluoride (HF), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), and nitrogen oxides (NO<sub>x</sub>). Each of these agents has the ability to incapacitate and kill within a short period of time. HCN, for example has been used in gas chambers for capital punishment. HCl, HF, and SO<sub>2</sub>, are classified as "irritants" and are highly corrosive, causing to choking, respiratory spasms, and "dry-land drowning", where the victim's respiratory tissue become inflamed and rupture, filling the lungs with fluid. CO<sub>2</sub> displaces O<sub>2</sub> in the respiratory system, causing rapid unconsciousness without warning. In addition, CO<sub>2</sub> induces hyperventilation, thereby increasing the intake of other dangerous gases. CO blocks hemoglobin in the bloodstream, making it impossible for the body to metabolize O<sub>2</sub> taken in through the lungs. Dense smoke and soot also have an incapacitating effect by inducing bronchospasms, blocking respiratory passages, and hindering eyesight. In fact, accident survivors have reported that "they could no longer breath or utter any sound after a breath or two of smoke". As few as three breaths of dense smoke have been sufficient to cause incapacitation and in some instances death [48].

The large number of fatalities arising from smoke inhalation as seen the Saudia, Air Canada, and Leisure Air Tours accidents during the mid-1980's led to proposals for the use of passenger gas masks or "smokehoods".

The result of these proposals was a joint effort by the CAA in the United Kingdom, the U. S. FAA, Transport Canada, and the French Civil Aviation Authority (DGAC), leading to a study to evaluate what positive benefit, if any, smokehoods would have had in past accidents dating from 1966. The investigation took into account current fire hardening practices and improvements in safety, including fire-blocking of seats, escape path lighting, lavatory smoke detectors, and fire extinguishers. This study, which was completed in 1987, indicated that use of smokehoods would save an average of 9 lives per year in aircraft having more than 30 seats. The report also indicated, however, that the smokehoods would have to be of high quality and durability [49].

Simulated live tests using smokehoods were also conducted in 1987 in Great Britain in order to gain insight into passenger behavior with regard to the donning of smokehoods. More specifically, it was desired to determine if the donning of smokehoods would delay passenger evacuation time, thereby raising the fatality risk in an accident scenario. To perform this experiment, 765 volunteers ranging from 18 to 50 years of age participated in 9 simulated emergency evacuations of the rear passenger compartment of a retired Trident III aircraft. The results of these tests showed that the donning of smokehoods does not significantly increase evacuation times. In fact, in some cases, the availability of smokehoods seemed to calm passengers in the presence of smoke, resulting in an overall more orderly exodus from the aircraft [50].

Despite these findings, a unanimous agreement was reached by the 4 constituents of this research effort not to mandate the implementation of smokehoods, based on continued doubts whether or not smokehoods would

indeed lengthen evacuation times in real accidents as potentially injured passengers fumble to put on their smoke hoods, rather than hastily evacuate the aircraft. According to Vant [50], the decision not to mandate smokehoods may not be soundly based, since the presence of smoke retards evacuation in any case, thereby lengthening passengers' exposure to risk in the aircraft and substantiating the need for respiratory and eye protection. It is the author's view that smokehood donning is not likely to take place after a crash, but rather before the passengers assume crash positions or at the onset of an in-flight fire. Considering this, the true questions are whether donned smokehoods are a potential source of injury during a crash and whether they are effective in reducing fatalities, regardless of potential extended egress times, during evacuations through smoke.

The vote not to mandate smokehood use, notwithstanding, the CAA has decided to keep this decision under review. Following issuance of the research results, the CAA issued Specification No. 20 in May 1988, which defined performance requirements for a potential passenger smokehood. Requirements were based on ease of donning, duration and level of protection, workload, respiratory resistance, inhalation temperature, communications, reliability, storage, and fire/thermal resistance [49].

It is interesting to note that a recent issue of Frequent Flyer Magazine [51] strongly recommended that travelers using Third World air carriers carry smokehoods with them as a means of increasing their personal safety in the event of an in-flight or post-crash fire. Since life vests, which are donned before a crash and only activated upon exit from the aircraft, are provided as standard safety equipment, it seems logical that smokehoods would also be provided for passenger use. Indeed, no one is arguing that the passenger who

stops to inflate his vest before exiting the aircraft is at fault for extending evacuation times. Further, if passengers, and especially frequent flyers, are being conditioned to expect a need for smokehoods, it seem reasonable that these items be made available. The cost for a single commercially available smokehood ranges from \$100 to \$200 [51]. It is expected that the prices would decrease as economies of scale are realized.

## **5.4 Current and Advanced Fire Suppression Agents**

### **5.4.1 General**

The jet transportation environment abounds with great challenges for ARFF efforts, owing to the large amount and diverse range of combustibles found. There are 4 classes of combustibles (Table 5.2), all of which are found in jet transportation. Currently, 3 basic types of fire suppression agents are used in jet transportation: fire-fighting foams, Halons™ (chlorofluorocarbons-CFC's), and dry chemical powders as defined by the FAA in 14 CFR §139.315 and §139.317. Each of these agents functions on a different principle and has both advantages and disadvantages (Table 5.3).

**Table 5.2: Classification of Fire Types**

<b>Fire Class</b>	<b>Materials Involved</b>	<b>Examples</b>	<b>Compatible Extinguishing Agents</b>
A	Common combustibles, cloth wood, paper, rubber, grass, etc.	Cabin upholstery, paneling, aircraft tires, wiring insulation, hoses, seals, gaskets, clothing, etc.	Water, some fire-fighting foams, some dry chemical powders. AFA's <sup>1</sup> .
B	Flammable and combustible liquids	Aviation fuels, hydraulic fluids, etc.	Fire fighting foams, dry chemical powders, and halons for pooled fuel fires. AFA's <sup>1</sup> .
C	Electrical equipment	Aircraft electrical systems	Halons, CO <sub>2</sub> , dry chemical powders. AFA's <sup>1</sup> .
D	Flammable metals (Mg, Ti, P, Na, etc.)	Aircraft wheel and brake assemblies, various high-strength/low-weight components	Specially formulated dry chemical powders, sand. AFA's <sup>1</sup> .

<sup>1</sup>Advanced Fire-Fighting Agents (AFA) based on water miscible surface active/emulsifying agents (surfactants). Note: the AFA acronym was coined for the purpose of this thesis for lack of a better term and does not represent widely accepted terminology

**Table 5.3: Generally Accepted Fire Suppression Agents for Use in the Jet Transportation Environment**

Agent	Mode of Extinguishment	Fire Class	Advantages; Disadvantages
Foam	O <sub>2</sub> exclusion, limited cooling	A, B	Attacks only burning fuel, coverage is easy to trace, long history of use; <i>difficult to apply, subject to thermal updraft, questionable cooling effect, environmentally safety questionable, limited shelf life.</i>
Halon	Chemical reaction	B, C	Very effective (especially in confined spaces), no cleanup; <i>difficult to apply in large amounts, may create noxious gases when used on Class-B fires, labor intensive, ozone depleting.</i>
Dry Chemical Powder	Chemical reaction	A, B, C	Effective on wide range of fires; <i>difficult to apply in large amounts, labor intensive, corrosive, obscures vision.</i>
AFA	Fuel neutralization, cooling, chemical reaction <sup>4?</sup> , O <sub>2</sub> exclusion <sup>4?</sup>	A, B, C <sup>2</sup> , D <sup>3</sup>	Neutralizes fuel, maximum cooling effect, protects ARFF crews and passengers, environmentally safe, biodegradable; <i>may act on full fuel volume, mechanism not fully understood, shelf life?</i>
<sup>1</sup> Advanced Fire-Fighting Agents (AFA) based on water miscible surface active/emulsifying agents (surfactants). <sup>2</sup> Using special application equipment. <sup>3</sup> Using special application methods. <sup>4</sup> Mechanism not completely understood.			

### 5.4.2 Fire-Fighting Foams

Fire-fighting foams are used exclusively for controlling post-crash and other fires on the airport surface, usually those involving large amounts of fuel. There are 4 types of fire-fighting foams which are generally accepted for aviation fire-fighting: aqueous film-forming foams (AFFF), fluoroprotein (FP) and film-forming fluoroprotein foams (FFFP), and protein foams. A fifth type known as high-expansion synthetic foams are sometimes used in hangar

fires, though they are not listed as a requirement or acceptable substitute for the four primary foams.

In order to initiate or support combustion, heat, fuel, an oxidant, and a chemical reaction are required. Absence or removal of any one of these components will preclude the onset or suppress a fire. Foams suppress fire through the mechanisms of oxygen exclusion and cooling (i.e. by removing the oxidant and the heat). Mixed at a ratio ranging from between 1% and 6% (3% is the most common) in water, properly proportioned and applied (i.e. aerated) foams form an air-tight fire-resistant blanket of foam, having a consistency similar to light shaving cream, on the surface of burning fuels. In this way, the fire is suppressed by being starved of oxygen and cooled to a point below its ignition temperature.

The various foams vary mainly in their required application rate (volumetric flow rate per area of fuel/fire measured in GPM/ft<sup>2</sup> or lpm/m<sup>2</sup>), ease and rapidity of application, stability after application ("drain time"), heat resistance ("burn-through resistance"), shelf-life, and cost. Currently, AFFF is the recommended foam owing to its rapid application and lack of need for aeration. Other advantages of AFFF are its low required application rate, rapid flow characteristics, and high-level vapor sealing effect stemming from the film-forming nature of the foam. Disadvantages are relatively rapid drain time and limited shelf-life in some cases. AFFF is also relatively expensive, however, costing approximately USD 20.00/gal. Fluoroprotein, film-forming fluoroprotein, and protein foams tend to be thicker in consistency than AFFF, reducing their rapidity of application but increasing their drain time. The disadvantages of these foams include increased required application rate, need for aeration and therefore special application equipment, the ability to



create lasting breaks in the foam blanket (i.e. by stepping on it) which can create reignition opportunities, and reduced burn-back resistance. The latter 2 problems are less pertinent to FFFP. These foams range in price from USD 2.00/gal. for protein foams to about USD 20.00/gal for high quality FFFP.

In general, fire-fighting foams have the advantage that they attack only the burning surface of the fuel to effect extinguishment and not the full bulk of the fuel, thereby requiring less extinguishing medium. Foams also have the advantage that it is easy to trace their coverage. Some foams may also be used in concert with dry chemical powders in a "combination attack". Foams are disadvantageous in their limited cooling effect, the fact that they obscure visibility, provide limited protection for fire-fighters, only provide a blanket of coverage which may be interrupted creating a reignition risk, and require specialized, sometimes impractical, application methods and equipment. The fact that they are very light and "fluffy" makes foams susceptible to being carried away by a large fire's thermal updraft before an effective blanket seal can be formed. Foams can be difficult to project over long distances and are not well suited to application in a cross-wind. They are also difficult to apply on burning three-dimensional objects, where a foam blanket is difficult to form. From an environmental standpoint, many foams have the negative aspect of containing harmful and sometimes carcinogenic components, making them incompatible for dispersal into the environment. Some of the more effective foams, for example, contains tensides or halogens, both of which are restricted by the U. S. Environmental Protection Agency (EPA). In fact, the EPA requires that many foams which are introduced into the environment as a part of fire preventative or suppression measures must be removed from the environment and disposed of at a hazardous waste facility.

The Austrian Ministry of the Environment requires that no more than 10 liters of AFFF enter the environment at one time without collection [52]. In reality, these regulations are wholly unenforceable and impossible to police, especially in training situations. Thus, massive amounts of foam enter the environment every year. One airport group in Europe uses 10,000 liters of foam for training annually, none of which is disposed in accordance with generally accepted practices. In the author's experience the basic philosophy exhibited by fire-fighting agencies worldwide is that "the job of fire-fighters is to extinguish fires -- let somebody else worry about the mess... our budgets don't account for cleanup costs". Based solely on environmental aspects, development is needed to make foam fire suppression agents more environmentally acceptable. Additionally, a mechanism needs to be developed to make budgetary and operational allowances for fire services to clean up the mess that they make.

#### **5.4.3 Halogenated Fluorocarbon Fire Suppression Agents (Halon<sup>TM</sup>)**

Halon<sup>TM</sup> is the trade name for a group of halogenated fluorocarbons which are highly effective at extinguishing a large range of fires by interrupting the oxidation reaction characteristic of burning. Halons are especially effective as used from hand-held fire extinguishers on fires still in the incipient phase (i.e. not yet fully established). Though there are a number of Halon agents, Halon 1211<sup>TM</sup> (Bromochlorodifluoromethane) and Halon 1301<sup>TM</sup> (Bromotrifluoromethane) are most commonly used in the jet transportation environment. Halon 1301<sup>TM</sup> is typically used for protecting aircraft cargo compartments and powerplants, whereas Halon 1211<sup>TM</sup> is generally used in portable fire extinguishers in the passenger compartment. Only Halon 1211<sup>TM</sup> is listed under FAA 14 CFR §139.317 for use by ARFF on

the airport surface. The advantages of Halon lies in its high effectiveness per amount of agent used. It is non-conductive, making it safe for use on Class-C electrical fires, which are highly prevalent in in-flight fires and it is also lighter than air, thus evaporating and leaving no residue. Though well suited for use in hand-held extinguishers and in confined spaces, Halon 1211™ is less practical for use on a large scale outdoors. First, as with any pressurized gas, Halon must be stored and transported in heavy cylinders which are labor intensive to handle, maintain, and refill. Second, the fact that Halon is lighter than air makes it difficult to project over long distances or under windy conditions. In addition, when applying Halon to some burning hydrocarbon fuels, noxious gases may develop as a byproduct.

Once thought of as the “cure-all” fire suppression agent throughout the world fire-fighting industry, Halon's greatest disadvantage lies in the fact that it belongs to a group of chlorinated fluorocarbons (CFC's) which are highly ozone destructive. As a result, the parties comprising the Montréal Protocol charged to deal with the problem of Halons in the environment, adopted an accelerated phase out of Halons in November 1992, which called for cessation of all Halon production by January 1, 1994 [53]. The Federal Republic of Germany had already issued legislation banning the distribution and use of Halons as early as 1991 [54].

On February 9 -10, 1993 the First Symposium on Halon Replacement in Aviation was convened under the auspices of the Aerospace Industries Association (AIA), the United States Air Force (USAF), and the Halon Alternatives Research Corporation (HARC), which is an industry sponsored information clearing house. During this symposium, 2 major problems were identified. First, it is necessary to find an environmentally acceptable fire

suppression agent and delivery system substitute for Halon, and second to identify and recycle existing Halon supplies to meet fire-fighting demands until a suitable replacement has been found. Of major concern is the replacement of the Halon 1301™ used in aircraft powerplants, auxiliary power units (APU's) and cargo bays, as a replacement agent will most likely require the implementation of an entirely new delivery system. As a result, a proposal has come forward to redeploy Halon 1301™ reserves currently distributed in industrial, computer, and telephone switchboard facilities, since it is foreseeable that fixed systems will be easier to retrofit for a potential Halon replacement than aircraft. The Halon 1211™ problem is less concerning since portable fire extinguishers used in aircraft cabins are easy to inventory and replace. [53]

In order to facilitate Halon redeployment, the Halon Recycling Corporation (HRC) has been incorporated as a not-for-profit organization by industry to organize and oversee the taking of inventory and redeployment of existing Halon reserves. The United Nations (UN) counterpart of HRC is the OzonAction Programme (UNEP IE/PAC) in Paris, France [55]. The U. S. EPA has also taken an active roll in Halon bank management and has recently published a brochure to this effect. Finally, the Fire Safety Branch at the FAA Technical Center has established a Halon Replacement Working Group which met for the first time in October of 1993. Participation is open to all individuals interested in Halon Replacement. [56]

Potential replacements for Halon include non-ozone depleting halons, water, and dry chemical powders. Extensive research on developing these agents is currently underway at the U. S. Air Force Engineering & Service Center, Engineering & Services Laboratory at Tyndall Air Force Base, Florida

[57]. Though none of these agents are expected to provide a “drop in” solution as far as current systems are concerned, the FAA does not foresee a need for redefinition of current certification rules. It will, however, be necessary to determine new performance criteria for replacement systems [53].

#### **5.4.4 Dry Chemical Powder Fire Suppression Agents**

There are two commonly accepted dry chemical powder fire suppression agents found in the jet transportation environment. The first is monoammonium phosphate which is often referred to as “ABC dry powder” since it is applicable on Class-A, -B, and -C fires. The second is sodium bicarbonate ( $\text{Na}_2\text{CO}_3$ ), or “BC dry powder”. Though fairly effective, especially in hand-held fire extinguishers and on fires in the incipient stage, dry chemical powders do suffer from a host of disadvantages. As was the case with Halons, dry powders are difficult to project in large quantities, over large distances, and in crosswinds. Powders, like Halon, are delivered from heavy pressurized cylinders, making them labor intensive. They are also highly corrosive. On the positive side, dry chemical powders may be used to augment the effectiveness of fire-fighting foams in “combination attacks” which not only smother and cool the fire, but also interfere with the oxidation reaction supporting combustion.

#### **5.4.5 Fuel Neutralization Agents and Foam Replacements**

Of late, a number of new fire suppression agents have appeared in the international market. Throughout this study, these agents will be referred as AFA's (Advanced Fire-Fighting Agents), for lack of a generally accepted term in industry. Producers of these products include Biosolve, Inc. of New York,

Fire-Freeze International of Rockaway, New Jersey, Pyrocap Incorporated of Springfield, Virginia, and Petrotech Industries, Ltd. of Georgetown, Cayman Islands (British West Indies).

According to their manufacturers' advertisements, these AFA's all affect fire suppression of hydrocarbon-based fires (Class-B) by "neutralizing" the burning fuel [58, 59, 60, and 61]. Apparently composed of surface active agent (surfactant) blends, the AFA's are believed to encapsulate burning and non-burning hydrocarbon fuel molecules through an emulsification process, thereby arresting fuel vapor production and causing extinguishment through the mechanism of fuel deprivation. In addition, these agents are said to be effective on Class-A, -C, and -D fire types, using fire-class-specific application methods, making AFA's multi-purpose fire-fighting agents. However, the specific mechanism by which the surfactants act on various fuels is far from being completely understood.

Applied in a similar manner to foam at concentrations ranging from 1% to 6% in water in unaerated form, AFA's have the advantage that they may be deployed using standard Class-A fire-fighting equipment (i.e. equipment used for deploying plain water). Since these agents are deployed in a spray rather than as a foam, they are able to take full advantage of the water's cooling effect. This is of particular interest in the jet transport environment in cases where it may be desirable to spray passengers escaping from a burning fuselage in order to protect them from fire. Such an agent would be compatible with the Cabin Misting Systems (incl. Tender System) mentioned in Section 5.2. Another major benefit offered by the AFA's mentioned here is that they seem to be environmentally safe. The "Type-2 Combined Fire-Fighting and Spill Mitigation Agent" manufactured by

Petrotech Industries, Ltd., for example, is non-corrosive, ozone-safe, and completely biodegradable which has won it a listing on the U.S. EPA's National Contingency Plan (NCP), making it the only fire-fighting agent to achieve this status at the time of this writing. The NCP is a list of products which have been determined to be acceptable for release into the environment and are recommended for use in the event of man-made and natural disasters. The EPA, however, does not make any assertions with regard to the effectiveness of those products listed on the NCP. Because AFA's attack hydrocarbon fuels directly, their manufacturers claim that they have the added benefit of being of use to clean and assist in the accelerated natural biodegradation of spilled fuel. In this way, AFA's are reported to be "dual" or "combination" agents having applications both in fire extinguishment and environmental clean-up. This is of particular interest since the agents currently used for fire response create substantial environmental hazards.

In the jet transportation environment it is plausible that AFA's could be used in cabin misting systems to reduce the required water carriage, in conjunction with high-pressure water vapor systems to replace ozone-depleting Halons, and as an environmentally safe replacement for fire-fighting foams. There are a number of fundamental problems with AFA's, however. First, AFA's are very new and function on principles which, as of yet, are not well understood, making them somewhat of a risk until some history of use can be accumulated. Since these agents are so new and often misunderstood, there is lack of means for evaluating them. In order for a new foam-replacing fire-fighting agent to be accepted by the FAA or ICAO, the product must first pass a performance test. This test, which was developed by Underwriter's

Laboratories (UL) in Northbrook, Illinois and industry, is defined expressly for foams which smother a fire rather than extinguishing it through fuel neutralization. As a result, this test is ill-equipped to bring potential benefits and disadvantages of AFA's to light. This problem is compounded by the fact that the large multi-million dollar corporations which manufacture fire-fighting foams (i.e. 3M, Hoechst, Angus, Ansul, Chubb, National Foam, etc.) take an active role in defining industry standards and therefore may have vested interests not to allow the manufacturer's of AFA's to get a foothold into the market. Additionally, many foam manufacturers own the large-scale foam dispensing systems which contain their products. Since changing from foam to an AFA would imply absorbing the huge cost of replacing or reconfiguring foam dispensing systems, a major barrier to entry for start-up firms attempting to market AFA's exists. The problem of evaluation is also apparent with governmental environmental regulatory bodies. For example, AFA's are listed as "dispersants" on the NCP for lack of a more accurate definition, though some of the AFA's do not function by a mechanism of dispersion.

The second major problem is that many of the firms marketing AFA's are small entrepreneurial enterprises with limited financial and intellectual resources which are seizing the opportunity of heightened environmental awareness to pressure their products into the market. The result is reduced credibility in the fire industry, which is typically based far more on tradition than technology, innovation, or logic. According to J. A. Wright of the FAA Technical Center [62], the claims made by many AFA producers remain unsubstantiated to this point. Many manufacturers claim, for example, that their products "encapsulate and biodegrade hydrocarbon fuels" and are "non-



toxic", yet are unable to provide consistent test data, if any, to support these highly subjective claims. Two reasons for this are: 1) the fact that such tests are difficult to define, the pertinent questions being "biodegradable and non-toxic with respect to what" or "under what conditions", and 2) the fact that generally acceptable testing is exorbitantly expensive makes hitting the "moving target" of producing accepted test data virtually impossible for these financially frail entrants. Officially speaking, the FAA is "extremely interested in the availability of advanced fire suppressants". However, it does not seem to be able to define exactly what it expects from an AFA, especially as a foam replacement. Currently, the FAA is involved with the U. S. Air force to test potential AFA's at Tyndall AFB in Florida [63], though it is not apparent what minimum levels of performance are expected or what action will be taken if an AFA does exhibit a high level of performance, albeit based on this subjective evaluation system. To put it concisely, with the exception of Halon replacements, the search towards the development of AFA's appears to be somewhat akin to catalog shopping-- there is no active search for new agents meeting specific requirements.

In the author's experience, having tested AFA's throughout the world for 2 years, great potential lies in the area of these new products. However, at this point both the products and the manufacturers, themselves, are somewhat unstable. In some scenarios, AFA's seem to completely fulfill their manufacturer's claims, exhibiting wondrous capabilities far exceeding the performance of currently available fire suppression agents. However, at other times these agents disappoint by falling far short of the currently accepted performance levels provided by fire-fighting foams. This problem is compounded by the lack of patentability of AFA agents (and chemical

mixtures, in general) which prevents manufacturers from divulging their products' contents to parties who would be capable of further developing them. Similarly, in an effort to stay afloat, AFA manufacturers tend to change the main emphasis of their enterprises between environmental and fire-related products, leaving consumers and regulators perplexed. The main problem is inconsistency.

Without a doubt, there is a bright future for AFA's. However, realizing this future will depend greatly on regulators' abilities to set performance goals and create a mechanism for AFA manufacturers to receive the support they need to develop their products.

## **5.5 Advanced Aircraft Rescue and Fire Fighting (ARFF) Equipment**

In addition to those airport fire-fighting requirements specified in FAA 14 CFR §139.319, extensive detailed information on ARFF service requirements, including vehicles, equipment, agents, and training may also be found in NFPA 403 issued by the National Fire Protection Association [64]. According to the NFPA, it is likely that NFPA 403 will be revised in the near future to raise the required amount of foam and water carried by ARFF trucks for the purpose of interior fire fighting [65].

### **5.5.1 Driver's Enhanced Vision System (DEVS)**

A major problem faced by Airport Rescue and Fire Fighting (ARFF) services is locating downed aircraft, both on and off the airport surface, especially during periods of inclement weather. In fact, even fires can be difficult to accurately locate in heavy fog. On December 3, 1993 ARFF crews at

Detroit Metropolitan Airport were delayed for a number of minutes while trying to reach a Northwest DC-9 and B727 which had collided while taxiing, having mistaken the glow of runway lights for that of the reported fire. Considering that the ARFF crews involved in this incident had the benefit of direction from the control tower, it is understandable the finding aircraft wreckage and fires off of the airport surface is vastly more difficult. Two cases where location of major aircraft crashes could not be readily ascertained include the Air Inter A320-111 crash near Strasbourg on January 20, 1992 and the earlier Japan Airlines B747SR-46 crash near Mt. Ogura on August 12, 1985. In both cases, loss of life occurred due to rescuers' inability to locate and reach the crash site. Though it is understood that many crashes are inaccessible to ARFF services, it is desirable to improve ARFF response time and effectiveness. According to FAA 14 CFR §139.319 ARFF required accident response time is defined as follows:

*“Within 3 minutes from the time of alarm, at least 1 required airport rescue and fire-fighting vehicle shall reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post, or reach any other specified point of comparable distance on the movement area which is available to air carriers, and begin application of foam, dry chemical, or Halon 1211... Within 4 minutes of the time of alarm, all other required vehicles shall reach the point specified [above] from the assigned post and begin application of foam, dry chemical, or Halon 1211.”*

According to Wright et al [66] at the FAA Technical Center, poor visibility affects ARFF response in 3 ways by making it difficult to locate accident sites, to navigate ARFF vehicles to crash sites, and to negotiate terrain and obstacles in low visibility conditions. These problems may be alleviated by applying recently available technology to current ARFF vehicles,

namely highly accurate electronic navigation aids such as the satellite-based Global Positioning System (GPS) and Head-Up Displays (HUD) similar to those used in fighter aircraft to form a driver interface. Combining a thermal sensing and imaging system such as the Forward Looking Infra-Red (FLIR) system used by the military for target acquisition and a Geographic Information System (GIS), these components comprise the Driver's Enhanced Vision System (DEVS) now under research and development by the FAA Technical Center.

In short, DEVS is an information system designed to improve an ARFF crew's situation awareness. The DEVS equipped ARFF vehicle is expected to make it possible to meet FAA response standards in all weather. In addition, it is hoped that the system will afford ARFF crews tactical information not previously available. With the aid of the FLIR system, it is hoped that the application of extinguishing agents may be better directed to the hottest portion of the fire, thereby speeding fire suppression. Further, it is hoped that the FLIR system will make it possible to locate and track passengers and firefighters in the fuselage and through dense smoke.

A number of issues, both technical and economic, are yet to be settled with respect to the DEVS system. On the technical side it will be necessary to produce an FLIR unit which functions over an extremely broad temperature sensing range since it will be expected to differentiate objects throughout a range of flame temperatures in excess of 540 °C (1000 °F) and still be capable of sensing the body temperatures of survivors and rescuers. An FLIR unit capable of this performance will need a dynamic sensing range of 10,000:1. A second technical issue arises when considering the cooling systems (ca. -270 °C) needed to make FLIR systems operate. Current systems have operating

lives on the order of 2,500 hours. Longer system life will be a requirement for ARFF application. Further, the ability of these systems to rapidly cool the FLIR unit to operating temperature will be a necessity in light of the response time requirements. From an economical perspective, DEVS will be expensive to implement based not only on installation of its costly components, but also based on maintenance costs. However, according to Wright et al, the expense of upgrading ARFF equipment to function effectively in low visibility situations is justifiable when considering the fact that aircraft are equipped to operate under these conditions [66]. Further, as was shown in Chapter 2, weather is the most frequently cited cause of and contributor to jet transport accidents, meaning that ARFF crews must be able to perform effectively under these conditions.

#### **5.5.2 U. S. Air Force Aircraft Skin Penetrator/ Agent Applicator Tool (SPAAT)**

As mentioned in Chapter 2, aircraft internal fires can be extremely difficult to combat since the seat of the fire may be located between bulkhead sections, in ventilation spaces, cargo compartments, or behind cabin paneling. In Chapter 3, a number of cases were discussed where internal fires had burned out of control and destroyed the aircraft even after the plane had safely landed and ARFF crews had arrived on the scene, most notably the Saudia and Air Canada accidents.

Both modern aircraft and ARFF vehicles are equipped with crash axes and crow bars to remove interior panels and penetrate the aircraft skin in an effort to extinguish a fire. ARFF vehicles also carry piercing nozzles and ventilating saws (extremely rugged chain saws), as well as the acclaimed “Jaws

of Life" extrication tools which are hydraulically-powered pliers-like combined cutter/spreader tools. The problem with these tools, however, is that they were originally designed for use on wood, thin sheet steel, and, in some cases concrete (i.e. those materials found in houses and automobiles), not on the tough skin of an airplane. In fact, tests conducted by the Dallas-Fort Worth ARFF Services on a DC-10 fuselage in 1993 showed that these devices were either wholly ineffective for aircraft applications, or were so slow [67].

In response to the need for a delivery system capable of penetrating the aircraft skin and delivering agents to the aircraft interior, the U. S. Air Force began development of the Skin Penetrator/ Agent Applicator Tool (SPAAT) during the mid-1980's through the AMETEK company. The SPAAT device features a pneumatically driven drill turning within a hollow shaft which doubles as a nozzle for agent (foam) delivery [68]. Though the SPAAT system is effective in penetrating the aircraft skin, it only produces a small hole and has a limited application area [67]. In addition, it is difficult to produce the desired foam quality using the SPAAT system.

As an alternative to employing a SPAAT-type system, some airport authorities are improvising to deal with the problem of aircraft internal fires. The ARFF services at Boston Logan International Airport, for example, have installed a uni-directional variable-pattern high volume spray nozzle on the end of their ladder truck which can be extended by means of the ladder through an opening in the fuselage to flood the interior compartment with liquid extinguishing medium. This system, of course, assumes that an open doorway or tear in the fuselage allows the insertion of the nozzle into the cabin [69].

## **5.6 Aircraft Command in Emergency Situations (ACES) System**

Two major problems uncovered in the case studies in Chapter 2 are the lack of fire status information available to the crew and poor crew communication and situation evaluation during in-flight fires. In response to these problems, the FAA is currently developing a computerized fire management system known as the ACES (Aircraft Command in Emergency Situations) system. The ACES prototype consists of an array of advanced fire sensors mounted in both accessible and inaccessible areas throughout the aircraft cabin, a system for interfacing these sensors with cockpit computers, and an integrated electronic checklist system designed to direct the cockpit crew through fire management procedures in the event of an in-flight fire. Among the advanced technologies being applied in the development of the ACES system are thermal-acoustic and fiber-optic detection systems. The keys to a successful ACES design are extremely high sensor sensitivity for detecting both flaming and smoldering fires, with a minimum of false alarms [29].

Based on a Boeing study, it has been estimated that the cost of outfitting 500 new B757 aircraft would cost on the order of \$25,000,000. If, as has been the case historically, 1 out of every 500 aircraft is destroyed in an in-flight fire, and the expected associated hull, life compensation, and other losses amount to \$250,000,000, then the ACES benefit to cost ratio would be 10:1. Allowing for the fact that the B757 is an extremely safe aircraft with respect to fire, one could degrade the benefit to cost ratio to approximately 2:1 to account for the average fleet. In other words, it appears that an effective ACES system would pay for itself [20].

## 5.7 Advanced ARFF Training

FAA 14 CFR §139.319, made effective on January 1, 1988, specifies that all aircraft rescue and fire fighting personnel serving at certified airports participate in at least one live fire drill every 12 months as part of their primary or annual training. Usually "live fire" involves a pit fire, possibly including an aircraft mockup, where sufficient fuel is ignited to produce a hot and intense fire. Specifics of live fire training are spelled out in NFPA 1003: Airport Fire Fighter Professional Qualifications.

At the same time Advisory Circular (AC) 150/5220-17 was released to specify a set of design standards for ARFF training facilities. Specific to this AC was an allowance for the use of aviation hydrocarbon fuels for training, which was accepted by the U. S. Environmental Protection Agency (EPA). Despite the EPA's acceptance of the plan and imposition of additional stringent requirements concerning water and soil pollution in the proximity of training facilities, a major problem has persisted around highly visible, dense, black smoke emissions associated with large scale fire training [69]. At Vienna, Austria's Schwechat International Airport, for example, all live fire training is suspended during the months of July and August, as the visibility of black smoke is considered to be a public nuisance, especially during the summer holidays period when it is also the most noticeable to vacationers and tourists. There is also the concern that soot settling out of the smoke clouds could fall on crops surrounding the training area, thereby contaminating the harvest [70].

In response to these environmental concerns a new computerized propane-fired training facility has been developed by the Symtron Company



as part of a new FAA-initiated regional fire training program. This facility is comprised of scale aircraft and component mock-ups on a gravel bed under which lies an array of propane jets with an accompanying sensor array designed decrease or shut off the flow of propane in response to the amount of foam extinguishing agent applied. Propane has been chosen as a fuel for its non-polluting characteristics. This simulator also includes a water recovery system in the interest of water conservation so that the same water may be used to extinguish a number of fires [71].

Four of these systems are currently in operation or being installed in 1) Fayetteville, North Carolina, 2) Dallas-Fort Worth, Texas, 3) Columbia, South Carolina, and 4) Duluth, Minnesota, each of which is a multi-million dollar project. The Duluth facility is being built under a \$13 million grant from the FAA [72]. Additional installations are also being negotiated. The facility in North Carolina, for example, features a 125 foot diameter pit containing a Boeing B727 mock-up at the center. The propane system is capable of generating 85 foot flames and is supplied by a 30,000 gallon propane tank. Smaller pits are also used to simulate engine and tire fires, which may be used in the absence or presence of smoke generators. Included in the facilities are operations buildings containing administrative offices, garages, changing rooms, training rooms, first aid rooms, and catering facilities, as well as a control room overlooking the fire ground [71].

Despite the fact that these new propane facilities are highly advanced and environmentally safe, it is questionable whether they fulfill their purpose. Though it is clear that propane training facilities have the ability to expose ARFF crews to fire, it is questionable whether they prepare fire fighters for the types of fires they are likely to encounter in an emergency situation.

To start, it is absurd to train fire fighters under the assumption that the fire they will face will be a pool fire. In fact, although fuel pooling is commonly found in aircraft accidents involving fire, there is also presence of three-dimensional fires. Liquid fuels spread on the ground, flow over inclined surfaces, and can even pour and spray from ruptured fuel tanks. Type of fire most likely to be encountered by ARFF crew is a three-dimensional uncontained pool fire and not the two-dimensional contained pool fire portrayed by propane simulators.

A second problem arises in the fact that propane and jet fuel have entirely different burn characteristics, since propane is gaseous and jet fuel is liquid. Jet fuel burns far hotter than propane, makes different noises at various stages of the fire, and reacts to wind differently. In addition, two of the major complicating factors in combating a liquid hydrocarbon fuel fire are the heat and the smoke. To remove these two variables is to greatly simplify the extinguishment process.

Finally, there is the matter concerning predictability. Any experienced fire fighter will explain that no two fires are alike, which is exactly what makes fire so dangerous. A fire which is extinguishable with relative ease on one day may cause far more difficulty due to changes in air temperature, wind speed, and wind direction. It is interesting to note that on a cold, damp 50 °F it may be impossible to light a kerosene pool fire using a blowtorch without using gasoline. The same pool can yield an explosive ignition on a 100 °F low humidity day, having been ignited by nothing more than a match. During one fire test in Paris, France, in which the author participated on a hot day, fuel spilled into a scrapped engine used to simulate an engine fire provided substantial enough explosive force to blow internal engine components out

of the inlet and exhaust of the powerplant at high velocity. Similarly, a 250 gallon AVGAS pit fire performed in Thailand required 3 times more extinguishing agent than a 1,200 Jet A fire in France. What this means is that it is a disservice to ARFF crews to reduce the process of fighting a highly unpredictable, hot, and dangerous aircraft fire into a computer game. Just as pilots are required to practice potentially dangerous maneuvers in preparation for their accidental occurrence, ARFF fighters need to practice fighting the variety of fires that they are expected to face successfully. It is ironic that so much money is put into the development of fire management aids such as DEVS, specialized agents, and nozzles, simulators etc. in the hope of reducing the loss of life to fire and yet it is theoretically possible the a newly-recruited ARFF fire fighter may never see a authentic large scale liquid fuel fire until the time that actual lives are at stake.

As Ruggles [69] states, in order for some benefit to be derived from these expensive propane installations "... the facilities will have to be multi-scenario, high quality facilities...". Undoubtedly, these expensive facilities have a place in increasing the exposure of ARFF fire fighters to fire in general. However, it is the author's opinion that these facilities should be considered a supplement to authentic live fire training.

## **Chapter 6:**

### **Summary and Conclusions**

#### **6.1 Overview**

This thesis has broached five major areas related to world jet transport safety and aviation fire safety: a review of current levels of aviation safety, a comprehensive review and breakdown of world jet transportation statistics of accidents occurring between 1970 and 1992, cases studies of important jet transport accidents, fire prevention and hardening measures in jet transportation, and fire management in jet transportation.

#### **6.2 Safety in World Jet Transportation**

Three important concepts may be extracted from our review of the current state of world jet transportation safety. Of paramount importance is the fact that jet transportation is extremely safe. In fact, flying in jet transport aircraft is about 20% safer than driving an automobile and 2500% safer than riding a motorcycle, when taken with respect to hours of exposure. Comparisons made on a passenger-mile basis using U. S. data yield even more spectacular results in favor of the merits of jet transport safety. The same Central European data suggests that jet transportation risk is somewhat higher than that risk associated with riding a bicycle.

The second most notable point is the fact that world jet transport risk has been decreasing over the past two decades. Specifically, the combined risk of death per flight of U. S. domestic and First World flag carriers has dropped from 1-in-6.1 million to 1-in-7.3 million between 1977 and 1989. Commensurate with this data is the extremely low third-party risk associated with jet transport operations.

The final point discussed concerns the disproportionately great amount of media coverage that jet transport accidents receive. Amazingly, commercial air transport accidents receive 60 times the coverage of AIDS and 81 times the coverage that homicide receives in the U. S., based on the number of stories per 1,000 deaths.

### **6.3 World Jet Transportation Accident Statistics : 1970 - 1992**

A review of sources of world jet transportation accident data reveals that a large amount of data exists. However, this data is distributed through a number of databases and is not well integrated. In addition, some of this data is not publicly accessible or is not accessible in any concise or easily usable form. The most comprehensive and easily accessible of these databases was developed by C. Y. Kimura [6] of the U. S. DOE and was originally intended to be used to predict the third-party risk of an aircraft hitting a nuclear power facility.

Kimura's data reveals that the majority of accidents -- about 75% -- occur during the starting and ending phases of flight (take-off, climb, approach, and landing). Landings are the most critical phase, responsible for 23% of all accidents versus the 12% occurring during take-off. In fact, more

accidents occur while aircraft are on the airport surface (13% of total) than do while en-route (10% of total). Fifteen accident types were investigated, revealing that Controlled Flight into Terrain (CFIT) is the number one killer by a large margin (13, 931 fatalities from 1970 through 1992). In-flight fire proved to be the least survivable type of accident, yielding a scant survivability factor of 12.2%. Unsurprisingly, ground stationary accidents were discovered to be the most benign, both with respect to number of fatalities and survivability. The low survivability of in-flight and post crash fires justify an in-depth investigation of these areas in Chapters 3 through 5.

#### **6.4 World Jet Transportation Accident Case Studies**

Further investigation of Kimura's data reveals that the average survivability of jet transport accidents is approximately 56%. Data shows that there is an even split between "non-survivable impact" and "survivable impact accidents". In cases where a crash is survivable, 20% of all fatalities are attributable to fire and 30% to impact, further justifying a closer look at aviation fire safety.

Taking this into account, case studies were compiled on important jet transport accidents. All of these accidents were instrumental in prompting research and/or regulation aimed at making jet transportation safer from a fire perspective. Most notable, the case discussing a post-crash fire involving a Delta Air Lines B727-232 having fire-blocked seats shows the benefits in safety which can be derived from a well-oriented and executed safety research and improvement program.

## **6.5 Fire Prevention and Fire Hardening**

Chapter 4 takes a thorough look at fire prevention and fire hardening initiatives in the world jet transport industry. Various aspects of design and construction for fire are discussed. Cabin material improvement is of key interest here, especially the move towards fire resistant paneling complying with the FAA's 65/65 rule and fire-blocking of passenger seat cushions. Fire-blocking of this nature is estimated to have saved 37 lives in the Delta Air Lines crash discussed earlier. Fire resistant fuselages and cargo liners are also discussed, cargo fires having been responsible for a number of large accidents. The discussion of advanced fuels and anti-misting agents reveals that, although jet fuels are becoming more efficient and environmentally safe, they are also becoming more dangerous based in extended explosive limits and increased pool rate of flame spread.

Safety has a price and in the jet transport industry this price equates to weight, displaced passengers and increased fuel burn. A study done in Great Britain reveals that, despite advances in technology which have enabled weight reductions in aircraft components and interiors, a modern aircraft interior is 84% heavier than its equally sized 1960 counterpart as a result of fire blocking activities.

## **6.6 Fire Management**

Fire management in jet transportation has been discussed in depth in this thesis. Key areas include: cabin misting systems, passenger smokehoods,

current and advanced fire suppression agents, advanced rescue and fire-fighting equipment and aircraft command in emergency situations (ACES).

Cabin misting systems have shown great promise in reducing fatalities in post-crash fire scenarios. FAA tests have shown available evacuation time increases in excess of 81 seconds and 39 seconds for narrow- and wide-body aircraft, respectively, in both low and moderate wind scenarios. By “zoning” spray, the FAA has been able to reduce the required water carriage by 90% compared to the original system developed by SAVE in Britain, without reducing effectiveness. The main problem with cabin misting systems is economics. Water carriage and hardware installation create extra weight which can displace paying passengers and freight. An additional safety question arises when such a system should inadvertently activate during flight. As a result, no regulations mandating the installation cabin misting systems have come about, though research and development are ongoing.

Passenger smokehoods are a controversial topic in aviation safety. Though proven effective in protecting passengers from noxious gasses and smoke, and estimated to be capable of saving an average of 9 lives per year in aircraft having more than 30 seats, the U. K., U. S., Canada, and France have opted not to make them mandatory. The justification for this decision is that donning smokehoods may delay passengers from egressing an aircraft in an emergency. Ironically, using this reasoning, personal flotation vests should also not be mandatory as they, too, require time to don. Considering this and the fact that private investigations of aviation fire safety have led to publications recommending that passengers purchase their own smokehoods, especially when flying with Third World carriers, it seems reasonable that the decision regarding the mandating of smokehoods be reviewed.



Review of the fire suppression agents currently used in aviation (i.e. foams, chemical dry powders, and Halons) reveals that these agents all exhibit disadvantages in ease of application, effectiveness, and especially in environmental safety. Firefighting foams are laden with environmentally restricted materials such as tensides and in some cases halons. In addition, they are not effective in all scenarios which ARFF crews may face. Dry chemical powders are corrosive and problematic to deploy. Halons, though highly effective, are difficult to deploy. In addition, they are so detrimental to the ozone layer that they have been banned. In light of these facts, there is a definite need to develop both a foam and a Halon replacement. Ideally, a single new product would replace both foam and Halon. One possible solution may lie in advanced fire-fighting and spill mitigation agents (AFA's) which are based on blended surface active agents (surfactants). Such agents have been test marketed with some success by a number of small, private ventures.

In the realm of advanced fire-fighting hardware and equipment, there have been a number of recent developments. Among these are the Driver's Enhanced Vision System (DEVS) and the U. S. Air Force Skin Penetrator/Agent applicator Tool (SPAAT). DEVS has been developed as a mechanism for maintaining ARFF crew effectiveness at night and during inclement weather such as heavy fog. Through implementation of DEVS, which integrates Forward-Looking Infra-Red (FLIR), the satellite-based Global Positioning System (GPS), Geographic Information System (GIS), and a Head-Up Display (HUD), it is hoped that ARFF crews will be able to reduce their response time by locating crashes faster both on and off the airport surface.

SPAAT has been developed to help get fire-fighting foams to fires seated beneath the aircraft skin. Because of their mechanical toughness, jet aircraft skins are extremely difficult to penetrate using standard ARFF extrication equipment, making it difficult to reach internal fires with fire suppressants. Thus was born SPAAT, which is essentially a hollow pneumatic drill through which foam extinguishing agents or water may be pumped in to the fuselage.

One major technical advance discussed in Chapter 5 is the development of the Aircraft Command in Emergency Situations (ACES) on-board fire management system. As became evident in the case studies discussed in Chapter 3, flight crews often experience extreme difficulty in evaluating the location and severity of in-flight fires, especially when the fires are seated in cargo compartments of between bulkheads. Through use of an advanced smoke and fire sensor array integrated with cockpit computers and an electronic checklist, it is hoped that ACES will take some of the guess-work out of in-flight management through enhanced information and reduction of misinformation. Preliminary studies made by Boeing Aircraft Company suggest that outfitting of new aircraft with the ACES system would actually pay for itself through hull-loss reduction.

From a human factors perspective, a major component of any successful ARFF program is training. According to FAA and ICAO regulations, all ARFF fire-fighters must train on at least one live-fire drill every 12 months. Though an absolute minimum standard, environmental restrictions imposed in many countries have made it difficult to meet these requirements. As a result, great effort has been made to develop cleaner propane-fueled training facilities. Currently, 4 such facilities are in service

throughout the U. S., each having an approximate \$13 million cost. Though environmentally safer than traditional training facilities using liquid hydrocarbon fuels (i.e. gasoline, jet fuel, etc.), some question exists whether or not these new training centers accurately emulate the fires that ARFF crews are likely to face, since propane has entirely different burning characteristics. Ideally, a compromise should be met between traditional training and training using propane gas in order for ARFF crews to receive the maximum exposure and benefit at minimum risk to the environment. Considering ever- heightening environmental awareness, however, it is likely that training with traditional fuels will likely be phased out entirely in the future, quite possibly at the cost of ARFF effectiveness.

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# Appendices

The following appendices are based on data compiled by Kimura [5].

# Appendix A

## Glossary of Terms

<b>Flight Type Abbreviations</b>			
EXE	Executive	NSP	Non-Scheduled Passenger
F	Freight	PVT	Private
G	Government	SP	Scheduled Passenger
FY	Ferry (Repositioning)	T	Training
MIL	Military		

<b>Flight Phase Abbreviations</b>			
C	Climb	LA	Landing Approach
ER	En-route	Taxi	Taxi
G	Ground	TO	Take-off
L	Landing		

<b>Aircraft Damage Abbreviations</b>			
DES	Destroyed	MJR	Major-Rebuilt
MAJ	Major	MJW	Major-Written Off
MIN	Minor	NON	None

Cause, Remark Abbreviations			
Aprt	Airport	Gnd	Ground
ATC	Air Traffic Control	GTC	Gnd Traffic Control
App.	Approach	Hvy	Heavy
Atmptd	Attempted	Hij.	Hijacking
Aprt	Airport	Impr.	Improper
Arr.	Arrival	Instr.	Instrument
Avail.	Available	Lnd	Landed
Coll.	Collision	Lndg	Landing
Crsh	Crash	LOC	Loss of Control
Crw	Crew	Maint.	Maintenance
Dpt	Depart	Op.	Operation
Depres.	Depressurisation	Pax	Passengers
Destr.	Destroyed	Res.	Rescue
Div.	Diversion	RTF	Return to Field
Emer.	Emergency	RTO	Rejected Take-Off
Err.	Error	Struc.	Structural
Evac.	Evacuation	T-Storm	Thunderstorm
Fat.	Fatalities	Unauth.	Unauthorized

**Accident Location Abbreviations**

AFG	Afghanistan	LEB	Lebanon
ALG	Algeria	LIB	Libya
ANG	Angola	MCD	Macedonia
ARG	Argentina	MEX	Mexico
AUS	Australia	MOR	Morocco
AUT	Austria	NEP	Nepal
BEL	Belgium	NTL	Netherlands
BOL	Bolivia	NIC	Nicaragua
BRA	Brazil	NIG	Nigeria
BUL	Bulgaria	NOR	Norway
CAM	Cameroon	PAN	Panama
CAN	Canada	PHI	Phillippines
CMB	Cambodia	POL	Poland
CIS	Commonwealth of Ind. States	POR	Portugal
COL	Columbia	QTR	Qatar
CUB	Cuba	RNK	Republic of North Korea
CYP	Cyprus	RSK	Republic of South Korea
CZK	Czechoslovakia	RUM	Rumania
DEN	Denmark	SAF	South Africa
ECU	Ecuador	SAR	Saudi Arabia
EGY	Egypt	SPN	Spain
ETH	Ethiopia	SWE	Sweden
FRA	France	SWI	Switzerland
FRG	Federal Republic of Germany	TAH	Tahiti
GAB	Gabon	TAI	Taiwan
GDR	German Democratic Republic	THL	Thailand
GRE	Greece	TUR	Turkey
IND	India	UAE	United Arab Emirates
IRE	Ireland	UK	United Kingdom
IRN	Iran	USA	United States of America
IRQ	Iraq	USSR	Union of Soviet Socialist Reps
ISR	Israel	VEN	Venezuela
ITA	Italy	YEM	Yemen
JAP	Japan	YUG	Yugoslavia
JOR	Jordan	ZAI	Zaire

## **Appendix B**

### **World Jet Transport Accidents 1970-1992: Chronological Listing**

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
70J.1	1	1.05.70	Spantax (Spain)	FY	CV.990-30A-5	DES	C	Stockholm Arlanda Arpt., SWE	5	0	0	5	10	0	10	Snow, 3-eng. TO, crw err.
70J.2	2	1.14.70	United Arab	SP	DH.106-IVC	DES	L	Addis Ababa Bole Arpt., ETH	0	0	0	0	9	5	14	crw err.
70J.3	3	2.06.70	LAN (Chile)	SP	SE.210-	?	G	Santiago Arpt., Chile	0	1	0	1	?	?		In-flt. hij., gnd. res. op.
70J.4	4	2.09.70	United Arab AL	SP	DH.106-IVC	DES	C	Munich Riem Arpt., FRG	0	0	0	0	9	14	23	Icing, buffeting, RTO
70J.5	5	2.15.70	Compania Dominicana	SP	DC-9-32	DES	C	Santo Domingo Arpt., Dominican Rep.	5	97	0	102	5	97	102	Eng. fail., crsh @ sea
70J.6	6	2.21.70	Swissair 330	SP	CV.990-30A-6	DES	C	Wuerenlingen, SWI	9	38	0	47	9	38	47	In-flt. bombing, in-flt. fire
70J.7	7	2.22.70	Israeli AC Industries	T	IAI.1121	DES	?	Tel Aviv Lod Arpt., ISR	0	0	0	0	4	0	4	Mech. fail, loss of cntrl, crw parachuted
70J.8	8	2.28.70	United States Air Force	?	T-39A	DES	?	?	?	?	?	?	?	?		No details avail.
70J.9	9	3.17.70	Eastern AL 1320	SP	DC-9-31	NON	LA	Boston, MA, USA	1	0	0	1	5	72	77	In-flt. atmpd hij., shooting
70J.10	10	4.01.70	Royal Air Maroc	SP	SE.210-IIIR	DES	LA	Casablanca Nouasseur Arpt., MOR	5	56	0	61	6	76	82	Fog, lnd 9.7 kms. short of RW
70J.11	11	4.19.70	S.A.S.	SP	DC-8-62	DES	TO	Rome Leonardo da Vinci Arpt., ITA	0	0	0	0	11	54	65	Eng. fail., RTO
70J.12	12	5.02.70	Antilliaanse	SP	DC-9-33CF	DES	LA	40 kms. ENE of St. Croix, Virgin Is.	1	22	0	23	6	57	63	Missed app., crw err., water lndg
70J.13	13	5.09.70	Executive Jet Aviation	NSP	Learjet 23A	DES	LA	Pellston Emmet Co. Arpt., MI, USA	2	4	0	6	2	4	6	impr. app., instr. fail., crw err.
70J.14	14	6.01.70	C.S.A. (Czechoslovakia)	SP	Tu-104A	DES	LA	Tripoli Int'l Arpt., LIB	10	3	0	13	10	3	13	Fog, undershot RW, crw err.
70J.15	15	7.03.70	Dan-Air London, Ltd.	NSP	DH.106-IV	DES	LA	Arbusias, 50 kms. NE of Barcelona, SPN	7	105	0	112	7	105	112	Fog, struck Montseny mtn., instr. err.
70J.16	16	7.05.70	Air Canada 621	SP	DC-8-63	DES	L	Toronto Int'l Arpt., Ontario, CAN	9	100	0	109	9	100	109	Hard lndg, impr. spoiler deployment, crw err., go-around, in-flt. 2-eng. fail., LOC
70J.17	17	7.19.70	Bavaria Flug.	NSP	BAC 1-11	MJR	TO	Gerona Arpt., SPN	0	0	0	0	5	80	85	RTO, crw err.
70J.18	18	7.19.70	United AL 611	SP	B737-222	MJW	TO	Philadelphia Int'l Arpt., PA, USA	0	0	0	0	6	55	61	RTO, crw err.
70J.19	19	7.20.70	Condor Flugdienst	SP	B737-130	MIN	LA	Tarragona, SPN	0	0	0	0	5	95	100	ATC failure
70J.19	20	7.20.70	Private AC	PVT	Piper	DES	?	Tarragona, SPN	1	2	0	3	1	2	3	ATC failure
70J.20	20	7.20.70	Imperial Tobacco Co.	T	HS.125-3B	DES	C	Edinburgh Turnhouse Arpt., UK	1	0	0	1	2	0	2	Siml. eng. fail. on TO, LOC
70J.21	21	7.27.70	Flying Tiger 45	F	DC-8-63AF	DES	LA	Naha AB, Okinawa, JPN	4	0	0	4	4	0	4	Rain, crw err., undershot RW
70J.22	22	8.08.70	Modern AT	FY	CV.990-30A-8	DES	LA	Acapulco, MEX	0	0	0	0	8	0	8	Undershot RW, VOR/ILS app.
70J.23	23	8.18.70	C.S.A. (Czechoslovakia)	SP	Tu-124V	DES	L	Zurich Klotten Arpt., SWI	0	0	0	0	6	14	20	crw err., gear-up lndg
70J.24	24	9.06.70	Pan American AW 93	SP	B747-121	DES	G	Cairo Int'l Arpt., EGY	0	0	0	0	19	156	175	gnd. bombing following in-flt. hij.
70J.25	25	9.07.70	El Al 219 (Israel)	SP	B707-458	NON	ER	ER Amsterdam, Neth.-New York, NY	0	1	0	1	13	145	158	atmpd in-flt hij., emer. descent
70J.26	26	9.8.70	Trans Int'l 863	FY	DC-8-63CF	DES	C	New York Kennedy Int'l Arpt., NY, USA	11	0	0	11	11	0	11	RTO, LOC
70J.27	27	9.12.70	Trans World AL 741	SP	B707-331B	DES	G	Dawson Field, Zerka, JOR	0	0	0	0	10	145	155	gnd. bombing, in-flt. hij. 9.6.70
70J.27	28	9.12.70	Swissair 100	SP	DC-8-53	DES	G	Dawson Field, Zerka, JOR	0	0	0	0	12	143	155	gnd. bombing, in-flt. hij. 9.6.70
70J.27	29	9.12.70	B.O.A.C. 775 (U.K.)	SP	VC.10-1151	DES	G	Dawson Field, Zerka, JOR	0	0	0	0	10	105	115	gnd. bombing, in-flt. hij. 9.9.70
70J.28	30	9.15.70	Alitalia 618 (Italy)	SP	DC-8-62	DES	L	New York Kennedy Int'l Arpt., NY, USA	0	0	0	0	10	146	156	Hard lndg, gear collapse, crw err.



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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
70J.29	31	10.07.70	Dan-Air London, Ltd.	T	DH.106-IV	DES	L	Newcastle Woolsington Arpt., UK	0	0	0	0	4	5	9	crw err., gear up Indg
70J.30	32	11.14.70	Southern AW 932	NSP	DC-9-31	DES	LA	Huntington Tristate Arpt., WV, USA	5	70	0	75	5	70	75	instr. err.? crw erf.
70J.31	33	11.14.70	Royal Crown Cola	EXE	AC.1121	DES	LA	Lexington, KY, USA	2	0	0	2	2	0	2	Missed app., LOC, crw err.
70J.32	34	11.27.70	Capitol Int'l C2C3/26	NSP	DC-8-63CF	DES	TO	Anchorage Int'l Arpt., AK, USA	1	46	0	47	10	219	229	Locked wheels, RTO
70J.33	35	11.30.70	Trans World AL	F	B707-373C	DES	TO	Tel Aviv Int'l Arpt., ISR	0	0	0	0	7	0	7	GTC fail.
70J.33	36	11.30.70	Israeli Air Force	G	B377	DES	G	Tel Aviv Int'l Arpt., ISR	0	0	2	2	0	0	0	GTC fail., towed AC
70J.34	37	12.07.70	TAROM (Rumania)	SP	BAC 1-11	DES	LA	Constanza Arpt., RUM	3	15	0	18	7	20	27	Short app. 4 kms. from RW
70J.35	38	12.18.70	Hamburger Flug	T	HFB-320	DES	L	Texel Is., NTL	0	0	0	0	?	?		No details avail.
70J.36	39	12.23.70	L'Armee de L'Air	?	MS.760	DES	?	Paris Le Bourget Arpt., FRA	?	?	?	?	?	?		No details avail.
70J.37	40	12.28.70	Trans Caribbean AW 505	SP	B727-2A7	DES	L	St. Thomas Truman Arpt., Virgin Is.	0	2	0	2	7	48	55	Hard Indg, crw err.
70J.38	41	12.28.70	Morrison-Knutson 223	EXE	HS.125-1A	DES	LA	10 mi. NE of Boise Vortac, ID, USA	2	0	0	2	2	0	2	impr. instr. app., crw err.
70J.39	42	12.30.70	Alitalia-LAI	SP	SE.210-VIN	MAJ	TO	Turin Arpt., ITA	0	0	1	1	5	33	38	coll. w/ snow removal truck on TO
71J.1	1	1.02.71	United Arab AL	SP	DH.106-IVC	DES	LA	Ben Gashir, Tripoli, LIB	8	8	0	16	8	8	16	Sandstorm, crsh 7 kms. from RW
71J.2	2	1.04.71	Air Inter	G	SE.210-III	DES	G	Paris Orly Arpt., FRA	0	0	0	0	0	0	0	gnd. fire
71J.3	3	1.09.71	American AL 30	SP	B707-323C	MAJ	LA	Newark, NJ, USA	0	0	0	0	7	14	21	ATC failure
71J.3	4	1.09.71	Linden Flight Service	PVT	Cessna 150	DES	ER	Newark, NJ, USA	2	0	0	2	2	0	2	ATC failure
71J.4	5	1.21.71	Cousin Properties	EXE	AC.1121	DES	ER	Lake Champlain, NY, USA	2	3	0	5	2	3	5	Missing AC, ditched in lake?
71J.5	6	1.22.71	Air Cambodge	G	SE.210-III	DES	G	Phnom Penh, CMB	0	0	0	0	0	0	0	Communist attack
71J.6	7	1.23.71	Air India	T	B707-437	DES	TO	Bombay Santa Cruz Arpt., IND	0	0	0	0	5	0	5	Siml. 3-eng. TO, crw err.
71J.7	8	3.23.71	Aerospatiale	T	SN.600	DES	?	Marseille, FRA	3	0	0	3	3	0	3	No details avail.
71J.8	9	3.26.71	?	?	HS.125-400B	DES	?	Devil's Peak, SAF	?	?	?	?	?	?		No details avail.
71J.8	10	3.26.71	?	?	HS.125-400B	DES	?	Devil's Peak, SAF	?	?	?	?	?	?		No details avail.
71J.8	11	3.26.71	?	?	HS.125-400B	DES	?	Devil's Peak, SAF	?	?	?	?	?	?		No details avail.
71J.9	12	3.31.71	Western AL 366	T	B720-047B	DES	C	Ontario Int'l Arpt., CA, USA	5	0	0	5	5	0	5	Siml. missed app., LOC
71J.10	13	4.17.71	F & S Contracting	EXE	Learjet 24B	DES	LA	Butte, MT, USA	2	2	0	4	2	2	4	struck high gnd., crw err.
71J.11	14	5.23.71	Aviogenex 130	NSP	Tu-134A	DES	L	Belgrade Rijeka Arpt., YUG	3	75	0	78	7	76	83	T-storm, wind shear? hard Indg, overturned
71J.12	15	6.06.71	Huges Air West 706	SP	DC-9-31	DES	C	Duarte, 20 mi. NE of Los Angeles, CA, USA	5	44	0	49	5	44	49	ATC failure
71J.12	16	6.06.71	U.S. Marine Corps	T	F-4B Phantom	DES	ER	Duarte, 20 mi. NE of Los Angeles, CA, USA	1	0	0	1	2	0	2	ATC failure
71J.13	17	7.05.71	General Transportation	FY	D. Falcon 20C	DES	LA	Boca Raton Arpt., FL, USA	0	0	0	0	2	0	2	In-flt. 2-eng. fail., crw err.
71J.14	18	7.25.71	Pan American AW 6005	F	B707-321C	DES	LA	Mt. Kamun near Manila, PHI	4	0	0	4	4	0	4	hvy rain, instr. fail., crw err.
71J.15	19	7.30.71	All Nippon AW 58	SP	B727-2E2/281	DES	ER	Morioko, Shizukuishi, Honshu, JPN	7	155	0	162	7	155	162	ATC failure
71J.15	20	7.30.71	Japan Air Self Def. Force	Mil.	F-86F Sabre	DES	?	Morioko, Shizukuishi, Honshu, JPN	0	0	0	0	1	0	1	ATC failure

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
71J.16	21	8.07.71	Aeroflot	SP	Tu-104B	DES	C	Irkutsk, RFSSR, USSR	?	?	0	97	?	97		Irkutsk-Vladivostok flt.
71J.17	22	9.04.71	Alaska AL 66	SP	B727-193	DES	LA	20 mi. W of Juneau Arpt., AK, USA	7	104	0	111	7	104	111	struck Mt. Fairweather, rain, fog, navigation err., cause unknown
71J.18	23	9.06.71	Pan Int'l	NSP	BAC 1-11	DES	C	Hamburg Fuhls. Arpt., FRG	1	21	0	22	6	115	121	Eng. fail., emer. lndg
71J.19	24	9.13.71	Chinese Air Force	?	HS.121-1E	DES	ER	Mongolian Border	?	?	?	?	?	?		unauth. flt.
71J.20	25	9.16.71	MALEV (Hungary)	SP	Tu-134A	DES	LA	Kiev, USSR	8	41	0	49	8	41	49	Cause unknown
71J.21	26	9.16.71	U.S. Air Force 375 MAW	?	C-9A	MJW	?	Scott AFB, IL, USA	?	?	?	?	?	?		No details avail.
71J.22	27	10.13.71	Aeroflot	SP	Tu-104	DES	TO	Moscow, USSR	2	18	0	20	2	18	20	No details avail.
71J.23	28	11.21.71	China AL (Taiwan)	SP	SE.210-III	DES	ER	Penghu Is., Formosa Strait	8	17	0	25	8	17	25	In-flt. bombing
71J.24	29	12.04.71	Eastern AL 898	SP	DC-9-31	MIN	LA	Raleigh-Durham Arpt., NC, USA	0	0	0	0	4	23	27	ATC failure
71J.24	30	12.04.71	Private AC	PVT	Cessna 206	DES	LA	Raleigh-Durham Arpt., NC, USA	1	1	0	2	1	1	2	ATC failure
71J.25	31	12.15.71	Pakistan Int'l	F	B707-340C	DES	L	Urumchi, ROC	0	0	0	0	5	0	5	No details avail.
71J.26	32	12.27.71	Swissair	SP	DC-9-32	MAJ	TO	Vienna Arpt., AUT	0	0	0	0	5	69	74	GTC failure
71J.26	33	12.27.71	Private AC	PVT	Beechcraft	DES	?	Vienna Arpt., AUT	1	0	0	1	1	0	1	GTC failure
72J.1	1	1.07.72	Iberia 602 (Spain)	SP	SE.210-VIR	DES	LA	Ibiza, Balearic Is., SPN	6	98	0	104	6	98	104	struck Rocas Altas Peak on app. crw err.
72J.2	2	1.18.72	Tandy Corp.	EXE	Learjet 25	DES	L	Victoria Co.-Foster Arpt., TX, USA	2	7	0	9	2	7	9	Below minima weather
72J.3	3	1.21.72	T.H.Y. (Turkey)	F	DC-9-32	DES	LA	2 kms. from Adana Arpt., TUR	1	0	0	1	5	0	5	Snow, depress., missed app.
72J.4	4	1.25.72	Bahktar Afghan	?	Yak-40	DES	L	Khost, AFG	?	?	?	?	?	?		No details avail.
72J.5	5	1.26.72	Jugoslav AT	SP	DC-9-32	DES	ER	Hermisdorf, CZK	4	23	0	27	5	23	28	In-flt. bombing
72J.6	6	1.28.72	British Caledonian AW	?	VC.10-1100	MJW	L	London Gatwick Arpt., UK	?	?	?	?	?	?		Hard lndg
72J.7	7	2.01.72	VFW/Fokker AC Co.	T	VFW/F.614	DES	ER	Bremen, FRG	?	?	?	?	?	?		Test flt.
72J.8	8	2.01.72	Wihuri-Yhtyma OY	EXE	D. Falcon 20F	DES	TO	Montreal, Quebec, CAN	0	0	0	0	2	4	6	No details avail.
72J.9	9	2.18.72	Olympic AW	EXE	Learjet 25B	DES	LA	Nice Antibes Arpt., FRA	2	0	0	2	2	0	2	crsh @ sea
72J.10	10	2.20.72	Fred-Air AG	EXE	D. Falcon 20D	DES	LA	Samedan, SWI	0	0	0	0	2	3	5	crsh into lake, marginal weather
72J.11	11	3.08.72	Trans World AL	?	B707-331	MJW	?	Las Vegas, NV, USA	?	?	?	?	?	?		No details avail.
72J.12	12	3.14.72	Sterling AW 296	NSP	SE.210-10B3	DES	LA	Fujairah, 50 mi. E. of Dubai, UAE	6	106	0	112	6	106	112	T-storms, struck high gnd., crw err.
72J.13	13	3.19.72	Egyptair 763	SP	DC-9-32	DES	LA	Aden Int'l Arpt., S. YEM	9	21	0	30	9	21	30	Struck Shamsan mts. 4 nmi. SW of arpt.
72J.14	14	4.18.72	East African	SP	VC.10-1154	MJW	TO	Addis Ababa Bole Arpt., ETH	8	35	0	43	11	96	107	RTO, overran RW, fire, struck farmhouse
72J.15	15	5.05.72	Alitalia 112 (Italy)	SP	DC-8-43	DES	LA	3 mi. SE of Punta Raisi Arpt., Palermo, ITA	7	108	0	115	7	108	115	Struck Montagna Lunga mtn., crw err.
72J.16	16	5.08.72	Sabena 507	SP	B707-	?	G	Tel Aviv Arpt., ISR	0	1	2	3	10	87	97	In-flt. hij. Israeli res. op.
72J.17	17	5.18.72	Eastern AL 346	SP	DC-9-31	DES	LA	Ft. Lauderdale Int'l Arpt., FL, USA	0	0	0	0	4	6	10	T-storm, crw err., hard lndg
72J.18	18	5.30.72	Delta AL 9570	T	DC-9-14	DES	LA	Ft. Worth SW Int'l Arpt., TX, USA	4	0	0	4	4	0	4	Preceding DC10 wingtip vortices

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
72J.19	19	6.14.72	Japan AL 471	SP	DC-8-53	DES	LA	10 mi. from New Delhi Palam Arpt., IND	11	75	4	90	11	78	89	impr. straight-in app. to RW 28, fire, crw err.
72J.20	20	6.15.72	Cathay Pacific 700Z	SP	CV.880-22M-21	DES	E R	Pleiku, South Vietnam	10	71	0	81	10	71	81	In-flt. bombing
72J.21	21	6.16.72	Egyptair	SP	Il-62	DES	L	Cairo Almaza Arpt., EGY	?	?	?	?	?	?	?	Ind@wrong arpt., overran RW
72J.22	22	6.18.72	B.E.A. 548 (U.K.)	SP	DH.121-IC	DES	C	Staines, Middlesex, UK	6	112	0	118	6	112	118	LOC, crw err., pilot heart attack?
72J.23	23	6.29.72	Inter-City Flug	NSP	HFB-320	DES	TO	Blackpool Arpt., UK	2	5	0	7	2	6	8	RTO, LOC, overran RW
72J.24	24	7.06.72	Aviaco (Spain)	Fy	DC-8-52	DES	LA	Las Palmas, Gran Canaria Is., SPN	10	0	0	10	10	0	10	Sea lndg 14 mi. from Gran Canaria Is.
72J.25	25	7.19.72	British Caledonian AL	NSP	BAC 1-11	MAJ	TO	Corfu, GRE	0	1	0	1	6	79	85	Engine fail., RTO
72J.26	26	8.14.72	Interflug (E. Germany)	NSP	Il-62	DES	C	Berlin Schoenfeld Arpt., GDR	8	148	0	156	8	148	156	In-flt. fuselage fire, LOC
72J.27	27	8.28.72	Vodavia S.A.	EXE	Learjet 23	DES	LA	Innstruck, AUT	2	0	0	2	2	0	2	Struck mtn., ER London-Innsbruck
72J.28	28	9.13.72	Trans World AL 604	F	B707-331C	DES	TO	San Francisco Int'l Arpt., CA, USA	0	0	0	0	3	0	3	RTO, overran RW
72J.29	29	9.19.72	Nigeria AW	SP	F.28-1000	MJW	L	Port Harcourt Arpt., NIG	0	0	0	0	?	?	?	Overran RW
72J.30	30	9.24.72	Japan AL	SP	DC-8-53	MJW	L	Bombay Juhu Arpt., IND	0	0	0	0	14	108	122	crw err., lnd on wrong arpt
72J.31	31	10.13.72	Aeroflot	SP	Il-62	DES	LA	Moscow Sheremetyevo Arpt., USR	8	168	0	176	8	168	176	Short 3rd app. 3 mi. from RW, bad weather
72J.32	32	10.27.72	Lider Taxi Aereo	NSP	Learjet 25C	MJR	L	Rio de Janeiro, BRA	0	0	0	0	2	3	5	No details avail.
72J.33	33	10.30.72	Interflug (E. Germany)	?	Tu-134	MJW	?	Dresden, GDR	?	?	?	?	?	?	?	No details avail.
72J.34	34	10.31.72	Marcel Dassault	T	D. Falcon 10	DES	E R	Romorantin, FRA	2	0	0	2	2	0	2	LOC, in-flt. struc. fail.
72J.35	35	11.28.72	Japan AL 446	SP	DC-8-62	DES	C	Moscow Sheremetyevo Arpt., USR	9	53	0	62	15	61	76	Icing, eng. fail., crw err.
72J.36	36	12.03.72	Spantax (Spain)	NSP	CV.990-30A-5	DES	C	Santa Cruz Arpt., Tenerife, SPN	7	148	0	155	7	148	155	LOC, turbulence, fog, crw err., fire
72J.37	37	12.05.72	Egyptair	T	B707-366C	DES	E R	Beni Sueif, 70 kms SE of Cairo, EGY	6	0	0	6	6	0	6	crw err., siml. 1-eng. fail.
72J.38	38	12.08.72	United AL 553	SP	B737-222	DES	LA	Chicago Midway Arpt., IL, USA	3	40	2	45	6	55	61	Fog, crw err., struck houses 1 mi. from arpt.
72J.39	39	12.12.72	Marathon Oil	EXE	HS.125-3A	DES	LA	Findlay, OH, USA	0	0	0	0	2	5	7	3rd app., struck trees, crw err.
72J.40	40	12.15.72	Zantop AW 23	FY	Learjet 23	DES	C	Detroit Metro. Arpt., MI, USA	2	0	1	3	2	0	2	Failed to climb, struck fuel storage tank, fire
72J.41	41	12.20.72	North Central AL 575	SP	DC-9-31	DES	TO	Chicago O'Hare Int'l Arpt., IL, USA	0	10	0	10	4	41	45	GTC failure, fog
72J.41	42	12.20.72	Delta AL 954	SP	CV.880-22-2	DES	Taxi	Chicago O'Hare Int'l Arpt., IL, USA	0	0	0	0	7	81	88	GTC failure, fog
72J.42	43	12.23.72	Braathens SAFE	SP	F.28-1000	DES	LA	Asdoeltjern, Asker, NOR	3	37	0	40	3	42	45	struck high gnd.
72J.43	44	12.27.72	Fluor Corp.	EXE	L.1329 Jetstar 6	DES	L	Adirondack Arpt., NY, USA	3	0	0	3	3	0	3	No details avail.
72J.44	45	12.28.72	Iberia (Spain)	F/T	F.28-1000	MJW	L	Bilbao/Sondica, SPN	0	0	0	0	4	0	4	Overran wet RW
72J.45	46	12.29.72	Eastern AL 401	SP	L.1011-1	DES	LA	Everglades, Miami, FL, USA	5	98	0	103	13	163	176	crw err., preoccupation w/ nosegear malfunction,
73J.1	1	1.02.73	Pacific Western AL	F	B707-321C	DES	LA	2 mi. from Edmonton Arpt., CAN	5	0	0	5	5	0	5	Undershot RW, snow, high winds

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									Dmg	PHS	Crw	Pax	Gnd	Tot		Crw
73J.2	2	1.09.73	Dresser Corp.	G	L1329 Jetstar 6	DES	G	Dallas Love Field, TX, USA	0	0	0	0	0	0	0	No details avail.
73J.3	3	1.19.73	Societe Exec. Transports	?	Learjet 23	MJR	L	Essey-les-Nancy, FRA	0	0	0	0	?	?		No details avail.
73J.4	4	1.22.73	Royal Jordanian/ Nigeria	NSP	B707-3D3C	DES	L	Kano Arpt., NIG	6	170	0	176	11	198	209	Undershot RW, fog, gear fail., pilgrimage flt. from Mecca
73J.5	5	1.30.73	S.A.S.	SP	DC-9-21	MJW	TO	Oslo Fornebu Arpt., NOR	0	0	0	0	4	29	33	RTO, overran RW, instr. err.
73J.6	6	2.19.73	Aeroflot	SP	Tu-154	DES	LA	Prague, CZK	4	62	0	66	13	87	100	Locked tailplane, crsh 200' short of RW
73J.7	7	2.21.73	Libyan Arab AL 114	SP	B727-224	DES	E R	Sinai, ER Benghazi-Cairo, EGY	8	100	0	108	9	104	113	Israeli Air Force shutdown, navig. err.
73J.8	8	2.21.73	Air Taxi Services	F	Learjet 24	MJR	L	Belleville, MI, USA	2	0	0	2	2	1	3	Bounced, struck lights, overran RW
73J.9	9	2.26.73	Machinery Buyers Corp.	EXE	Learjet 24	DES	C	Atlanta DeKalb Arpt., GA, USA	2	5	0	7	2	5	7	Birdstrike, in-flt. eng. fail., struck bldg.
73J.10	10	2.00.73	J.A.T. (Yugoslavia)	?	SE.210-III	MJW	L	Belgrade, YUG	?	?	?	?	?	?		No details avail.
73J.11	11	3.05.73	Iberia 504 (Spain)	SP	DC-9-32	DES	E R	Nantes, FRA	7	61	0	68	7	61	68	ATC failure
73J.11	12	3.05.73	Spantax (Spain)	NSP	CV.990-30A-5	MAJ	E R	Nantes, FRA	0	0	0	0	9	99	108	ATC failure
73J.12	13	3.05.73	Aviaco (Spain)	FY	SE.210-10R	DES	LA	Funchal Arpt., Madeira	3	0	0	3	3	0	3	App. short of RW, ditched @ sea
73J.13	14	3.07.73	Ziegler, Inc.	EXE	R. Sabreliner 40	DES	E R	Blaine, MN, USA	2	0	0	2	2	0	2	Cause unknown
73J.14	15	3.09.73	Midland AC	EXE	HFB-320	DES	L	Phoenix Int'l Arpt., AZ, USA	0	0	0	0	2	7	9	No details avail.
73J.15	16	3.23.73	C.A.A.C. (China)	SP?	Il-62	DES	?	?	?	?	?	?	?	?		No details avail.
73J.16	17	4.12.73	N.A.S.A. (U.S.)	T	CV.990-30A-5	DES	LA	Moffett NAS, CA, USA	?	?	0	4?	?	4?		ATC failure
73J.16	18	4.12.73	United States Navy	Mil.	P-3C Orion	DES	?	Moffett NAS, CA, USA	?	?	0	12?	?	13?		ATC failure
73J.17	19	4.13.73	Continental AL	EXE	R. Sabreliner 60	DES	E R	Montrose, CO, USA	2	0	0	2	2	1	3	In-flt. eng. thrust rev. op.
73J.18	20	5.05.73	Egyptair	SP	B707-366C	MIN	E R	Alps, ER Cairo, EGY-London, UK	1	0	0	1	?	124		Severe turbulence
73J.19	21	5.05.73	Lider Taxi Aero	NSP	Learjet 24	DES	LA	Rio de Janeiro Galeao Arpt., BRA	2	1	0	3	2	1	3	struck high gnd., struck powerline, fire
73J.20	22	5.10.73	Thai AW Int'l	SP	DC-8-32/33	DES	L	Katmandu Arpt., NEP	0	0	1	1	10	100	110	Overran RW
73J.21	23	5.25.73	Aeroflot	SP	Tu-104	DES	E R	Chita, S. Siberia, USR	?	?	0	100	?	?		atmptd hij., in-flt. shooting
73J.22	24	5.31.73	Indian AL	SP	B737-2A8	DES	LA	6 kms. S of Delhi Palam Arpt., IND	5	43	0	48	7	58	65	Short app., crw err., fire
73J.23	25	6.01.73	Cruzeiro do Sul	SP	SE.210-VIR	DES	LA	Sao Luis, BRA	7	16	0	23	7	16	23	atmptd go-around
73J.24	26	6.03.73	Tupolev	T	Tu-144	DES	C/	Le Bourget, Paris, FRA	6	0	8	14	6	0	6	Demonstration flt.
73J.25	27	6.09.73	VARIG (Brazil)	F	B707-327C	DES	LA	Rio de Janeiro Galeao Arpt., BRA	2	0	0	2	4	0	4	crw err., control fail.
73J.26	28	6.18.73	Philip Holzmann	EXE	Learjet 24B	DES	LA	Mariensiel, FRG	2	2	0	4	2	2	4	impr. app., struck trees, fire
73J.27	29	6.20.73	Aeromexico	SP	DC-9-15	DES	LA	Puerto Vallarta, MEX	5	22	0	27	5	22	27	struck high gnd., 32 kms. SE of arpt.
73J.28	30	6.21.73	Air Canada	G	DC-8-53	DES	G	Toronto Int'l Arpt., Ontario, CAN	0	0	0	0	0	0	0	gnd. fire
73J.29	31	6.30.73	Aeroflot	SP	Tu-134A	DES	TO	Amman Arpt., JOR	1	1	7	9	7	77	84	RTO, overran RW, crw err.
73J.30	32	7.03.73	Indian AL	SP	SE.210-10A/VI	MJW	L	Bombay Santa Cruz Arpt., IND	0	0	0	0	7	8	15	crw err., fast lndg, gear collapse
73J.31	33	7.11.73	VARIG 820 (Brazil)	SP	B707-345C	DES	LA	Paris Orly Arpt., FRA	7	116	0	123	17	117	134	In-flt. fire, emer. lndg

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
73J.32	34	7.22.73	Pan American	SP	B707-321B	DES	C	Papeete, TAH	10	68	0	78	10	69	79	crsh @ sea, stalled on climbout, crw err.
73J.33	35	7.24.73	Japan	SP	B747-246B	DES	G	Benghazi, LIB	1	1	0	2	23	124	147	hij. 7.20.73, grd bombing
73J.34	36	7.31.73	Delta	SP	DC-9-31	DES	L	Boston Logan Int'l Arpt., MA, USA	6	83	0	89	6	83	89	impr. ILS app., undershot RW04R, crw err., fog, ATC err.
73J.35	37	8.13.73	Aviaco (Spain)	SP	SE.210-10R	DES	LA	Corunna, SPN	6	79	1	86	6	79	85	4th app., bad weather, crw err.
73J.36	38	8.20.73	AVENSA (Venezuela)	SP	SE.210-III	MJW	L	Baraquisimeto, VEN	?	?	?	?	?	?	?	Struck bldg. on Indg
73J.37	39	8.28.73	Trans World	SP	B707-331B	NON	LA	Los Angeles, CA, USA	0	1	0	1	8	141	149	instr. fail., AC oscillations
73J.38	40	8.29.73	C.S.A. 531	SP	Tu-104A	DES	L	Nicosia Arpt., CYP	0	0	0	0	8	62	70	Diverted, overran RW, crw err.
73J.39	41	9.08.73	World	F	DC-8-63CF	DES	LA	24 kms. S of Cold Bay, AK, USA	6	0	0	6	6	0	6	Struck Mt. Dutton, crw err., drizzle
73J.40	42	9.10.73	American Jet Ind.	F	CV.990-30A-5	DES	LA	Agana Field, Guam, Marianas Is.	0	0	0	0	3	1	4	Overran wet RW
73J.41	43	9.11.73	J.A.T. (Yugoslavia)	SP	SE.210-VIN	DES	LA	35 kms. N of Titograd, YUG	6	35	0	41	6	35	41	struck high gnd.
73J.42	44	9.23.73	Air Algeria	SP	SE.210-III	MJW	L	Dar-el-Brieda, ALG	0	0	0	0	?	?	?	No details avail.
73J.43	45	9.24.73	Iberia (Spain)	G	SE.210-VIR	MJW	G	Madrid Barajas Arpt., SPN	0	0	0	0	0	0	0	Hangar fire
73J.44	46	9.25.73	Lisa Jet	EXE	Learjet 25	DES	C	Lincoln, NE, USA	2	1	0	3	2	1	3	crw err., low ceiling, fog
73J.45	47	9.25.73	Continental Jet Corp.	G	IAI.1121	DES	G	St. Petersburg, FL, USA	0	0	0	0	0	0	0	Hangar fire
73J.46	48	10.11.73	Avionas Banamex	EXE	HS.125-1A	DES	L	Acapulco, MEX	2	6	0	8	2	6	8	No details avail.
73J.47	49	10.13.73	Aeroflot	SP	Tu-104	DES	L	Moscow Domodedovo Arpt., USR	?	?	?	28	?	?	?	No details avail.
73J.48	50	10.20.73	Mexicana	SP	B727-14	MJW	LA	Mazatlan Buelna Arpt., MEX	0	0	0	0	6	117	123	crsh 1.5 mi. from arpt., gear fail.
73J.49	51	11.03.73	Pan American	F	B707-321CF	DES	ER	ER New York, NY-Boston, MA, USA	3	0	0	3	3	0	3	In-flt. fire, emer. Indg @ Boston, MA
73J.50	52	11.03.73	National	SP	DC-10-10	MAJ	ER	ER Houston, TX-Las Vegas, NV, USA	1	0	0	1	12	118	130	In-flt. eng. fail., depress.
73J.51	53	11.05.73	Iberia (Spain)	G	SE.210-VIR	MJW	G	Madrid Barajas Arpt., SPN	0	0	0	0	0	0	0	gnd. fire
73J.52	54	11.27.73	Eastern	SP	DC-9-31	MJW	L	Akron-Canton Region. Arpt, OH, USA	0	0	0	0	5	31	36	Overran wet RW, brake fail.
73J.53	55	11.27.73	Delta	SP	DC-9-32	DES	LA	Chattanooga Mncpal. Arpt., TN, USA	0	0	0	0	5	74	79	hvy rain, wind shear, crw err., fire
73J.54	56	12.04.73	Austral	SP	BAC 1-11	MJW	TO	Bahia Blanca Esport Arpt., ARG	0	0	0	0	6	68	74	RTO, loss of power
73J.55	57	12.08.73	Aeroflot	SP	Tu-104	DES	LA	Moscow Domodedovo Arpt., USR	?	?	?	13	?	72	?	Undershot RW, bad weather
73J.56	58	12.12.73	Fred Olsen	EXE	D. Falcon 20C	DES	TO	Norwich, UK	0	0	0	0	3	6	9	No details avail.
73J.57	59	12.16.73	Aeroflot	SP	Tu-124	DES	LA	Vilnius, Lithuania, USR	?	?	?	?	?	?	?	No details avail.
73J.58	60	12.17.73	Pan American	SP	B707-321B	DES	G	Rome Leonardo da Vinci Arpt., ITA	?	?	?	30	?	?	?	gnd. terr.ist attack
73J.59	61	12.17.73	Iberia 933 (Spain)	SP	DC-10-30	DES	LA	Boston Logan Int'l Arpt., MA, USA	0	0	0	0	14	153	167	ILS app., struck app. lights, crw err.
73J.60	62	12.19.73	Lufthansa	SP	B707-330B	DES	LA	Delhi Palam Arpt., IND	0	0	0	0	11	98	109	Undershot RW, crw err.
73J.61	63	12.22.73	Royal Air Maroc	NSP	SE.210-VIN	DES	LA	20 kms. from Tetuanm, MOR	7	99	0	106	7	99	106	Struck Mt. Mellaline, crw err., rain
73J.62	64	12.23.73	Cruzeiro do Sul	SP	SE.210-VIR	DES	L	Manaus Arpt., BRA	0	0	0	0	5	53	58	Overran wet RW, crw err., fire
74J.1	1	1.01.74	Itavia 897 (Italy)	SP	F.28-1000	DES	LA	Torino/Turin, ITA	3	36	0	39	4	38	42	Undershot RW, fog, hvy rain

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot	
74J.2	2	1.04.74	Midwest Oil Co.	EXE	R. Sabreliner 40	DES	C	Midland, TX, USA	2	0	0	2	2	0	2	Dove into gnd., cause unknown	
74J.3	3	1.15.74	Kerr-McGee Corp.	EXE	R. Sabreliner	DES	LA	Oklahoma City, OK, USA	2	0	0	2	2	0	2	impr. ILS app., crw err.	
74J.4	4	1.16.74	Trans World AL 701	SP	B707-131B	MJW	L	Los Angeles Int'l Arpt., CA, USA	0	0	0	0	7	56	63	Hard lndg, gear fail., crw err., fog	
74J.5	5	1.19.74	Cable Enterprises	EXE	D. Falcon 20C	DES	L	Ft. Worth Meacham Field, TX, USA	0	0	0	0	2	0	2	Overran wet RW, crw err.	
74J.6	6	1.26.74	T.H.Y. (Turkey)	SP	F.28-1000	DES	C	Cumovasi AFB, Izmir, TUR	4	62	0	66	5	68	73	Icing, overrotation on TO, stalled, crw err., fire	
74J.7	7	1.30.74	Pan American AW 806	SP	B707-321B	DES	LA	Pago, Pago Int'l Arpt., Amer. Samoa	10	87	0	97	10	91	101	Windshear, rain, crw err., lnd short of RW	
74J.8	8	2.02.74	Transbrasil	SP	BAC 1-11	DES	L	Sao Paulo Arpt., BRA	0	0	0	0	8	88	96	Overran wet RW	
74J.9	9	2.02.74	Pan American AW	SP	B747-121	NON	ER	Honolulu, HI, USA	0	1	0	1	?	299		Infant strangled by seat belt	
74J.10	10	2.09.74	United States Air Force	?	T-39A	DES	?	Colorado Springs, CO, USA	?	?	?	?	?	?		No details avail.	
74J.11	11	2.19.74	Taylor Industries	G	HS.125-400A	MJR	G	San Jose, Costa Rica	0	0	0	0	0	0	0		No details avail.
74J.12	12	2.28.74	Brethour Realty Services	EXE	R. Sabreliner	DES	ER	Frobisher Bay, NW Territories, CAN	2	7	0	9	2	7	9		struck high gnd., ER Spain-Toronto
74J.13	13	3.03.74	B.O.A.C. (U.K.)	G	VC.10-1151	MJW	G	Amsterdam Int'l Arpt., NTL	?	?	?	?	?	?			hij, fire
74J.14	14	3.03.74	T.H.Y. 981 (Turkey)	SP	DC-10-10	DES	C	Bosquet de Dammar, Paris, FRA	12	334	0	346	12	334	346		In-flt. cargo door opening, mech. fail., control fail.
74J.15	15	3.05.74	?	F	Learjet 24	DES	C	Normandia, BOL	0	0	0	0	2	0	2		In-flt. eng. fire, emer. lndg
74J.16	16	3.15.74	Sterling AW	NSP	SE.210-10B3	DES	Taxi	Teheran, IRN	0	15	0	15	4	92	96		Taxiing fire, gear collapse
74J.17	17	3.22.74	Air Inter	G	SE.210-III	DES	G	Poretta Arpt., Corsica	?	?	?	?	?	?			gnd. bombing
74J.18	18	3.23.74	Airlift Int'l	G	DC-8-63CF	DES	G	Travis AFB, CA, USA	0	0	0	0	0	0	0		gnd. fire
74J.19	19	4.18.74	Court Line	NSP	BAC 1-11	MAJ	TO	Luton, UK	0	0	0	0	5	86	91		GTC failure
74J.19	20	4.18.74	Private AC	PVT	Piper Aztec	MAJ	Taxi	Luton, UK	1	0	0	1	1	1	2		GTC fail., crw err.
74J.20	21	4.19.74	Trans World AL	G	L.1011-1	DES	G	Boston Logan Int'l Arpt., MA, USA	0	0	0	0	0	0	0		gnd. fire
74J.21	22	4.22.74	Pan American AW 812	SP	B707-321B	DES	LA	Denpasar, Bali Is., Indonesia	11	96	0	107	11	96	107		Struck 4000' mtn., instr. fail., navigation err.
74J.22	23	5.11.74	Taxi Aereo Servicio	F	R. Sabreliner	MJR	ER	Belem, BRA	0	0	0	0	?	?			No details avail.
74J.23	24	6.24.74	Int'l Business Machines	T	G.1159 GS II	DES	ER	Kline, SC, USA	3	0	0	3	3	0	3		In-flt. spoiler op., LOC
74J.24	25	7.10.74	Egyptair	T	Tu-154	DES	LA	Cairo, EGY	6	0	0	6	6	0	6		Overshoot RW, LOC
74J.25	26	7.22.74	Cyprus AW	G	HS.121-1E	DES	G	Nicosia Arpt., CYP	0	0	0	0	0	0	0		struck during Turkish air raid
74J.25	27		Cyprus AW	G	HS.121-2E	DES	G	Nicosia Arpt., CYP	0	0	0	0	0	0	0		struck during Turkish air raid
74J.26	28	8.31.74	Alpine AC Charters	T	Learjet 25B	DES	?	Eaton, Briggsdale, CO, USA	1	3	0	4	1	3	4		LOC, cause unknown
74J.27	29	9.08.74	Trans World AL 841	SP	B707-331B	DES	ER	Ionian Sea, 215 mi. W of Athens, GRE	9	79	0	88	9	79	88		In-flt. bombing, 95 kms. W of Cephalonia
74J.28	30	9.11.74	Eastern AL 212	SP	DC-9-31	DES	LA	Charlotte Municipal Arpt., NC, USA	2	70	0	72	4	78	82		impr. IFR app., crw err., fire

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
74J.29	31	9.13.74	Conair of Scandinavia	NSP	B720-025	MJW	L	Copenhagen Kastrup Arpt., DEN	?	?	?	?	?	?		Hard Indg
74J.30	32	9.15.74	Air Vietnam 706	SP	B727-121C	DES	ER	ER Da Nang-SIN	8	67	0	75	8	67	75	hij., In-flt. bombing, on app.
74J.31	33	11.20.74	Lufthansa 540/19	SP	B747-130	DES	C	Nairobi Arpt., KEN	4	55	0	59	17	140	157	impr. TO config., crw err., fire
74J.32	34	11.21.74	Iran Govt./Air Taxi Co.	EXE	D. Falcon 20E	DES	LA	Kermanshah Arpt., IRN	2	0	0	2	3	0	3	struck gnd. 3 kms. short of RW, crw err.
74J.33	35	11.22.74	Alpa S.A.	NSP	C.500 Citation I	DES	TO	Barcelona, SPN	2	2	0	4	2	2	4	No details avail.
74J.34	36	11.23.74	J.A.T. (Yugoslavia)	SP	DC-9-32	MJW	LA	Belgrade Surcin Arpt., YUG	0	0	0	0	6	44	50	Ind short of RW, crw err.
74J.35	37	12.01.74	Trans World AL 514	SP	B727-231	DES	LA	Berryville, VA, USA	7	85	0	92	7	85	92	App. control fail., struck Mt. Weather 30 mi. NW of IAD
74J.36	38	12.01.74	Northwest AL 6231	FY	B727-251	DES	C	Thiells, NY, USA	3	0	0	3	3	0	3	Icing, LOC, crw err.
74J.37	39	12.04.74	Garuda Indonesian AW	NSP	DC-8-55F	DES	LA	Maskeliya, Colombo, Sri Lanka	9	182	0	191	9	182	191	Struck high gnd. 45 mi, ESE of arpt., navigation err.
74J.38	40	12.22.74	AVENSA 358	SP	DC-9-14	DES	C	32 kms. from Maturin, VEN	6	69	0	75	6	69	75	LOC, in-flt. eng fail.? explosion?
74J.39	41	12.26.74	Togo Govt.	EXE	G.1159 GS II	DES	L	Lome Arpt., Togo	0	3	0	3	1	5	6	No details avail.
74J.40	42	12.27.74	Anchor Hocking	F	R. Sabreliner 60	DES	LA	Lancaster, OH, USA	3	0	0	3	3	0	3	struck trees, mtn., impr. IFR app.
75J.1	1	1.30.75	T.H.Y. (Turkey)	SP	F.28-1000	DES	LA	Istanbul Yesilkoy Arpt., TUR	4	38	0	42	4	38	42	Overshot RW, RW lighting fail.
75J.2	2	2.09.75	Jet Travel	NSP	BAC 1-11	MJW	TO	South Lake Tahoe Arpt., CA, USA	0	0	0	0	6	45	51	Runway snow, LOC
75J.3	3	2.19.75	General Air (W.	SP	Yak-40EC	DES	L	Saarbrucken, FRG	0	0	0	0	2	14	16	Overran RW
75J.4	4	2.23.75	General Motors	EXE	R. Sabreliner	DES	LA	Pontiac, MI, USA	1	0	0	1	2	0	2	struck tree, impr. IFR app., rain, fog
75J.5	5	3.03.75	LTV Aerospace	EXE	D. Falcon 20C	DES	TO	Dallas NAS, TX, USA	0	0	0	0	2	3	5	No details avail.
75J.6	6	3.13.75	C. Ribeiro	?	C.500 Citation I	DES	L	Belem, BRA	?	?	0	3	?	?		No details avail.
75J.7	7	3.13.75	Jet Travel/Cimarron Ind.	EXE	IAI.1121	DES	L	Tulahoma Arpt., OK, USA	0	0	0	0	2	5	7	Overran wet RW, struck trees
75J.8	8	3.31.75	Western AL 470	SP	B737-247	DES	L	Casper Natrona Co. Arpt., WY, USA	0	0	0	0	6	93	99	impr. app., overran RW
75J.9	9	4.08.75	South African AW	SP?	B747-	?	L	Luanda, ANG	0	0	0	0	?	287		gnd. antiaircraft fire
75J.10	10	4.09.75	Aerolinee Itavia	SP	F.28-1000	MJW	TO	Bergamo Orio Al Serio Arpt., ITA	0	0	0	0	?	?		No details avail.
75J.11	11	5.07.75	Pan American AW	SP	B707-321B	NON	ER	St. Johns, Newfoundland, CAN	0	1	0	1	9	175	184	in-flt depress.
75J.12	12	6.06.75	Philippine AL	SP	BAC 1-11 524FF	MAJ	LA	Manila, PHI	0	1	0	1	5	59	64	In-flt. bombing
75J.13	13	6.12.75	Air France	SP	B747-128	DES	TO	Bombay Santa Cruz Arpt., IND	0	0	0	0	18	376	394	Tire fail. on TO
75J.14	14	6.14.75	Kerr-McGee Corp.	EXE	R. Sabreliner	DES	C	Watertown Arpt., SD, USA	0	0	0	0	2	4	6	Birdstrikes, in-flt eng. fail, emer. Indg
75J.15	15	6.17.75	Indian AL	SP	SE.210-VIN	MJW	L	Bombay Santa Cruz Arpt., IND	0	0	0	0	6	87	93	Overran RW
75J.16	16	6.24.75	Eastern AL 66	SP	B727-225	DES	LA	New York JFK Int'l Arpt., NY, USA	6	109	0	115	8	116	124	T-storms, hvy rain, wind shear, struck app. lights
75J.17	17	7.03.75	Danair Inc.	EXE	Learjet 25B	DES	TO	Richmond, IN, USA	0	0	0	0	2	6	8	No details avail.
75J.18	18	7.05.75	Balkan Bulgarian	SP	Tu-154	MAJ	L	Sofia Arpt., BUL	0	0	0	0	?	?		GTC failure

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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities			Aboard AC			Cause, Remarks, Details	
									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
75J.18	19	7.05.75	Balkan Bulgarian	SP	Tu-134	MAJ ?		Sofia Arpt., BUL	0	0	0	0	?	?	GTC failure	
75J.19	20	7.15.75	National AL	SP	DC-10-30	MIN E R		ER, Diverted Jacksonville, FL, USA	0	1	0	1	13	58	71	Passenger suicide, in-flt. fire
75J.20	21	7.15.75	Aeroflot	SP	Yak-40	DES ?		Batum Arpt., Georgia, USR	?	?	?	28	?	?	crsh @ sea	
75J.21	22	8.03.75	Alia Royal Jordanian AL	NSP	B707-321C	DES LA		Imzezem Immouzer, Agadir, MOR	7	181	0	188	7	181	188	Struck mtn. 25 mi. NW of Agadir, crw err.
75J.22	23	8.07.75	Continental AL 426	SP	B727-224	DES C		Denver Int'l Arpt., CO, USA	0	0	0	0	7	124	131	Wind shear, settled back on RW
75J.23	24	8.20.75	C.S.A. (Czechoslovakia)	SP	Il-62	DES LA		Damascus, Syria	11	115	0	126	11	117	128	struck sand hill on app., cause unknown
75J.24	25	8.23.75	Alpine AC Charters	T	Learjet 24	MJR TO		Englewood Arpt., CO, USA	0	0	0	0	2	0	2	No details avail.
75J.25	26	9.01.75	Interflug (E. Germany)	SP	Tu-134	DES LA		Leipzig Schkeuditz Arpt., GDR	3	23	0	26	6	28	34	lnd short of RW, flt. from Stuttgart
75J.26	27	9.15.75	British AW	SP	HS.121-1E	MJW TO		Bilbao Arpt., SPN	0	0	0	0	7	110	117	Skidded off RW
75J.27	28	9.24.75	Garuda (Indonesia)	SP	F.28-1000	DES LA		Palembang, Sumatra, Indonesia	4	21	1	26	4	57	61	lnd short of RW, struck trees
75J.28	29	9.27.75	Federal Express	F	D. Falcon 20DC	MJR TO		Warwick Green Arpt., RI, USA	0	0	0	0	3	0	3	No details avail.
75J.29	30	9.30.75	MALEV (Hungary)	SP	Tu-154	DES LA		Beirut, LEB	10	50	0	60	10	50	60	crsh into sea, flt. to Budapest
75J.30	31	9.30.75	Avianca (Colombia)	F	B727-24C	DES LA		Barranquilla Cortissoz Arpt, COL	4	0	0	4	4	0	4	2nd app., lnd short of RW
75J.31	32	10.30.75	Inex Adria (Yugoslavia)	NSP	DC-9-32	DES LA		Prague, CZK	4	71	0	75	5	115	120	lnd short of RW
75J.32	33	11.12.75	Overseas National 32	SP	DC-10-30CF	DES TO		New York JFK Int'l Arpt., NY, USA	0	0	0	0	11	128	139	Bird strike, RTO
75J.33	34	11.15.75	Aerolineas Argentinas	SP	F.28-1000	DES LA		6 kms. from Concordia, ARG	0	0	0	0	4	56	60	lnd short of RW, struck trees
75J.34	35	11.20.75	Hawker Siddeley AC Co.	T	HS.125-600B	DES C		Dunsfold, Surrey, UK	0	0	6	6	2	7	9	Birdstrikes, in-flt. eng. fail., struck car
75J.35	36	12.21.75	United States Navy	?	CT-39E	DES ?		Alameda NAS, CA, USA	?	?	?	?	?	?		No details avail.
75J.36	37	12.22.75	Trans World AL	SP	B707-331B	DES LA		Milan Malpensa Arpt., ITA	0	0	0	0	8	117	125	2nd app., lnd short of RW
75J.37	38	12.28.75	British AW	G	DH.121-1C	MJW G		London Heathrow Arpt., UK	0	0	0	0	0	0	0	Cabin fire
76J.1	1	1.01.76	Middle East AL 438	SP	B720-023B	DES E R		25 mi. NW of Al Qaysumah, SAR	15	66	0	81	15	66	81	In-flt. bombing
76J.2	2	1.02.76	Overseas National	NSP	DC-10-30CF	MJW L		Istanbul Yesilkoy Arpt., TUR	0	0	0	0	12	361	373	hvy lndg, ran off RW, crw err.
76J.3	3	1.03.76	Aeroflot	SP	Tu-134	DES C		Moscow Vnukovo Arpt., USR	4	83	0	87	4	83	87	In-flt. fire, Moscow-Brest, Belorussia flt.
76J.4	4	1.03.76	Winship AS	NSP	Learjet 24A	MJR LA		Anchorage Int'l Arpt., AK, USA	2	4	0	6	2	6	8	impr. ILS app.
76J.5	5	1.14.76	Federal Av.	F	R. Sabreliner 40	DES E R		Recife, BRA	1	0	0	1	3	0	3	Fuel exhaustion, ditched in S. Atlantic
76J.6	6	1.22.76	L'Armee de l'Air	?	D. Falcon 20C	DES ?		Rambouillet, FRA	?	?	?	?	?	?		No details avail.
76J.7	7	2.02.76	Estramed SpA	EXE	Learjet 24D	DES TO		Bari Palese Arpt., ITA	0	0	0	0	2	1	3	No details avail.
76J.8	8	2.22.76	Faberge Inc.	EXE	G.1159 GS II	DES LA		Burlington Int'l Arpt., VT, USA	0	0	0	0	3	1	4	Oscillating roll, wing struck RW, cartwheeled
76J.9	9	3.09.76	Syrianair	?	Yak-40	MJW ?		Beirut, LEB	?	?	?	?	?	?		No details avail.
76J.10	10	3.18.76	Cubana	SP	DC-8-43	MJW LA		Havana, CUB	0	0	0	0	16	13	29	ATC failure



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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
76T.15	11	3.18.76	Cubana	T	An-24V	DES	ER	Havana, CUB	5	0	0	5	5	0	5	ATC failure
76J.11	12	3.25.76	Int'l AS	FY	L.1329 Jetstar 6	DES	TO	Chicago Midway Arpt., IL, USA	2	2	0	4	2	2	4	Overran RW, failed to rotate, struck ILS
76J.12	13	4.05.76	Alaska AL 60	SP	B727-81	DES	L	Ketchikan Int'l Arpt., AK, USA	0	1	0	1	7	50	57	Fast app., crw err., overran RW
76J.13	14	4.22.76	Int'l Travel	F	B720-022	DES	LA	Barranquilla Arpt., COL	0	0	0	0	3	1	4	Undershot RW
76J.14	15	4.27.76	American AL 625	SP	B727-95	DES	L	St. Thomas Arpt., Virgin Islands	2	35	0	37	7	81	88	crw err., atempt. go-around
76J.15	16	5.09.76	Imp. Iranian AF ULF48	F	B747-131F	DES	LA	80 kms. SE of Madrid, SPN	10	7	0	17	10	7	17	Lightning strike, in-flt. fire
76J.16	17	5.23.76	Philippine AL	SP	BAC 1-11	DES	G	Zamboanga, PHI	0	10	3	13	10	93	103	In-flt. hij. 5.21.76, gnd. res. oper.
76J.17	18	6.01.76	Aeroflot	SP	Tu-154	DES	C	Macias Nguema, Equatorial Guinea	4	42	0	46	4	42	46	Struck high gnd.
76J.18	19	6.23.76	Allegheny AL 121	SP	DC-9-31	MJW	LA	Philadelphia Int'l Arpt., PA, USA	0	0	0	0	4	102	106	Windshear, atempt. go-around
76J.19	20	6.27.76	Middle East AL	SP	B720-047B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	3	0	3	Artillery fire after pax unloaded
76J.20	21	6.29.76	Construcciones Protexa	EXE	Learjet 24D	DES	L	MEX City, MEX	2	2	0	4	2	2	4	No details avail.
76J.21	22	7.04.76	Air France 139	SP	A.300B4-2C/20	NON	G	Entebbe, Uganda	0	4	1	5	12	256	268	hij., Israeli res. op.
76J.22	23	8.02.76	Korean AL	F	B707-373C	DES	C	Alborz Mtns., Teheran, IRN	5	0	0	5	5	0	5	Struck high gnd.
76J.23	24	8.07.76	Hansa Jet / Colonial	NSP	D. Falcon 20C	DES	LA	Acapulco, MEX	1	2	0	3	1	2	3	Struck mtn., bad weather
76J.24	25	8.16.76	Avianca (Colombia)	SP	B720-047B	MJW	L	MEX City Arpt., MEX	0	0	0	0	?	?		Bounced on Indg, rain squall
76J.25	26	8.21.76	Airtrust (Singapore)	F	CV.880-22M-3	DES	TO	Seletar Arpt., SIN	0	0	0	0	4	5	9	RTO, misloaded cargo
76J.26	27	8.30.76	Air France	SP	SE.210-III	MJW	G	Ho Chi Minh City, Vietnam	0	1	0	1	?	20		hij., gnd. bombing by hijacker
76J.27	28	9.02.76	Aeromexico	SP	DC-9-15	MJW	L	Leon-Guanajuato Arpt., MEX	0	0	0	0	?	?		Overran RW
76J.28	29	9.07.76	Air France	SP	B707-328	DES	Taxi	Ajaccio, Corsica	0	0	0	0	?	181		Terr.ist gnd. bombing
76J.29	30	9.10.76	British AW 476	SP	HS.121-3B	DES	ER	Zagreb, YUG	9	54	0	63	9	54	63	ATC failure
76J.29	31	9.10.76	Inex Adria 550	NSP	DC-9-31	DES	C	Zagreb, YUG	5	108	0	113	5	108	113	ATC failure
76J.30	32	9.19.76	T.H.Y. (Turkey)	SP	B727-2F2	DES	LA	Karatepe Mtns., Isparta, TUR	8	147	0	155	8	147	155	Struck mtn. 65-mi. N of Antalya, navigation err.
76J.31	33	9.26.76	Johnson & Johnson	EXE	G.1159 GS II	DES	LA	Hot Springs Ingalls Field, VA, USA	3	8	0	11	3	8	11	impr. ILS app., cause unknown, fire
76J.32	34	9.26.76	S.P.A. (Brazil)	EXE	Learjet 25C	DES	LA	Campinas/Viracops Arpt., BRA	2	5	0	7	2	5	7	impr. instr. app., struck trees, rain
76J.33	35	10.06.76	Cubana 455	SP	DC-8-43	DES	C	Barbados Int'l Airport, Barbados	12	61	0	73	12	61	73	In-flt. bombing, crsh @ sea
76J.34	36	10.12.76	Indian AL	SP	SE.210-VIN	DES	C	Bombay Santa Cruz Arpt., IND	6	89	0	95	6	89	95	In-flt. engine fire, atemptd. emer. Indg
76J.35	37	10.13.76	L.A.B. (Bolivia)	F	B707-131	DES	C	Santa Cruz, BOL	3	0	110	113	3	0	3	crsh into town, eng. fail.? crw err.?
76J.36	38	11.12.76	Taxi Aereo Jaragua	NSP	C.500 Citation I	DES	L	Rio de Janeiro Dumont Arpt., BRA	0	0	0	0	2	6	8	No details avail.
76J.37	39	11.12.76	Reynolds Tobacco Co.	EXE	D. Falcon 20F	DES	C	Naples, FL, USA	0	0	0	0	2	9	11	Birdstrikes, in-flt. eng. fail., struc. fail.
76J.38	40	11.12.76	?	?	Learjet 25B	DES	?	Guanabara Bay, BRA	?	?	?	?	?	?		No details avail.
76J.39	41	11.16.76	Texas Int'l 987	SP	DC-9-15	DES	TO	Denver Int'l Arpt., CO, USA	0	0	0	0	5	79	84	RTO, instr. fail., overran RW
76J.40	42	11.27.76	W. German Air Force	?	HFB-320	DES	?	Schwabmunchen, FRG	?	?	?	?	?	?		No details avail.

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
76J.41	43	11.28.76	Aeroflot	SP	Tu-104	DES	C	Moscow, USSR	5	67	0	72	5	67	72	No details avail.
76J.42	44	12.16.76	Air Trine/Batch Air?	F	CV.880-22M-22	MJW	TO	Miami Int'l Arpt., FL, USA	0	0	0	0	3	0	3	RTO, misloaded cargo
76J.43	45	12.25.76	Egyptair 864	SP	B707-366C	DES	LA	Bangkok Arpt., THL	9	44	19	72	9	44	53	impr. app., crw err., struck textile mill
77J.1	1	1.02.77	C.S.A. (Czechoslovakia)	SP	Tu-134A	DES	L	Prague Ruzyne Arpt., CZK	0	0	0	0	6	42	48	ATC failure
77T.1	2	1.02.77	C.S.A. (Czechoslovakia)	?	Il-18V	MAJ	TO	Prague Ruzyne Arpt., CZK	0	0	0	0	6	0	6	ATC failure
77J.2	3	1.04.77	Trans Brasil	SP	BAC 1-11	MJW	L	Sao Paulo Vira Copos Arpt., BRA	0	0	0	0	5	38	43	hvy lndg
77J.3	4	1.06.77	Jet Aviation	EXE	Learjet 24B	DES	C	Palm Springs, CA, USA	2	2	0	4	2	2	4	Struck Mt. San Bernardino
77J.4	5	1.06.77	Jet Aviation	F	Learjet 23	DES	L	Flint Arpt., MI, USA	2	0	0	2	2	0	2	No details avail.
77J.5	6	1.13.77	Aeroflot	SP	Tu-104B	DES	LA	Alma Ata, Kazakhstan, USSR	6	90	0	96	6	90	96	In-flt. 2 eng. fail.
77J.6	7	1.13.77	Japan AL	F	DC-8-62AF	DES	C	Anchorage Int'l Arpt., AK, USA	5	0	0	5	5	0	5	Icing, intoxicated pilot, crw err.
77J.7	8	1.18.77	Yugoslav Govt.	EXE	Learjet 25B	DES	LA	Inac Mtn., Sarajevo, YUG	3	5	0	8	3	5	8	impr. app., struck 4480' mtn.
77J.8	9	2.21.77	Air Inter	SP	SE.210-III	MAJ	L	Bordeaux, FRA	0	0	1	1	5	23	28	Struck van on lndg, lnd @ Toulouse
77J.9	10	3.03.77	?	?	R. Sabreliner	DES	LA	Nassau, Bahamas	1	0	0	1	1	0	1	hvy rain
77J.10	11	3.04.77	Overseas National	F	DC-8-63CF	DES	LA	Niamey, Niger	2	0	0	2	4	0	4	lnd 800 m. short of RW
77J.11	12	3.17.77	British Airtours	T	B707-436	DES	C	Prestwick Arpt., Scotland, UK	0	0	0	0	5	0	5	Siml. eng. failure, crw err.
77J.12	13	3.27.77	Pan American AW 1736	NSP	B747-121	DES	Taxi	Los Rodeos Arpt, Tenerife, Canary Is.	9	326	0	335	16	380	396	GTC failure
77J.12	14		K.L.M. 4806	NSP	B747-206B	DES	TO	Los Rodeos Arpt, Tenerife, Canary Is.	14	234	0	248	14	234	248	GTC failure, crw err.
77J.13	15	4.02.77	Aviogenex (Yugoslavia)	F	Tu-134A-3	DES	LA	Libreville Arpt., GAB	6	2	0	8	6	2	8	Missed app., lnd short of RW
77J.14	16	4.03.77	Mountain Bell Telephone	EXE	D. Falcon 10	DES	TO	Denver Int'l Arpt., CO, USA	2	2	0	4	2	3	5	In-flt. hydraulic fail., LOC
77J.15	17	4.04.77	Southern AW 242	SP	DC-9-31	DES	E R	New Hope, 20 mi. NW of Atlanta, GA, USA	2	60	9	71	4	81	85	T-storm, hail, in-flt. 2 eng. fail.
77J.16	18	4.18.77	Philippine AL	SP	DC-8-53	MJW	C	Tokyo Haneda Int'l Arpt., JPN	0	0	0	0	13	127	140	Mech. fail., LOC, high winds
77J.17	19	4.22.77	Trans World AL	?	B707-131	DES	?	Indianapolis, IN, USA	?	?	?	?	?	?	?	Fire
77J.18	20	4.27.77	Rockwell Int'l	EXE	R. Sabreliner	DES	L	Wheeling Walker Arpt., IL, USA	0	0	0	0	2	0	2	3rd touchdown, reverser fail., overran RW
77J.19	21	4.28.77	Southern Co. Services	EXE	HS.125-600A	DES	C	McLean, VA, USA	2	2	0	4	2	2	4	instr. fail., LOC
77J.20	22	4.28.77	Arab Wings	F	Learjet 35	DES	TO	Riyadh Int'l Arpt., SAR	2	0	0	2	2	0	2	1-eng. TO, LOC
77J.21	23	5.14.77	Dan-Air	F	B707-321C	DES	LA	Lusaka Int'l Arpt., Zambia	5	1	0	6	5	1	6	In-flt. tailplane struc. fail.
77J.22	24	5.26.77	Ponderosa/Chrysler	EXE	Learjet 25B	DES	L	Detroit, MI, USA	0	0	0	0	2	0	2	Reverser fail., overran RW
77J.23	25	5.27.77	Aeroflot	SP	Il-62	DES	LA	Havana Arpt., CUB	9	60	0	69	9	61	70	Undershot RW, struck powerlines
77J.24	26	5.28.77	Societa Avio Ligure	?	Yak-40EC	DES	L	Genoa Cristoforo Colombo Arpt., ITA	0	0	0	0	4	0	4	Overran RW
77J.25	27	7.25.77	A. Blattner?	F?	HFB-320	DES	LA	Adjivou, Ivory Coast	2	1	0	3	2	1	3	crsh into Atlantic Ocean
77J.26	28	8.07.77	Pearl Air	F	B707-430	MJW	L	Sana'a Arpt., YEM	0	0	0	0	?	?	?	Hard lndg, go-around, gear fail.

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						Dmg	PHS		Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
77J.27	29	8.13.77	China AL (Taiwan)	SP	B747-132	NON	Taxi	Honolulu Int'l Arpt., HI, USA	0	0	1	1	22	345	367	gnd. personnel run over by AC on pushback from jetway
77J.28	30	8.16.77	Bass Aviation	?	Learjet 24	DES	TO	Baton Rouge Arpt., LA, USA	0	0	0	0	2	6	8	No details avail.
77J.29	31	8.20.77	Monarch Aviation	F	CV.880-22-2(F)	DES	C	San Jose Int'l Arpt., Costa Rica	3	0	0	3	3	0	3	Struck gnd. 2 mi. from RW
77J.30	32	9.08.77	Champion Home	EXE	Learjet 25B	DES	C	Sanford, NC, USA	2	3	0	5	2	3	5	In-flt. fire, explosion
77J.31	33	9.21.77	MALEV (Hungary)	SP	Tu-134	DES	LA	6.3 kms. SW of Urziceni, Romania	8	21	0	29	8	45	53	Reduced power, emer. lndg
77J.32	34	9.23.77	Arab Wings	NSP	Learjet 36A	DES	C	Amman Arpt., JOR	2	2	0	4	2	2	4	Misloaded AC, LOC
77J.33	35	9.27.77	Japan AL	SP	DC-8-62H	DES	LA	32 kms. from Kuala Lumpur, Malaysia	8	26	0	34	10	69	79	T-storm, struck hill, crw err.
77J.34	36	9.30.77	Air Inter	SP	SE.210-	?	G	Paris, FRA	0	1	0	1	7	93	100	gnd. bombing by hijacker
77J.35	37	10.05.77	Trico Aviation	EXE	Learjet 25B	DES	C	Amarillo Int'l Arpt., TX, USA	0	0	0	0	2	1	3	LOC, crw err.
77J.36	38	10.18.77	Lufthansa 181	SP	B737-230QC	?	G	Aden, Mogadishu, Somalia	1	3	0	4	5	86	91	hij. on 10.13.77, res. op.
77J.37	39	11.03.77	El Al (Israel)	SP	B747-	MIN	ER	Over Belgrade, ER Amsterdam	0	1	0	1	?	?	?	In-flt. depress.
77J.38	40	11.07.77	Mech. Equipment Co.	EXE	R. Sabreliner 40	DES	C	New Orleans, LA, USA	1	2	0	3	2	2	4	crsh into Lake Ponchartrain
77J.39	41	11.19.77	T.A.P. 425 (Portugal)	SP	B727-282 Adv.	DES	L	Funchal Arpt., Madeira, POR	6	125	0	131	8	156	164	lnd 2000' beyond threshold, overran wet RW 24
77J.40	42	11.19.77	Ethiopian AL	F	B707-360C	DES	C	Rome Leonardo Da Vinci Arpt., ITA	3	2	0	5	3	2	5	impr. rotation, flew into gnd.
77J.41	43	11.19.77	T.A.M. (Brazil)	F	Learjet 25B	DES	TO	Rio de Janeiro Dumont Arpt., BRA	0	0	0	0	2	0	2	RTO, eng. fail., overran wet RW
77J.42	44	11.21.77	Austral SPL-9	NSP	BAC 1-11	DES	LA	San Carlos de Bariloche, ARG	5	41	0	46	5	74	79	VOR fail., VFR app., crw err.
77J.43	45	11.22.77	Interflug (E. Germany)	?	Tu-134A	DES	L	E. Berlin Schonefeld Arpt, GDR	0	0	0	0	?	69	69	lnd short of RW
77J.44	46	12.02.77	Balkan Bulgarian	NSP	Tu-154A	DES	L	Labrak AFB, Benghazi, LIB	0	59	0	59	6	159	165	Fuel exhaustion, emer. lndg
77J.45	47	12.04.77	Malaysian AL System 653	SP	B737-2H6 Adv.	DES	LA	Johore Strait, Malaysia	7	93	0	100	7	93	100	hij., in-flt. shooting of crw
77J.46	48	12.09.77	Aerotour	NSP	SE.210-VIN	MJW	Taxi	Oujda, MOR	0	0	0	0	?	?	?	Gear fail.
77J.47	49	12.09.77	Churchill Falls Corp.	EXE	HS.125-400A	DES	LA	Churchill Falls, Labrador, Nfndlnd. CAN	2	6	0	8	2	6	8	impr. app., crw err.
77J.48	50	12.11.77	Charlotte AC Corp.	G	DC-8-33F	DES	G	Lake City, FL, USA	?	?	?	?	?	?	?	gnd. fire while refueling
77J.49	51	12.18.77	S.A.T.A. 730 (Portugal)	NSP	SE.210-10R	DES	LA	Funchal Arpt., Madeira, POR	1	35	0	36	5	52	57	Short app., crw err., water lndg
77J.50	52	12.18.77	United AL 2860	F	DC-8-54F	DES	LA	NE of Salt Lake City, UT, USA	3	0	0	3	3	0	3	crw err., holding, struck Wasatch Mtns.
78J.1	1	1.01.78	Air India 855	SP	B747-237B	DES	C	Bay of Bombay, IND	23	190	0	213	23	190	213	crw err., instr. fail.?
78J.2	2	1.12.78	Indian AL 117	SP	B737-2A8	NON	L	Hyderabad Begumpet Arpt., IND	0	0	1	1	6	99	105	struck unauth. person on RW
78J.3	3	1.27.78	Austral L.A.	G	BAC 1-11	MAJ	G	Buenos Aires Aeroparque, ARG	?	?	?	?	?	?	?	Oxygen fire
78J.4	4	2.11.78	Pacific Western	SP	B737-275	DES	L	Cranbrook Arpt., Brit. Columbia, CAN	5	39	0	44	5	45	50	Thrust rev. fail., RW obstacle avoidance
78J.5	5	2.15.78	Sobelair	NSP	B707-329	DES	L	Tenerife Santa Cruz Arpt., Canary Is.	0	0	0	0	7	189	196	lnd short of RW, gear fail., fire
78J.6	6	2.22.78	Maniglia Costruzioni	EXE	Learjet 35A	DES	LA	Palermo, Sicily, ITA	1	2	0	3	1	2	3	crsh @ sea

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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
78J.7	7	2.26.78	?	PVT	F-104	DES	LA	Mojave, CA, USA	0	0	0	0	1	0	1	Indg gear fail., crw ejected
78J.8	8	3.01.78	Continental AL 603	SP	DC-10-10	DES	TO	Los Angeles Int'l Arpt., CA, USA	0	2	0	2	14	186	200	Tire fail., RTO on wet RW, overran RW, fire
78J.9	9	3.01.78	Nigeria AW	SP	F.28-1000	DES	LA	Kano Arpt., NIG	5	11	0	16	5	11	16	ATC failure
78J.9	10	3.01.78	Military AC	Mil.	MiG-21	DES	LA	Kano Arpt., NIG	2	0	0	2	2	0	2	ATC failure
78J.10	11	3.03.78	Iberia (Spain)	SP	DC-8-63	MJW	LA	Santiago De Compostela, SPN	0	0	0	0	11	211	222	High final app., overran RW, fire
78J.11	12	3.09.78	China AL (Taiwan)	SP	B737-	?	ER	ER Kaoshiung, TWN-Hong Kong	1	0	0	1	6	92	98	Unsuccessful hij. attempt
78J.12	13	3.16.78	Balkan-Bulgarian	SP	Tu-134	DES	C	Gabare, 130 km NE of Sofia, BUL	7	66	0	73	7	66	73	emer. declared, LOC
78J.13	14	3.24.78	Balkan-Bulgarian	F	Tu-154	DES	L	Damascus, Syria	4	0	0	4	4	0	4	No details avail.
78J.14	15	3.28.78	Aerocondor Colombia	SP	A.300B4-102	NON	Taxi	Miami Int'l Arpt., FL, USA	0	0	1	1	11	191	202	gnd. industrial accident
78J.15	16	3.30.78	National Jets Inc.	Amb.	Learjet 23	DES	L	Burbank Arpt., CA, USA	0	0	0	0	3	2	5	Overran wet RW, brake fail., struck fence, crw err.
78J.16	17	4.02.78	V.A.S.P. (Brazil)	SP	B737-2A1	DES	L	Sau Paulo Congonhas Arpt., BRA	0	0	0	0	7	37	44	Gear-up Indg, fire
78J.17	18	4.04.78	Sabena (Belgium)	T	B737-229C	DES	TO	Gosselies Arpt., Charleroi, BEL	0	0	0	0	3	0	3	Bird strike, RTO
78J.18	19	4.07.78	Arthur Roland	EXE	Learjet 24	DES	L	Soda Springs, ID, USA	0	0	0	0	2	1	3	No details avail.
78J.19	20	4.20.78	Korean AL	SP	B707-321B	DES	ER	Kem, Karelskaya, USR	0	2	0	2	13	97	110	Soviet AF interception, navigation err.
78J.20	21	4.27.78	John Cassidy Jr.	EXE	IAI.1121A	DES	C	Flatwoods, LA, USA	2	0	0	2	2	0	2	In-flt. explosion, fire, cause unknown
78J.21	22	5.08.78	National AL 193	SP	B727-235	MJW	LA	Escambia Bay, Pensacola, FL, USA	0	3	0	3	6	52	58	Fog, crw err., crsh @ sea
78J.22	23	5.18.78	Flight Safety Int'l	T	D. Falcon 20C	DES	C	3.7 mi. W of Memphis Int'l Arpt., TN, USA	4	0	0	4	4	0	4	ATC failure
78J.22	24	5.18.78	Private AC	PVT	Cessna 150M	DES	?	3.7 mi. W of Memphis Int'l Arpt., TN, USA	1	1	0	2	1	1	2	ATC failure
78J.23	25	5.20.78	Rio Sul Servicos Aereos	?	R. Sabreliner 60	DES	L	Sao Paulo Viracorpos Arpt., BRA	0	0	0	0	2	0	2	No details avail.
78J.24	26	5.25.78	Groth AS	F	CV.880-22-2	MJW	TO	Miami Int'l Arpt., FL, USA	0	0	0	0	3	3	6	RTO, cargo misloaded, gear collapse, overran RW
78J.25	27	5.26.78	Aerobec Ltd.	NSP	IAI.1121	DES	L	Winnipeg, Manitoba, CAN	0	0	0	0	2	1	3	No details avail.
78J.26	28	6.11.78	Delta AL	SP	L.1011-1	NON	G	Atlanta Int'l Arpt., GA, USA	0	0	1	1	11	172	183	gnd. industrial accident
78J.27	29	6.26.78	Air Canada 189	SP	DC-9-32	DES	TO	Toronto Int'l Arpt., Ontario, CAN	0	2	0	2	5	102	107	RTO, tire fail, fog
78J.28	30	6.00.78	Aeroflot	T	Tu-144	DES	?	E of Moscow, USR	2	0	0	2	5	0	5	No details avail.
78J.29	31	7.09.78	Allegheny AL 453	SP	BAC 1-11	MJW	L	Rochester Mncpl. Arpt., NY, USA	0	0	0	0	4	73	77	Fast Indg, overran RW, crw err.
78J.30	32	8.03.78	LAN-Chile	SP	B707-351B	DES	LA	Buenos Aires Ezeiza Arpt., ARG	0	0	0	0	8	55	63	Ind short of RW, fog
78J.31	33	8.18.78	Philippine AL	SP	BAC 1-11 524FF	MAJ	ER	ER Cebu-Manila, PHI	0	1	0	1	6	78	84	In-flt. bombing
78J.32	34	9.25.78	Pacific SW AL 182	SP	B727-214	DES	LA	San Diego, CA, USA	7	128	13	148	7	128	135	ATC failure, crw err.
78J.32	35	9.25.78	Gibbs Flite Center	PVT	Cessna 172M	DES	C	San Diego, CA, USA	2	0	0	2	2	0	2	ATC failure
78J.33	36	9.26.78	LACSA (Costa Rica)	T	BAC 1-11 531FS	MAJ	L	Miami, FL, USA	0	0	0	0	2	0	2	Gear-up, no-flap Indg, crw err.

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
78J.34	37	10.17.78	Martin Aviation	T	Learjet 24	DES	C	Lancaster Fox Arpt., CA, USA	2	0	0	2	2	0	2	Touch-&-go Indg, LOC
78J.35	38	10.20.78	Kelco Aircraft	T	Learjet 25B	DES	E R	Vickery, Sandusky, OH, USA	3	0	0	3	3	0	3	LOC, cause unknown
78J.36	39	10.24.78	National Jets	T	Learjet 24D	MJW	TO	Las Vegas Int'l Arpt., NV, USA	0	0	0	0	2	0	2	gnd. looped on TO run, LOC, crw err.
78J.37	40	11.15.78	Icelandic/Garuda	NSP	DC-8-63CF	DES	LA	Colombo Katunayake Arpt., Sri Lanka	8	176	0	184	13	249	262	struck coconut plantation 1 mi. from RW on ILS app., crw err., ILS fail., hvy rain, wind shear
78J.38	41	12.04.78	Inlet Marine, Inc.	EXE	Learjet 25C	DES	L	Anchorage Int'l Arpt., AK, USA	2	3	0	5	2	5	7	High winds, LOC, crw err.
78J.39	42	12.17.78	Indian AL	SP	B737-2A8	DES	C	Hyderabad Begumpet Arpt., IND	0	1	3	4	6	126	132	impr. TO config.
78J.40	43	12.20.78	Flight Training Center	NSP	Learjet 25	DES	C	Minneapolis Int'l Arpt., MN, USA	0	0	0	0	2	5	7	LOC, icing, crw err.
78J.41	44	12.23.78	Alitalia 4128 (Italy)	SP	DC-9-32	DES	LA	3 kms. N of Palermo, Sicily, ITA	5	103	0	108	5	124	129	crsh @ sea 3.5 mi. short of RW, crw err.
78J.42	45	12.26.78	Lider Taxi Aereo/TAM	?	Learjet 25C	DES	TO	Sao Paulo Congonhas Arpt., BRA	0	0	0	0	2	?		Overran RW
78J.43	46	12.28.78	United AL 173	SP	DC-8-61	DES	LA	10 kms. N of Portland, OR, USA	2	8	0	10	8	181	189	crw err., fuel exhaust., gear fail.
78J.44	47	00.00.78	United States Air Force	?	T-39A	DES	?	?	?	?	?	?	?	?		No details avail.
79J.1	1	1.05.79	Walt Disney	EXE	C.500 Citation I	DES	L	Burbank Arpt., CA, USA	0	0	0	0	2	3	5	Overran wet RW, struck fence
79J.2	2	1.19.79	Massey-Ferguson	EXE	Learjet 25D	DES	LA	Detroit Metro. Arpt., MI, USA	2	4	0	6	2	4	6	LOC, preceding DC9 wake-vortices, icing
79J.3	3	1.26.79	Big 6 General Partnership	EXE	HS.125-3A	DES	L	Taos Mncpl. Arpt., NM, USA	0	0	0	0	2	8	10	Hard Indg, ran off RW, struck snowbank, crw err.
79J.4	4	1.30.79	VARIG (Brazil)	F	B707-323C	DES	E R	ER Tokyo, JPN-Los Angeles, CA	5	0	0	5	5	0	5	Missing AC, cause unknown
79J.5	5	2.09.79	Eastern AL	T	DC-9-14	DES	C	Dade Collier Arpt., Miami, FL, USA	0	0	0	0	4	1	5	Siml. eng. fail.
79J.6	6	2.17.79	Trans Mediterranean AW	F	B707-321C	MAJ	LA	Taoyuan, TWN	0	0	0	0	5	0	5	ATC failure
79J.6	7	2.17.79	Taiwan Air Force	Mil.	Northrop F-5	DES	?	Taoyuan, TWN	1	0	0	1	1	0	1	ATC failure
79J.7	8	3.06.79	Garuda (Indonesia)	F	F.28-1000	DES	LA	Ngadirefo, Sukapur, Java, Indonesia	4	0	0	4	4	0	4	struck high gnd.
79J.8	9	3.13.79	U.S. Air Force 475 ABW	?	T-39A	DES	?	Kunsong, RSK	?	?	?	?	?	?		No details avail.
79J.9	10	3.14.79	Alia-Royal Jordanian 600	SP	B727-2D3	DES	LA	Doha Int'l Arpt., QTR	3	42	0	45	15	49	64	T-storm, windshear, missed app.
79J.10	11	3.14.79	C.A.A.C. (China)	T	HS.121-2E	DES	C	Beijing Hsijiao Arpt., ROC	12	0	32	44	12	0	12	No details avail.
79J.11	12	3.17.79	Aeroflot	SP	Tu-104	DES	TO	Moscow Vnukovo Arpt., USR	?	90	0	90	?	90		Freezing rain, fog
79J.12	13	3.30.79	Aeroservice Cargo	?	SN.601-100	DES	TO	Nkayi, Congo	0	0	0	0	2	0	2	No details avail.
79J.13	14	4.02.79	Uganda AL	G	B707-321C	DES	G	Entebbe Arpt., Uganda	?	?	?	?	?	?		destr. by Tanzanian gnd. gunfire
79J.14	15	4.22.79	Tunis Air	SP	B727-2H3	MAJ	TO	Jeddah Arpt., SAR	0	0	1	1	2	8	10	TO on wrong RW, crw err., struck excavation
79J.15	16	4.26.79	Indian AL	SP	B737-2A8	DES	LA	St. Thomas Mt. Arpt., Madras, IND	0	0	0	0	6	61	67	In-flt. bombing
79J.16	17	5.25.79	American AL 191	SP	DC-10-10	DES	C	Chicago O'Hare Int'l Arpt., IL, USA	13	258	2	273	13	258	271	Engine separation near rotation, stalled on climbout, impr. gnd. maint.

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
79J.17	18	5.27.79	Mauritanian	?	SE.210-VIR	DES	?	Atlantic Ocean off Senegal	?	?	?	?	?	?	No details avail.	
79J.18	19	6.18.79	?	?	HS.125-3B/RA	DES	?	Brasilia, BRA	?	?	?	?	?	?	No details avail.	
79J.19	20	6.00.79	L'Armee de l'Air	?	SE.210-11R	MJW	?	TAH	?	?	?	?	?	?	No details avail.	
79J.20	21	7.06.79	Chapman Commodities	T	Learjet 25B	MJW	L	Pueblo Arpt., CO, USA	2	0	0	2	2	1	3	LOC, inverted,,crw err.
79J.21	22	7.09.79	?	PVT	T-33	DES	TO	Sebring, FL, USA	0	0	0	0	1	1	2	Takeoff run on taxiway, struck cows, crw err.
79J.22	23	7.11.79	Garuda (Indonesia)	SP	F.28-1000	DES	LA	Medan Airfield, Sumatra, Indonesia	4	57	0	61	4	57	61	Struck mtn.
79J.23	24	7.20.79	Aerotal Colombia	SP	SE.210-10A/VI	MJW	C	Bogata El Dorado Arpt., COL	0	0	0	0	6	51	57	Hydraulic fail., gear-up Indg
79J.24	25	7.23.79	Trans Mediterranean AW	T	B707-327C	DES	C	Beirut Int'l Arpt., LEB	6	0	0	6	6	0	6	Siml eng. fail, crw err., LOC
79J.25	26	7.26.79	Lufthansa 527	F	B707-330C	DES	C	Serra dos Macacos, Petropolis, BRA	3	0	0	3	3	0	3	struck high gnd., ATC err.
79J.26	27	8.02.79	Thurman Munson	T	C.501 Citation I	DES	LA	Canton, OH, USA	1	0	0	1	1	2	3	Touch-&-go short of RW, crw err.
79J.27	28	8.11.79	Aeroflot	SP	Tu-134	DES	E R	Dneprodzerzhinsk, Ukraine, USR	?	?	?	?	?	?	?	ATC failure
79J.27	29	8.11.79	Aeroflot	SP	Tu-134	DES	E R	Dneprodzerzhinsk, Ukraine, USR	?	?	?	173	?	173	?	ATC failure
79J.28	30	8.11.79	Bahri Aviation	EXE	Learjet 35	DES	E R?	60 nmi. S of Katab, EGY	2	3	0	5	2	3	5	Missing AC, ER Athens-Jeddah, S. Arabia
79J.29	31	8.19.79	Cyprus AW	SP	B707-123B	MJW	L	Muharraq Int'l Arpt., BAH	0	0	0	0	8	58	66	Hard Indg, bounced, gear collapse
79J.30	32	8.23.79	Lider Taxi Aereo	?	Learjet 24D	DES	L	Sao Paulo Viracopos Arpt., BRA	0	0	0	0	2	0	2	No details avail.
79J.31	33	9.03.79	Sterling AW	NSP	SN.601-100	DES	LA	Nice, FRA	2	8	0	10	2	8	10	In-flt. 2-eng. fail., LOC
79J.32	34	9.11.79	China AL	T	B707-324C	DES	C	Taipei, TWN	6	0	0	6	6	0	6	crsh @ sea, cause unknown
79J.33	35	9.12.79	S.A.N. Ecuador	?	SE.210-VIR	MJW	?	?	?	?	?	?	?	?	?	No details avail.
79J.34	36	9.14.79	Aero Transporti Italiani	SP	DC-9-32	DES	LA	Sarroch, Caghari, Sardinia	4	27	0	31	4	27	31	struck high gnd., crw err., bad weather
79J.35	37	10.07.79	Swissair	SP	DC-8-62	DES	L	Athens Hellinikon Arpt., GRE	0	14	0	14	12	142	154	Overran RW, brake fail., fire
79J.36	38	10.31.79	Western AL 2605	SP	DC-10-10	DES	L	MEX City Int'l Arpt., MEX	11	61	1	73	13	76	89	Ind on wrong RW, crw err., struck dump truck
79J.37	39	11.19.79	National Jet Industries	F	C.500 Citation I	DES	LA	Castle Rock, CO, USA	1	1	0	2	2	1	3	impr. IFR op., icing, crw err.
79J.38	40	11.26.79	Pakistan Int'l AL 740	SP	B707-340C	DES	C	145 kms. E of Jeddah, SAR	11	145	0	156	11	145	156	In-flt. cabin fire, atmpd emer. Indg, crw err.
79J.39	41	11.27.79	Irish Air Corps	F	HS.125-600B	DES	TO	Baldonnel AB, Dublin, IRE	0	0	0	0	3	0	3	No details avail.
79J.40	42	11.28.79	Air New Zealand 901	NSP	DC-10-30	DES	E R	Mt. Erebus, Ross Island, Antarctica	20	237	0	257	20	237	257	Struck mtn., crw navigation err.
79J.41	43	11.00.79	Saudia	?	B707-373C	MJW	L	Jeddah, SAR	?	?	?	?	?	?	?	Hard Indg
79J.42	44	12.02.79	ERA Helicopters	NSP	Learjet 24D	DES	TO	Dutch Harbor, AK, USA	0	0	0	0	2	4	6	RTO, skidded off wet, icy RW, struck rocks
79J.43	45	12.07.79	ALPA S.A.	NSP	HS.125-400B	DES	L	Sassandra, Ivory Coast	0	0	0	0	3	7	10	No details avail.
79J.44	46	12.10.79	Ferruzzi SpA	EXE	Learjet 36A	DES	LA	Forli, Arcona, ITA	2	1	2	5	2	4	6	Struck tower, house 2 kms. from RW

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
79J.45	47	12.15.79	Venezuelan Govt.	EXE	C.500 Citation I	DES	L	Zulia State, VEN	2	0	0	2	2	4	6	No details avail.
79J.46	48	12.23.79	T.H.Y. (Turkey)	SP	F.28-1000	DES	LA	Cucuk Koy, Ankara, TUR	3	38	0	41	4	41	45	High high gnd.
80J.1	1	1.07.80	Alitalia (Italy)	G	DC-9-32	DES	G	Rome Leonardo Da Vinci Arpt., ITA	?	?	?	?	?	?		Hangar fire
80J.2	2	1.13.80	Garuda (Indonesia)	SP	DC-9-32	MJW	L	Banjarmasin, Kalimantan, Indonesia	0	0	0	0	5	121	126	Hard lndg, bad weather
80J.3	3	1.21.80	Iran Air	SP	B727-86	DES	LA	Elburz Mtns., 20 mi. N of Tehran, IRN	8	120	0	128	8	120	128	struck high gnd. on ILS app., inoperative ILS
80J.4	4	1.23.80	L.O.T. (Poland)	?	Tu-134	MJW	L	Warsaw Arpt., POL	?	?	?	?	?	?		Overran runway 11
80J.5	5	1.27.80	Avianca (Colombia)	SP	B720-059B	MJW	L	Mariscal Sucre Arpt., Quito, ECU	0	0	0	0	?	?		Fast lndg, overran RW, crw err.
80J.6	6	1.30.80	Kellogg Co.	EXE	D. Falcon 10	DES	TO	Chicago Meigs Field, IL, USA	1	1	0	2	2	4	6	Overran RW, parking brake on, crw err.
80J.7	7	1.30.80	L'Armee de l'Air	?	D. Falcon	DES	LA	Toul-Rosieres, FRA	?	?	?	?	?	?		No details avail.
80J.8	8	2.03.80	Cubana	NSP	Yak-40	DES	L	Baracoa, CUB	0	1	0	1	?	37		Cause unknown
80J.9	9	2.06.80	Gabon Govt.	EXE	G.1159 GS II	DES	L	N'gaoundere, GAB	2	3	0	5	2	3	5	No details avail.
80J.10	10	2.27.80	China AL (Taiwan)	SP	B707-309C	DES	LA	Manila Int'l Arpt., PHI	0	2	0	2	11	122	133	Undershot RW, cause unknown
80J.11	11	3.03.80	Bass Aviation	EXE	Learjet 25	DES	LA	Port au Prince, HAI	2	1	3	6	3	1	4	Struck mtns., houses 13 mi. N of arpt.
80J.12	12	3.14.80	L.O.T. 007 (Poland)	SP	II-62	DES	LA	Warsaw Okecie Arpt., POL	10	77	0	87	10	77	87	atmptd go-around, in-flt. eng. fail., LOC
80J.13	13	3.17.80	Texas Int'l	SP	DC-9-14	DES	L	Baton Rouge Ryan Arpt., LA, USA	0	0	0	0	4	47	51	Overran short RW
80J.14	14	3.26.80	Air Traffic Exec. Jet AS	EXE	Learjet 36	DES	LA	Sebha, Tripoli, LIB	0	0	0	0	2	1	3	IFR app.
80J.15	15	3.29.80	Monarch Aviation/Inair	F	CV.880-22-2(F)	MJW	TO	PAN City Int'l Arpt., PAN	?	?	?	?	?	?		No details avail.
80J.16	16	4.03.80	Bangladesh Biman	SP	B707-373C	MJW	C	Paya Lebar Int'l Arpt., SIN	0	0	0	0	9	65	74	In-flt. eng. fail., crw err.
80J.17	17	4.03.80	Canadair	T	CL.600	DES	ER	California City, CA, USA	1	0	0	1	3	0	3	Stall tests, loss of cntrl, crw parachuted
80J.18	18	4.11.80	Thunderbird AW	FY	Learjet 25B	DES	ER	Conlon, TX, USA	2	0	0	2	2	0	2	Dove from 41200', cause unknown
80J.19	19	4.12.80	Transbrasil	SP	B727-27C	DES	LA	Florianopolis Arpt., BRA	8	47	0	55	8	50	58	T-storm, struck high gnd.
80J.20	20	4.21.80	Aeroservicios Int'l	G	R. Sabreliner 40	DES	G	Leon Guanajuato, MEX	0	0	0	0	?	?		No details avail.
80J.21	21	4.25.80	Dan-Air 1008	NSP	B727-46	DES	LA	5 mi. SW of Tenerife Arpt., Canary Is., SPN	8	138	0	146	8	138	146	Struck mtns. on impr. app., navigation err.
80J.22	22	5.06.80	Kennedy Flt. Center	T	Learjet 23	DES	LA	Richmond Byrd Int'l Arpt., VA, USA	2	0	0	2	2	0	2	impr. ILS app., crw err., fatigue
80J.23	23	5.10.80	Indian AL	SP	B737-2A8	MAJ	ER	Rampur Hat, IND	0	2	0	2	6	128	134	Severe in-flt. turbulence
80J.24	24	5.11.80	Zaire Int'l Cargo	F	B707-329C	MJW	L	Douala, CAM	0	0	0	0	3	0	3	Skidded on lndg, gear fail.
80J.25	25	5.19.80	NE Jet Co.	FY	Learjet 25D	DES	ER	104 mi. W of Sarasota, FL, USA	2	0	0	2	2	0	2	Clear air turbulence, LOC, crw err., crsh in Gulf of Mexico
80J.26	26	6.08.80	T.A.A.G. (Angola)	SP	Yak-40FG	DES	ER	Matala, Huila Province, ANG	4	25	0	29	4	25	29	"Military Combat"
80J.27	27	6.09.80	Midwest Air Charter	F	SE.210-VIR	MJW	L	Atlanta Int'l Arpt., GA, USA	0	0	0	0	3	1	4	Preceding L1011 wake-vortices
80J.28	28	6.12.80	Aeroflot	SP	Yak-40	DES	ER	Tadzhikistan, USR	?	?	0	?	?	?		struck high gnd.

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
80J.29	29	6.19.80	McDonnell Douglas AC	T	MD-81	MJW	L	Yuma Int'l Arpt., AZ, USA	0	0	0	0	3	0	3	Siml. hydraulic fail., crw err., further damaged, by crane
80J.30	30	6.27.80	Aerolinee Itavia 870	SP	DC-9-15	DES	ER	Tyrrhenian Sea, W of Naples, ITA	4	77	0	81	4	77	81	Accidental air-to-air missile struck by NATO aircraft?
80J.31	31	7.07.80	Aeroflot	SP	Tu-154	DES	C	Alma Ata, Kazakhstan SSR, USSR	?	?	0	163	?	163		No details avail.
80J.32	32	8.01.80	Aeronaves del Peru	F	DC-8-42/43F	DES	LA	Cerro Lilio, MEX City, MEX	3	0	0	3	7	0	7	Fog, struck mtn.
80J.33	33	8.07.80	TAROM (Romania)	SP	Tu-154B-1	DES	LA	Nouadhibou, Mauritania	0	2	0	2	16	152	168	Short app., ditched @ sea
80J.34	34	8.13.80	Spantax	NSP	Learjet 35A	DES	LA	Tetuan, Majorca, Balearic Is., SPN	2	2	0	4	2	2	4	Visual night app., struck mtn.
80J.35	35	8.19.80	Saudia 163	SP	L.1011-200	DES	C	Riyadh, SAR	14	287	0	301	14	287	301	In-flt. cargo bay fire, emer. lndg, crw err., failure to evacuate AC
80J.36	36	9.03.80	Pan American AW	SP	B727-21	MJW	LA	San Jose Int'l Arpt., Costa Rica	0	0	0	0	6	67	73	lnd short of RW, gear fail.
80J.37	37	9.12.80	Aeronaves del Peru	F	DC-8-32/33F	DES	LA	Iquitos, Peru	4	0	0	4	4	0	4	crsh into jungle, cause unknown
80J.38	38	9.23.80	Iraqi AW	F	Il-76T	DES	L	Baghdad, IRQ	?	?	?	?	?	?		Shot down during Iranian air raid
80J.39	39	10.01.80	Penarth Commercial	F	C.500 Citation I	DES	LA	St. Peters Arpt., Jersey Is., UK	1	0	0	1	1	0	1	Missed app., struck house, crw err.
80J.40	40	10.14.80	T.H.Y. (Turkey)	SP	B727-	?	G	Diyarbakir	?	1	?	1	?	?		hij.
80J.41	41	11.03.80	Latin. Aerea de Carga	T	CV.880-22-2(F)	DES	TO	Caracas Int'l Arpt., VEN	4	0	0	4	4	0	4	Eng. fail. on TO
80J.42	42	11.04.80	T.A.A.G. (Angola)	SP	B737-2M2C	DES	LA	Benguela, ANG	0	0	0	0	6	128	134	App. short of RW, gear collapse
80J.43	43	11.19.80	Korean AL	SP	B747-2B5B	DES	LA	Seoul Kimpo Int'l Arpt., RSK	6	9	0	15	14	212	226	Undershot app., gear fail., crw err.
80J.44	44	11.21.80	Continental AL 614	SP	B727-92C	DES	L	Yap Arpt., Yap Island, Carolina Is.	0	0	0	0	6	67	73	Gear fail., crw err.
80J.45	45	11.30.80	Trans World AL	SP	B707-131B	MJW	L	San Francisco Int'l Arpt., CA, USA	0	0	0	0	?	133		Gear fail.
80J.46	46	12.03.80	Mexican Govt.	?	HS.125-400A	DES	L	Nogales, Sonora, MEX	0	0	0	0	?	?		No details avail.
80J.47	47	12.19.80	W.K. McWilliams	EXE	AC.1121	DES	LA	Many, Gretna, LA, USA	2	1	0	3	2	2	4	struck trees on final app.
80J.48	48	12.20.80	Aero.Territ. del Colombia	F	B707-321(F)	DES	LA	Bogota El Dorado Arpt., COL	0	0	0	0	4	0	4	Rain, crw err.
80J.49	49	12.21.80	Aerovias del Cesar (Col.)	SP	SE.210-VIR	DES	C	Rio-Hacha Guajira Arpt., COL	7	63	0	70	7	63	70	In-flt. explosion, bombing?
80J.50	50	12.22.80	Saudia 162	SP	L.1011-200	MAJ	ER	Persian Gulf	0	2	0	2	20	271	291	In-flt. tire explosion
80J.51	51	12.26.80	SARSA	FY	HS.125-400A	DES	C	Cancun Arpt., MEX	3	0	0	3	3	0	3	crsh into trees, fire
81J.1	1	1.08.81	Pakistan Int'l AL	SP	B720-047B	MJW	L	Quetta Arpt., Pakistan	0	0	0	0	7	72	79	Nose gear collapse
81J.2	2	1.15.81	Overseas National AL	G	DC-8-61	DES	G	Findel Arpt., LUX	0	0	0	0	0	0	0	gnd. fire while refurbishing
81J.3	3	1.21.81	Georgia-Pacific Corp.	EXE	C.500 Citation I	DES	L	Bluefield Mercer Co.Arpt., WV, USA	2	3	0	5	2	3	5	Overran wet RW, atmpd go-around
81J.4	4	2.02.81	Pakistan Int'l AL	G	DC-10-30	DES	G	Karachi Arpt., Pakistan	0	0	0	0	0	0	0	Hangar fire
81J.5	5	2.06.81	Eastern AL	SP	A.300B4-2C/10	NON	G	Miami Int'l Arpt., FL, USA	0	0	1	1	9	40	49	gnd. indr'l. acc. while embarking pax
81J.6	6	2.07.81	Aeroflot	NSP	Tu-134	DES	TO	Leningrad, USSR	?	?	?	70	?	?		No details avail.
81J.7	7	2.11.81	Texas Gulf Aviation	EXE	L.1329-731	DES	LA	Westchester Co. Arpt., NY, USA	2	6	0	8	2	6	8	In-flt. elec. sys. fail, ILS app.



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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
81J.8	8	2.11.81	Argentina Air Force	?	FMA.760	DES	?	San Rafael, Mendoza, ARG	?	?	0	2	?	?	No details avail.	
81J.9	9	2.17.81	Air California 336	SP	B737-293	MJW	L	Orange Co. Int'l Arpt., CA, USA	0	0	0	0	5	95	100	Gear-up Indg, crw err.
81J.10	10	2.00.81	?	?	R. Sabreliner 40	DES	?	MEX City, MEX	?	?	?	?	?	?	No details avail.	
81J.11	11	3.11.81	Ghana AW	T	F.28-2000	MJW	L	Accra Int'l Arpt., Ghana	0	0	0	0	2	0	2	hvy Indg
81J.12	12	3.28.81	Garuda (Indonesia)	SP	DC-9-32	MAJ	G	Bangkok Int'l Arpt., THL	1	5	0	6	9	44	53	In-flt. hij., res. op.
81J.13	13	3.29.81	Sobelair	NSP	B707-329	MJW	C	Brussels Nat'l Arpt., BEL	0	0	0	0	9	109	118	Eng. fail., hydraulic fail., emer. Indg
81J.14	14	3.29.81	Alco Aviation	EXE	L.1329 Jetstar 6	DES	L	Luton Arpt., Bedfordshire, UK	0	0	0	0	2	7	9	Overran RW, crw err., fire
81J.15	15	4.07.81	?	FY	Learjet 23	MIN	C	Cincinnati, OH, USA	1	0	0	1	2	0	2	Birdstrike, emer. Indg
81J.16	16	5.02.81	SARSA	NSP	HS.125-700A	DES	LA	Monterrey Norte Arpt., MEX	2	2	0	4	2	2	4	instr. app., bad weather, instr. fail.
81J.17	17	5.07.81	Austral L.A.	SP	BAC 1-11	DES	LA	River Plate Estuary, ARG	5	26	0	31	5	26	31	T-storm, wind shear?
81J.18	18	5.20.81	Pan American AW	SP	DC-10-10	NON	G	Miami Int'l Arpt., FL, USA	0	0	1	1	10	77	87	gnd. industrial accident
81J.19	19	5.31.81	Presidence du Conseil	EXE	D. Falcon 20C	DES	L	Bamako Arpt., Mali	1?	2?	0	3	2?	4?	No details avail.	
81J.20	20	6.05.81	Uni Air Int'l	?	Learjet 23	DES	?	Paris Le Bourget Arpt., FRA	0	0	0	0	2	2	4	No details avail.
81J.21	21	6.11.81	VARIG (Brazil)	F	B707-341C	MJW	L	Eduardo Gomes Arpt., Manaus, BRA	?	?	?	?	?	?	No details avail.	
81J.22	22	7.27.81	Aeromexico	SP	DC-9-32	DES	L	Chihuahua Villalobos Arpt., MEX	2	48	0	50	6	60	66	T-storm, turbulence
81J.23	23	8.05.81	S.A.S.	SP	DC-8-63	NON	G	Annan	0	0	1	1	11	171	182	gnd. industrial accident
81J.24	24	8.22.81	Far Eastern AT 103	SP	B737-222	DES	C	Miao-li, 100 mi. SSW of Taipei, TWN	6	104	0	110	6	104	110	In-flt. struc. fail., flt. to Kao-hsiung
81J.25	25	8.31.81	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?	gnd. bombing	
81J.26	26	9.07.81	American AL	SP	DC-10-10	NON	G	Salt Lake City Int'l Arpt., UT, USA	0	1	0	1	13	263	276	Passenger fell from airstair
81J.27	27	9.15.81	Korean AL	SP	B747-230B	MAJ	TO	Manila Int'l Arpt., PHI	0	1	0	1	26	352	378	Eng. fire, RTO, overran RW
81J.28	28	9.20.81	World AW 32	SP	DC-10-30CF	NON	E R	ER Baltimore, MD-London, UK	1	0	0	1	14	332	346	In-flt. industrial accident
81J.29	29	10.01.81	Sky Train Aviation	EXE	Learjet 24	DES	E R	2.5 mi. SW of Felt, OK, USA	2	1	0	3	2	1	3	LOC, clear air turbulence
81J.30	30	10.06.81	NLM (Netherlands)	SP	F.28-4000	DES	E R	Moerdijk, NTL	4	13	0	17	4	13	17	Turbulence, in-flt. struc. fail.
81J.31	31	10.21.81	MALÉV (Hungary)	SP	Tu-154B	MJW	LA	Prague Ruzyne Arpt., CZK	0	0	0	0	?	81	Rain, hard Indg short of RW	
81J.32	32	10.22.81	Middle East AL	F	B707-331C	MJW	L	Tokyo Narita Int'l Arpt., JPN	0	0	0	0	3	0	3	Eng. fail., ret. to field, ran off RW
81J.33	33	11.09.81	Aeromexico	SP	DC-9-32	DES	C	65 kms. E of Zihuatanejo, MEX	6	12	0	18	6	12	18	depress., emer. descent, struck mtn.
81J.34	34	11.13.81	Gates Learjet AC Corp.	T	Learjet 55	DES	C	Waterkloof, Transvall, South Africa	2	0	0	2	2	0	2	Low level aerobatics
81J.35	35	11.16.81	TAB/Air Benin	?	SN.601-100	DES	LA	Lagos, NIG	2	2	0	4	2	2	4	No details avail.
81J.36	36	12.01.81	Inex Adria (Yugoslavia)	NSP	MD-81	DES	LA	Ajaccio, Corsica, FRA	7	173	0	180	7	173	180	struck Mt. San Pietro, clouds, turbulence, crw err.
81J.37	37	12.10.81	Servicios Ejecutivos	NSP	HS.125	DES	LA	Laredo, TX, USA	0	0	0	0	2	8	10	Ind short of RW, crw err., alcohol
81J.38	38	12.12.81	Hispaniola AW	Fy	B707-124	MJW	L	Miami Int'l Arpt., FL, USA	0	0	0	0	5	0	5	Gear fail., collapse, fatigue

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82J.1	1	1.11.82	Redec Aviation	F	Learjet 25XR	DES	ER	70 nmi NNE of Narssarsuaq, Greenland	2	0	0	2	2	0	2	Descending from cruise, cause unknown	
82J.2	2	1.13.82	Air Florida 90	SP	B737-222	DES	C	Washington Nat. Arpt., VA, USA	4	70	4	78	5	74	79	hvy snow, icing, eng. fail., crw err.	
82J.3	3	1.19.82	Alyemda (P.D.R. Yemen)	F	B707-348C	MJW	LA	Damascus, Syria	?	?	?	?	?	?	?	Gunfire	
82J.4	4	1.23.82	World AW 30H	SP	DC-10-30CF	DES	L	Boston Logan Int'l Arpt., MA, USA	0	2	0	2	12	200	212	Overran icy RW	
82J.5	5	1.23.82	Aeroflot	SP	Tu-154	DES	TO	Krasnoyarsk Arpt., RFSSR, USSR	?	?	0	110	?	?	?	Eng. fail., fatigue fail. of compressor disc	
82J.6	6	2.09.82	Japan AL	SP	DC-8-61	DES	LA	Tokyo Haneda Int'l Arpt., JPN	0	24	0	24	8	166	174	Short app., water lndg, crw err.	
82J.7	7	3.08.82	Trans World AL	?	B707-131B	MJW	?	Las Vegas Int'l Arpt., NV, USA	0	0	0	0	0	0	0	No details avail.	
82J.8	8	3.17.82	Air France	SP	A.300B4-203	DES	TO	Sanaa El-Rahaba Int'l Arpt., YEM	0	0	0	0	13	111	124	Eng. fail., RTO, fire	
82J.9	9	3.20.82	Garuda (Indonesia)	SP	F.28-1000	DES	L	Branti Arpt., Sumatra, Indonesia	4	23	0	27	4	23	27	Overran wet RW, fire	
82J.10	10	4.26.82	C.A.A.C. 3303 (China)	SP	HS.121-2E	DES	LA	Yangshuo, Guilin, Guangxi, ROC	8	104	0	112	8	104	112	Struck Mt. Yangsu 30 mi. SE of Kweilin, rain	
82J.11	11	5.03.82	Presidence du Conseil	EXE	G.1159 GS II	DES	ER	Qotur, IRN	4	10	0	14	4	10	14	Shot down by fighter launched missile	
82J.12	12	5.06.82	Ibex Corp.	EXE	Learjet 23	DES	ER	Atlantic Ocean near Savannah, GA	2	2	0	4	2	2	4	LOC, cause unknown	
82J.13	13	5.16.82	T.A.M. (Brazil)	NSP	Learjet 25B	DES	L	Uberaba, BRA	0	0	0	0	2	8	10	No details avail.	
82J.14	14	5.19.82	Hurler Flugdienst	EXE	C.551 Citation	DES	LA	Kassel, FRG	2	6	0	8	2	6	8	struck high gnd., impr. app., crw err.	
82J.15	15	5.23.82	?	G	Learjet 23	DES	G	?	?	?	?	?	?	?	?	gnd. fire	
82J.16	16	5.24.82	V.A.S.P. (Brazil)	SP	B737-2A1	DES	L	Brasilia Int'l Arpt., BRA	0	2	0	2	7	112	119	T-storm, hard lndg, struc. fail.	
82J.17	17	5.29.82	?	?	MS.760	DES	?	Villacoublay, FRA	?	?	?	?	?	?	?	No details avail.	
82J.18	18	6.02.82	Air Canada	G	DC-9-32	DES	G	Montreal Dorval Arpt., Quebec, CAN	0	0	0	0	0	0	0	0	Hangar fire
82J.19	19	6.07.82	?	?	Learjet 35A	DES	?	Falkland Is.	?	?	?	?	?	?	?	No details avail.	
82J.20	20	6.08.82	V.A.S.P. 168 (Brazil)	SP	B727-212 Adv.	DES	LA	15 mi. SW of Fortaleza, BRA	9	128	0	137	9	128	137	Struck 2000' Serra da Pacatuba mtns., crw err.	
82J.21	21	6.12.82	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.21	22	6.16.82	Middle East AL	G	B707-3B4C	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.21	23	6.16.82	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.21	24	6.16.82	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.21	25	6.16.82	Middle East AL	G	B720-047B	MJW	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.22	26	6.22.82	Air India	SP	B707-437	MJW	L	Bombay Santa Cruz Arpt., IND	2	17	0	19	12	99	111	Overran wet RW, crw err.	
82J.23	27	7.06.82	Aeroflot 411	SP	Il-62	DES	C	Moscow Sheremet'yevoy Arpt, USSR	8	82	0	90	8	82	90	In-flt. eng. fail., crsh 5 mi. W of arpt.	
82J.24	28	7.09.82	Pan American AW 759	SP	B727-235	DES	C	New Orleans Int'l Arpt., LA, USA	7	138	8	153	7	138	145	Rainstorm, wind shear, LOC, struck trees	
82J.25	29	7.00.82	Nevis Industries	G	IAI.1121	DES	G	?	0	0	0	0	0	0	0	0	No details avail.
82J.26	30	8.01.82	Middle East AL	G	B720-047B	MJW	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0	Israeli assault on West Beirut

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82J.27	31	8.11.82	Pan American AW	SP	B747-121	MIN	ER	ER Tokyo, JPN-Honolulu, HI	0	1	0	1	?	?		In-flt. bombing
82J.28	32	8.16.82	China AW	SP	B747-	NON	ER	Near Hong Kong	0	2	0	2	12	273	285	Severe turbulence
82J.29	33	8.16.82	Trans Mediterranean AW	G	B707-323C	MJW	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.30	34	8.26.82	Nansei AL	SP	B737-2Q3 Adv.	DES	L	Ishigaki Arpt., JPN	0	0	0	0	5	133	138	Overran RW, brake fail., crw err.
82J.31	35	9.03.82	T.A.M. (Brazil)	NSP	Learjet 25B	DES	LA	Rio Branco, BRA	2	8	0	10	2	8	10	3rd app., bad weather, fuel exhaustion
82J.32	36	9.10.82	Sudan AW	FY	B707-348C	DES	LA	5 kms. S of Khartoum Arpt., Sudan	0	0	0	0	11	0	11	T-storm, ditched in Nile river
82J.33	37	9.13.82	Spantax (Spain)	NSP	DC-10-30CF	DES	TO	Malaga Arpt., SPN	3	48	0	51	13	380	393	Tire fail., RTO, overran RW, struck vehicles, fire
82J.34	38	9.17.82	Japan AL 792	SP	DC-8-61	MJW	C	Shanghai Hongqiao Arpt., ROC	0	0	0	0	11	113	124	In-flt. hydraulic fail., overran RW
82J.35	39	9.29.82	Aeroflot	SP	Il-62M	DES	L	Findel Arpt., LUX	0	7	0	7	11	66	77	Brake fail., asymmetric reverse thrust
82J.36	40	10.17.82	Egyptair	SP	B707-366C	DES	LA	Geneva, SWI	0	0	0	0	10	172	182	impr. app., crw err.
82J.37	41	11.06.82	Duncan Aviation	G	Learjet 24D	DES	G	Elizabeth City, NC, USA	0	0	0	0	0	0	0	No details avail.
82J.38	42	11.11.82	Arrow AW	F	B707-338C	NON	C	Miami, FL, USA	1	0	0	1	3	0	3	In-flt. depress.
82J.39	43	11.12.82	Cessna AC Co.	?	C.501 Citation I	DES	L	Wichita Mid-Cont. Arpt., KS, USA	0	0	0	0	1	0	1	unauth. flight
82J.40	44	11.18.82	Coin Acceptors Inc.	EXE	C.551 Citation	DES	C	Mountain View Arpt., MO, USA	1	2	0	3	1	2	3	LOC, crw err.
82J.41	45	12.04.82	Global Int'l	NSP	B707-323B	MJW	TO	Brasilia Int'l Arpt., BRA	0	0	0	0	8	49	57	Struck ILS aials, emer. Indg
82J.42	46	12.06.82	Transair S.A.	NSP	Learjet 35A	DES	TO	Paris Le Bourget Arpt., FRA	0	0	0	0	2	2	4	RTO, birdstrikes, overran RW
83J.1	1	1.03.83	A.E. Staley Manuf. Co.	Fy	CL.600	DES	LA	Hailey, Sun Valley, ID, USA	2	0	0	2	2	0	2	Missed app., struck mtn., crw err.
83J.2	2	1.07.83	Iran Air	T	B727-86	DES	Taxi	Tehran Mehrabad Arpt., IRN	0	0	0	0	?	0		Ran off RW, flt. mechanic crw
83J.3	3	1.11.83	United AL 2885	F	DC-8-54F	DES	C	Detroit Metro. Arpt., MI, USA	3	0	0	3	3	0	3	LOC, crw err.
83J.4	4	1.11.83	Sun Oil Co.	EXE	R. Sabreliner 65	DES	LA	Toronto Int'l Arpt., CAN	2	3	0	5	2	3	5	In-flt. eng. fail., icing, LOC
83J.5	5	1.16.83	T.H.Y. (Turkey)	SP	B727-2F2 Adv.	MJW	LA	Ankara Esenboga Arpt., TUR	0	47	0	47	7	60	67	Snow, windshear, undershot RW
83J.6	6	1.16.83	Libyan Arab AL	?	L.2329 Jetstar II	DES	ER	ER Tripoli-Algiers	2	0	0	2	2	0	2	Missing AC
83J.7	7	2.06.83	Weatherford Int'l	EXE	C.550 Citation	DES	TO	Houston Hobby Arpt., TX, USA	0	0	0	0	2	3	5	GTC failure
83J.7	8	2.06.83	Weatherford Int'l	EXE	C.550 Citation	MAJ	Taxi	Houston Hobby Arpt., TX, USA	0	0	0	0	2	1	3	GTC failure
83J.8	9	2.13.83	Upali USA Inc.	EXE	Learjet 35A	DES	C	Strait of Malacca	2	4	0	6	2	4	6	Cause unknown
83J.9	10	2.22.83	V.A.S.P. (Brazil)	F	B737-2A1C	MJW	C	Manaus Gomes Arpt., BRA	2	0	0	2	2	0	2	LOC, crw err.
83J.10	11	2.27.83	C.A.A.C. (China)	SP	HS.121-2E	MJW	L	Fuzhou Arpt., ROC	0	0	0	0	?	96		Overran RW, gear collapse
83J.11	12	3.11.83	Avensa (Venezuela)	SP	DC-9-32	DES	L	Barquisimeto Arpt., VEN	1	22	0	23	5	45	50	ILS app., fog, hard Indg, gear fail.
83J.12	13	3.14.83	Jamahiriya AT (Libya)	FY	B707-338C	DES	C	30 km N of Sebha, LIB	5	0	0	5	5	0	5	3-eng TO, in-flt. explosion
83J.13	14	3.28.83	L.A.M. (Mozambique)	SP	B737-2B1	MJW	LA	Quelimane, Mozambique	0	0	0	0	6	104	110	Ind short of RW, crw err.
83J.14	15	3.30.83	Central AL 27	F	Learjet 25XR	DES	LA	Newark Int'l Arpt., NJ, USA	2	0	0	2	2	0	2	crw err.
83J.15	16	3.31.83	Winn Exploration	EXE	C.500 Citation I	DES	LA	Eagle Pass, TX, USA	2	2	0	4	2	2	4	Cause unknown, smoke, haze, dust

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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC FLT Dmg PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
								Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
83J.16	17	4.14.83	Flight Int'l	?	Learjet 24D	DES L	Puerto Vallarto, MEX	0	0	0	0	2	2	4	No details avail.
83J.17	18	4.26.83	Cessna AC Co.	T	C.500 Citation I	DES TO	Wichita Mid-Cont. Arpt., KS, USA	0	0	0	0	2	3	5	No details avail.
83J.18	19	4.29.83	S.A.N. (Ecuador)	SP	SE.210-VIR	DES C	Guayaquil Bolivar Arpt., ECU	1	7	0	8	?	94		Eng. fail., ret. to field, hard lndg
83J.19	20	5.11.83	Groth AS	G	CV.880-22-2	DES G	MEX City Int'l Arpt., MEX	?	?	?	?	?	?		No details avail.
83J.20	21	5.18.83	Air Traffic	T	Learjet 25B	DES E R	200 mi. S of Iceland, N. Atlantic	3	0	0	3	3	0	3	Missing AC, navigation err.?
83J.21	22	6.02.83	Garuda (Indonesia)	SP	F.28-3000RC	MAJ TO	Branti Arpt., Sumatra, Indonesia	2	1	0	3	4	57	61	Eng. fail., RTO, crw err.
83J.22	23	6.02.83	Air Canada 797	SP	DC-9-32	DES E R	Cincinnati Int'l Arpt., KY, USA	0	23	0	23	5	41	46	In-flt. cabin fire
83J.23	24	6.29.83	Erasmus Inc.	T	HS.125-1A/522	DES TO	Houston Hobby Arpt., TX, USA	0	0	0	0	2	0	2	Siml. eng. fail., struck waiting AC
83J.23	25	6.29.83	?	PVT	Gulfstream	? Taxi	Houston Hobby Arpt., TX, USA	2	0	0	2	2	0	2	Waiting AC
83J.24	26	6.00.83	Middle East AL	G	B720-023B	MJW G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?		Artillery shelling
83J.25	27	7.01.83	C.A.A.K. (North Korea)	NSP	Il-62M	DES E R	Labe, Guinea West Africa	?	?	?	23	?	23		crsh in mtns.
83J.26	28	7.01.83	Altair Linee Aeree	NSP	SE.210-III	MJW TO	Milan Malpensa Arpt., ITA	0	0	0	0	7	82	89	RTO, eng. fail.
83J.27	29	7.11.83	T.A.M.E./Ecuador A.F.	SP	B737-2V2 Adv.	DES LA	Cuenca Bashum, ECU	8	111	0	119	8	111	119	struck high gnd. 1 mi. short of RW, crw err.
83J.28	30	7.12.83	U.S. Air Force 375 MAW	?	C-9A	MJR L	Louisville, KY, USA	0	0	0	0	?	?		Overran RW
83J.29	31	7.22.83	Imani & Sons	F	Learjet 25D	DES L	Lagos, NIG	0	0	0	0	3	0	3	No details avail.
83J.30	32	8.04.83	Pan American AW	SP	B747-121	MJW L	Karachi Int'l Arpt., Pakistan	0	0	0	0	16	227	243	Overran wet RW, LOC
83J.31	33	8.30.83	Aeroflot	SP	Tu-134	DES LA	Alma Ata, Kazakhstan SSR, USSR	?	?	?	?	?	?		No details avail.
83J.32	34	9.01.83	Korean AL 007	SP	B747-230B	DES E R	Sea of JPN 50 mi. SW of Sakhalin Is.	29	240	0	269	29	240	269	Soviet Air Force shootdown
83J.33	35	9.14.83	C.A.A.C. (China)	SP	HS.121-2E	MJW Taxi	Giulin Arpt., ROC	0	11	0	11	6	100	106	GTC failure
83J.33	36	9.14.83	Chinese Air Force	Mil.	Il-28 Beagle	L	Giulin Arpt., ROC	?	?	0	?	?	?		GTC failure
83J.34	37	9.23.83	Gulf Air 771	SP	B737-2P6 Adv.	DES LA	Mino Jobel Ali, 30 mi. NE of Abu Dhabi	6	105	0	111	6	105	111	In-flt. bombing, cargo hold fire
83J.35	38	9.25.83	R&N Cargo of Nigeria	F	B707-336C	DES Taxi	Kotoka Arpt., Accra, Ghana	0	0	0	0	4	0	4	AC fire, sabotage?
83J.36	39	10.05.83	SAM Colombia	SP	B727-21	DES L	Sesquicentenario Arpt., COL	?	?	0	?	?	?		Gear-up lndg
83J.37	40	10.14.83	Coastal AW	G	B707-436	DES G	Rivesaltes Arpt., Perpignan, FRA	0	0	0	0	?	?		gnd. fire, arson
83J.38	41	11.08.83	T.A.A.G. (Angola)	SP	B737-2M2 Adv.	DES C	Lubango Arpt., ANG	4	126	0	130	4	126	130	gnd. missile shootdown?
83J.39	42	11.27.83	Avianca 11 (Colombia)	SP	B747-283B	DES LA	Mejorado Del Campo, Madrid, SPN	19	162	0	181	19	173	192	crsh 7.5 mi. SE of arpt., navigation err.
83J.40	43	11.28.83	Nigeria AW	SP	F.28-2000	DES LA	Enugu Arpt., NIG	2	51	0	53	6	66	72	Poor visibility, short app., fire
83J.41	44	12.07.83	Iberia 350 (Spain)	SP	B727-256 Adv.	DES TO	Madrid Barajas Arpt., SPN	1	50	0	51	9	84	93	GTC failure
83J.41	45	12.07.83	Aviaco 134 (Spain)	SP	DC-9-32	DES Taxi	Madrid Barajas Arpt., SPN	5	37	0	42	5	37	42	GTC fail., crw err.
83J.42	46	12.08.83	Brencham Ltd.	EXE	C.500 Citation I	DES L	Stornoway, Lewis, Scotland, UK	2	8	0	10	2	8	10	No details avail.
83J.43	47	12.14.83	TAMPA Colombia	F	B707-373C	DES C	Medellin Las Playas Arpt., COL	3	0	22	25	3	0	3	Engine fail., crw err.
83J.44	48	12.18.83	Malaysian AL System	SP	A.300B4-120	DES LA	Kuala Lumpur Int'l Arpt., Malaysia	0	0	0	0	14	233	247	T-storm, ILS fail., crw err., fire

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
83J.45	49	12.20.83	Ozark AL	SP	DC-9-31	MAJ	L	Sioux Falls Field, SD, USA	0	0	1	1	4	27	31	coll. with snowplow on RW
83J.46	50	12.23.83	Korean AL 84	F	DC-10-30CF	DES	TO	Anchorage Int'l Arpt., AK, USA	0	0	0	0	3	0	3	GTC fail., crw err.
83J.46	51	12.23.83	Southcentral Air 59	SP	Piper	DES	Taxi	Anchorage Int'l Arpt., AK, USA	0	0	0	0	1	8	9	GTC failure
84J.1	1	1.10.84	Balkan Bulgarian	SP	Tu-134A	DES	LA	4 kms. from Sofia Arpt., BUL	5	45	0	50	5	45	50	Snow, overshoot RW
84J.2	2	1.20.84	Bolivia Air Force	?	R. Sabreliner 60	DES	?	Brownsville, TX, USA	?	?	?	?	?	?	?	Emer. Indg
84J.3	3	1.30.84	Aviation Business Flts.	T	Learjet 24A	DES	L	Santa Catalina Arpt., CA, USA	2	4	0	6	2	4	6	Overran RW down 90' bluff, fire
84J.4	4	1.31.84	Aerolineas Argentinas	SP	B727-287	NON	Taxi	Rio Grande, ARG	0	0	1	1	7	121	128	Bldg. collapse caused by jet exhaust
84J.5	5	2.09.84	T.A.A.G. (Angola)	SP	B737-2M2 Adv.	DES	TO	Huambo-Albano Machado, ANG	0	0	0	0	6	136	142	gnd. bombing, emer. Indg
84J.6	6	2.20.84	Flight Safety Australia	F	C.500 Citation I	DES	LA	Prosperine, Queensland, AUS	2	0	0	2	2	0	2	crsh 5 kms short of RW, cause unknown
84J.7	7	3.05.84	Air Zaire	SP	B737-298C	MAJ	L	N'Djili Arpt., Kinshasa, ZAI	0	0	0	0	?	?	?	Gear-up Indg, ran off RW
84J.8	8	3.10.84	U.T.A. 772 (France)	SP	DC-8-63PF	DES	G	N'Djamena, Chad	0	0	0	0	5	18	23	gnd. bombing
84J.9	9	3.22.84	Pacific Western	SP	B737-275 Adv.	DES	TO	Calgary Mncpl. Arpt., Alberta, CAN	0	0	0	0	5	114	119	Engine fail., RTO, fire
84J.10	10	3.28.84	Lider Taxi Aereo	NSP	Learjet 24D	DES	L	Florianopolis, BRA	2	2	0	4	2	2	4	No details avail.
84J.11	11	5.15.84	Argentine Government	EXE	Learjet 35A	DES	LA	Ushuaia, Tierra del Fuego, ARG	2	10	0	12	2	10	12	crsh into water, crw err.
84J.12	12	6.01.84	State of Baja Govt.	G	HFB-320	DES	G	San Diego Lindbergh Field, CA, USA	0	0	0	0	0	0	0	gnd. fire, arson?
84J.13	13	6.04.84	Air Continental 4	F	Learjet 23	DES	LA	Windsor Locks Int'l Arpt., CT, USA	2	1	0	3	2	1	3	LOC, cause unknown
84J.14	14	6.11.84	Garuda (Indonesia)	F	DC-9-32	MJW	L	Jakarta Kemayoran Arpt., Indonesia	0	0	0	0	2	3	5	Hard Indg, fuselage struc. fail.
84J.15	15	7.20.84	?	EXE	R. Sabreliner	DES	LA	Wilson Arpt., KEN	0	0	0	0	1	5	6	crsh short of RW, crw err.
84J.16	16	7.28.84	?	?	Learjet 25B	DES	?	Waterville, ME, USA	?	?	?	?	?	?	?	No details avail.
84J.17	17	7.00.84	Wolf Aviation	?	B707-458	MJW	L	Kinshasa	?	?	?	?	?	?	?	No details avail.
84J.18	18	8.04.84	Philippine AL	SP	BAC 1-11	MAJ	L	Tacloban Ronualdez Arpt., PHI	0	0	0	0	5	75	80	Overran RW
84J.19	19	8.30.84	Air Cameroon	SP	B737-2H7C	MJW	G	Douala Arpt., CAM	0	2	0	2	7	109	116	Engine fail., fuel rupture, fire
84J.20	20	9.18.84	A.E.C.A. 767-103	F	DC-8-55F	DES	C	Quito Mariscal Sucre Arpt., ECU	4	0	49	53	4	0	4	Eng. fail., crw err.
84J.21	21	9.18.84	L.A.C. Colombia	F	DC-8-54F	MJW	L	Barranquilla Arpt., COL	0	0	0	0	3	2	5	crw err., ran off RW
84J.22	22	9.19.84	Aeroflot	NSP	Il-62	DES	C	Qazi Ahmed, Pakistan	9	15	0	24	9	15	24	T-storm, in-flt. struc. fail.
84J.23	23	9.26.84	Air Niagara	T	C.500 Citation I	DES	C?	Orillia, Ontario, CAN	2	0	0	2	2	0	2	Low pass, LOC, cause unknown
84J.24	24	10.04.84	McCullum Aviation	EXE	HFB-320	DES	TO	Aberdeen Arpt., SD, USA	2	1	0	3	2	1	3	TO on wrong RW, crw err.
84J.25	25	10.05.84	Grondmet Handels	?	C.500 Citation I	DES	C	Skiathos, GRE	0	0	0	0	2	8	10	crsh @ sea
84J.26	26	10.08.84	Clay Lacy Aviation	EXE	Learjet 24B	DES	C	San Francisco Int'l Arpt., CA, USA	2	1	0	3	2	1	3	Autopilot fail.? LOC
84J.27	27	10.15.84	Aeroflot	SP	Tu-154	DES	L	Omsk Arpt., RFSSR, USSR	?	?	?	150	?	150	?	coll. with fuel truck on RW
84J.28	28	11.10.84	Combs Gate/Lisle AC	EXE	Learjet 24E	DES	LA	St. Thomas Field, Virgin Islands	1	1	0	2	2	2	4	3rd app., crsh 2 mi. short of RW
84J.29	29	12.20.84	Jet East Inc.	T	Learjet 35	DES	TO	Waco Arpt., TX, USA	1	0	0	1	3	0	3	Siml. 1-eng. TO, LOC
84J.30	30	12.30.84	Garuda (Indonesia)	SP	DC-9-32	DES	L	Dempasar Arpt., Bali, Indonesia	0	0	0	0	6	69	75	Fast, high app., ran off RW

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot	
85J.1	1	1.01.85	Eastern AL	SP	B727-225 Adv.	DES	LA	Mt. Illimani near La Paz, BOL	8	21	0	29	8	21	29	Navigation err., struck mtn @ 19600'	
85J.2	2	1.23.85	Lloyd Aereo Boliviano	SP	B727-2K3 Adv.	MAJ	LA	Santa Cruz, BOL	0	1	0	1	7	120	127	In-flt. bombing, pax suicide	
85J.3	3	2.01.85	Aeroflot	SP	Tu-134	DES	C	Minsk Arpt., Belorussia, USSR	?	?	0	80	?	?		No details avail.	
85J.4	4	2.06.85	Airborne Express	F	DC-9-15	MJW	C	Philadelphia Int'l Airport, PA	0	0	0	0	?	0		Icing, stall after lift-off	
85J.5	5	2.07.85	TAG Int'l	EXE	CL.601	DES	LA	Paris Le Bourget Arpt., FRA	0	0	0	0	3	9	12	Missed app., struck short of RW, gear fail.	
85J.6	6	2.19.85	Iberia 610 (Spain)	SP	B727-256 Adv.	DES	LA	Monte Oiz, Sondica, Bilbao, SPN	7	141	0	148	7	141	148	Struck high gnd., antenna, 20 mi. SE of arpt., crw err.	
85J.7	7	2.23.85	Middle East AL	SP	B707-	MIN	G	Beirut, LEB	0	1	0	1	?	103		hij., pax disembarked	
85J.8	8	3.07.85	?	?	Learjet 25D	DES	?	?	?	?	?	?	?	?		No details avail.	
85J.9	9	3.16.85	U.T.A. (France)	G	B747-3B3	MJW	G	Paris Charles de Gaulle Arpt., FRA	0	0	0	0	0	0	0	0	gnd. fire
85J.10	10	3.28.85	SATENA (Colombia)	NSP	F.28-3000	DES	LA	Florencia, COL	6	40	0	46	6	40	46	Clouds, struck mountain	
85J.11	11	4.11.85	YPF (Argentina)	NSP	HS.125-700B	DES	LA	Salta, Uruguay	2	5	0	7	2	5	7	Struck mtn. on missed app.	
85J.12	12	4.15.85	Thai AW	NSP	B737-2P5 Adv.	DES	LA	Phuket Arpt., Phang-Nga, THL	7	4	0	11	7	4	11	Emer. lndg. instr. fail., struck high gnd.	
85J.13	13	4.20.85	U.S. Air Force 1402 MAS	?	CT-39A	DES	?	Wilkes-Barre, Scranton, PA, USA	?	?	?	?	?	?		No details avail.	
85J.14	14	5.03.85	Aeroflot	SP	Tu-134	DES	LA	Snilow Airport, Lvov, Ukraine, USSR	?	?	0	70	?	?		ATC failure	
85J.14	15	5.03.85	Soviet Military Flight	Mil.	An-2	DES	LA	Snilow Airport, Lvov, Ukraine, USSR	?	?	0	8	?	?		ATC failure	
85J.15	16	5.12.85	Getty Refining & Market.	EXE	D. Falcon 50	DES	LA	Lake Geneva, WI, USA	0	0	0	0	2	4	6	lnd short of RW, gear fail., fire	
85J.16	17	5.21.85	Target Development	FY	C.501 Citation I	DES	LA	Harrison Boone Co. Arpt., AR, USA	2	0	0	2	2	0	2	2nd app., crsh 3.5 nmi. WSW of arpt.	
85J.17	18	6.10.85	Euralair Int'l	F	Learjet 24B	DES	ER	Provins, FRA	2	0	0	2	2	0	2	ER Marseilles-Paris, cause unknown	
85J.18	19	6.11.85	Sultan Industries	?	IAI.1121	DES	L	Van Nuys Arpt.? CA, USA	0	0	0	0	2	1	3	No details avail.	
85J.19	20	6.12.85	Alia (Jordan)	SP	B727-2D3	DES	G	Beirut Int'l Airport, LEB	?	?	?	?	?	?		hij.	
85J.20	21	6.13.85	Trans. Aeriens du Benin	F	B707-336B	DES	TO	Sebah, LIB	0	0	0	0	?	0		RTO, overran RW	
85J.21	22	6.14.85	Trans World AL 847	SP	B727-231	?	?	?	?	?	?	?	?	?		hij.	
85J.22	23	6.23.85	Air India 182	SP	B747-237B	DES	ER	Atlantic Ocean, 110 mi. E of Cork, IRE	22	307	0	329	22	307	329	In-flt. bombing	
85J.23	24	7.10.85	Aeroflot	SP	Tu-154B-2	DES	ER	Uch Kuduk, Uzbek SSR, USSR	9	191	0	200	9	191	200	crsh 200 mi. NNW of Karshi, went into flat spin	
85J.24	25	7.11.85	Hardee's Food Systems	EXE	HS.125-F400A	DES	L	Sparta-White Co. Arpt., TN, USA	0	0	0	0	2	3	5	No details avail.	
85J.25	26	7.17.85	N.A.S.A. (U.S.A.)	T	CV.990-30A-5	DES	TO	March AFB, CA	0	0	0	0	?	19		Tire fail. on TO, fuel tank puncture	
85J.26	27	8.02.85	Delta AL 191	SP	L.1011-385-1	DES	LA	Dallas/Ft. Worth Arpt., TX, USA	8	126	1	135	11	152	163	T-storm, wind shear, struck water tanks	
85J.27	28	8.12.85	Japan AL123	SP	B747SR-46	DES	C	Mt. Ogura, Gunma Pref., JPN	15	505	0	520	15	509	524	Aft cabin bulkhead structural fail., hydraulic fail., LOC, struck high gnd.	
85J.28	29	8.15.85	Alyemda (P.D.R. Yemen)	SP	B707-336C	MIN	ER	ER Aden-Abu Dhabi	1	2	0	3	8	65	73	Turbulence, control fail.	
85J.29	30	8.20.85	ERA Jet Alaska	F	Learjet 24DXR	DES	LA	Gulkana, AK, USA	2	1	0	3	2	1	3	Cause unknown	

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
85J.30	31	8.21.85	Middle East AL	G	B720-047B	MJW	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?	Hostile action	
85J.30	32	8.21.85	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?	Shelling	
85J.31	33	8.22.85	British Airtours 328	NSP	B737-236 Adv.	DES	TO	Manchester Ringway Int'l Arpt., UK	2	53	0	55	6	131	137	Eng. fail. on TO run, RTO, fire
85J.32	34	8.27.85	A. Searle	EXE	Learjet 35A	DES	L	Cape Town Int'l Arpt., SAF	0	0	0	0	2	5	7	No details avail.
85J.33	35	9.06.85	Midwest Express 105	SP	DC-9-14	DES	C	Milwaukee Mitchell Field, WI, USA	4	27	0	31	4	27	31	Eng. fail., LOC
85J.34	36	9.22.85	Louisiana Pacific	EXE	Learjet 35A	DES	LA	Auburn Pitts Arpt., AL, USA	1	0	1	2	2	4	6	In-flt. coll. w/ ultralight AC
85J.35	37	10.10.85	Pel-Air Aviation	F	IAI.1124	DES	C	Sydney, AUS	2	0	0	2	2	0	2	instr. fail., crw err., LOC
85J.36	38	10.22.85	ERA Jet Alaska	Amb.	Learjet 24DXR	DES	LA	243 nmi. WSE of Juneau, AK, USA	2	2	0	4	2	2	4	Struck high gnd., premature descent
85J.37	39	11.10.85	Nabisco Inc.	Fy	D. Falcon 50	DES	LA	Cliffside Park, NJ, USA	2	0	1	3	2	0	2	ATC failure
85J.37	40	11.10.85	Air Pegasus Corp.	PVT	Piper PA.28	DES	ER	Cliffside Park, NJ, USA	1	2	0	3	1	2	3	ATC failure
85J.38	41	11.24.85	Egyptair	SP	B737-266 Adv.	MJW	G	Luqa Arpt., Malta	?	?	?	?	?	?	?	hij.
85J.39	42	12.02.85	Air France	SP	B747-228B	MJW	L	Rio de Janeiro Int'l Arpt., BRA	0	0	0	0	?	273		Overran RW, eng. control fail.
85J.40	43	12.08.85	Corporate Air Inc.	T	Learjet 35A	DES	LA	Minneapolis Int'l Arpt., MN, USA	2	1	0	3	2	1	3	5th app., touch-&-go, LOC
85J.41	44	12.12.85	Arrow Air	NSP	DC-8-63PF	DES	C	Gander Arpt., Newfoundland, CAN	8	248	0	256	8	248	256	Icing? in-flt. explosion? sabotage? carried returning, members of 101st AB Div. from UN peacekeeping mission
85J.42	45	12.12.85	General Telephone Co.	EXE	Learjet 35A	DES	C	College Station Field, TX, USA	1	1	0	2	2	1	3	In-flt. eng. fail., LOC
85J.43	46	12.12.85	Air Provence	?	Learjet 24B	DES	?	Toulouse Blagnac Arpt., FRA	0	0	0	0	?	?		No details avail.
85J.44	47	12.31.85	President of Nigeria	EXE	HS.125-700B	DES	LA	Kaduna, NIG	3	4	0	7	3	4	7	No details avail.
86J.1	1	1.15.86	Soc Cora Revillon, Paris?	?	D. Falcon 10	DES	L	Chalon-Vatry, FRA	2	0	0	2	2	0	2	No details avail.
86J.2	2	1.18.86	Aerovias de Guatemala	NSP	SE.210-VIN	DES	LA	Flores Santa Elena Arpt., Guatemala	6	81	0	87	6	81	87	Missed app., low clouds, struck hills
86J.3	3	1.27.86	Aerolineas Argentinas	F	B707-387C	MJW	L	Buenos Aires Int'l Arpt., ARG	0	0	0	0	4	1	5	Overran RW, windy, rain
86J.4	4	1.28.86	V.A.S.P. (Brazil)	SP	B737-2A1	DES	TO	Sao Paulo Int'l Arpt., BRA	0	1	0	1	5	67	72	crw err., TO from taxiway, fog
86J.5	5	1.31.86	?	?	Learjet 23	DES	?	?	?	?	?	?	?	?		No details avail.
86J.6	6	2.16.86	China AL (Taiwan)	SP	B737-281	DES	LA	Makung, Pescadores Is., TWN	7	6	0	13	7	6	13	atmptd. go-around
86J.7	7	2.21.86	USAir 499	SP	DC-9-31	MAJ	L	Erie Int'l Airport, PA, USA	0	0	0	0	5	18	23	Overran wet RW
86J.8	8	2.27.86	Seneca Livestock Inc.	EXE	D. Falcon 10	DES	ER/	Coatesville Arpt., PA, USA	0	0	0	0	2	4	6	No details avail.
86J.9	9	3.05.86	Flight Int'l AL	T	Learjet 35	DES	?	San Clemente Is., CA, USA	2	0	0	2	2	0	2	USN training flt., ATC fail.
86J.9	10		Flight Int'l AL	T	Learjet 24D	DES	?	San Clemente Is., CA, USA	2	0	0	2	2	0	2	USN training flt., ATC fail.
86J.10	11	3.05.86	Flight Int'l AL	?	Learjet 24B	MJR	?	San Clemente Is., CA, USA	0	0	0	0	?	?		In-flt. coll. avoidance
86J.11	12	3.31.86	Mexicana 940	SP	B727-264 Adv.	DES	C	Maravatio, 100 mi. NW of MEX City,	8	159	0	167	8	159	167	Overheated tires during TO roll, in-flt. tire explosion, fire, hydraulic system fail., LOC
86J.12	13	4.02.86	Trans World AL 840	SP	B727-231 Adv.	MAJ	LA	near Corinth, GRE	0	4	0	4	7	114	121	In-flt. bombing

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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
86j.13	14	4.04.86	Singer Co. Kearfott Div.	EXE	IAI.1124	DES	E R	Redwater, TX, USA	2	5	0	7	2	5	7	LOC, T-storm, struc. fail.
86j.14	15	4.15.86	Libyan Arab AL	G	Il-76TD	DES	G	Tripoli, LIB	0	0	0	0	0	0	0	struck during U.S. Air Force/Navy air raid
86j.15	16	5.03.86	Air Lanka	SP	L.1011-100	DES	G	Colombo Int'l Arpt., Sri Lanka	0	16	0	16	?	?		gnd. bombing
86j.16	17	5.07.86	My Wife's Yacht Sales	?	Learjet 24	DES	L	Hollywood Arpt., FL, USA	0	0	0	0	2	2	4	No details avail.
86j.17	18	6.22.86	Aeroflot	SP	Tu-134A	DES	TO	Penza, USSR	0	1	0	1	6	53	59	RTO, eng. fail., overran RW
86j.18	19	7.02.86	Aeroflot	SP	Tu-134A	DES	E R	Syktvykar, Komi ASSR, USSR	2	52	0	54	8	86	94	In-flt. fire, emer. lndg
86j.19	20	7.23.86	Yomiuri Shinbun	T	MU.300-IA	DES	E R	Sado Island, JPN	4	0	4	8	4	0	4	Struck Mt. Kimpoku., cause unknown
86j.20	21	8.02.86	American Agronomics	FY	HS.125-1A/522	DES	L	Bedford Mncpl. Arpt., IN, USA	2	0	0	2	2	0	2	Atmpted go-around, overran RW, fire
86j.21	22	8.06.86	Kabo Air	NSP	SE.210-III	MJW	L	Calabar Arpt., NIG	0	0	0	0	0	0	0	Overran RW
86j.22	23	8.06.86	Federal Paper Board Co.	EXE	Learjet 55 ER	DES	TO	Rutland Arpt., VT, USA	0	0	0	0	2	1	3	RTO, TO on wrong RW, crw err.
86j.23	24	8.10.86	American Transport	NSP	DC-10-40	DES	G	Chicago O'Hare Int'l Arpt., IL, USA	0	0	0	0	0	0	0	gnd. fire, crw err.
86j.24	25	8.31.86	Aero Mexico 498	SP	DC-9-32	DES	LA	Cerritos, CA, USA	6	58	15	79	6	58	64	ATC failure
86j.24	26	8.31.86	Private AC	PVT	Piper	DES	E R	Cerritos, CA, USA	1	2	0	3	1	2	3	ATC failure, crw err.
86j.25	27	9.05.86	Pan American AW	SP	B747-121	MAJ	G	Karachi, Pakistan	?	?	?	21	?	383		hij., crw escaped AC
86j.26	28	9.20.86	Aeroflot	SP	Tu-134	?	G	Ufa, USSR	0	2	0	2	?	76		atmptd hij.
86j.27	29	9.25.86	?	Fy	C.318 (A-37)	DES	E R	Yantley, AL, USA	1	0	0	1	1	0	1	LOC, turbulence
86j.28	30	9.29.86	Indian AL	SP	A.300B2-1C	MJW	TO	Madras Meenambakham Arpt., IND	0	0	0	0	10	185	195	Eng. fail., RTO, overran RW
86j.29	31	9.29.86	?	?	R. Sabreliner	DES	?	Liberal, KS, USA	?	?	?	?	?	?		No details avail.
86j.30	32	10.02.86	Swaziland Tobacco Co.	EXE	D. Falcon 10	DES	LA	Tzaneen, Transvall, SAF	2	2	0	4	2	2	4	impr. app., crw err.
86j.31	33	10.15.86	Iran Air	SP	B737-286 Adv.	DES	G	Shiraz Arpt., IRN	0	3	0	3	?	?		Iraqi air raid
86j.32	34	10.16.86	Aeroflot	SP	Tu-134	DES	E R	Syktvykar, USSR	?	?	0	2	?	82		In-flt. fire in cargo bay, emer. lndg
86j.33	35	10.19.86	Mozambique	NSP	Tu-134A	DES	LA	Komatipoort, SAF	8	26	0	34	9	35	44	crw err., navigation err.
86j.34	36	10.20.86	Aeroflot	SP	Tu-134A	DES	L	Kuybyshev, Tatar ASSR, USSR	4	66	0	70	7	85	92	Hard lndg, left RW
86j.35	37	10.24.86	Aviation Management	F	Learjet 25DXR	DES	E R	Medina, SAR	2	0	0	2	2	0	2	crsh in mtn. area, cause unknown
86j.36	38	10.26.86	Piedmont AL 467	SP	B737-222	MJW	L	Charlotte Int'l Arpt., NC, USA	0	0	0	0	5	114	119	crw err., overran wet RW
86j.37	39	11.06.86	Pan American AW 301	SP	B727-235	MAJ	Taxi	Tampa Int'l Arpt., FL, USA	0	0	0	0	6	17	23	GTC failure
86j.37	40	11.06.86	Private AC	PVT	Piper	DES	L	Tampa Int'l Arpt., FL, USA	1	0	0	1	1	0	1	GTC failure, crw err.
86j.38	41	11.06.86	Barbary Coast Hotel	?	C.551 Citation	DES	?	San Ignacio, Mulege, Baja, MEX	0	0	0	0	?	?		No details avail.
86j.39	42	11.27.86	Aerosucre (Colombia)	F	SE.210-11R	MJW	TO	Arauca, COL	0	0	0	0	3	2	5	RTO, control fail., overran RW
86j.40	43	12.12.86	Aeroflot	SP	Tu-134A	DES	LA	E. Berlin Schoenfeld Arpt., GDR	9	61	0	70	9	73	82	crw err., fog
86j.41	44	12.15.86	RCC of Nigeria	?	HS.125-600B	DES	LA	Casablanca Arpt., MOR	2	6	2	10	2	6	8	Undershot RW, struck house
86j.42	45	12.25.86	Iraqi AW	SP	B737-270C	DES	E R	Arar, SAR	3	60	0	63	15	91	106	hij., in-flt. gunfight



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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
87J.1	1	1.02.87	Pelita AS	NSP	F.28-1000	MAJ	LA	Dumai Arpt., Sumatra, Indonesia	0	0	0	0	6	64	70	Undershot RW, gear collapse
87J.2	2	1.03.87	VARIG (Brazil)	SP	B707-379C	DES	C	Abidjan, Ivory Coast	12	38	0	50	12	39	51	Engine fail. on climb, RTF
87J.3	3	1.06.87	Transwede	NSP	SE.210-10R	DES	C	Stockholm Arlanda Arpt., SWE	0	0	0	0	6	21	27	Icing, control fail., gear collapse
87J.4	4	1.08.87	Middle East AL	SP	B707-323C	DES	L	Beirut Int'l Arpt., LEB	0	0	0	0	?	126		struck by artillery fire
87J.5	5	1.10.87	Nigeria AW	T	DC-10-30	DES	TO	Illorin, NIG	0	0	0	0	9	0	9	Touch-&-go, RTO, overran RW
87J.6	6	1.14.87	Fidinam Fiduciaria	?	Learjet 35A	DES	L	Agno Arpt., Lugano, SWI	0	0	0	0	?	2?		No details avail.
87J.7	7	1.15.87	U.S. Air Force 1402 MAS	?	Learjet	DES	TO	Maxwell AFB, Montgomery, AL, USA	?	?	0	2	?	3		No details avail.
87J.8	8	1.16.87	Aeroflot	SP	Yak-40	DES	C	Tashkent, USSR	4	5	0	9	4	5	9	preceding Il-76 wake-vortices
87J.9	9	2.05.87	Aero France	EXE	Learjet 55	DES	ER	Jakiri, CAM	2	9	0	11	2	9	11	crsh in mtn. area, cause unknown
87J.10	10	2.08.87	Iran Air Force	?	D. Falcon 20	DES	?	Omidiyeh AB	?	?	?	?	?	?		Shot down by Iranian air defences
87J.11	11	2.14.87	Skyworld AL	?	B707-323B	?	?	Durango, MEX	?	?	?	?	?	?		No details avail.
87J.12	12	2.23.87	S.A.S.	SP	DC-9-41	MJW	L	Trondheim Vaernes Arpt., NOR	0	0	0	0	4	103	107	crw err., hard lndg
87J.13	13	3.27.87	Connie Kalitta Services	Amb.	Learjet 24A	DES	LA	Eagle Co. Arpt., CO, USA	2	1	0	3	2	1	3	crsh into mtn., cause unknown
87J.14	14	4.04.87	Garuda (Indonesia)	SP	DC-9-32	DES	LA	Medan Polonia Arpt., Indonesia	4	23	0	27	8	37	45	hvy rain, struck aerial, pylon, windshear?
87J.15	15	4.11.87	Transbrasil	F	B707-330C	MJW	L	Manaus Gomes Int'l Arpt., BRA	0	0	0	0	7	0	7	ILS app., rain, gear collapse
87J.16	16	4.13.87	Buffalo AW/Burlington	F	B707-351CF	DES	LA	Kansas City Int'l Arpt., MO, USA	3	1	0	4	3	1	4	ILS app., fog, rain, crw err.
87J.17	17	5.09.87	LOT (Poland)	NSP	Il-62M	DES	C	Warsaw Okęcie Arpt., POL	10	172	0	182	10	172	182	In-flt. eng. fail., emer. ret. to field, LOC
87J.18	18	5.11.87	Corporate Air Transport.	F	Learjet 35A	DES	C	Allegheny, Pittsburgh, PA, USA	2	0	0	2	2	0	2	Fail. to climb, fire, cause unknown
87J.19	19	5.31.87	Travel Air GmbH	EXE	C.501 Citation I	DES	LA	Lubeck Blankensee Arpt., FRG	2	0	0	2	2	2	4	VFR night app., struck radio tower
87J.20	20	6.09.87	Alaska AL	?	B727-90C	DES	Taxi	Anchorage Int'l Arpt., AK, USA	0	0	0	0	?	?		Wing struck loading ramp, fire
87J.21	21	6.16.87	C.A.A.C. (China)	NSP	B737-2T4 Adv.	MAJ	LA	Fuzhou Arpt., ROC	0	0	0	0	?	?		ATC failure, lnd safely
87J.21	22	6.16.87	Chinese Air Force	Mil.	J-6 (MiG-19)	DES	?	Fuzhou Arpt., ROC	1	0	0	1	1	0	1	ATC failure
87J.22	23	6.19.87	Aeroflot	SP	Yak-40	DES	TO	Berdiansk, USSR	2	6	0	8	5	24	29	atmptd go-around, overran RW
87J.23	24	7.16.87	Trans Aero Corp.	F	IAI.1121	DES	TO	Jackson Thompson Arpt., MS, USA	0	0	0	0	2	3	5	No details avail.
87J.24	25	7.24.87	Air Afrique 056	SP	DC-10-30	?	ER	ER Rome-Paris	0	1	0	1	15	148	163	hij.
87J.25	26	7.31.87	Trans Latin Air	F	Learjet 23	DES	LA	Guatemala City, Guatemala	2	1	0	3	2	1	3	Poor weather
87J.26	27	8.04.87	LAN Chile	SP	B737-2A1 Adv.	MJW	L	El Loa Arpt., Calama, Chile	0	1	0	1	8	27	35	Undershot RW, gear fail., fire
87J.27	28	8.16.87	Northwest AL 255	SP	MD-82	DES	C	Detroit Metro. Arpt., MI, USA	6	148	2	156	6	149	155	impr. TO config., stalled, crw err.
87J.28	29	8.31.87	Thai AW 365	SP	B737-2P5 Adv.	DES	LA	1 mi. E of Phuket Arpt., THL	9	74	0	83	9	74	83	Stalled on app., crsh @ sea, crw err., ATC err.
87J.29	30	9.08.87	Brazil Air Force	?	HS.125-403B/	DES	TO	Carajas, BRA	?	?	0	9	?	9		No details avail.
87J.30	31	9.17.87	United States Air Force 2	G	KC-10A	DES	G	Barksdale AFB, LA, USA	?	?	0	1	?	17		gnd. fire during refueling, gnd. crw err.

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ACC Code	#	Date	AC Operator	FLT Type	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
87J.31	32	9.21.87	Egyptair	T	A.300B4-203	DES	L/T	Luxor, EGY	5	0	0	5	5	0	5	Practice touch & go
87J.32	33	9.30.87	Air Truck/DHL	F	D. Falcon 20DC	DES	L	Las Palmas Arpt., Canary Is.	0	0	0	0	2	0	2	No details avail.
87J.33	34	10.11.87	Drenair	F	D. Falcon 20D	DES	ER	Keflavik, Iceland	0	0	0	0	2	4	6	Ditched @ sea, cause unknown
87J.34	35	10.15.87	Falcon Jet Corp.	T	D. Falcon 100	DES	C	Rancho Murieta Arpt., CA, USA	2	1	0	3	2	1	3	LOC? fire
87J.35	36	11.15.87	Continental AL 1713	SP	DC-9-14	DES	TO	Denver Int'l Arpt., CO, USA	3	25	0	28	5	77	82	Icing, crw err.
87J.36	37	11.19.87	Air Karelia	NSP	C.500 Citation I	DES	LA	Tuusula, Helsinki, Finland	0	0	0	0	2	4	6	In-flt. 2-eng fail., fuel exhaustion
87J.37	38	11.28.87	South African AW 295	SP	B747-244B	DES	LA	Indian Ocean 220 kms. NE of Mauritius	19	140	0	159	19	140	159	In-flt. upper cargo hold fire
87J.38	39	11.29.87	Korean Air 858	SP	B707-3B5C	DES	ER	Andaman Sea near Burma	11	104	0	115	11	104	115	In-flt. bombing
87J.39	40	12.05.87	Scott Cable	EXE	HS.125-400A	DES	LA	Lexington Blue Grass Field, KY, USA	2	0	0	2	2	2	4	In-flt. eng. fire
87J.40	41	12.07.87	Pacific SW AL 1771	SP	BAe.146-200A	DES	ER	Paso Robles, CA, USA	5	39	0	44	5	39	44	In-flt. shooting
87J.41	42	12.28.87	Eastern AL 573	SP	DC-9-31	MJW	L	Pensacola Regional Arpt., FL, USA	0	0	0	0	4	102	106	Hard lndg
88J.1	1	1.04.88	Condor	NSP	B737-230 Adv.	DES	LA	Izmir, TUR	5	11	0	16	5	11	16	struck high gnd., ILS fail.?
88J.2	2	1.08.88	Phoenix Air	F	Learjet 36A	DES	LA	Monroe, LA, USA	2	0	0	2	2	0	2	crsh 8 nmi SW of arpt, cause unknwn
88J.3	3	1.11.88	Ivory Coast Govt.	EXE	G.1159 GS III	DES	L	St. Louise Arpt., Senegal	?	?	0	2	?	6		No details avail.
88J.4	4	1.15.88	Air Material Exec. Jets	EXE	D. Falcon 20F	DES	TO	Lugano Agno Arpt., SWI	0	0	0	0	2	0	2	RTO, overran wet RW, struck embank.
88J.5	5	1.18.88	Aeroflot	SP	Tu-154B-1	DES	L	Krasnovodsk, Turkmeniya, USR	0	11	0	11	6	137	143	crw err., hard lndg
88J.6	6	1.18.88	Aero Astro	EXE	HS.125-600B	DES	LA	Houston Hobby Arpt., TX, USA	1	0	0	1	2	6	8	Low app., struck powerlines
88J.7	7	1.24.88	Aeroflot	SP	Yak-40	DES	C	Nizhnevartovsk, Siberia, USR	4	23	0	27	4	27	31	crw err.? eng. fail.
88J.8	8	2.08.88	T.A.A.G. (Angola)	F	B707-349C	MJW	LA	Luanda Arpt., ANG	0	0	0	0	9	0	9	Low app., overran RW
88J.9	9	2.11.88	?	?	D. Falcon 20D	DES	?	Akron, OH, USA	?	?	?	?	?	?		No details avail.
88J.10	10	2.24.88	Cia Comercio &	T	Learjet 24F	DES	LA	Macre, BRA	2	0	0	2	2	0	2	In-flt. 2-eng. fail.
88J.11	11	2.27.88	Aeroflot	SP	Tu-134A	DES	LA	Surgut, Tyumenskaya Oblast, USR	3	17	0	20	6	45	51	crw err., hard lndg short of RW
88J.12	12	2.27.88	Talia AW	Fy	B727-2H9 Adv.	DES	LA	Mt. Bufavento, Kyrenia, CYP	14	0	0	14	14	0	14	Poor visibility, struck mountain
88J.13	13	2.00.88	?	?	B707-	NON	?	MEX	1	0	0	1	?	?		Severe turbulence
88J.14	14	3.08.88	Aeroflot	SP	Tu-154B-2	DES	ER	ER domestic USSR flight	1	3	0	4	?	?		hij.
88J.15	15	3.17.88	Avianca 410 (Colombia)	SP	B727-21	DES	C	Mt. La Cuchilla, Cucuta, COL	7	132	0	139	7	132	139	Struck mtn., storm, crw err.
88J.16	16	3.31.88	Arax AL	F	DC-8-55CF	DES	TO	Cairo Int'l Arpt., EGY	4	0	0	4	4	0	4	RTO, 2nd attempt, eng. fire
88J.17	17	4.05.88	Kuwait AW 422	SP	B747-269B	NON	ER	ER Bangkok-Kuwait	0	2	0	2	?	?		hij.
88J.18	18	4.28.88	Aloha AL 243	SP	B737-297	MJW	ER	ER Hilo, HI-Honolulu, HI near Maui, HI	0	1	0	1	5	90	95	In-flt. struct. fail., depress., emer. lndg.
88J.19	19	5.21.88	American AL 70	SP	DC-10-30	DES	TO	Dallas/Ft. Worth Arpt., TX, USA	0	0	0	0	14	240	254	RTO, overran RW, brake fail.
88J.20	20	5.23.88	L.A.C.S.A. (Costa Rica)	SP	B727-22	DES	TO	San Jose Int'l Arpt., Costa Rica	0	0	0	0	9	16	25	RTO, overran RW
88J.21	21	5.24.88	United Executive	FY	Learjet 35A	DES	LA	W. Patterson, Teterboro, NJ, USA	2	2	0	4	2	2	4	crsh in vacant lot in residential area

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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
88J.22	22	6.03.88	Ecuador Air Force	?	R. Sabreliner 40	DES	?	Quito Arpt., ECU	?	?	0	11	?	11		No details avail.
88J.23	23	6.12.88	Austral Lineas Aereas	SP	MD-81	DES	LA	Posadas Arpt., ARG	6	16	0	22	6	16	22	Fog, struck high trees 3 mi. from RW
88J.24	24	6.26.88	Air France 296	T	A.320-111	DES	LA	Mulhouse Habsheim Arpt., FRA	0	3	0	3	6	130	136	atmptd. go-around, crw err.
88J.25	25	7.03.88	Iran Air 655	SP	A.300B2-203	DES	C	Persian Gulf, Strait of Hormuz	12	278	0	290	12	278	290	Surface to air missile shootdown by U.S. Navy
88J.26	26	7.12.88	United States Navy	?	CT-39E	DES	?	S. ROC Sea	0	0	0	0	?	3		Ditched @ sea
88J.27	27	7.21.88	T.A.A.G. (Angola)	F	B707-328C	DES	LA	25 kms. from Lagos Arpt., NIG	6	0	0	6	6	0	6	Poor visibility
88J.28	28	7.26.88	Northeast Jet Co.	FY	Learjet 35A	DES	LA	Morristown Arpt., NJ, USA	1	0	0	1	2	0	2	NDB app., struck fence, fire
88J.29	29	7.30.88	Jet Management	FY	Learjet 23	DES	LA	March AFB, Perris, CA, USA	2	0	0	2	2	0	2	LOC? crsh 1 nmi. S of RW
88J.30	30	8.02.88	Balkan Bulgarian	SP	Yak-40	DES	C	Sofia Vrajdebna Arpt., BUL	?	?	0	27	4	33	37	In-flt. fire, crw err.?
88J.31	31	8.27.88	Trans World AL	SP	B727-31	MJW	L	Chicago O'Hare Int'l Arpt., IL, USA	0	0	0	0	6	62	68	Gear-up lndg
88J.32	32	8.31.88	C.A.A.C. 301 (China)	SP	HS.121-2E	MJW	L	Kai Tak Int'l Arpt., Hong Kong	6	1	0	7	11	78	89	Short app., struck app. lights, ran off RW
88J.33	33	8.31.88	Delta AL 1141	SP	B727-232 Adv.	DES	C	Dallas/Ft. Worth Arpt., TX, USA	4	9	0	13	7	97	104	crw err., impr. TO config.
88J.34	34	9.06.88	Taxi Aereo Marilia	NSP	C.550 Citation	DES	L	Rio de Janeiro Dumont Arpt., BRA	0	0	0	0	2	5	7	No details avail.
88J.35	35	9.09.88	Hang Khong (Vietnam)	SP	Tu-134A	DES	LA	Bangkok Int'l Arpt., THL	3	73	0	76	6	84	90	hvy rain, turbulence, undershot RW
88J.36	36	9.15.88	Ethiopian AL	SP	B737-260 Adv.	DES	C	Bahar Dar Arpt., ETH	0	35	0	35	6	99	105	Birdstrike, eng. fail.
88J.37	37	9.24.88	Aeroflot	?	Tu-154B-2	MJW	?	Aleppo	?	?	?	?	?	?		No details avail.
88J.38	38	9.26.88	Aerolineas Argentinas	SP	B737-287 Adv.	MJW	L	Ushuaia Naval Air Base, ARG	6	56	0	62	6	56	62	Overran RW
88J.39	39	9.29.88	V.A.S.P. (Brazil)	SP	B737-	NON	E R	ER Belo Horizonte-Goiania	1	1	0	2	7	98	105	hij., in-flt. shooting
88J.40	40	10.10.88	T.A.A.G. (Angola)	SP	B707-347C	MJW	G	Luanda, ANG	0	0	0	0	3	0	3	Fire in fwd. cargo hold, elec. fail.
88J.41	41	10.15.88	Nigeria AW	SP	B737-2F9 Adv.	DES	L	Port Harcourt, NIG	0	0	0	0	7	125	132	hvy rain, ran off RW, gear collapse
88J.42	42	10.17.88	Uganda AL 755	SP	B707-338C	DES	LA	Rome Leonardo Da Vinci Arpt., ITA	7	25	0	32	7	45	52	Fog, 3rd app., undershot RW
88J.43	43	10.19.88	Indian AL 113	SP	B737-2A8	DES	LA	Ahmadebad Arpt., Gujarat, IND	6	124	0	130	6	129	135	Undershot 5 mi. from RW, struck powerlines
88J.44	44	10.25.88	Aero Peru	SP	F.28-1000	DES	C	Manco Capac Arpt., Juliaca, Peru	1	11	0	12	4	65	69	crsh in high nose-up attitude
88J.45	45	10.26.88	Aero-Technik	?	C.501 Citation I	DES	C	Salzburg, AUT	2	0	0	2	2	0	2	ATC failure
88J.45	46	10.26.88	Private AC	PVT	Cessna 172	DES	?	Salzburg, AUT	1	3	0	4	1	3	4	ATC failure
88J.46	47	10.29.88	Griffin Records	EXE	CL.600	DES	TO	Aspen Pitkin Co. Arpt., CO, USA	0	0	0	0	3	4	7	No details avail.
88J.46	48		Pegasus Aviation Inc.	G	L.1329 Jetstar 2	DES	G	Aspen Pitkin Co. Arpt., CO, USA	0	0	0	0	0	0	0	No details avail.
88J.47	49	11.03.88	F.A.A. (U.S.)	T	IAI.1121B	DES	E R	Westmoreland, Latrobe, PA, USA	3	0	0	3	3	0	3	In-flt. 2-eng. fail., cause unknown
88J.48	50	12.14.88	G.A.S. Air Nigeria	F	B707-351C	DES	LA	Kom-Omran, Luxor, EGY	5	3	5	13	5	3	8	Forced lndg, fuel exhaustion
88J.49	51	12.16.88	Tom Wackendorfer Avia.	?	Learjet 24B	DES	E R	Monclova, MEX	2	0	0	2	2	0	2	crw incapacitated? LOC

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						Dmg	PHS		Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
88J.50	52	12.21.88	Pan American AW 103	SP	B747-121	DES	E R	Lockerbie, Scotland, UK	16	243	11	270	16	243	259	In-flt. bombing
89J.1	1	1.08.89	British Midland 92	SP	B737-4Y0	DES	C/	E. Midlands Arpt., Leicestershire, UK	0	47	0	47	8	118	126	Eng. fail., ret. to field, crw err.
89J.2	2	1.13.89	Aeroflot	F	Tu-154C	DES	TO	Monrovia Roberts Int'l Arpt., Liberia	0	0	0	0	?	?		No details avail.
89J.3	3	1.30.89	Air Enterprise AL	FY	Learjet 23	MJW	L	Lisbon Arpt., POR	0	0	0	0	2	0	2	Gear-up Indg
89J.4	4	2.08.89	Independent Air 1851	NSP	B707-331B	DES	LA	Mt. Pico Alto, Santa Maria, Azores Is.	7	137	0	144	7	137	144	struck high gnd., fog, crw & ATC err.
89J.5	5	2.09.89	L.A.M. (Mozambique)	SP	B737-2B1 Adv.	MJW	L	Lichinga, Mozambique	0	0	0	0	?	108		Overran wet RW, rainstorm
89J.6	6	2.09.89	TAROM (Rumania)	T	Tu-154B-2	DES	TO	Bucharest Otopeni Arpt., RUM	5	0	0	5	5	0	5	No details avail.
89J.7	7	2.15.89	Reliant AL	?	D. Falcon 20DC	DES	L	Binghampton Arpt., NY, USA	0	0	0	0	2	0	2	Overran RW, struc. fail.
89J.8	8	2.17.89	S.P.A. (Brazil)	?	D. Falcon 10	DES	L	Guanabara Bay, Rio de Janeiro, BRA	0	0	0	0	2	0	2	No details avail.
89J.9	9	2.18.89	Flying Tiger	F	B747-249F	DES	LA	Puchong, Kuala Lumpur, Malaysia	4	0	0	4	4	0	4	Misty, struck high gnd., crw & ATC err.
89J.10	10	2.24.89	United AL 811	SP	B747-121	MAJ	C	Pacific Ocean, Hawaiian Islands	0	9	0	9	18	337	355	In-flt. cargo door fail., depress., 2-eng. fail.
89J.11	11	2.27.89	Nynex Corp.	F	C.550 Citation	DES	L	Poughkeepsie Arpt., NY, USA	0	0	0	0	?	?		No details avail.
89J.12	12	3.09.89	Piedmont AL	SP	B737-201	MIN	E R	Dayton, OH, USA	0	1	0	1	6	70	76	In-flt. depress.
89J.13	13	3.10.89	Air Ontario	SP	F.28-1000	DES	C	Dryden, Ontario, CAN	3	21	0	24	4	65	69	hvy snow
89J.14	14	3.18.89	Evergreen Int'l	F	DC-9-33RC	DES	C	Carswell AFB, Saginaw, TX, USA	2	0	0	2	2	0	2	Mech. fail., atempt. ret. to field
89J.15	15	3.21.89	Transbrasil	F	B707-349C	DES	LA	Sao Paulo Int'l Arpt., BRA	3	0	18	21	3	0	3	Emer. Indg 2 mi. short of RW
89J.16	16	3.21.89	Soviet Air Force	?	Il-76	DES	?	Menongue AB, ANG	?	?	?	?	?	?		Shot down by UNITA forces
89J.17	17	4.03.89	Faucett Peru	SP	B737-248	MJW	L	Iquitos, Peru	0	0	0	0	6	133	139	Skidded off wet RW, rainstorm
89J.18	18	4.26.89	Aerosucre (Colombia)	F	SE.210-11R	DES	C	Barranquilla, COL	3	2	2	7	3	2	5	Deep stall or cargo shift
89J.19	19	5.17.89	Somali AL	SP	B707-330B	MJW	TO	Nairobi KENtta Int'l Arpt., KEN	0	0	0	0	13	57	70	RTO, overran RW
89J.20	20	6.07.89	Surinam AW 764	SP	DC-8-62	DES	LA	Paramaribo Int'l Arpt., Surinam	10	167	0	177	10	177	187	3rd app., fog, crsh 1 mi. short of RW
89J.21	21	6.17.89	Interflug (E. Germany)	SP	Il-62M	DES	TO	Berlin Schonefeld Arpt., GDR	0	20	1	21	10	103	113	RTO, overran RW, control fail.
89J.22	22	6.29.89	Phoenix Air Group Inc.	F	D. Falcon 20DC	DES	TO	Cartersville Arpt., GA, USA	2	0	0	2	2	0	2	No details avail.
89J.23	23	7.11.89	Kenya AW	SP	B707-351B	DES	L	Addis Ababa Int'l Arpt., ETH	0	0	0	0	10	66	76	Ret. to field, gear fail., overran wet RW
89J.24	24	7.12.89	American AL	SP	A.300B4-605R	NON	Taxi	San Juan Int'l Arpt., Puerto Rico	0	0	1	1	?	?		gnd. industrial accident
89J.25	25	7.19.89	United AL 232	SP	DC-10-10	DES	E R	Sioux City Gateway Arpt., IA, USA	1	111	0	112	11	285	296	In-flt. eng. fail., LOC, emer. land.
89J.26	26	7.21.89	Philippine AL	SP	BAC 1-11	DES	L	Manila Int'l Arpt., Philippine Is.	0	1	9	10	7	91	98	Overran RW, hvy rain, struck cars
89J.27	27	7.27.89	Korean Air 803	SP	DC-10-30	DES	LA	Tripoli Int'l Arpt., LIB	4	68	0	72	18	181	199	Short app., fog, ILS fail., crw err.
89J.28	28	8.02.89	Ariana Afghan AL	?	Yak-40	MJW	L	Qala Nua	?	?	?	?	?	?		crsh into hangar
89J.29	29	8.10.89	APISA Air Cargo (Peru)	F	DC-8-32/33F	MJW	L	Iquitos, Peru	0	0	0	0	?	?		Rainstorm, overran wet RW
89J.30	30	8.13.89	L.M. Barbennell	?	BAe.125-3A	DES	L	Houston Hobby Arpt., TX, USA	0	0	0	0	2	6	8	No details avail.

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89J.31	31	8.16.89	L.A.D.E. (Argentina)	SP	F.28-1000C	MJW	L	San Carlos Arpt., ARG	0	0	0	0	6	59	65	Overran snow-covered RW, struck embank.
89J.32	32	8.25.89	Torosair (Turkey)	NSP	B727-247	DES	TO	Ankara Esenboga Arpt., TUR	0	0	0	0	8	157	165	No details avail.
89J.33	33	9.03.89	VARIG 254 (Brazil)	SP	B737-241 Adv.	DES	C	Sao Jose do Xingu, BRA	0	12	0	12	6	48	54	Navigation err., crw err., fuel exh.
89J.34	34	9.03.89	Cubana	NSP	Il-62M	DES	C	Havana, CUB	11	115	34	160	11	115	126	T-storm, rain., high winds, struck nav. aerals
89J.35	35	9.07.89	Okada Air	SP	BAC 1-11	DES	L	Port Harcourt, NIG	0	0	0	0	4	88	92	Gear-up Indg
89J.36	36	9.19.89	U.T.A. 772 (France)	SP	DC-10-30	DES	C	Tenere Desert, Niger	14	156	0	170	14	156	170	In-flt. bombing
89J.37	37	9.20.89	USAir 5050	SP	B737-401	DES	TO	New York LaGuardia Arpt., USA	0	2	0	2	6	55	61	RTO, crw err., overran RW
89J.38	38	9.23.89	Province of Misiones	EXE	Learjet 25D	DES	L	Rio Alto Parana, Posadas, ARG	0	2	0	2	2	5	7	No details avail.
89J.39	39	10.02.89	Harry O'Connor	PVT	C.501 Citation I	DES	L	Sedona Arpt., AZ, USA	0	0	0	0	1	0	1	No details avail.
89J.40	40	10.02.89	GTE South Inc.	F	C.550 Citation	DES	L	Roxboro Person Co. Arpt., NC, USA	2	0	0	2	2	0	2	No details avail.
89J.41	41	10.14.89	Delta AL 1558	SP	B727-232 Adv.	MJW	G	Salt Lake City Int'l Arpt., USA	0	0	0	0	7	10	17	gnd. fire after preboarding pax
89J.42	42	10.18.89	Aeroflot/Soviet Air Force	?	Il-76	DES	C	Caspian Sea, Azerbaijan, USR	?	?	0	57	?	?	?	Eng. fire
89J.43	43	10.20.89	Aeroflot	F	Il-76T	DES	LA	Leninakan, Armenian SSR, USR	10	7	0	17	10	7	17	Struck mountain
89J.44	44	10.21.89	T.A.N. 800/414?	SP	B727-224	DES	C	Las Tablitas, Honduras	4	127	0	131	12	139	151	struck mtn. 10 mi. S of arpt., hvy rain, high winds
89J.45	45	10.26.89	China AL (Taiwan)	SP	B737-209 Adv.	DES	C	Hualien, TWN	7	47	0	54	7	47	54	Poor visability, crw err.
89J.46	46	10.26.89	Presidencia de la	EXE	R. Sabreliner	DES	L	Saltillo, MEX	0	0	0	0	4	3	7	No details avail.
89J.47	47	11.04.89	Bel-Air Taxi Aereo	?	Learjet 25C	DES	L	Belo Horizonte Arpt., BRA	2	2	0	4	2	2	4	No details avail.
89J.48	48	11.14.89	Air Express AS	F	C.551 Citation	DES	L	Bardufoss, NOR	2	2	0	4	2	2	4	No details avail.
89J.49	49	11.25.89	Korean Air 175	SP	F.28-4000	DES	C	Seoul Kimpo Int'l Arpt., RSK	0	0	0	0	6	47	53	L. eng. fail., crw err.
89J.50	50	11.27.89	Avianca 203 (Colombia)	SP	B727-21	DES	C	Soacha, Bogata, COL	6	101	3	110	6	101	107	In-flt. bombing
89J.51	51	12.30.89	Air Ivoire	SP	F.28-4000	MJW	L	Man, Ivory Coast	0	0	0	0	4	66	70	Overran RW
90J.1	1	1.05.90	Aerolíneas Argentinas	SP	F.28-4000	DES	L	Villa Gesell, ARG	0	0	0	0	5	85	90	Overran wet RW on 2nd app., fire
90J.2	2	1.06.90	Greco Air	FY	L.1329	DES	TO	Miami Int'l Arpt., FL, USA	1	0	0	1	2	0	2	RTO, 3-eng. flt., 1-eng. fail., struck ILS
90J.3	3	1.13.90	Aeroflot	SP	Tu-134	DES	ER	Ufa, Bashkir, A.S.S.R., USR	3	22	0	25	6	66	72	In-flt. eng. fire, atmpt. emer. Indg
90J.4	4	1.18.90	Eastern AL 111	SP	B727-225 Adv.	MAJ	L	Atlanta Hartsfield Int'l Arpt., GA, USA	0	0	0	0	8	141	149	GTC failure
90T.8	5	1.18.90	Epps AS	FY	Bch. A100 King	MJW	Taxi	Atlanta Hartsfield Int'l Arpt., GA, USA	1	0	0	1	1	1	2	GTC failure
90J.5	6	1.18.90	Aero Flight Services, Inc.	F	Learjet 23	DES	ER	Dayton, OH, USA	2	0	0	2	2	0	2	Impacted nose-down from 29500'
90J.6	7	1.19.90	Eastman Kodak Corp.	EXE	G.1159 GS II	DES	L	Little Rock Adams Field, AR, USA	2	5	0	7	2	5	7	Undershot RW, fire
90J.7	8	1.25.90	Avianca 52 (Colombia)	SP	B707-321B	DES	LA	Cove Neck, Long Island, NY, USA	8	65	0	73	9	152	161	In-flt. fuel exhaustion, crw err.
90J.8	9	1.31.90	Slender You, Ltd.	EXE	BAe.125-3B	DES	ER/	COL, MO, USA	1	0	0	1	2	1	3	Fuel flow difficulties

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
90J.9	10	2.01.90	Soviet Air Force	?	Il-76	DES ?		Lithuania, USR	?	?	0	6	?	?	No details avail.	
90J.10	11	2.14.90	Indian AL 605	SP	A.320-231	DES LA		Bangalore, Karnataka, IND	5	87	0	92	7	139	146	Undershot app. 0.5 km short of RW, crw err.
90J.11	12	2.18.90	Aviaco (Spain)	SP	DC-9-32	MJW L		Mahon, Menorca, SPN	0	0	0	0	?	?		hvy lndg
90J.12	13	2.22.90	Learjet Corp.	T	Learjet 31	DES L		Taiyuan Arpt., ROC	0	0	0	0	2	5	7	Fuselage struck RW, crw err.
90J.13	14	3.11.90	Alaska AL	SP	B727-227 Adv.	MIN TO		Phoenix Sky Harbor Arpt., AZ, USA	0	0	1	1	6	35	41	Struck person on RW during TO run
90J.14	15	3.22.90	C.A.A.C. (China)	SP	HS.121-2E	MJW L		Guilin Arpt., ROC	0	0	0	0	5	102	107	Overran wet RW, lnd long on RW
90J.15	16	3.27.90	Aeroflot	F	Il-76	DES LA		Kabul, AFG	10	0	0	10	10	0	10	struck high gnd., mech. fail.
90J.16	17	4.02.90	Flight Int'l Inc.	T	Learjet 35	DES TO		Carlsbad Arpt., CA, USA	0	0	0	0	2	0	2	Eng. fail., LOC, flt. for U.S. Navy
90J.17	18	4.06.90	Transamerica Taxi Aereo	F	Learjet 25C	DES L		Serrinha Arpt., Juiz de Fora, BRA	2	0	0	2	4	0	4	Overran wet RW, fire
90J.18	19	5.11.90	Philippine AL 143	SP	B737-3Y0	DES Taxi		Manila Int'l Arpt., PHI	0	8	0	8	6	121	127	gnd. explosion, fire on pushback
90J.19	20	5.11.90	Air North Queensland	NSP	C.500 Citation I	DES LA		Cairns, Mataeba, Queensland, Aust.	1	10	0	11	1	10	11	struck high gnd. during T-storm
90J.20	21	6.02.90	Markair	FY	B737-2X6C	MJW LA		Unalakleet, AK, USA	0	0	0	0	4	0	4	Fog, struck hillside 11 km. from airfield
90J.21	22	7.14.90	Trans Arabian AT	F	B707-349C	MJW L		Khartoum Arpt., Sudan	0	0	0	0	?	?		Gear collapse
90J.22	23	7.15.90	Concrete Pipe &	F	Learjet 24D	DES L		Benton Harbor Ross Field, MI, USA	0	0	0	0	2	0	2	Overran RW, poor weather
90J.23	24	7.22.90	USAir	SP	B737-222	MJW TO		Kinston Arpt., NC, USA	0	0	0	0	5	22	27	RTO, eng. fail., nose gear failure
90J.24	25	7.25.90	Ethiopian AL	F	B707-379C	MjW TO		Addis Ababa Bole Arpt., ETH	0	0	0	0	5	0	5	RTO, birdstrike? skidded off RW
90J.25	26	8.01.90	Aeroflot	SP	Yak-40	DES LA		Agdam Azerbaidzhan, USR	4	26	0	30	4	26	30	Struck mountain, bad weather, Verevan-Stepanakert flt.
90J.26	27	8.13.90	Aviex Jet	NSP	IAI.1121	DES LA		Cozumel, MEX	1	0	0	1	2	6	8	Undershot app. short of RW, struck ILS
90J.27	28	8.16.90	?	EXE	C.500 Citation I	DES ?		Freisach, AUT	?	?	?	?	?	?		No details avail.
90J.28	29	9.11.90	Faucett Peru	Fy	B727-247	DES ER		180 mi. SE Newfoundland, CAN	3	13	0	16	3	13	16	Fuel exhaustion, ditched @ sea
90J.29	30	9.14.90	Aeroflot	SP	Yak-42	DES LA		Sverdlovsk Koltsovo Arpt., USR	0	4	0	4	?	124		In-flt. eng. fail.
90J.30	31	9.16.90	Connie Kalita Services	?	Learjet 24	DES L		Morristown Arpt., TN, USA	0	0	0	0	1	3	4	unauth. flt.
90J.31	32	9.20.90	Omega Air, Inc.	FY	B707-321B	DES C		Pinal Air Park, AZ, USA	1	0	0	1	3	0	3	Stripped down AC for KC-135E program, rt. wing hit, gnd. after rotation, delivery flt. to Davis
90J.32	33	9.24.90	Hi-Tech Helicopters Inc.	?	C.500 Citation I	DES LA		San Luis Obispo, CA, USA	4	0	0	4	4	0	4	No details avail.
90J.33	34	10.02.90	Xiamen AL 8301	SP	B737-247	DES L		Canton Arpt., Guangzhou, ROC	7	77	1	85	9	95	104	hij., coll. w/ parked ACs
90J.33	35		China Southern AL	SP	B757-21B	DES Taxi		Canton Arpt., Guangzhou, ROC	0	47	0	47	12	106	118	Parked on taxiway, flt. to Shanghai
90J.33	36		China Southwest AL	G	B707-321B	MJW G		Canton Arpt., Guangzhou, ROC	0	0	0	0	1	0	1	Parked AC
90J.34	37	10.02.90	Iraqi AW	?	Il-76	DES C		Kuwait City, Kuwait	?	?	?	126+	?	126+		struck by gnd.-to-air missile, Kuwaiti resistance
90J.35	38	10.03.90	Eastern AL	SP	DC-9-31	MIN ER		West Palm Beach, FL, USA	0	1	0	1	?	97		Clear air turbulence @ 31000'

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

ACC Code	#	Date	AC Operator	FLT Type	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
90J.36	39	10.24.90	Cubana	NSP	Yak-40	DES	LA	Punta Jardinero, Santiago de CUB	2	8	0	10	7	29	36	struck high gnd., poor weather
90J.37	40	11.14.90	Alitalia 404	SP	DC-9-32	DES	LA	Zurich, SWI	6	40	0	46	6	40	46	ILS app., struck hills 8 kms from arpt.
90J.38	41	11.19.90	Aeroflot	F	Tu-154M	MJW	ER	Trutnov, Prague, CZK	0	0	0	0	6	0	6	In-flt fire, ER Basel-Moscow, emer lndg
90J.39	42	11.21.90	Aeroflot	SP	Il-62	DES	LA	Yakutsk, Yakut S.S.R., USR	0	0	0	0	10	174	184	struck ravine 1 km. from RW, explosion
90J.40	43	11.29.90	Executive Jet Inc.	NSP	C.550 Citation	DES	L	Sebring Regional Arpt., FL, USA	0	0	0	0	1	2	3	No details avail.
90J.41	44	11.30.90	Aeroflot	SP	Yak-40	DES	L	Dikson, USR	0	0	0	0	4	31	35	No details avail.
90J.42	45	12.02.90	?	EXE	IAI.1121	DES	?	Lagura del Saule, Uruguay	?	?	?	?	?	?	?	No details avail.
90J.43	46	12.03.90	Northwest AL 1482	SP	DC-9-14	DES	Taxi	Detroit Wayne Co. Metro. Arpt., MI, USA	1	7	0	8	5	39	44	GTC failure, crw err.
90J.43	47	12.03.90	Northwest AL 299	SP	B727-251 Adv.	MAJ	TO	Detroit Wayne Co. Metro. Arpt., MI, USA	0	0	0	0	10	146	156	GTC failure
90J.44	48	12.04.90	Sudania Aviation Co.	F	B707-321C	DES	LA	Nairobi KENtta Int'l Arpt., KEN	7	3	0	10	7	3	10	Undershot 2nd app., struck powerlines
90J.45	49	12.00.90	?	?	HFB-320	MJW	?	Mojave, CA, USA	?	?	?	?	?	?	?	No details avail.
91J.1	1	1.10.91	Romavia/TAROM	T	B707-3K1C	MJW	L	Bucharest Otopeni Arpt., Romania	0	0	0	0	13	0	13	hvy lndg, wingtip struck gnd., fire
91J.2	2	1.11.91	Belair Taxi Aereo	F	Learjet 25C	DES	L	Belo Horizonte, BRA	2	3	0	5	2	3	5	crsh in hvy rainstorm
91J.3	3	1.12.91	Vietnam AL	SP	Tu-134A	DES	L	Ho Chi Minh City Arpt., Vietnam	0	0	0	0	4	72	76	Hard lndg
91J.4	4	32111	Kuwait AW	G	G.1159A GS II	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	5	32111	Kuwait AW	G	G.1159A GS III	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	6	32111	Iraqi AW	G	BAe.125-700B	DES	G	Muthana AB, Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	7	32111	Kuwait AW	G	B767-269 ER	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	8	32111	Kuwait AW	G	B767-269 ER	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	9	2.15.91	Kuwait AW	G	A.300C4-620	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	10	2.15.91	Kuwait AW	G	A.300C4-620	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.5	11	2.01.91	USAir 1493	SP	B737-3B7	DES	L	Los Angeles Int'l Arpt., CA, USA	2	20	0	22	6	83	89	GTC failure, ATC err.
91T.9	12	31778	Skywest / Delta	SP	SA.227AC	DES	Taxi	Los Angeles Int'l Arpt., CA, USA	2	10	0	12	2	10	12	GTC failure, ATC err.
91J.6	13	2.14.91	Seanaire Inc.	EXE	Learjet 35A	DES	LA	Aspen Pitkin Co. Arpt., CO, USA	2	1	0	3	2	1	3	LOC, stalled, crw err.
91J.7	14	2.17.91	Emery Worldwide AL 590	F	DC-9-15F RC	DES	C	Cleveland Hopkins Arpt., OH, USA	2	0	0	2	2	0	2	crsh on initial climb, stalled, icing, fire
91J.8	15	2.17.91	British AW	G	B747-136	DES	G	Kuwait City Int'l Arpt., Kuwait	0	0	0	0	0	0	0	Impounded by Iraqi 8.3.90, blown up by
91J.8	16		Kuwait Government	G	DC-9-32CF	DES	G	Kuwait City Int'l Arpt., Kuwait	0	0	0	0	0	0	0	Iraqi forces
91J.9	17	2.20.91	LAN Chile	NSP	BAe.146-200A	DES	L	Puerto Williams, Navarion Is., Chile	0	20	0	20	7	65	72	Overran wet RW, crsh into water
91J.10	18	2.28.91	Japan Military AC	?	Learjet 36A	DES	?	JPN	?	?	?	?	?	?	?	No details avail.
91J.11	19	3.03.91	United AL 585	SP	B737-291 Adv	DES	LA	Colorado Springs, CO, USA	5	20	0	25	5	20	25	Windshear? crsh 3.5 nmi. S of arpt.
91J.12	20	3.03.91	United States Navy	?	CT-39G	DES	?	Glenview, IL, USA	?	?	?	?	?	?	?	No details avail.

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
91J.13	21	3.05.91	L.A.V. Venezuela 108	SP	DC-9-32	DES	C	Trujillo, SW of Caracas, VEN	5	48	0	53	5	48	53	struck Los Torres Mtn. range, navigation err.
91J.14	22	3.06.91	Singapore AL	G	A.310-324	?	G	Changi Arpt., SIN	0	4	0	4	11	118	129	In-flt hij. ER Kuala Lumpur-Singapore, gnd. res. op.
91J.15	23	3.12.91	Air Transport Int'l / DHL	F	DC-8-62H AF	DES	TO	New York Kennedy Int'l Arpt., NY, USA	0	0	0	0	5	0	5	RTO, attmpd. to steer onto other RW, gear collapse, engs. torn off, fire, overload AC
91J.16	24	3.15.91	Lider Taxi Aereo SA	F	Learjet 35A	DES	LA	Uberlandia, BRA	0	0	0	0	2	2	4	Flt. from Sao Paulo
91J.17	25	3.15.91	Duncan AC	NSP	HS.125-1A/S52	DES	C	Otay Mtn., San Diego, CA, USA	2	7	0	9	2	7	9	struck 5200' mtn., cause unknown
91J.18	26	3.18.91	Air Conesul Taxi Aereo	NSP	Learjet 25D	DES	LA	Brasilia, BRA	2	5	0	7	2	5	7	Night app., crsh & exploded
91J.19	27	3.25.91	Ethiopian AL	G	B707-385C	DES	G	Yohannes IV Arpt., Asmara, ETH	0	0	0	0	0	0	0	gnd. attack?
91J.20	28	4.15.91	?	G	GS-A.1159 GS	DES	G	Jeddah, SAR	?	?	?	?	?	?	?	No details avail.
91J.21	29	4.30.91	Indian AL	SP	B737-2A8 Adv.	MAJ	G	Meenambakham, IND	0	0	1	1	?	?	?	Struck by tug prior to pushback
91J.22	30	5.01.91	PGA Tour Investments	Exec	IAI.1124A-II	DES	L	Waterbury/Oxford Arpt., CT, USA	0	0	0	0	2	6	8	Hard lndg, gear collapse, ran off RW
91J.23	31	5.03.91	Ryan Int'l/Emery	F	B727-22C	MJW	TO	Hartford Int'l Arpt., CT, USA	0	0	0	0	3	0	3	Eng. explosion on TO roll, RTO
91J.24	32	5.06.91	Petrolift Aviation Serv.	G	Learjet 25D	DES	G	Shreveport Regional Arpt., LA, USA	0	0	0	0	0	0	0	No details avail.
91J.24	33	5.06.91	Petrolift Aviation Serv.	G	C.501 Citation	DES	G	Shreveport Regional Arpt., LA, USA	0	0	0	0	0	0	0	No details avail.
91J.24	34	5.06.91	Franks Petroleum	G	BAe(HS).125-4	DES	G	Shreveport Regional Arpt., LA, USA	0	0	0	0	0	0	0	No details avail.
91J.25	35	5.09.91	SAM Colombia	?	B727-46	MJW	L	Medellin, COL	0	0	0	0	?	83	?	Emer. lndg, ret. to field
91J.26	36	5.09.91	?	?	CL.600	DES	?	Silt, CO, USA	1	0	0	1	1	0	1	High wind gusts
91J.27	37	5.21.91	Ashaka Cement Co.	EXE	C.550 Citation	DES	LA	Bauchi, NIG	2	1	0	3	2	1	3	atmpd missed app., poor weather
91J.28	38	5.23.91	Aeroflot 8556	SP	Tu-154B-1	DES	L	Leningrad Pulkovo Int'l Arpt, USR	0	12	0	12	4	166	170	Eng. fail., crsh in hvy rain
91J.29	39	5.24.91	Metro Cargo/Sigi Air	FY	Il-76TD	DES	LA	Sighkamar, Bakhtaran, IRN	6	0	0	6	10	0	10	Emer. lndg, fuel exhaust., relief flt.
91J.30	40	5.26.91	Lauda Air 004 (Austria)	SP	B767-329 ER	DES	C	Suphan Buri Province, THL	10	213	0	223	10	213	223	In-flt. eng. reversal op., struc. fail.
91J.31	41	6.13.91	Korean Air 376	SP	B727-281	MJW	L	Taegu Arpt., RSK	0	0	0	0	7	119	126	Gear-up lndg, crw err.
91J.32	42	6.17.91	Air Waves Corp.	?	GS-A.1159 GS	DES	LA	18 mi. S of Caracas, VEN	4	0	0	4	4	0	4	crsh in mtns.
91J.33	43	6.26.91	Okada Air	SP	BAC 1-11	DES	LA	Sokoto, NIG	0	3	0	3	5	48	53	Weather div., emer. lndg
91J.34	44	6.28.91	LTU Sud Int'l AW	G	L.1011-385-1	DES	G	Dusseldorf, FRG	0	0	0	0	0	0	0	Hangar fire during maint.
91J.35	45	7.01.91	?	EXE	Learjet 25B	DES	?	Columbus, OH, USA	?	?	?	?	?	?	?	No details avail.
91J.36	46	7.11.91	Nigeria AW 2120/	NSP	DC-8-61	DES	C	Jiddah Int'l Arpt., SAR	14	247	0	261	14	247	261	In-flt. fire in wheelwell, tire fail. during TO, ret. to field, crsh 3 kms. from RW
91J.37	47	7.23.91	Bard Air Corp.	FY	Learjet 23	DES	C	Detroit, MI, USA	?	?	0	3	?	3	?	LOC? cause unknown
91J.38	48	7.00.91	?	EXE	SN.601-100	DES	?	VEN	?	?	?	?	?	?	?	No details avail.



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						Dmg	PHS		Crw	Pax	Gnd	Tot	Crw	Pax		Tot
91J.39	49	8.15.91	Indian AL 257	SP	B737-2A8 Adv.	DES	LA	Lake Lok Tak, Imphal, IND	6	63	0	69	6	63	69	struck high gnd., bad weather? sabotage?
91J.40	50	8.31.91	L.A.B.	G	B707-323C	MJW	G	Dothan Arpt., AL, USA	0	0	0	0	0	0	0	Hangar fire while painting, explosion
91J.41	51	9.05.91	Conoco Inc., Houston	EXE	G.1159 GS II	DES	LA	30 mi. S of Kota Kinabalu, Indonesia	3	9	0	12	3	9	12	crsh in jungle, struck high gnd.
91J.42	52	9.14.91	Cubana	SP	Tu-154B-2	DES	L	Mexico City Arpt., MEX	0	0	0	0	13	100	113	lnd long, gear fail., overran RW, fire
91J.43	53	9.16.91	Kabo Air	SP	BAC 1-11	MJW	L	Port Harcourt, NIG	0	0	0	0	?	55		Gear-up lndg, crw err.
91J.44	54	9.25.91	Soc Finprogetti	NSP	D. Falcon 20C	DES	L	Kiel, FRG	?	?	0	1	?	11		Overran wet RW, struck trees, high winds
91J.45	55	9.29.91	Aerosucre (Colombia)	F	SE.210-11R	MJW	TO	Bogota Eldorado Arpt., COL	0	0	0	0	3	0	3	R. gear collapse on TO run
91J.46	56	11.07.91	Azerbaijan AL/Aeroflot	SP	Yak-40	DES	LA	Makhachkala, CIS	4	30	0	34	4	30	34	struck high gnd. 12 mi. short, flt. from Elista
91J.47	57	11.10.91	Aeronica	G	B727-25	MJW	G	Managua, NIC	?	?	?	?	?	?		Oxygen fire during maint.
91J.48	58	11.17.91	S.A.H.S.A.	SP	B737-2K6 Adv.	MJW	L	San Jose Arpt., Costa Rica	0	0	0	0	6	36	42	ILS app., fog, gear fail., overran RW
91J.49	59	11.21.91	Azerbaijan AL/Aeroflot	SP?	Yak-40	DES	?	Nagorno-Karabakh, Khodzhevend	?	?	0	20	?	20		No details avail.
91J.50	60	11.27.91	?	EXE	Bch. 400A	DES	?	Parma, ITA	?	?	?	?	?	?		No details avail.
91J.51	61	12.02.91	?	EXE	D. Falcon 20E	DES	?	Villacoublay, FRA	?	?	?	?	?	?		No details avail.
91J.52	62	12.09.91	Libyan Arab AL	SP?	B707-351C	MJW	TO	Tripoli Arpt., LIB	0	0	0	0	10	189	199	Ran off RW, broke into 3 sections
91J.53	63	12.11.91	Brunos, Inc.	EXE	Bch.400	DES	C	6 mi. W of Rome, GA, USA	2	7	0	9	2	7	9	struck Mt. Lavender, crw err.
91J.54	64	12.17.91	Alitalia 1212	SP	DC-9-32	MJW	L	Warsaw Okęcie Arpt., POL	0	0	0	0	6	90	96	Overran wet RW, gear fail., flt. from Rome
91J.55	65	12.27.91	S.A.S. 571	SP	MD-81	MJW	C	Gottrora, 10 mi. N of Stockholm Arpt., SWE	0	0	0	0	6	123	129	In-flt. 2-eng. fail., ice ingestion, emer. lndg in field
91J.56	66	12.29.91	China AL 358	F	B747-2R7F	DES	C	Wanli, 11 nmi. NNE of Taipei, TWN	5	0	0	5	5	0	5	In-flt. eng. fail., struck high gnd., fog, drizzle, Taipei-Anchorage flt.
92J.1	1	1.18.92	USAir 305	SP	DC-9-31	MJW	L	Elmira Corning Arpt., NY, USA	0	0	0	0	5	36	41	hvy lndg, flt. from Ithaca, NY
92J.2	2	1.20.92	Air Inter 5148	SP	A.320-111	DES	LA	Baar, 30 mi. SW of Strasbourg, FRA	5	82	0	87	6	90	96	struck Mt. St. Odile, fog, crw err.
92J.3	3	2.15.92	MK Air Cargo	F	DC-8-54F	MJW	LA	8 mi. from Kano Arpt., NIG	0	0	0	0	5	0	5	crsh 8 kms. short of RW
92J.4	4	2.15.92	Burlington AE/ ATI	F	DC-8-63(F)	DES	LA	Toledo, OH, USA	4	0	0	4	4	0	4	Undershot 3rd app. 3 kms. from RW, fog, rain, flt. from Seattle, WA
92J.5	5	2.20.92	T.A.A.G. (Angola)	?	B707-349C	MJW	L	Luanda, ANG	0	0	0	0	4	0	4	Gear collapse on lndg, fuselage struc. damage
92J.6	6	3.19.92	Kamchatavia	?	Yak-40	MJW	L/G ?		0	0	0	0	?	?		Declared WO during major overhaul following hard lndg from previous flt.
92J.7	7	3.22.92	USAir 405	SP	F.28-4000	DES	TO	New York LaGuardia Arpt., NY, USA	2	25	0	27	4	47	51	RTO, snow, icing, crw err., early rotation, crsh into Flushing Bay, NYC

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						Dmg	PHS		Crw	Pax	Gnd	Tot	Crw	Pax		Tot
92J.8	8	3.24.92	Golden Star AC/Sudan	F	B707-321C	DES	LA	Mt. Mymittus, Athens, GRE	7	0	0	7	7	0	7	struck high gnd. 5 mi. short of arpt., fog, instr. fail.
92J.9	9	3.26.92	Intercontinental de	SP	DC-9-15	MJW	L	Tumaco, COL	0	0	0	0	4	88	92	hvy lndg, fuselage struc. fail.
92J.10	10	3.28.92	Export Air del Peru	?	DC-8-33F	MJW	L	Iquitos Airport, Peru	0	0	0	0	?	?		Nose gear collapse
92J.11	11	3.30.92	AVIACO	SP	DC-9-32	DES	L	Granada, SPN	0	0	0	0	5	94	99	Fuselage aft of wing failed, high winds
92J.12	12	3.31.92	Trans AS/Kabo Air	F	B707-321C	DES	E R	Istres, FRA, ER Kano-LUX	0	0	0	0	5	0	5	Violent in-flt. maneuvers, 2-eng. fail., emer. lndg @ Le Tube AB, gear collapse
92J.13	13	4.08.92	Trans World AL	SP	DC-9-32	MIN	Taxi	Dayton Cox Int'l Arpt., OH, USA	0	0	1	1	?	28		Damaged tire during pushback, failed killing gnd. personnel
92J.14	14	4.29.92	GAS Air Cargo	T	B707-351C	MJW	L	Lagos, NIG	0	0	0	0	?	?		Gear-up lndg
92J.15	15	5.02.92	Transamerica Taxi Aereo	?	Learjet 35A	DES	L	Cumuatillo, Michoacan, MEX	2	0	0	2	2	0	2	Smuggling flt.
92J.16	16	5.04.92	United AL	SP	B757-222	NON	Taxi	Denver Stapleton Int'l Arpt., CO, USA	1	0	0	1	?	62		Pilot heart attack
92J.17	17	5.13.92	Turkmenavia	SP	Yak-40	DES	LA	Cardzhou, Turkmenia	0	0	0	0	4	34	38	atmptd go-around, struck radio mast, fire
92J.18	18	5.29.92	Arghan Ariana	?	Tu-154M	MJW	LA	Kabul, AFG	0	0	0	0	?	?		struck by surface-to-air missile, emer. lndg
92J.19	19	6.05.92	Balkan Bulgarian AL	NSP	Tu-154B	MJW	L	Varna, BUL	0	0	0	0	?	127		Overran RW, damaged front fuselage, nosegear
92J.20	20	6.06.92	Com. Panamena de	SP	B737-204 Adv.	DES	E R	Darien Pass, Tucuti, PAN	7	40	0	47	7	40	47	T-storm, violent maneuvers, in-flt. breakup, crsh in jungle
92J.21	21	6.12.92	Delmarva AC/Jet	EXE	Learjet 25B	DES	TO	Sheboygan, WI, USA	2	0	0	2	2	0	2	No details avail.
92J.22	22	6.22.92	V.A.S.P. (Brazil)	F	B737-2A1C	DES	LA	15 kms. from Curzeiro del Sul, BRA	3	0	0	3	3	0	3	In-flt. fire, crsh in jungle near Moa River
92J.23	23	6.00.92	Aeroflot?	G	Tu-154B	MJW	G	Bratsk	?	?	?	?	?	?		gnd. accident
92J.23	24	6.00.92	Aeroflot?	G	Tu-154B	MJW	G	Bratsk	?	?	?	?	?	?		gnd. accident
92J.24	25	6.00.92	Jakutavia?	?	Il-62	DES	L	Yakutsk, Russia, CIS	?	?	?	?	?	?		Overran RW? into ravine, bad weather div.
92J.25	26	7.09.92	Chile Military AC	EXE	C.650 Citation	DES	?	Cerro Lucata, Chile	?	?	?	?	?	?		No details avail.
92J.26	27	7.20.92	Georgian CAD	F	Tu-154B	DES	TO	Novoalexeyevko, Tblisi, Georgia, CIS	8	16	30	54	8	16	24	Overran RW, struck bldg., overloaded AC
92J.27	28	7.27.92	Crasa Taxi Aereo Ltda	EXE	Learjet 25C	DES	?	BRA	?	?	?	?	?	?		No details avail.
92J.28	29	7.30.92	Trans World AL 843	SP	L.1011-385-1	DES	C	New York JFK Int'l Arpt., NY, USA	0	0	0	0	12	280	292	False stall warning on initial climb, emer. lndg, fire, ran off RW
92J.29	30	7.31.92	Thai AW Int'l 311	SP	A.310-304	DES	LA	Katmandu Tribhuvan Int'l Arpt., NEP	14	99	0	113	14	99	113	Bad weather, struck forested high gnd., 3rd app., crw err.
92J.30	31	7.31.92	China General 7552	SP	Yak-42D	DES	C	Nanjing, Jiangsu, ROC	?	?	0	109	10	116	126	In-flt. eng. fail., overran RW, struck wall

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC FLT		Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
						Dmg	PHS		Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
92J.31	32	8.01.92	Afghan Ariana	G	Tu-154M	DES	G	Kabul, AFG	?	?	?	?	?	?	gnd. rocket attack, previously W.O. 5.29.92	
92J.31	33	8.01.92	Afghan Ariana	G	Yak-40	DES	G	Kabul, AFG	?	?	?	?	?	?	gnd. fighting	
92J.31	34	8.01.92	Afghan Ariana	G	Yak-40	DES	G	Kabul, AFG	?	?	?	?	?	?	gnd. fighting	
92J.32	35	8.23.92	Kabo Air	?	BAC 1-11	MJW	L	Sokoto, NIG	0	0	0	0	4	53	57	Overran RW, Ind@closed arpt., crw err.
92J.33	36	8.23.92	Korean AL	SP	B747-385	NON	Taxi	Chicago O'Hare Int'l Arpt., IL, USA	1	0	0	1	?	276		No details avail.
92J.34	37	8.24.92	Arrow Air	G	DC-8-63F	MJR?	G	Miami Int'l Arpt., FL, USA	0	0	0	0	0	0	0	Hangar collapse, Hurricane Andrew
92J.35	38	8.27.92	Mineral-Vodskoe PO?	SP	Tu-134A	DES	LA	Ivanovo, Russia, CIS	7	77	0	84	7	77	84	crsh 3 km. short of arpt., rain, fog, crw err.
92J.36	39	8.28.92	Aeroflot?	G	Il-76T	MJW	G	Kabul, AFG	?	?	?	?	?	?		gnd. rocket attack
92J.37	40	8.29.92	Hold-Trade Air	SP	BAC 1-11	MJW	L	Kaduna, NIG	0	0	0	0	6	66	72	Overran RW into soft gnd.
92J.38	41	9.21.92	Time Air Sweden	EXE	IAI.1124	MJW	TO	Umea, SWE	0	0	0	0	?	?		Uncontained eng. fail. on TO roll, fuselage damaged
92J.39	42	9.28.92	Pakistan Int'l AL 268	SP	A.300B4-203	DES	LA	Katmandu Tribhuvan Int'l Arpt., NEP	12	155	0	167	12	155	167	crsh 8 nmi. short of RW 02, 1500' low on app., crw err.
92J.40	43	10.04.92	El Al 8162 (Israel)	F	B747-258F	DES	C	Bijlmermeer, Amsterdam, NTL	3	1	47	51	3	1	4	In-flt. 2-eng. fail. and separation, atmpd RTF, struck apartment bldg. on app.
92J.41	44	10.13.92	Antonov Desgn Bureau	T	An-124	DES	?	Kiev, Ukraine, CIS	8	0	0	8	9	0	9	LOC, in-flt. nose door opening? during in-flt. eng. restart tests
92J.42	45	10.13.92	Belarus Air	NSP	Tu-154B-2	DES	TO	Vladivostok, Russia, CIS	0	0	0	0	6	62	68	RTO, overran RW, overloaded AC
92J.43	46	10.15.92	LAC Colombia	F	DC-8-F-55	MJW	L	Medellin, COL	0	0	0	0	3	0	3	Overran RW
92J.44	47	11.14.92	Vietnam AL 474	SP	Yak-40	DES	LA	Nha Trang, Vietnam	6	24	0	30	6	25	31	Tropical storm Forest, flt. from Ho Chi Minh City
92J.45	48	11.20.92	Aerolineas Argentinas	SP	B737-287C	MJW	TO	San Luis, ARG	0	0	0	0	6	107	113	RTO, tire fail., overran RW
92J.46	49	11.22.92	Flight Operations, Inc.	Amb.	Learjet 25B	MJW	L	Cleveland Hopkins Int'l Arpt., OH, USA	0	0	0	0	1	3	4	No details avail.
92J.47	50	11.24.92	China Southern AL 3943	SP	B737-3Y0	DES	LA	Yangti, Guilin, ROC	8	133	0	141	8	133	141	In-flt. eng. fail., LOC, crsh 20 kms. short of RW, flt. from Guangzhou
92J.48	51	11.25.92	DAS Air Cargo	F	B707-321C	DES	LA	Kano, NIG	0	0	0	0	3	0	3	struck trees, crsh 2 mi short of RW, DME, ILS fail.
92J.49	52	11.26.92	Aerobrasil	F	B707-365C	MJW	C	Manaus-AM, BRA	0	0	0	0	4	0	4	struck app. lights, emer. lndg, overran RW, gear fail.
92J.50	53	12.05.92	Armenian AL	?	Tu-154A	MJW	L	Yerevan	0	0	0	0	8	146	154	Overran RW, struck concrete wall, poor visibility
92J.51	54	12.08.92	USAir	SP	B737-3B7	NON	Taxi	New York LaGuardia Arpt., NY, USA	0	0	1	1	?	60		AC struck gnd. personnel on pushback from jetway
92J.52	55	12.13.92	?	G	DC-8-32/33	DES	G	Buenos Aires Ezeiza Arpt., ARG	0	0	0	0	0	0	0	gnd. fire

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
92J.53	56	12.19.92	U.S. Dept. of Energy	EXE	C.550 Citation	DES	LA	Billings Logan Int'l Arpt., MT, USA	2	6	0	8	2	6	8	struck warehouse, fire, wake-vortices? in-flt. eng. fail? wind shear? Watertown, SD-Billings, MT flt.
92J.54	57	12.20.92	Martinair Holland 495	NSP	DC-10-30F (CF)	DES	L	Faro, POR	2	54	0	56	11	275	286	Bad weather, hvy rain, high winds, 2nd app., wingtip struck gnd., fire
92J.55	58	12.22.92	Libyan Arab AL 1103	SP	B727-2L5 Adv.	DES	LA	Suq-es-Sebt, 30 mi. SE of Tripoli, LIB	10	147	0	157	10	147	157	ATC fail., flt. from Benghazi
92J.55	59	12.22.92	Libyan Air Force	Mil.	Mig-23U	DES	?	Suq-es-Sebt, 30 mi. SE of Tripoli, LIB	0	0	0	0	2	0	2	ATC fail., crw ejected safely
92J.56	60	12.27.92	Merpati Nusantara AL	?	F.28-4000	MJW	E R	Pekanbaru, Simpang Tiga Arpt.	0	0	0	0	4	41	45	In-flt. hydraulic fail., emer. gear-up Indg, ran off RW
93J.1	1	1.09.93	Uzbeki/Indian AL	SP	Tu-154B-2	DES	L	Delhi Arpt., IND	0	0	0	0	13	152	165	Missed RW, fog, rolled, inverted, fire
93J.2	2	1.15.93	Air Afrique (TAROM) 153	F	B707-321C	MJW	LA	Abidjan, Ivory Coast	0	0	0	0	3	0	3	Undershot RW 21, night app., fog, gear collapse
93J.3	3	1.31.93	L.A.D.E.	SP	B707-387B	MJW	L	Recife, BRA	0	0	0	0	12	158	170	Hydraulic, fail., main gear collapse
93J.4	4	2.08.93	Iran Air Tours 962	NSP	Tu-154M	DES	C	Karaj, Tehran or Meherabad, IRN	16	119	0	135	16	119	135	Mid-air coll., pilgrimage flt. to Mashhad
93J.4	5	2.08.93	Iran Air Force	Mil.	Su-25	DES	?	Karaj, Tehran or Meherabad, IRN	2	0	0	2	2	0	2	Mid-air coll.
93J.5	6	3.05.93	Pal Air Macedonian	SP	F.100	DES	C	Skopje, MCD	4	77	0	81	6	91	97	Stall due to icing, crsh 0.5 mi. from RW, snowstorm, AC not deiced before TO, flt. to Zurich
93J.6	7	3.30.93	Royal Thai Air Force	T	B737-3Z6	DES	?	Muang Khon Kaen, THL	5	1	0	6	5	1	6	In-flt. eng. fail? loss of pitch-trim control? pitch up, rolled, stalled, dived, impacted vertically
93J.7	8	4.02.93	Lineas Aeropostal	T	DC-9-15	DES	?	Caribbean Sea, 10 mi. N of Margarita Is.	2	9	0	11	2	9	11	crsh @ sea, maint. test flt.
93J.8	9	4.05.93	T.A.C.A. Int'l 510	SP	B767-2S1	MJR	L	Guatemala City Int'l Arpt., Guatemala	0	0	0	0	9	227	236	Ind long, overran wet RW, struck bldgs., gear collapse, struck embankment
93J.9	10	4.06.93	China Eastern	SP	MD-11	MAJ	E R	Pacific Ocean	0	2	0	2	16	248	264	In-flt. leading edge slat deployment, emer. Indg @ Shemya, Aleutian Is.
93J.10	11	4.14.93	American AL 102	SP	DC-10-30	MJW	L	Dallas/Ft. Worth Int'l Arpt., TX, USA	0	0	0	0	13	189	202	Ran off RW, nose & lt. gear collapse, emer. evac., flt. from Honolulu, HI
93J.11	12	4.18.93	Japan AS 451	SP	DC-9-41	DES	L	Hanamaki Arpt., JPN	0	0	0	0	5	72	77	Tail, rt. wing struck gnd., 25 kt. crosswind, 32 kt. gusts, crw err., rt. gear collapse, fire, flt. from Nagoya
93J.12	13	4.21.93	Uzbeki	?	Il-76TD	MJW	C	Tehkal, Peshawar	?	?	?	?	?	?	?	Emer. Indg, overran RW, struck wall, shops
93J.13	14	4.24.93	Air Inter	?	A.300B2-21C	MJW	Taxi	Montpellier	0	0	0	0	?	?	?	Tail struck light std. during pushback
93J.14	15	4.26.93	Indian AL 491	SP	B737-2A8	DES	C	Aurangabad, 280 km. NE of Bombay, IND	2	53	0	55	6	112	118	Fail. to climb, overloaded AC, struck truck, powerline
93J.15	16	5.06.93	SERCA	FY	SE.210-10B3	MJW	L	Cayenne	0	0	0	0	4	0	4	Hard Indg, delivery flt. to Colombia

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC FLT Dmg	PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
93J.16	17	5.06.93	VARIG	SP	B747-	MJW	TO	Lima, Peru	0	0	0	0	?	?		RTO, FOD eng. fail.
93J.17	18	5.17.93	Tumenavia	?	Yak-40	MJW	L	Hanty-Mansiysk	0	0	0	0	?	?		Overran RW, nose gear collapse
93J.18	19	5.18.93	Biman Bangladesh AL	SP	DC-10-30	MJW	L	Dacca, Bangladesh	0	0	0	0	12	123	135	Ran off wet RW, hvy rain, gear damaged
93J.19	20	5.19.93	SAM Colombia 505	SP	B727-46	DES	LA	Mt. Frontino, Medellin, COL	7	125	0	132	7	125	132	App. guidance destr. by terrorists, night, bad weather, struck mtn. @ 12300'
93J.20	21	5.26.93	City Air	?	C.550 Citation	MJW	L	Southampton, UK	0	0	0	0	2	0	2	Overran wet RW onto road, rain, T-storm
93J.21	22	6.01.93	Merpati Nusantara AL	SP	F.28-3000R	DES	LA	Sorong, Irian Jaya, Indonesia	4	37	0	41	4	39	43	crsh @ sea 0.6 km. short of RW, hvy rainstorm
93J.22	23	6.07.93	Aero-Dienst	T	Learjet 35A	DES	C	Cologne, FRG	2	2	0	4	2	2	4	Eng. fail. or siml. fail., LOC?
93J.23	24	7.18.93	S.A.S.H.A. 415	SP	B737-2H6 Adv.	MJW	L	Managua Arpt., NIC	0	0	0	0	6	88	94	hvy lndg, ran off RW into ditch, flt. from Tegucigalpa
93J.24	25	7.19.93	SERVIVENSA	?	DC-9-32	MJW	L	Ciudad Bolivar	0	0	0	0	5	60	65	Overran wet RW 24
93J.25	26	7.23.93	China Northwest AL	SP	BAe.146-300	DES	TO	Yinchuan Arpt., Ningxia, ROC	0	55	0	55	5	108	113	Ran off RW on 2nd TO run, ran into lake
93J.26	27	7.26.93	Asiana AL 733	SP	B737-5L9	DES	LA	4.5 mi. S of Makpo Arpt., RSK	3	63	0	66	6	110	116	struck high gnd., 3rd app., bad weather, Seoul-Makpo flt.
93J.27	28	7.26.93	Trans Mediterranean	?	B707-327C	MJW	Taxi	Amsterdam Schiphol Intl. Arpt., NTL	0	0	0	0	?	?		lndg gear fail.
93J.28	29	7.26.93	Bombardier	T	CL.600-2B19	DES	?	Iuka, 60 mi. W of Wichita, KS, USA	3	0	0	3	3	0	3	Rolled inverted, LOC
93J.29	30	8.04.93	SAM Colombia	G	B727-46	MJW	G	Bogota, COL	0	0	0	0	0	0	0	gnd. eng. fire during maint.
93J.30	31	8.18.93	American Int'l AW/ KFS	F	DC-8-61F	MJW	LA	Guantanamo Bay NAS, CUB	0	0	0	0	3	0	3	R. wing struck gnd. on steep app., cartwheeled, fire, short of RW, flt. from Norfolk NAS
93J.31	32	8.27.93	Tadzhikistan National AL	SP	Yak-40	DES	TO	Khorog, Tadzhikistan	5	77	0	82	5	77	82	Eng. fail.? overloaded AC, overran RW into river
93J.32	33	9.02.93	TAESA	NSP	Learjet 25D	MJW	L	Tijuana, MEX	0	0	0	0	2	4	6	hvy lndg, ran off RW, flt. from Mexico City
93J.33	34	9.03.93	Aerocondor	?	NA.265-40A	DES	L	Buenos Aires Airport, ARG	0	0	0	0	2	0	2	Overran RW, overturned, thrust rev. fail.
93J.34	35	9.05.93	Dominicana de Aviacion	?	B727-281 Adv.	MJW	Taxi	Santo Domingo	0	0	0	0	?	?		Fire @ terminal upon arr. from San Juan
93J.35	36	9.14.93	Lufthansa 2904	SP	A.320-211	DES	L	Warsaw Int'l Arpt., POL	1	1	0	2	6	74	80	Overran wet RW, struck embankment, fire
93J.36	37	9.14.93	Air France	SP	B747-428	MJR?	L	Papette Arpt., TAH	0	0	0	0	16	256	272	Overran RW 04 into shallow lagoon, thrust rev. fail.
93J.37	38	9.21.93	Transair Georgia/Aeroflot	?	Tu-134A	DES	LA	Sukhumi, Georgia, CIS	5	22	0	27	5	22	27	struck by rebel SAM, crsh in Black Sea

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: CHRONOLOGICAL LISTING**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
93J.38	39	9.22.93	Transair Georgia/Aeroflot	NSP	Tu-154B	DES	LA	Sukhumi Arpt., Georgia, CIS	?	?	?	80?	12	120	132	struck by rebel gunfire, SAM, explosion
93J.39	40	9.23.93	Transair Georgia	?	Tu-134	DES	G	Sukhumi Arpt., Georgia, CIS	?	?	?	1+	?	?		struck by rebel missile while boarding pax
93J.40	41	10.26.93	China Eastern 5398	SP	MD-82	DES	L	Fuzhou, ROC	0	2	0	2	9	71	80	Ind long, overran RW into swamp, flt. from Shenzhen
93J.41	42	11.04.93	China AL 605	SP	B747-409	MJW	L	Victoria Harbor, Hong Kong Int'l Arpt.	0	0	0	0	?	296		Overran RW 13 during tropical storm Ira, into sea, Taipei-Hong Kong flt.
93J.42	43	11.11.93	Aviastar/Magistralnye	?	An-124	DES	LA	Joupar Mtns., 40 kms. E of Kerman, IRN	?	?	0	17	?	17		struck mtn., emer. refueling div., Dubain-Tashkent flt.
93J.43	44	11.13.93	China Northern 6901	SP	MD-82	DES	LA	Urumqi, Xinjiang, ROC	4	8	0	12	9	92	101	crsh short of app., poor visibility, Beijing-Urumqi flt.
93J.44	45	11.15.93	Indian AL	SP	A.300B2-101	DES	ER	Tirupati, 100 kms. NW of Madras	0	0	0	0	13	250	263	Weather div. from Hyderabad, fuel exhaustion, in-flt. flaps & gear fail., emer. lndg in rice field
93J.45	46	11.21.93	Avioimpex	NSP	Yak-42D	DES	LA	4 mi. E of Ohrid Arpt., MCD	8	107	0	115	8	108	116	struck Mt. Trojani, 2nd app., Geneva-Skopje flt.
93J.46	47	12.15.93	?	EXE	IAI.1124	DES	LA	Santa Ana, CA, USA	1	4	0	5	1	4	5	crsh in field, preceding B.757 wake-vortices
<b>SUMMARY STATISTICS:</b>		<b>Tot. Aircraft Involved</b>		1,133												
		<b>Tot. Aircraft Destroyed</b>		848												
		<b>Tot. Aircraft Written Off</b>		170												

## **Appendix C**

### **World Jet Transport Accidents 1970-1992: Phase of Flight**

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: LISTED BY PHASE OF FLIGHT**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities			Aboard AC			Cause, Remarks, Details	
									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
70J.7	7	2.22.70	Israeli AC Industries	T	IAI.1121	DES ?		Tel Aviv Lod Arpt., ISR	0	0	0	0	4	0	4	Mech. fail, loss of cntrl, crw parachuted
70J.8	8	2.28.70	United States Air Force	?	T-39A	DES ?	?		?	?	?	?	?	?	?	No details avail.
70J.19	20	7.20.70	Private AC	PVT	Piper	DES ?		Tarragona, SPN	1	2	0	3	1	2	3	ATC failure
70J.36	39	12.23.70	L'Armee de L'Air	?	MS.760	DES ?		Paris Le Bourget Arpt., FRA	?	?	?	?	?	?	?	No details avail.
71J.7	8	3.23.71	Aerospatiale	T	SN.600	DES ?		Marseille, FRA	3	0	0	3	3	0	3	No details avail.
71J.8	9	3.26.71	?	?	HS.125-400B	DES ?		Devil's Peak, SAF	?	?	?	?	?	?	?	No details avail.
71J.8	10	3.26.71	?	?	HS.125-400B	DES ?		Devil's Peak, SAF	?	?	?	?	?	?	?	No details avail.
71J.8	11	3.26.71	?	?	HS.125-400B	DES ?		Devil's Peak, SAF	?	?	?	?	?	?	?	No details avail.
71J.15	20	7.30.71	Japan Air Self Def. Force	Mil.	F-86F Sabre	DES ?		Morioko, Shizukuishi, Honshu, JPN	0	0	0	0	1	0	1	ATC failure
71J.21	26	9.16.71	U.S. Air Force 375 MAW	?	C-9A	MJW ?		Scott AFB, IL, USA	?	?	?	?	?	?	?	No details avail.
71J.26	33	12.27.71	Private AC	PVT	Beechcraft	DES ?		Vienna Arpt., AUT	1	0	0	1	1	0	1	GTC failure
72J.11	11	3.08.72	Trans World AL	?	B707-331	MJW ?		Las Vegas, NV, USA	?	?	?	?	?	?	?	No details avail.
72J.33	33	10.30.72	Interflug (E. Germany)	?	Tu-134	MJW ?		Dresden, GDR	?	?	?	?	?	?	?	No details avail.
73J.15	16	3.23.73	C.A.A.C. (China)	SP?	Il-62	DES ?		?	?	?	?	?	?	?	?	No details avail.
73J.16	18	4.12.73	United States Navy	Mil.	P-3C Orion	DES ?		Moffett NAS, CA, USA	?	?	0	12?	?	13?	?	ATC failure
74J.10	10	2.09.74	United States Air Force	?	T-39A	DES ?		Colorado Springs, CO, USA	?	?	?	?	?	?	?	No details avail.
74J.26	28	8.31.74	Alpine AC Charters	T	Learjet 25B	DES ?		Eaton, Briggsdale, CO, USA	1	3	0	4	1	3	4	LOC, cause unknown
75J.18	19	7.05.75	Balkan Bulgarian	SP	Tu-134	MAJ ?		Sofia Arpt., BUL	0	0	0	0	?	?	?	GTC failure
75J.20	21	7.15.75	Aeroflot	SP	Yak-40	DES ?		Batum Arpt., Georgia, USR	?	?	?	28	?	?	?	crsh @ sea
75J.35	36	12.21.75	United States Navy	?	CT-39E	DES ?		Alameda NAS, CA, USA	?	?	?	?	?	?	?	No details avail.
76J.6	6	1.22.76	L'Armee de l'Air	?	D. Falcon 20C	DES ?		Rambouillet, FRA	?	?	?	?	?	?	?	No details avail.
76J.9	9	3.09.76	Syrianair	?	Yak-40	MJW ?		Beirut, LEB	?	?	?	?	?	?	?	No details avail.
76J.38	40	11.12.76	?	?	Learjet 25B	DES ?		Guanabara Bay, BRA	?	?	?	?	?	?	?	No details avail.
76J.40	42	11.27.76	W. German Air Force	?	HFB-320	DES ?		Schwabmunchen, FRG	?	?	?	?	?	?	?	No details avail.
77J.17	19	4.22.77	Trans World AL	?	B707-131	DES ?		Indianapolis, IN, USA	?	?	?	?	?	?	?	Fire
78J.22	24	5.18.78	Private AC	PVT	Cessna 150M	DES ?		3.7 mi. W of Memphis Int'l Arpt., TN, USA	1	1	0	2	1	1	2	ATC failure
78J.28	30	6.00.78	Aeroflot	T	Tu-144	DES ?		E of Moscow, USR	2	0	0	2	5	0	5	No details avail.
78J.44	47	00.00.78	United States Air Force	?	T-39A	DES ?		?	?	?	?	?	?	?	?	No details avail.
79J.6	7	2.17.79	Taiwan Air Force	Mil.	Northrop F-5	DES ?		Taoyuan, TWN	1	0	0	1	1	0	1	ATC failure
79J.8	9	3.13.79	U.S. Air Force 475 ABW	?	T-39A	DES ?		Kunsong, RSK	?	?	?	?	?	?	?	No details avail.
79J.17	18	5.27.79	Mauritanian	?	SE.210-VIR	DES ?		Atlantic Ocean off Senegal	?	?	?	?	?	?	?	No details avail.
79J.18	19	6.18.79	?	?	HS.125-3B/RA	DES ?		Brasilia, BRA	?	?	?	?	?	?	?	No details avail.



**WORLD JET TRANSPORT ACCIDENTS 1970-1993: LISTED BY PHASE OF FLIGHT**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities			Aboard AC			Cause, Remarks, Details	
									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
79J.19	20	6.00.79	L'Armee de l'Air	?	SE.210-11R	MJW	?	TAH	?	?	?	?	?	?	No details avail.	
79J.33	35	9.12.79	S.A.N. Ecuador	?	SE.210-VIR	MJW	?	?	?	?	?	?	?	?	No details avail.	
81J.8	8	2.11.81	Argentina Air Force	?	FMA.760	DES	?	San Rafael, Mendoza, ARG	?	?	0	2	?	?	No details avail.	
81J.10	10	2.00.81	?	?	R. Sabreliner 40	DES	?	MEX City, MEX	?	?	?	?	?	?	No details avail.	
81J.20	20	6.05.81	Uni Air Int'l	?	Learjet 23	DES	?	Paris Le Bourget Arpt., FRA	0	0	0	0	2	2	4	No details avail.
82J.7	7	3.08.82	Trans World AL	?	B707-131B	MJW	?	Las Vegas Int'l Arpt., NV, USA	0	0	0	0	0	0	0	No details avail.
82J.17	17	5.29.82	?	?	MS.760	DES	?	Villacoublay, FRA	?	?	?	?	?	?	No details avail.	
82J.19	19	6.07.82	?	?	Learjet 35A	DES	?	Falkland Is.	?	?	?	?	?	?	No details avail.	
84J.2	2	1.20.84	Bolivia Air Force	?	R. Sabreliner 60	DES	?	Brownsville, TX, USA	?	?	?	?	?	?	Emer. lndg	
84J.16	16	7.28.84	?	?	Learjet 25B	DES	?	Waterville, ME, USA	?	?	?	?	?	?	No details avail.	
85J.8	8	3.07.85	?	?	Learjet 25D	DES	?	?	?	?	?	?	?	?	No details avail.	
85J.13	13	4.20.85	U.S. Air Force 1402 MAS	?	CT-39A	DES	?	Wilkes-Barre, Scranton, PA, USA	?	?	?	?	?	?	No details avail.	
85J.21	22	6.14.85	Trans World AL 847	SP	B727-231	?	?	?	?	?	?	?	?	?	hij.	
85J.43	46	12.12.85	Air Provence	?	Learjet 24B	DES	?	Toulouse Blagnac Arpt., FRA	0	0	0	0	?	?	No details avail.	
86J.5	5	1.31.86	?	?	Learjet 23	DES	?	?	?	?	?	?	?	?	No details avail.	
86J.9	9	3.05.86	Flight Int'l AL	T	Learjet 35	DES	?	San Clemente Is., CA, USA	2	0	0	2	2	0	2	USN training flt., ATC fail.
86J.9	10		Flight Int'l AL	T	Learjet 24D	DES	?	San Clemente Is., CA, USA	2	0	0	2	2	0	2	USN training flt., ATC fail.
86J.10	11	3.05.86	Flight Int'l AL	?	Learjet 24B	MJR	?	San Clemente Is., CA, USA	0	0	0	0	?	?		In-flt. coll. avoidance
86J.29	31	9.29.86	?	?	R. Sabreliner	DES	?	Liberal, KS, USA	?	?	?	?	?	?	?	No details avail.
86J.38	41	11.06.86	Barbary Coast Hotel	?	C.551 Citation	DES	?	San Ignacio, Mulege, Baja, MEX	0	0	0	0	?	?	?	No details avail.
87J.10	10	2.08.87	Iran Air Force	?	D. Falcon 20	DES	?	Omidiyeh AB	?	?	?	?	?	?	?	Shot down by Iranian air defences
87J.11	11	2.14.87	Skyworld AL	?	B707-323B	?	?	Durango, MEX	?	?	?	?	?	?	?	No details avail.
87J.21	22	6.16.87	Chinese Air Force	Mil.	J-6 (MiG-19)	DES	?	Fuzhou Arpt., ROC	1	0	0	1	1	0	1	ATC failure
88J.9	9	2.11.88	?	?	D. Falcon 20D	DES	?	Akron, OH, USA	?	?	?	?	?	?	?	No details avail.
88J.13	13	2.00.88	?	?	B707-	NON	?	MEX	1	0	0	1	?	?	?	Severe turbulence
88J.22	22	6.03.88	Ecuador Air Force	?	R. Sabreliner 40	DES	?	Quito Arpt., ECU	?	?	0	11	?	11	?	No details avail.
88J.26	26	7.12.88	United States Navy	?	CT-39E	DES	?	S. ROC Sea	0	0	0	0	?	3	?	Ditched @ sea
88J.37	37	9.24.88	Aeroflot	?	Tu-154B-2	MJW	?	Aleppo	?	?	?	?	?	?	?	No details avail.
88J.45	46	10.26.88	Private AC	PVT	Cessna 172	DES	?	Salzburg, AUT	1	3	0	4	1	3	4	ATC failure
89J.16	16	3.21.89	Soviet Air Force	?	Il-76	DES	?	Menongue AB, ANG	?	?	?	?	?	?	?	Shot down by UNITA forces
90J.9	10	2.01.90	Soviet Air Force	?	Il-76	DES	?	Lithuania, USR	?	?	0	6	?	?	?	No details avail.
90J.27	28	8.16.90	?	EXE	C.500 Citation I	DES	?	Freisach, AUT	?	?	?	?	?	?	?	No details avail.

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									Crw	Pax	Gnd	Tot	Crw	Pax	
90J.42	45	12.02.90	?	EXE	IAI.1121	DES	?	Lagura del Saule, Uruguay	?	?	?	?	?	?	No details avail.
90J.45	49	12.00.90	?	?	HFB-320	MJW	?	Mojave, CA, USA	?	?	?	?	?	?	No details avail.
91J.10	18	2.28.91	Japan Military AC	?	Learjet 36A	DES	?	JPN	?	?	?	?	?	?	No details avail.
91J.12	20	3.03.91	United States Navy	?	CT-39G	DES	?	Glenview, IL, USA	?	?	?	?	?	?	No details avail.
91J.26	36	5.09.91	?	?	CL.600	DES	?	Silt, CO, USA	1	0	0	1	1	0	1 High wind gusts
91J.35	45	7.01.91	?	EXE	Learjet 25B	DES	?	Columbus, OH, USA	?	?	?	?	?	?	No details avail.
91J.38	48	7.00.91	?	EXE	SN.601-100	DES	?	VEN	?	?	?	?	?	?	No details avail.
91J.49	59	11.21.91	Azerbaijan AL/Aeroflot	SP?	Yak-40	DES	?	Nagorno-Karabakh, Khodzhavend	?	?	0	20	?	20	No details avail.
91J.50	60	11.27.91	?	EXE	Bch. 400A	DES	?	Parma, ITA	?	?	?	?	?	?	No details avail.
91J.51	61	12.02.91	?	EXE	D. Falcon 20E	DES	?	Villacoublay, FRA	?	?	?	?	?	?	No details avail.
92J.25	26	7.09.92	Chile Military AC	EXE	C.650 Citation	DES	?	Cerro Lucata, Chile	?	?	?	?	?	?	No details avail.
92J.27	28	7.27.92	Crasa Taxi Aereo Ltda	EXE	Learjet 25C	DES	?	BRA	?	?	?	?	?	?	No details avail.
92J.41	44	10.13.92	Antonov Design Bureau	T	An-124	DES	?	Kiev, Ukraine, CIS	8	0	0	8	9	0	9 LOC, in-flt. nose door opening? during in-flt. eng. restart tests
92J.55	59	12.22.92	Libyan Air Force	Mil.	Mig-23U	DES	?	Suq-es-Sebt, 30 mi. SE of Tripoli, LIB	0	0	0	0	2	0	2 ATC fail., crw ejected safely
93J.4	5	2.08.93	Iran Air Force	Mil.	Su-25	DES	?	Karaj, Tehran or Meherabad, IRN	2	0	0	2	2	0	2 Mid-air coll.
93J.6	7	3.30.93	Royal Thai Air Force	T	B737-3Z6	DES	?	Muang Khon Kaen, THL	5	1	0	6	5	1	6 In-flt. eng. fail? loss of pitch-trim control? pitch up, rolled, stalled, dived, impacted vertically
93J.7	8	4.02.93	Lineas Aeropostal	T	DC-9-15	DES	?	Caribbean Sea, 10 mi. N of Margarita Is.	2	9	0	11	2	9	11 crsh @ sea, maint. test flt.
93J.28	29	7.26.93	Bombardier	T	CL.600-2B19	DES	?	Iuka, 60 mi. W of Wichita, KS, USA	3	0	0	3	3	0	3 Rolled inverted, LOC
70J.1	1	1.05.70	Spantax (Spain)	FY	CV.990-30A-5	DES	C	Stockholm Arlanda Arpt., SWE	5	0	0	5	10	0	10 Snow, 3-eng. TO, crw err.
70J.4	4	2.09.70	United Arab AL	SP	DH.106-IVC	DES	C	Munich Riem Arpt., FRG	0	0	0	0	9	14	23 Icing, buffeting, RTO
70J.5	5	2.15.70	Compania Dominicana	SP	DC-9-32	DES	C	Santo Domingo Arpt., Dominican Rep.	5	97	0	102	5	97	102 Eng. fail., crsh @ sea
70J.6	6	2.21.70	Swissair 330	SP	CV.990-30A-6	DES	C	Wuerenlingen, SWI	9	38	0	47	9	38	47 In-flt. bombing, in-flt. fire
70J.20	20	7.20.70	Imperial Tobacco Co.	T	HS.125-3B	DES	C	Edinburgh Turnhouse Arpt., UK	1	0	0	1	2	0	2 Siml. eng. fail. on TO, LOC
70J.26	26	9.8.70	Traas Int'l 863	FY	DC-8-63CF	DES	C	New York Kennedy Int'l Arpt., NY, USA	11	0	0	11	11	0	11 RTO, LOC
71J.9	12	3.31.71	Western AL 366	T	B720-047B	DES	C	Ontario Int'l Arpt., CA, USA	5	0	0	5	5	0	5 Siml. missed app., LOC
71J.12	15	6.06.71	Huges Air West 706	SP	DC-9-31	DES	C	Duarte, 20 mi. NE of Los Angeles, CA, USA	5	44	0	49	5	44	49 ATC failure
71J.16	21	8.07.71	Aeroflot	SP	Tu-104B	DES	C	Irkutsk, RFSSR, USR	?	?	0	97	?	97	Irkutsk-Vladivostok flt.
71J.18	23	9.06.71	Pan Int'l	NSP	BAC 1-11	DES	C	Hamburg Fuhls. Arpt., FRG	1	21	0	22	6	115	121 Eng. fail., emer. lndg
72J.22	22	6.18.72	B.E.A. 548 (U.K.)	SP	DH.121-1C	DES	C	Staines, Middlesex, UK	6	112	0	118	6	112	118 LOC, crw err., pilot heart attack?
72J.26	26	8.14.72	Interflug (E. Germany)	NSP	Il-62	DES	C	Berlin Schoenfeld Arpt., GDR	8	148	0	156	8	148	156 In-flt. fuselage fire, LOC

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
72J.35	35	11.28.72	Japan AL 446	SP	DC-8-62	DES	C	Moscow Sheremetyevo Arpt., USSR	9	53	0	62	15	61	76	Icing, eng. fail., crw err.
72J.36	36	12.03.72	Spantax (Spain)	NSP	CV.990-30A-5	DES	C	Santa Cruz Arpt., Tenerife, SPN	7	148	0	155	7	148	155	LOC, turbulence, fog, crw err., fire
72J.40	40	12.15.72	Zantop AW 23	FY	Learjet 23	DES	C	Detroit Metro. Arpt., MI, USA	2	0	1	3	2	0	2	Failed to climb, struck fuel storage tank, fire
73J.9	9	2.26.73	Machinery Buyers Corp.	EXE	Learjet 24	DES	C	Atlanta DeKalb Arpt., GA, USA	2	5	0	7	2	5	7	Birdstrike, in-flt. eng. fail., struck bldg.
73J.32	34	7.22.73	Pan American AW 816	SP	B707-321B	DES	C	Papeete, TAH	10	68	0	78	10	69	79	crsh @ sea, stalled on climbout, crw err.
73J.44	46	9.25.73	Lisa Jet	EXE	Learjet 25	DES	C	Lincoln, NE, USA	2	1	0	3	2	1	3	crw err., low ceiling, fog
74J.2	2	1.04.74	Midwest Oil Co.	EXE	R. Sabreliner 40	DES	C	Midland, TX, USA	2	0	0	2	2	0	2	Dove into gnd., cause unknown
74J.6	6	1.26.74	T.H.Y. (Turkey)	SP	F.28-1000	DES	C	Cumovasi AFB, Izmir, TUR	4	62	0	66	5	68	73	Icing, overrotation on TO, stalled, crw err., fire
74J.14	14	3.03.74	T.H.Y. 981 (Turkey)	SP	DC-10-10	DES	C	Bosquet de Dammar, Paris, FRA	12	334	0	346	12	334	346	In-flt. cargo door opening, mech. fail., control fail.
74J.15	15	3.05.74	?	F	Learjet 24	DES	C	Normandia, BOL	0	0	0	0	2	0	2	In-flt. eng. fire, emer. lndg
74J.31	33	11.20.74	Lufthansa 540/19	SP	B747-130	DES	C	Nairobi Arpt., KEN	4	55	0	59	17	140	157	impr. TO config., crw err., fire
74J.36	38	12.01.74	Northwest AL 6231	FY	B727-251	DES	C	Thiells, NY, USA	3	0	0	3	3	0	3	Icing, LOC, crw err.
74J.38	40	12.22.74	AVENSA 358	SP	DC-9-14	DES	C	32 kms. from Maturin, VEN	6	69	0	75	6	69	75	LOC, in-flt. eng fail.? explosion?
75J.14	14	6.14.75	Kerr-McGee Corp.	EXE	R. Sabreliner	DES	C	Watertown Arpt., SD, USA	0	0	0	0	2	4	6	Birdstrikes, in-flt. eng. fail, emer. lndg
75J.22	23	8.07.75	Continental AL 426	SP	B727-224	DES	C	Denver Int'l Arpt., CO, USA	0	0	0	0	7	124	131	Wind shear, settled back on RW
75J.34	35	11.20.75	Hawker Siddeley AC Co.	T	HS.125-600B	DES	C	Dunsfold, Surrey, UK	0	0	6	6	2	7	9	Birdstrikes, in-flt. eng. fail., struck car
76J.3	3	1.03.76	Aeroflot	SP	Tu-134	DES	C	Moscow Vnukovo Arpt., USSR	4	83	0	87	4	83	87	In-flt. fire, Moscow-Brest, Belorussia flt.
76J.17	18	6.01.76	Aeroflot	SP	Tu-154	DES	C	Macias Nguema, Equatorial Guinea	4	42	0	46	4	42	46	Struck high gnd.
76J.22	23	8.02.76	Korean AL	F	B707-373C	DES	C	Alborz Mtns., Teheran, IRN	5	0	0	5	5	0	5	Struck high gnd.
76J.29	31	9.10.76	Inex Adria 550	NSP	DC-9-31	DES	C	Zagreb, YUG	5	108	0	113	5	108	113	ATC failure
76J.33	35	10.06.76	Cubana 455	SP	DC-8-43	DES	C	Barbados Int'l Airport, Barbados	12	61	0	73	12	61	73	In-flt. bombing, crsh @ sea
76J.34	36	10.12.76	Indian AL	SP	SE.210-VIN	DES	C	Bombay Santa Cruz Arpt., IND	6	89	0	95	6	89	95	In-flt. engine fire, atmptd. emer. lndg
76J.35	37	10.13.76	L.A.B. (Bolivia)	F	B707-131	DES	C	Santa Cruz, BOL	3	0	110	113	3	0	3	crsh into town, eng. fail.? crw err.?
76J.37	39	11.12.76	Reynolds Tobacco Co.	EXE	D. Falcon 20F	DES	C	Naples, FL, USA	0	0	0	0	2	9	11	Birdstrikes, in-flt. eng. fail., struc. fail.
76J.41	43	11.28.76	Aeroflot	SP	Tu-104	DES	C	Moscow, USSR	5	67	0	72	5	67	72	No details avail.
77J.3	4	1.06.77	Jet Aviation	EXE	Learjet 24B	DES	C	Palm Springs, CA, USA	2	2	0	4	2	2	4	Struck Mt. San Bernardino
77J.6	7	1.13.77	Japan AL	F	DC-8-62AF	DES	C	Anchorage Int'l Arpt., AK, USA	5	0	0	5	5	0	5	Icing, intoxicated pilot, crw err.
77J.11	12	3.17.77	British Airtours	T	B707-436	DES	C	Prestwick Arpt., Scotland, UK	0	0	0	0	5	0	5	Siml. eng. failure, crw err.
77J.16	18	4.18.77	Philippine AL	SP	DC-8-53	MJW	C	Tokyo Haneda Int'l Arpt., JPN	0	0	0	0	13	127	140	Mech. fail., LOC, high winds
77J.19	21	4.28.77	Southern Co. Services	EXE	HS.125-600A	DES	C	McLean, VA, USA	2	2	0	4	2	2	4	instr. fail., LOC

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
77J.29	31	8.20.77	Monarch Aviation	F	CV.880-22-2(F)	DES	C	San Jose Int'l Arpt., Costa Rica	3	0	0	3	3	0	3	Struck gnd. 2 mi. from RW
77J.30	32	9.08.77	Champion Home	EXE	Learjet 25B	DES	C	Sanford, NC, USA	2	3	0	5	2	3	5	In-flt. fire, explosion
77J.32	34	9.23.77	Arab Wings	NSP	Learjet 36A	DES	C	Amman Arpt., JOR	2	2	0	4	2	2	4	Misloaded AC, LOC
77J.35	37	10.05.77	Trico Aviation	EXE	Learjet 25B	DES	C	Amarillo Int'l Arpt., TX, USA	0	0	0	0	2	1	3	LOC, crw err.
77J.38	40	11.07.77	Mech. Equipment Co.	EXE	R. Sabreliner 40	DES	C	New Orleans, LA, USA	1	2	0	3	2	2	4	crsh into Lake Ponchartrain
77J.40	42	11.19.77	Ethiopian AL	F	B707-360C	DES	C	Rome Leonardo Da Vinci Arpt., ITA	3	2	0	5	3	2	5	impr. rotation, flew into gnd.
78J.1	1	1.01.78	Air India 855	SP	B747-237B	DES	C	Bay of Bombay, IND	23	190	0	213	23	190	213	crw err., instr. fail.?
78J.12	13	3.16.78	Balkan-Bulgarian	SP	Tu-134	DES	C	Gabare, 130 km NE of Sofia, BUL	7	66	0	73	7	66	73	emer. declared, LOC
78J.20	21	4.27.78	John Cassidy Jr.	EXE	IAI.1121A	DES	C	Flatwoods, LA, USA	2	0	0	2	2	0	2	In-flt. explosion, fire, cause unknown
78J.22	23	5.18.78	Flight Safety Int'l	T	D. Falcon 20C	DES	C	3.7 mi. W of Memphis Int'l Arpt., TN, USA	4	0	0	4	4	0	4	ATC failure
78J.32	35	9.25.78	Gibbs Flite Center	PVT	Cessna 172M	DES	C	San Diego, CA, USA	2	0	0	2	2	0	2	ATC failure
78J.34	37	10.17.78	Martin Aviation	T	Learjet 24	DES	C	Lancaster Fox Arpt., CA, USA	2	0	0	2	2	0	2	Touch-&-go lndg, LOC
78J.39	42	12.17.78	Indian AL	SP	B737-2A8	DES	C	Hyderabad Begumpet Arpt., IND	0	1	3	4	6	126	132	impr. TO config.
78J.40	43	12.20.78	Flight Training Center	NSP	Learjet 25	DES	C	Minneapolis Int'l Arpt., MN, USA	0	0	0	0	2	5	7	LOC, icing, crw err.
79J.5	5	2.09.79	Eastern AL	T	DC-9-14	DES	C	Dade Collier Arpt., Miami, FL, USA	0	0	0	0	4	1	5	Siml. eng. fail.
79J.10	11	3.14.79	C.A.A.C. (China)	T	HS.121-2E	DES	C	Beijing Hsijiao Arpt., ROC	12	0	32	44	12	0	12	No details avail.
79J.16	17	5.25.79	American AL 191	SP	DC-10-10	DES	C	Chicago O'Hare Int'l Arpt., IL, USA	13	258	2	273	13	258	271	Engine separation near rotation, stalled on climbout, impr. gnd. maint.
79J.23	24	7.20.79	Aerotal Colombia	SP	SE.210-10A/VI	MJW	C	Bogata El Dorado Arpt., COL	0	0	0	0	6	51	57	Hydraulic fail., gear-up lndg
79J.24	25	7.23.79	Trans Mediterranean AW	T	B707-327C	DES	C	Beirut Int'l Arpt., LEB	6	0	0	6	6	0	6	Siml eng. fail, crw err., LOC
79J.25	26	7.26.79	Lufthansa 527	F	B707-330C	DES	C	Serra dos Macacos, Petropolis, BRA	3	0	0	3	3	0	3	struck high gnd., ATC err.
79J.32	34	9.11.79	China AL	T	B707-324C	DES	C	Taipei, TWN	6	0	0	6	6	0	6	crsh @ sea, cause unknown
79J.38	40	11.26.79	Pakistan Int'l AL 740	SP	B707-340C	DES	C	145 kms. E of Jeddah, SAR	11	145	0	156	11	145	156	In-flt. cabin fire, atmpdt emer. lndg, crw err.
80J.16	16	4.03.80	Bangladesh Biman	SP	B707-373C	MJW	C	Paya Lebar Int'l Arpt., SIN	0	0	0	0	9	65	74	In-flt. eng. fail., crw err.
80J.31	31	7.07.80	Aeroflot	SP	Tu-154	DES	C	Alma Ata, Kazakhstan SSR, USR	?	?	0	163	?	163		No details avail.
80J.35	35	8.19.80	Saudia 163	SP	L.1011-200	DES	C	Riyadh, SAR	14	287	0	301	14	287	301	In-flt. cargo bay fire, emer. lndg, crw err., failure to evacuate AC
80J.49	49	12.21.80	Aerovias del Cesar (Col.)	SP	SE.210-VIR	DES	C	Rio-Hacha Guajira Arpt., COL	7	63	0	70	7	63	70	In-flt. explosion, bombing?
80J.51	51	12.26.80	SARSA	FY	HS.125-400A	DES	C	Cancun Arpt., MEX	3	0	0	3	3	0	3	crsh into trees, fire
81J.13	13	3.29.81	Sobelair	NSP	B707-329	MJW	C	Brussels Nat'l Arpt., BEL	0	0	0	0	9	109	118	Eng. fail., hydraulic fail., emer. lndg
81J.15	15	4.07.81	?	FY	Learjet 23	MIN	C	Cincinnati, OH, USA	1	0	0	1	2	0	2	Birdstrike, emer. lndg
81J.24	24	8.22.81	Far Eastern AT 103	SP	B737-222	DES	C	Miao-li, 100 mi. SSW of Taipei, TWN	6	104	0	110	6	104	110	In-flt. struc. fail., flt. to Kao-hsiung

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
81J.33	33	11.09.81	Aeromexico	SP	DC-9-32	DES	C	65 kms. E of Zihuatanejo, MEX	6	12	0	18	6	12	18	depress., emer. descent, struck mtn.
81J.34	34	11.13.81	Gates Learjet AC Corp.	T	Learjet 55	DES	C	Waterkloof, Transvall, South Africa	2	0	0	2	2	0	2	Low level aerobatics
82J.2	2	1.13.82	Air Florida 90	SP	B737-222	DES	C	Washington Nat. Arpt., VA, USA	4	70	4	78	5	74	79	hvy snow, icing, eng. fail., crw err.
82J.23	27	7.06.82	Aeroflot 411	SP	Il-62	DES	C	Moscow Sheremet'yevo Arpt, USR	8	82	0	90	8	82	90	In-flt. eng. fail., crsh 5 mi. W of arpt.
82J.24	28	7.09.82	Pan American AW 759	SP	B727-235	DES	C	New Orleans Int'l Arpt., LA, USA	7	138	8	153	7	138	145	Rainstorm, wind shear, LOC, struck trees
82J.34	38	9.17.82	Japan AL 792	SP	DC-8-61	MJW	C	Shanghai Hongqiao Arpt., ROC	0	0	0	0	11	113	124	In-flt. hydraulic fail., overran RW
82J.38	42	11.11.82	Arrow AW	F	B707-338C	NON	C	Miami, FL, USA	1	0	0	1	3	0	3	In-flt. depress.
82J.40	44	11.18.82	Coin Acceptors Inc.	EXE	C.551 Citation	DES	C	Mountain View Arpt., MO, USA	1	2	0	3	1	2	3	LOC, crw err.
83J.3	3	1.11.83	United AL 2885	F	DC-8-54F	DES	C	Detroit Metro. Arpt., MI, USA	3	0	0	3	3	0	3	LOC, crw err.
83J.8	9	2.13.83	Upali USA Inc.	EXE	Learjet 35A	DES	C	Strait of Malacca	2	4	0	6	2	4	6	Cause unknown
83J.9	10	2.22.83	V.A.S.P. (Brazil)	F	B737-2A1C	MJW	C	Manaus Gomes Arpt., BRA	2	0	0	2	2	0	2	LOC, crw err.
83J.12	13	3.14.83	Jamahiriya AT (Libya)	FY	B707-338C	DES	C	30 km N of Sebha, LIB	5	0	0	5	5	0	5	3-eng TO, in-flt. explosion
83J.18	19	4.29.83	S.A.N. (Ecuador)	SP	SE.210-VIR	DES	C	Guayaquil Bolivar Arpt., ECU	1	7	0	8	?	94		Eng. fail., ret. to field, hard lndg
83J.38	41	11.08.83	T.A.A.G. (Angola)	SP	B737-2M2 Adv.	DES	C	Lubango Arpt., ANG	4	126	0	130	4	126	130	gnd. missile shootdown?
83J.43	47	12.14.83	TAMPA Colombia	F	B707-373C	DES	C	Medellin Las Playas Arpt., COL	3	0	22	25	3	0	3	Engine fail., crw err.
84J.20	20	9.18.84	A.E.C.A. 767-103	F	DC-8-55F	DES	C	Quito Mariscal Sucre Arpt., ECU	4	0	49	53	4	0	4	Eng. fail., crw err.
84J.22	22	9.19.84	Aeroflot	NSP	Il-62	DES	C	Qazi Ahmed, Pakistan	9	15	0	24	9	15	24	T-storm, in-flt. struc. fail.
84J.23	23	9.26.84	Air Niagara	T	C.500 Citation I	DES	C?	Orillia, Ontario, CAN	2	0	0	2	2	0	2	Low pass, LOC, cause unknown
84J.25	25	10.05.84	Grondmet Handels	?	C.500 Citation I	DES	C	Skiathos, GRE	0	0	0	0	2	8	10	crsh @ sea
84J.26	26	10.08.84	Clay Lacy Aviation	EXE	Learjet 24B	DES	C	San Francisco Int'l Arpt., CA, USA	2	1	0	3	2	1	3	Autopilot fail.? LOC
85J.3	3	2.01.85	Aeroflot	SP	Tu-134	DES	C	Minsk Arpt., Belorussia, USR	?	?	0	80	?	?		No details avail.
85J.4	4	2.06.85	Airborne Express	F	DC-9-15	MJW	C	Philadelphia Int'l Airport, PA	0	0	0	0	?	0		Icing, stall after lift-off
85J.27	28	8.12.85	Japan AL123	SP	B747SR-46	DES	C	Mt. Ogura, Gunma Pref., JPN	15	505	0	520	15	509	524	Aft cabin bulkhead structural fail., hydraulic fail., LOC, struck high gnd.
85J.33	35	9.06.85	Midwest Express 105	SP	DC-9-14	DES	C	Milwaukee Mitchell Field, WI, USA	4	27	0	31	4	27	31	Eng. fail., LOC
85J.35	37	10.10.85	Pel-Air Aviation	F	IAI.1124	DES	C	Sydney, AUS	2	0	0	2	2	0	2	instr. fail., crw err., LOC
85J.41	44	12.12.85	Arrow Air	NSP	DC-8-63PF	DES	C	Gander Arpt., Newfoundland, CAN	8	248	0	256	8	248	256	Icing? in-flt. explosion? sabotage? carried returning, members of 101st AB Div. from UN peacekeeping mission
85J.42	45	12.12.85	General Telephone Co.	EXE	Learjet 35A	DES	C	College Station Field, TX, USA	1	1	0	2	2	1	3	In-flt. eng. fail., LOC
86J.11	12	3.31.86	Mexicana 940	SP	B727-264 Adv.	DES	C	Maravatio, 100 mi. NW of MEX City,	8	159	0	167	8	159	167	Overheated tires during TO roll, in-flt. tire explosion, fire, hydraulic system fail., LOC

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
87J.2	2	1.03.87	VARIG (Brazil)	SP	B707-379C	DES	C	Abidjan, Ivory Coast	12	38	0	50	12	39	51	Engine fail. on climb, RTF
87J.3	3	1.06.87	Transwede	NSP	SE.210-10R	DES	C	Stockholm Arlanda Arpt., SWE	0	0	0	0	6	21	27	Icing, control fail., gear collapse
87J.8	8	1.16.87	Aeroflot	SP	Yak-40	DES	C	Tashkent, USSR	4	5	0	9	4	5	9	preceding Il-76 wake-vortices
87J.17	17	5.09.87	LOT (Poland)	NSP	Il-62M	DES	C	Warsaw Okęcie Arpt., POL	10	172	0	182	10	172	182	In-flt. eng. fail., emer. ret. to field, LOC
87J.18	18	5.11.87	Corporate Air Transport.	F	Learjet 35A	DES	C	Allegheny, Pittsburgh, PA, USA	2	0	0	2	2	0	2	Fail. to climb, fire, cause unknown
87J.27	28	8.16.87	Northwest AL 255	SP	MD-82	DES	C	Detroit Metro. Arpt., MI, USA	6	148	2	156	6	149	155	impr. TO config., stalled, crw err.
87J.34	35	10.15.87	Falcon Jet Corp.	T	D. Falcon 100	DES	C	Rancho Murieta Arpt., CA, USA	2	1	0	3	2	1	3	LOC? fire
88J.7	7	1.24.88	Aeroflot	SP	Yak-40	DES	C	Nizhnevartovsk, Siberia, USSR	4	23	0	27	4	27	31	crw err.? eng. fail.
88J.15	15	3.17.88	Avianca 410 (Colombia)	SP	B727-21	DES	C	Mt. La Cuchilla, Cucuta, COL	7	132	0	139	7	132	139	Struck mtn., storm, crw err.
88J.25	25	7.03.88	Iran Air 655	SP	A.300B2-203	DES	C	Persian Gulf, Strait of Hormuz	12	278	0	290	12	278	290	Surface to air missile shootdown by U.S. Navy
88J.30	30	8.02.88	Balkan Bulgarian	SP	Yak-40	DES	C	Sofia Vrajdebna Arpt., BUL	?	?	0	27	4	33	37	In-flt. fire, crw err.?
88J.33	33	8.31.88	Delta AL 1141	SP	B727-232 Adv.	DES	C	Dallas/Ft. Worth Arpt., TX, USA	4	9	0	13	7	97	104	crw err., impr. TO config.
88J.36	36	9.15.88	Ethiopian AL	SP	B737-260 Adv.	DES	C	Bahar Dar Arpt., ETH	0	35	0	35	6	99	105	Birdstrike, eng. fail.
88J.44	44	10.25.88	Aero Peru	SP	F.28-1000	DES	C	Manco Capac Arpt., Juliaca, Peru	1	11	0	12	4	65	69	crsh in high nose-up attitude
88J.45	45	10.26.88	Aero-Technik	?	C.501 Citation I	DES	C	Salzburg, AUT	2	0	0	2	2	0	2	ATC failure
89J.10	10	2.24.89	United AL 811	SP	B747-121	MAJ	C	Pacific Ocean, Hawaiian Islands	0	9	0	9	18	337	355	In-flt. cargo door fail., depress., 2-eng. fail.
89J.13	13	3.10.89	Air Ontario	SP	F.28-1000	DES	C	Dryden, Ontario, CAN	3	21	0	24	4	65	69	hvy snow
89J.14	14	3.18.89	Evergreen Int'l	F	DC-9-33RC	DES	C	Carswell AFB, Saginaw, TX, USA	2	0	0	2	2	0	2	Mech. fail., atempt. ret. to field
89J.18	18	4.26.89	Aerosucre (Colombia)	F	SE.210-11R	DES	C	Barranquilla, COL	3	2	2	7	3	2	5	Deep stall or cargo shift
89J.33	33	9.03.89	VARIG 254 (Brazil)	SP	B737-241 Adv.	DES	C	Sao Jose do Xingu, BRA	0	12	0	12	6	48	54	Navigation err., crw err., fuel exh.
89J.34	34	9.03.89	Cubana	NSP	Il-62M	DES	C	Havana, CUB	11	115	34	160	11	115	126	T-storm, rain., high winds, struck nav. aerals
89J.36	36	9.19.89	U.T.A. 772 (France)	SP	DC-10-30	DES	C	Tenere Desert, Niger	14	156	0	170	14	156	170	In-flt. bombing
89J.42	42	10.18.89	Aeroflot/Soviet Air Force	?	Il-76	DES	C	Caspian Sea, Azerbaijan, USSR	?	?	0	57	?	?		Eng. fire
89J.44	44	10.21.89	T.A.N. 800/414?	SP	B727-224	DES	C	Las Tablitas, Honduras	4	127	0	131	12	139	151	struck mtn. 10 mi. S of arpt., hvy rain, high winds
89J.45	45	10.26.89	China AL (Taiwan)	SP	B737-209 Adv.	DES	C	Hualien, TWN	7	47	0	54	7	47	54	Poor visibility, crw err.
89J.49	49	11.25.89	Korean Air 175	SP	F.28-4000	DES	C	Seoul Kimpo Int'l Arpt., RSK	0	0	0	0	6	47	53	L. eng. fail., crw err.
89J.50	50	11.27.89	Avianca 203 (Colombia)	SP	B727-21	DES	C	Soacha, Bogata, COL	6	101	3	110	6	101	107	In-flt. bombing
90J.31	32	9.20.90	Omega Air, Inc.	FY	B707-321B	DES	C	Pinal Air Park, AZ, USA	1	0	0	1	3	0	3	Stripped down AC for KC-135E program, rt. wing hit, gnd. after rotation, delivery flt. to Davis

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot		
90J.34	37	10.02.90	Iraqi AW	?	Il-76	DES	C	Kuwait City, Kuwait	?	?	?	126+	?	126+		struck by gnd.-to-air missile, Kuwaiti resistance	
91J.7	14	2.17.91	Emery Worldwide	F	DC-9-15F	RC	DES	C	Cleveland Hopkins Arpt., OH, USA	2	0	0	2	2	0	2	crsh on initial climb, stalled, icing, fire
91J.13	21	3.05.91	L.A.V. Venezuela 108	SP	DC-9-32		DES	C	Trujillo, SW of Caracas, VEN	5	48	0	53	5	48	53	struck Los Torres Mtn. range, navigation err.
91J.17	25	3.15.91	Duncan AC	NSP	HS.125-1A/S52		DES	C	Otay Mtn., San Diego, CA, USA	2	7	0	9	2	7	9	struck 5200' mtn., cause unknown
91J.30	40	5.26.91	Lauda Air 004 (Austria)	SP	B767-329	ER	DES	C	Suphan Buri Province, THL	10	213	0	223	10	213	223	In-flt. eng. reversal op., struc. fail.
91J.36	46	7.11.91	Nigeria AW 2120/	NSP	DC-8-61		DES	C	Jiddah Int'l Arpt., SAR	14	247	0	261	14	247	261	In-flt. fire in wheelwell, tire fail. during TO, ret. to field, crsh 3 kms. from RW
91J.37	47	7.23.91	Bard Air Corp.	FY	Learjet 23		DES	C	Detroit, MI, USA	?	?	0	3	?	3		LOC? cause unknown
91J.53	63	12.11.91	Brunos, Inc.	EXE	Bch.400		DES	C	6 mi. W of Rome, GA, USA	2	7	0	9	2	7	9	struck Mt. Lavender, crw err.
91J.55	65	12.27.91	S.A.S. 571	SP	MD-81		MJW	C	Gottroda, 10 mi. N of Stockholm Arpt., SWE	0	0	0	0	6	123	129	In-flt. 2-eng. fail., ice ingestion, emer. lndg in field
91J.56	66	12.29.91	China AL 358	F	B747-2R7F		DES	C	Wanli, 11 nmi. NNE of Taipei, TWN	5	0	0	5	5	0	5	In-flt. eng. fail., struck high gnd., fog, drizzle, Taipei-Anchorage flt.
92J.28	29	7.30.92	Trans World AL 843	SP	L.1011-385-1		DES	C	New York JFK Int'l Arpt., NY, USA	0	0	0	0	12	280	292	False stall warning on initial climb, emer. lndg, fire, ran off RW
92J.30	31	7.31.92	China General 7552	SP	Yak-42D		DES	C	Nanjing, Jiangsu, ROC	?	?	0	109	10	116	126	In-flt. eng. fail., overran RW, struck wall
92J.40	43	10.04.92	El Al 8162 (Israel)	F	B747-258F		DES	C	Bijlmermeer, Amsterdam, NTL	3	1	47	51	3	1	4	In-flt. 2-eng. fail. and separation, atmptd RTF, struck apartment bldg. on app.
92J.49	52	11.26.92	Aerobrasil	F	B707-365C		MJW	C	Manaus-AM, BRA	0	0	0	0	4	0	4	struck app. lights, emer. lndg, overran RW, gear fail.
93J.4	4	2.08.93	Iran Air Tours 962	NSP	Tu-154M		DES	C	Karaj, Tehran or Meherabad, IRN	16	119	0	135	16	119	135	Mid-air coll., pilgrimage flt. to Mashhad
93J.5	6	3.05.93	Pal Air Macedonian	SP	F.100		DES	C	Skopje, MCD	4	77	0	81	6	91	97	Stall due to icing, crsh 0.5 mi. from RW, snowstorm, AC not deiced before TO, flt. to Zurich
93J.12	13	4.21.93	Uzbeki	?	Il-76TD		MJW	C	Tehkal, Peshawar	?	?	?	?	?	?		Emer. lndg, overran RW, struck wall, shops
93J.14	15	4.26.93	Indian AL 491	SP	B737-2A8		DES	C	Aurangabad, 280 km. NE of Bombay, IND	2	53	0	55	6	112	118	Fail. to climb, overloaded AC, struck truck, powerline
93J.22	23	6.07.93	Aero-Dienst	T	Learjet 35A		DES	C	Cologne, FRG	2	2	0	4	2	2	4	Eng. fail. or siml. fail., LOC?
73J.24	26	6.03.73	Tupolev	T	Tu-144		DES	C/	Le Bourget, Paris, FRA	6	0	8	14	6	0	6	Demonstration flt.
89J.1	1	1.08.89	British Midland 92	SP	B737-4Y0		DES	C/	E. Midlands Arpt., Leicestershire, UK	0	47	0	47	8	118	126	Eng. fail., ret. to field, crw err.
70J.25	25	9.07.70	El Al 219 (Israel)	SP	B707-458		NON	E R	ER Amsterdam, Neth.-New York, NY	0	1	0	1	13	145	158	atmptd in-flt hij., emer. descent
71J.3	4	1.09.71	Linden Flight Service	PVT	Cessna 150		DES	E R	Newark, NJ, USA	2	0	0	2	2	0	2	ATC failure

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						Dmg	PHS		Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
71J.4	5	1.21.71	Cousin Properties	EXE	AC.1121	DES	E R	Lake Champlain, NY, USA	2	3	0	5	2	3	5	Missing AC, ditched in lake?
71J.12	16	6.06.71	U.S. Marine Corps	T	F-4B Phantom	DES	E R	Duarte, 20 mi. NE of Los Angeles, CA, USA	1	0	0	1	2	0	2	ATC failure
71J.15	19	7.30.71	All Nippon AW 58	SP	B727-2E2/281	DES	E R	Morioko, Shizukuishi, Honshu, JPN	7	155	0	162	7	155	162	ATC failure
71J.19	24	9.13.71	Chinese Air Force	?	HS.121-1E	DES	E R	Mongolian Border	?	?	?	?	?	?	?	unauth. flt.
71J.23	28	11.21.71	China AL (Taiwan)	SP	SE.210-III	DES	E R	Penghu Is., Formosa Strait	8	17	0	25	8	17	25	In-flt. bombing
72J.5	5	1.26.72	Jugoslav AT	SP	DC-9-32	DES	E R	Hermsdorf, CZK	4	23	0	27	5	23	28	In-flt. bombing
72J.7	7	2.01.72	VFW/Fokker AC Co.	T	VFW/F.614	DES	E R	Bremen, FRG	?	?	?	?	?	?	?	Test flt.
72J.20	20	6.15.72	Cathay Pacific 700Z	SP	CV.880-22M-21	DES	E R	Pleiku, South Vietnam	10	71	0	81	10	71	81	In-flt. bombing
72J.34	34	10.31.72	Marcel Dassault	T	D. Falcon 10	DES	E R	Romorantin, FRA	2	0	0	2	2	0	2	LOC, in-flt. struc. fail.
72J.37	37	12.05.72	Egyptair	T	B707-366C	DES	E R	Beni Sueif, 70 kms SE of Cairo, EGY	6	0	0	6	6	0	6	crw err., siml. 1-eng. fail.
73J.7	7	2.21.73	Libyan Arab AL 114	SP	B727-224	DES	E R	Sinai, ER Benghazi-Cairo, EGY	8	100	0	108	9	104	113	Israeli Air Force shootdown, navig. err.
73J.11	11	3.05.73	Iberia 504 (Spain)	SP	DC-9-32	DES	E R	Nantes, FRA	7	61	0	68	7	61	68	ATC failure
73J.11	12	3.05.73	Spantax (Spain)	NSP	CV.990-30A-5	MAJ	E R	Nantes, FRA	0	0	0	0	9	99	108	ATC failure
73J.13	14	3.07.73	Ziegler, Inc.	EXE	R. Sabreliner 40	DES	E R	Blaine, MN, USA	2	0	0	2	2	0	2	Cause unknown
73J.17	19	4.13.73	Continental AL	EXE	R. Sabreliner 60	DES	E R	Montrose, CO, USA	2	0	0	2	2	1	3	In-flt. eng. thrust rev. op.
73J.18	20	5.05.73	Egyptair	SP	B707-366C	MIN	E R	Alps, ER Cairo, EGY-London, UK	1	0	0	1	?	124		Severe turbulence
73J.21	23	5.25.73	Aeroflot	SP	Tu-104	DES	E R	Chita, S. Siberia, USSR	?	?	0	100	?	?		atmptd hij, in-flt. shooting
73J.49	51	11.03.73	Pan American AW 160	F	B707-321CF	DES	E R	ER New York, NY-Boston, MA, USA	3	0	0	3	3	0	3	In-flt. fire, emer. lndg @ Boston, MA
73J.50	52	11.03.73	National AL 27	SP	DC-10-10	MAJ	E R	ER Houston, TX-Las Vegas, NV, USA	1	0	0	1	12	118	130	In-flt. eng. fail., depress.
74J.9	9	2.02.74	Pan American AW	SP	B747-121	NON	E R	Honolulu, HI, USA	0	1	0	1	?	299		Infant strangled by seat belt
74J.12	12	2.28.74	Brethour Realty Services	EXE	R. Sabreliner	DES	E R	Frobisher Bay, NW Territories, CAN	2	7	0	9	2	7	9	struck high gnd., ER Spain-Toronto
74J.22	23	5.11.74	Taxi Aereo Servicio	F	R. Sabreliner	MJR	E R	Belem, BRA	0	0	0	0	?	?		No details avail.
74J.23	24	6.24.74	Int'l Business Machines	T	G.1159 GS II	DES	E R	Kline, SC, USA	3	0	0	3	3	0	3	In-flt. spoiler op., LOC
74J.27	29	9.08.74	Trans World AL 841	SP	B707-331B	DES	E R	Ionian Sea, 215 mi. W of Athens, GRE	9	79	0	88	9	79	88	In-flt. bombing, 95 kms. W of Cephalonia
74J.30	32	9.15.74	Air Vietnam 706	SP	B727-121C	DES	E R	ER Da Nang-SIN	8	67	0	75	8	67	75	hij., In-flt. bombing on app.
75J.11	11	5.07.75	Pan American AW	SP	B707-321B	NON	E R	St. Johns, Newfoundland, CAN	0	1	0	1	9	175	184	in-flt depress.
75J.19	20	7.15.75	National AL	SP	DC-10-30	MIN	E R	ER, Diverted Jacksonville, FL, USA	0	1	0	1	13	58	71	Passenger suicide, in-flt. fire
76J.1	1	1.01.76	Middle East AL 438	SP	B720-023B	DES	E R	25 mi. NW of Al Qaysumah, SAR	15	66	0	81	15	66	81	In-flt. bombing
76J.5	5	1.14.76	Federal Av.	F	R. Sabreliner 40	DES	E R	Recife, BRA	1	0	0	1	3	0	3	Fuel exhaustion, ditched in S. Atlantic
76T.15	11	3.18.76	Cubana	T	An-24V	DES	E R	Havana, CUB	5	0	0	5	5	0	5	ATC failure
76J.29	30	9.10.76	British AW 476	SP	HS.121-3B	DES	E R	Zagreb, YUG	9	54	0	63	9	54	63	ATC failure
77J.15	17	4.04.77	Southern AW 242	SP	DC-9-31	DES	E R	New Hope, 20 mi. NW of Atlanta, GA, USA	2	60	9	71	4	81	85	T-storm, hail, in-flt. 2 eng. fail.



**WORLD JET TRANSPORT ACCIDENTS 1970-1993: LISTED BY PHASE OF FLIGHT**

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
77J.37	39	11.03.77	El Al (Israel)	SP	B747-	MIN	ER	Over Belgrade, ER Amsterdam	0	1	0	1	?	?		In-flt. depress.
78J.11	12	3.09.78	China AL (Taiwan)	SP	B737-	?	ER	ER Kaoshiung, TWN-Hong Kong	1	0	0	1	6	92	98	Unsuccessful hij. attempt
78J.19	20	4.20.78	Korean AL	SP	B707-321B	DES	ER	Kern, Karelskaya, USSR	0	2	0	2	13	97	110	Soviet AF interception, navigation err.
78J.31	33	8.18.78	Philippine AL	SP	BAC 1-11 524FF	MAJ	ER	ER Cebu-Manila, PHI	0	1	0	1	6	78	84	In-flt. bombing
78J.35	38	10.20.78	Kelco Aircraft	T	Learjet 25B	DES	ER	Vickery, Sandusky, OH, USA	3	0	0	3	3	0	3	LOC, cause unknown
79J.4	4	1.30.79	VARIG (Brazil)	F	B707-323C	DES	ER	ER Tokyo, JPN-Los Angeles, CA	5	0	0	5	5	0	5	Missing AC, cause unknown
79J.27	28	8.11.79	Aeroflot	SP	Tu-134	DES	ER	Dneprodzerzhinsk, Ukraine, USSR	?	?	?	?	?	?		ATC failure
79J.27	29	8.11.79	Aeroflot	SP	Tu-134	DES	ER	Dneprodzerzhinsk, Ukraine, USSR	?	?	?	173	?	173		ATC failure
79J.28	30	8.11.79	Bahri Aviation	EXE	Learjet 35	DES	ER?	60 nmi. S of Katab, EGY	2	3	0	5	2	3	5	Missing AC, ER Athens-Jeddah, S. Arabia
79J.40	42	11.28.79	Air New Zealand 901	NSP	DC-10-30	DES	ER	Mt. Erebus, Ross Island, Antarctica	20	237	0	257	20	237	257	Struck mtn., crw navigation err.
80J.17	17	4.03.80	Canadair	T	CL.600	DES	ER	California City, CA, USA	1	0	0	1	3	0	3	Stall tests, loss of cntrl, crw parachuted
80J.18	18	4.11.80	Thunderbird AW	FY	Learjet 25B	DES	ER	Conlon, TX, USA	2	0	0	2	2	0	2	Dove from 41200', cause unknown
80J.23	23	5.10.80	Indian AL	SP	B737-2A8	MAJ	ER	Rampur Hat, IND	0	2	0	2	6	128	134	Severe in-flt. turbulence
80J.25	25	5.19.80	NE Jet Co.	FY	Learjet 25D	DES	ER	104 mi. W of Sarasota, FL, USA	2	0	0	2	2	0	2	Clear air turbulence, LOC, crw err., crsh in Gulf of Mexico
80J.26	26	6.08.80	T.A.A.G. (Angola)	SP	Yak-40FG	DES	ER	Matala, Huila Province, ANG	4	25	0	29	4	25	29	"Military Combat"
80J.28	28	6.12.80	Aeroflot	SP	Yak-40	DES	ER	Tadzhikistan, USSR	?	?	0	?	?	?		struck high gnd.
80J.30	30	6.27.80	Aerolinee Itavia 870	SP	DC-9-15	DES	ER	Tyrrhenian Sea, W of Naples, ITA	4	77	0	81	4	77	81	Accidental air-to-air missile struck by NATO aircraft?
80J.50	50	12.22.80	Saudia 162	SP	L.1011-200	MAJ	ER	Persian Gulf	0	2	0	2	20	271	291	In-flt. tire explosion
81J.28	28	9.20.81	World AW 32	SP	DC-10-30CF	NON	ER	ER Baltimore, MD-London, UK	1	0	0	1	14	332	346	In-flt. industrial accident
81J.29	29	10.01.81	Sky Train Aviation	EXE	Learjet 24	DES	ER	2.5 mi. SW of Felt, OK, USA	2	1	0	3	2	1	3	LOC, clear air turbulence
81J.30	30	10.06.81	NLM (Netherlands)	SP	F.28-4000	DES	ER	Moerdijk, NTL	4	13	0	17	4	13	17	Turbulence, in-flt. struc. fail.
82J.1	1	1.11.82	Redec Aviation	F	Learjet 25XR	DES	ER	70 nmi NNE of Narssarsuaq, Greenland	2	0	0	2	2	0	2	Descending from cruise, cause unknown
82J.11	11	5.03.82	Presidence du Conseil	EXE	G.1159 GS II	DES	ER	Qotur, IRN	4	10	0	14	4	10	14	Shot down by fighter launched missile
82J.12	12	5.06.82	Ibex Corp.	EXE	Learjet 23	DES	ER	Atlantic Ocean near Savannah, GA	2	2	0	4	2	2	4	LOC, cause unknown
82J.27	31	8.11.82	Pan American AW	SP	B747-121	MIN	ER	ER Tokyo, JPN-Honolulu, HI	0	1	0	1	?	?		In-flt. bombing
82J.28	32	8.16.82	China AW	SP	B747-	NON	ER	Near Hong Kong	0	2	0	2	12	273	285	Severe turbulence
83J.6	6	1.16.83	Libyan Arab AL	?	L.2329 Jetstar II	DES	ER	ER Tripoli-Algiers	2	0	0	2	2	0	2	Missing AC
83J.20	21	5.18.83	Air Traffic	T	Learjet 25B	DES	ER	200 mi. S of Iceland, N. Atlantic	3	0	0	3	3	0	3	Missing AC, navigation err.?
83J.22	23	6.02.83	Air Canada 797	SP	DC-9-32	DES	ER	Cincinnati Int'l Arpt., KY, USA	0	23	0	23	5	41	46	In-flt. cabin fire
83J.25	27	7.01.83	C.A.A.K. (North Korea)	NSP	IL-62M	DES	ER	Labe, Guinea West Africa	?	?	?	23	?	23		crsh in mtns.

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
83J.32	34	9.01.83	Korean AL 007	SP	B747-230B	DES	ER	Sea of JPN 50 mi. SW of Sakhalin Is.	29	240	0	269	29	240	269	Soviet Air Force shootdown
85J.17	18	6.10.85	Euralair Int'l	F	Learjet 24B	DES	ER	Provins, FRA	2	0	0	2	2	0	2	ER Marseilles-Paris, cause unknown
85J.22	23	6.23.85	Air India 182	SP	B747-237B	DES	ER	Atlantic Ocean, 110 mi. E of Cork, IRE	22	307	0	329	22	307	329	In-flt. bombing
85J.23	24	7.10.85	Aeroflot	SP	Tu-154B-2	DES	ER	Uch Kuduk, Uzbek SSR, USSR	9	191	0	200	9	191	200	crsh 200 mi. NNW of Karshi, went into flat spin
85J.28	29	8.15.85	Alyemda (P.D.R. Yemen)	SP	B707-336C	MIN	ER	ER Aden-Abu Dhabi	1	2	0	3	8	65	73	Turbulence, control fail.
85J.37	40	11.10.85	Air Pegasus Corp.	PVT	Piper PA.28	DES	ER	Cliffside Park, NJ, USA	1	2	0	3	1	2	3	ATC failure
86J.13	14	4.04.86	Singer Co. Kearfott Div.	EXE	IAI.1124	DES	ER	Redwater, TX, USA	2	5	0	7	2	5	7	LOC, T-storm, struc. fail.
86J.18	19	7.02.86	Aeroflot	SP	Tu-134A	DES	ER	Syktvykar, Komi ASSR, USSR	2	52	0	54	8	86	94	In-flt. fire, emer. lndg
86J.19	20	7.23.86	Yomiuri Shinbun	T	MU.300-1A	DES	ER	Sado Island, JPN	4	0	4	8	4	0	4	Struck Mt. Kimpoku., cause unknown
86J.24	26	8.31.86	Private AC	PVT	Piper	DES	ER	Cerritos, CA, USA	1	2	0	3	1	2	3	ATC failure, crw err.
86J.27	29	9.25.86	?	Fy	C.318 (A-37)	DES	ER	Yantley, AL, USA	1	0	0	1	1	0	1	LOC, turbulence
86J.32	34	10.16.86	Aeroflot	SP	Tu-134	DES	ER	Syktvykar, USSR	?	?	0	2	?	82		In-flt. fire in cargo bay, emer. lndg
86J.35	37	10.24.86	Aviation Management	F	Learjet 25DXR	DES	ER	Medina, SAR	2	0	0	2	2	0	2	crsh in mtn. area, cause unknown
86J.42	45	12.25.86	Iraqi AW	SP	B737-270C	DES	ER	Arar, SAR	3	60	0	63	15	91	106	hij., in-flt. gunfight
87J.9	9	2.05.87	Aero France	EXE	Learjet 55	DES	ER	Jakiri, CAM	2	9	0	11	2	9	11	crsh in mtn. area, cause unknown
87J.24	25	7.24.87	Air Afrique 056	SP	DC-10-30	?	ER	ER Rome-Paris	0	1	0	1	15	148	163	hij.
87J.33	34	10.11.87	Drenair	F	D. Falcon 20D	DES	ER	Keflavik, Iceland	0	0	0	0	2	4	6	Ditched @ sea, cause unknown
87J.38	39	11.29.87	Korean Air 858	SP	B707-3B5C	DES	ER	Andaman Sea near Burma	11	104	0	115	11	104	115	In-flt. bombing
87J.40	41	12.07.87	Pacific SW AL 1771	SP	BAe.146-200A	DES	ER	Paso Robles, CA, USA	5	39	0	44	5	39	44	In-flt. shooting
88J.14	14	3.08.88	Aeroflot	SP	Tu-154B-2	DES	ER	ER domestic USSR flight	1	3	0	4	?	?		hij.
88J.17	17	4.05.88	Kuwait AW 422	SP	B747-269B	NON	ER	ER Bangkok-Kuwait	0	2	0	2	?	?		hij.
88J.18	18	4.28.88	Aloha AL 243	SP	B737-297	MJW	ER	ER Hilo, HI-Honolulu, HI near Maui, HI	0	1	0	1	5	90	95	In-flt. struct. fail., depress., emer. lndg.
88J.39	39	9.29.88	V.A.S.P. (Brazil)	SP	B737-	NON	ER	ER Belo Horizonte-Goiania	1	1	0	2	7	98	105	hij., in-flt. shooting
88J.47	49	11.03.88	F.A.A. (U.S.)	T	IAI.1121B	DES	ER	Westmoreland, Latrobe, PA, USA	3	0	0	3	3	0	3	In-flt. 2-eng. fail., cause unknown
88J.49	51	12.16.88	Tom Wackendorfer Avia.	?	Learjet 24B	DES	ER	Monclova, MEX	2	0	0	2	2	0	2	crw incapacitated? LOC
88J.50	52	12.21.88	Pan American AW 103	SP	B747-121	DES	ER	Lockerbie, Scotland, UK	16	243	11	270	16	243	259	In-flt. bombing
89J.12	12	3.09.89	Piedmont AL	SP	B737-201	MIN	ER	Dayton, OH, USA	0	1	0	1	6	70	76	In-flt. depress.
89J.25	25	7.19.89	United AL 232	SP	DC-10-10	DES	ER	Sioux City Gateway Arpt., IA, USA	1	111	0	112	11	285	296	In-flt. eng. fail., LOC, emer. land.
90J.3	3	1.13.90	Aeroflot	SP	Tu-134	DES	ER	Ufa, Bashkir, A.S.S.R., USSR	3	22	0	25	6	66	72	In-flt. eng. fire, atmt. emer. lndg
90J.5	6	1.18.90	Aero Flight Services, Inc.	F	Learjet 23	DES	ER	Dayton, OH, USA	2	0	0	2	2	0	2	Impacted nose-down from 29500'
90J.28	29	9.11.90	Faucett Peru	Fy	B727-247	DES	ER	180 mi. SE Newfoundland, CAN	3	13	0	16	3	13	16	Fuel exhaustion, ditched @ sea

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
90J.35	38	10.03.90	Eastern AL	SP	DC-9-31	MIN	ER	West Palm Beach, FL, USA	0	1	0	1	?	97	Clear air turbulence @ 31000'	
90J.38	41	11.19.90	Aeroflot	F	Tu-154M	MJW	ER	Trutnov, Prague, CZK	0	0	0	0	6	0	6	In-flt fire, ER Basel-Moscow, emer lndg
92J.12	12	3.31.92	Trans AS/Kabo Air	F	B707-321C	DES	ER	Istres, FRA, ER Kano-LUX	0	0	0	0	5	0	5	Violent in-flt. manuevers, 2-eng. fail., emer. lndg @ Le Tube AB, gear collapse
92J.20	20	6.06.92	Com. Panamena de	SP	B737-204 Adv.	DES	ER	Darien Pass, Tucuti, PAN	7	40	0	47	7	40	47	T-storm, violent manuevers, in-flt. breakup, crsh in jungle
92J.56	60	12.27.92	Merpati Nusantara AL	?	F.28-4000	MJW	ER	Pekanbaru, Simpany Tiga Arpt.	0	0	0	0	4	41	45	In-flt. hydraulic fail., emer. gear-up lndg, ran off RW
93J.9	10	4.06.93	China Eastern	SP	MD-11	MAJ	ER	Pacific Ocean	0	2	0	2	16	248	264	In-flt. leading edge slat deployment, emer. lndg @ Shemya, Aleutian Is.
93J.44	45	11.15.93	Indian AL	SP	A.300B2-101	DES	ER	Tirupati, 100 kms. NW of Madras	0	0	0	0	13	250	263	Weather div. from Hyderabad, fuel exhaustion, in-flt. flaps & gear fail., emer. lndg in rice field
86J.8	8	2.27.86	Seneca Livestock Inc.	EXE	D. Falcon 10	DES	ER/	Coatesville Arpt., PA, USA	0	0	0	0	2	4	6	No details avail.
90J.8	9	1.31.90	Slender You, Ltd.	EXE	BAe.125-3B	DES	ER/	COL, MO, USA	1	0	0	1	2	1	3	Fuel flow difficulties
70J.3	3	2.06.70	LAN (Chile)	SP	SE.210-	?	G	Santiago Arpt., Chile	0	1	0	1	?	?	?	In-flt. hij., gnd. res. op.
70J.24	24	9.06.70	Pan American AW 93	SP	B747-121	DES	G	Cairo Int'l Arpt., EGY	0	0	0	0	19	156	175	gnd. bombing following in-flt. hij.
70J.27	27	9.12.70	Trans World AL 741	SP	B707-331B	DES	G	Dawson Field, Zerka, JOR	0	0	0	0	10	145	155	gnd. bombing, in-flt. hij. 9.6.70
70J.27	28	9.12.70	Swissair 100	SP	DC-8-53	DES	G	Dawson Field, Zerka, JOR	0	0	0	0	12	143	155	gnd. bombing, in-flt. hij. 9.6.70
70J.27	29	9.12.70	B.O.A.C. 775 (U.K.)	SP	VC.10-1151	DES	G	Dawson Field, Zerka, JOR	0	0	0	0	10	105	115	gnd. bombing, in-flt. hij. 9.9.70
70J.33	36	11.30.70	Israeli Air Force	G	B377	DES	G	Tel Aviv Int'l Arpt., ISR	0	0	2	2	0	0	0	GTC fail., towed AC
71J.2	2	1.04.71	Air Inter	G	SE.210-III	DES	G	Paris Orly Arpt., FRA	0	0	0	0	0	0	0	gnd. fire
71J.5	6	1.22.71	Air Cambodge	G	SE.210-III	DES	G	Phnom Penh, CMB	0	0	0	0	0	0	0	Communist attack
72J.16	16	5.08.72	Sabena 507	SP	B707-	?	G	Tel Aviv Arpt., ISR	0	1	2	3	10	87	97	In-flt. hij., Israeli res. op.
73J.2	2	1.09.73	Dresser Corp.	G	L.1329 Jetstar 6	DES	G	Dallas Love Field, TX, USA	0	0	0	0	0	0	0	No details avail.
73J.28	30	6.21.73	Air Canada	G	DC-8-53	DES	G	Toronto Int'l Arpt., Ontario, CAN	0	0	0	0	0	0	0	gnd. fire
73J.33	35	7.24.73	Japan AL 404	SP	B747-246B	DES	G	Benghazi, LIB	1	1	0	2	23	124	147	hij. 7.20.73, grd bombing
73J.43	45	9.24.73	Iberia (Spain)	G	SE.210-VIR	MJW	G	Madrid Barajas Arpt., SPN	0	0	0	0	0	0	0	Hangar fire
73J.45	47	9.25.73	Continental Jet Corp.	G	IAI.1121	DES	G	St. Petersburg, FL, USA	0	0	0	0	0	0	0	Hangar fire
73J.51	53	11.05.73	Iberia (Spain)	G	SE.210-VIR	MJW	G	Madrid Barajas Arpt., SPN	0	0	0	0	0	0	0	gnd. fire
73J.58	60	12.17.73	Pan American AW	SP	B707-321B	DES	G	Rome Leonardo da Vinci Arpt., ITA	?	?	?	30	?	?	?	gnd. terr.ist attack
74J.11	11	2.19.74	Taylor Industries	G	HS.125-400A	MJR	G	San Jose, Costa Rica	0	0	0	0	0	0	0	No details avail.
74J.13	13	3.03.74	B.O.A.C. (U.K.)	G	VC.10-1151	MJW	G	Amsterdam Int'l Arpt., NTL	?	?	?	?	?	?	?	hij., fire
74J.17	17	3.22.74	Air Inter	G	SE.210-III	DES	G	Poretta Arpt., Corsica	?	?	?	?	?	?	?	gnd. bombing

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74j.18	18	3.23.74	Airlift Int'l	G	DC-8-63CF	DES	G	Travis AFB, CA, USA	0	0	0	0	0	0	0	0	gnd. fire	
74j.20	21	4.19.74	Trans World AL	G	L.1011-1	DES	G	Boston Logan Int'l Arpt., MA, USA	0	0	0	0	0	0	0	0	gnd. fire	
74j.25	26	7.22.74	Cyprus AW	G	HS.121-1E	DES	G	Nicosia Arpt., CYP	0	0	0	0	0	0	0	0	struck during Turkish air raid	
74j.25	27		Cyprus AW	G	HS.121-2E	DES	G	Nicosia Arpt., CYP	0	0	0	0	0	0	0	0	struck during Turkish air raid	
75j.37	38	12.28.75	British AW	G	DH.121-1C	MJW	G	London Heathrow Arpt., UK	0	0	0	0	0	0	0	0	Cabin fire	
76j.16	17	5.23.76	Philippine AL	SP	BAC 1-11	DES	G	Zamboanga, PHI	0	10	3	13	10	93	103		In-flt. hij. 5.21.76, gnd. res. oper.	
76j.19	20	6.27.76	Middle East AL	SP	B720-047B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	3	0	3		Artillery fire after pax unloaded	
76j.21	22	7.04.76	Air France 139	SP	A.300B4-2C/20	NON	G	Entebbe, Uganda	0	4	1	5	12	256	268		hij., Israeli res. op.	
76j.26	27	8.30.76	Air France	SP	SE.210-III	MJW	G	Ho Chi Minh City, Vietnam	0	1	0	1	?	20			hij., gnd. bombing by hijacker	
77j.34	36	9.30.77	Air Inter	SP	SE.210-	?	G	Paris, FRA	0	1	0	1	7	93	100		gnd. bombing by hijacker	
77j.36	38	10.18.77	Lufthansa 181	SP	B737-230QC	?	G	Aden, Mogadishu, Somalia	1	3	0	4	5	86	91		hij. on 10.13.77, res. op.	
77j.48	50	12.11.77	Charlotte AC Corp.	G	DC-8-33F	DES	G	Lake City, FL, USA	?	?	?	?	?	?			gnd. fire while refueling	
78j.3	3	1.27.78	Austral L.A.	G	BAC 1-11	MAJ	G	Buenos Aires Aeroparque, ARG	?	?	?	?	?	?			Oxygen fire	
78j.26	28	6.11.78	Delta AL	SP	L.1011-1	NON	G	Atlanta Int'l Arpt., GA, USA	0	0	1	1	11	172	183		gnd. industrial accident	
79j.13	14	4.02.79	Uganda AL	G	B707-321C	DES	G	Entebbe Arpt., Uganda	?	?	?	?	?	?			destr. by Tanzanian gnd. gunfire	
80j.1	1	1.07.80	Alitalia (Italy)	G	DC-9-32	DES	G	Rome Leonardo Da Vinci Arpt., ITA	?	?	?	?	?	?			Hangar fire	
80j.20	20	4.21.80	Aeroservicios Int'l	G	R. Sabreliner 40	DES	G	Leon Guanajuato, MEX	0	0	0	0	?	?			No details avail.	
80j.40	40	10.14.80	T.H.Y. (Turkey)	SP	B727-	?	G	Diyarbakir	?	1	?	1	?	?			hij.	
81j.2	2	1.15.81	Overseas National AL	G	DC-8-61	DES	G	Findel Arpt., LUX	0	0	0	0	0	0	0	0		gnd. fire while refurbishing
81j.4	4	2.02.81	Pakistan Int'l AL	G	DC-10-30	DES	G	Karachi Arpt., Pakistan	0	0	0	0	0	0	0	0		Hangar fire
81j.5	5	2.06.81	Eastern AL	SP	A.300B4-2C/10	NON	G	Miami Int'l Arpt., FL, USA	0	0	1	1	9	40	49		gnd. indr'l. acc. while embarking pax	
81j.12	12	3.28.81	Garuda (Indonesia)	SP	DC-9-32	MAJ	G	Bangkok Int'l Arpt., THL	1	5	0	6	9	44	53		In-flt. hij., res. op.	
81j.18	18	5.20.81	Pan American AW	SP	DC-10-10	NON	G	Miami Int'l Arpt., FL, USA	0	0	1	1	10	77	87		gnd. industrial accident	
81j.23	23	8.05.81	S.A.S.	SP	DC-8-63	NON	G	Annan	0	0	1	1	11	171	182		gnd. industrial accident	
81j.25	25	8.31.81	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?			gnd. bombing	
81j.26	26	9.07.81	American AL	SP	DC-10-10	NON	G	Salt Lake City Int'l Arpt., UT, USA	0	1	0	1	13	263	276		Passenger fell from airstair	
82j.15	15	5.23.82	?	G	Learjet 23	DES	G	?	?	?	?	?	?				gnd. fire	
82j.18	18	6.02.82	Air Canada	G	DC-9-32	DES	G	Montreal Dorval Arpt., Quebec, CAN	0	0	0	0	0	0	0	0		Hangar fire
82j.21	21	6.12.82	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0		Israeli assault on West Beirut
82j.21	22	6.16.82	Middle East AL	G	B707-3B4C	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0		Israeli assault on West Beirut
82j.21	23	6.16.82	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0		Israeli assault on West Beirut
82j.21	24	6.16.82	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	0		Israeli assault on West Beirut

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82J.21	25	6.16.82	Middle East AL	G	B720-047B	MJW	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.25	29	7.00.82	Nevis Industries	G	IAI.1121	DES	G	?	0	0	0	0	0	0	0	No details avail.
82J.26	30	8.01.82	Middle East AL	G	B720-047B	MJW	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.29	33	8.16.82	Trans Mediterranean AW	G	B707-323C	MJW	G	Beirut Int'l Arpt., LEB	0	0	0	0	0	0	0	Israeli assault on West Beirut
82J.37	41	11.06.82	Duncan Aviation	G	Learjet 24D	DES	G	Elizabeth City, NC, USA	0	0	0	0	0	0	0	No details avail.
83J.19	20	5.11.83	Groth AS	G	CV.880-22-2	DES	G	MEX City Int'l Arpt., MEX	?	?	?	?	?	?	?	No details avail.
83J.24	26	6.00.83	Middle East AL	G	B720-023B	MJW	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?	?	Artillery shelling
83J.37	40	10.14.83	Coastal AW	G	B707-436	DES	G	Rivesaltes Arpt., Perpignan, FRA	0	0	0	0	?	?	?	gnd. fire, arson
84J.8	8	3.10.84	U.T.A. 772 (France)	SP	DC-8-63PF	DES	G	N'Djamena, Chad	0	0	0	0	5	18	23	gnd. bombing
84J.12	12	6.01.84	State of Baja Govt.	G	HFB-320	DES	G	San Diego Lindbergh Field, CA, USA	0	0	0	0	0	0	0	gnd. fire, arson?
84J.19	19	8.30.84	Air Cameroon	SP	B737-2H7C	MJW	G	Douala Arpt., CAM	0	2	0	2	7	109	116	Engine fail., fuel rupture, fire
85J.7	7	2.23.85	Middle East AL	SP	B707-	MIN	G	Beirut, LEB	0	1	0	1	?	103	?	hij., pax disembarked
85J.9	9	3.16.85	U.T.A. (France)	G	B747-3B3	MJW	G	Paris Charles de Gaulle Arpt., FRA	0	0	0	0	0	0	0	gnd. fire
85J.19	20	6.12.85	Alia (Jordan)	SP	B727-2D3	DES	G	Beirut Int'l Airport, LEB	?	?	?	?	?	?	?	hij.
85J.30	31	8.21.85	Middle East AL	G	B720-047B	MJW	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?	?	Hostile action
85J.30	32	8.21.85	Middle East AL	G	B720-023B	DES	G	Beirut Int'l Arpt., LEB	?	?	?	?	?	?	?	Shelling
85J.38	41	11.24.85	Egyptair	SP	B737-266 Adv.	MJW	G	Luqa Arpt., Malta	?	?	?	?	?	?	?	hij.
86J.14	15	4.15.86	Libyan Arab AL	G	Il-76TD	DES	G	Tripoli, LIB	0	0	0	0	0	0	0	struck during U.S. Air Force/Navy air raid
86J.15	16	5.03.86	Air Lanka	SP	L.1011-100	DES	G	Colombo Int'l Arpt., Sri Lanka	0	16	0	16	?	?	?	gnd. bombing
86J.23	24	8.10.86	American Transport	NSP	DC-10-40	DES	G	Chicago O'Hare Int'l Arpt., IL, USA	0	0	0	0	0	0	0	gnd. fire, crw err.
86J.25	27	9.05.86	Pan American AW	SP	B747-121	MAJ	G	Karachi, Pakistan	?	?	?	21	?	383	?	hij., crw escaped AC
86J.26	28	9.20.86	Aeroflot	SP	Tu-134	?	G	Ufa, USSR	0	2	0	2	?	?	?	atmptd hij.
86J.31	33	10.15.86	Iran Air	SP	B737-286 Adv.	DES	G	Shiraz Arpt., IRN	0	3	0	3	?	?	?	Iraqi air raid
87J.30	31	9.17.87	United States Air Force 2	G	KC-10A	DES	G	Barksdale AFB, LA, USA	?	?	0	1	?	17	?	gnd. fire during refueling, gnd. crw err.
88J.40	40	10.10.88	T.A.A.G. (Angola)	SP	B707-347C	MJW	G	Luanda, ANG	0	0	0	0	3	0	3	Fire in fwd. cargo hold, elec. fail.
88J.46	48		Pegasus Aviation Inc.	G	L.1329 Jetstar 2	DES	G	Aspen Pitkin Co. Arpt., CO, USA	0	0	0	0	0	0	0	No details avail.
89J.41	41	10.14.89	Delta AL 1558	SP	B727-232 Adv.	MJW	G	Salt Lake City Int'l Arpt., USA	0	0	0	0	7	10	17	gnd. fire after preboarding pax
90J.33	36		China Southwest AL	G	B707-321B	MJW	G	Canton Arpt., Guangzhou, ROC	0	0	0	0	1	0	1	Parked AC
91J.4	4	32111	Kuwait AW	G	G.1159A GS II	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	5	32111	Kuwait AW	G	G.1159A GS III	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	6	32111	Iraqi AW	G	BAe.125-700B	DES	G	Muthana AB, Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	7	32111	Kuwait AW	G	B767-269 ER	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm

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91J.4	8	32111	Kuwait AW	G	B767-269 ER	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	9	2.15.91	Kuwait AW	G	A.300C4-620	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.4	10	2.15.91	Kuwait AW	G	A.300C4-620	DES	G	Baghdad, IRQ	0	0	0	0	0	0	0	Coalition air attack, Oper. Desert Storm
91J.8	15	2.17.91	British AW	G	B747-136	DES	G	Kuwait City Int'l Arpt., Kuwait	0	0	0	0	0	0	0	Impounded by Iraqi 8.3.90, blown up by
91J.8	16		Kuwait Government	G	DC-9-32CF	DES	G	Kuwait City Int'l Arpt., Kuwait	0	0	0	0	0	0	0	Iraqi forces
91J.14	22	3.06.91	Singapore AL	G	A.310-324	?	G	Changi Arpt., SIN	0	4	0	4	11	118	129	In-flt hij. ER Kuala Lumpur-Singapore, gnd. res. op.
91J.19	27	3.25.91	Ethiopian AL	G	B707-385C	DES	G	Yohannes IV Arpt., Asmara, ETH	0	0	0	0	0	0	0	gnd. attack?
91J.20	28	4.15.91	?	G	GS-A.1159 GS	DES	G	Jeddah, SAR	?	?	?	?	?	?	?	No details avail.
91J.21	29	4.30.91	Indian AL	SP	B737-2A8 Adv.	MAJ	G	Meenambakham, IND	0	0	1	1	?	?	?	Struck by tug prior to pushback
91J.24	32	5.06.91	Petrolift Aviation Serv.	G	Learjet 25D	DES	G	Shreveport Regional Arpt., LA, USA	0	0	0	0	0	0	0	No details avail.
91J.24	33	5.06.91	Petrolift Aviation Serv.	G	C.501 Citation	DES	G	Shreveport Regional Arpt., LA, USA	0	0	0	0	0	0	0	No details avail.
91J.24	34	5.06.91	Franks Petroleum	G	BAe(HS).125-4	DES	G	Shreveport Regional Arpt., LA, USA	0	0	0	0	0	0	0	No details avail.
91J.34	44	6.28.91	LTU Sud Int'l AW	G	L.1011-385-1	DES	G	Dusseldorf, FRG	0	0	0	0	0	0	0	Hangar fire during maint.
91J.40	50	8.31.91	L.A.B.	G	B707-323C	MJW	G	Dothan Arpt., AL, USA	0	0	0	0	0	0	0	Hangar fire while painting, explosion
91J.47	57	11.10.91	Aeronica	G	B727-25	MJW	G	Managua, NIC	?	?	?	?	?	?	?	Oxygen fire during maint.
92J.23	23	6.00.92	Aeroflot?	G	Tu-154B	MJW	G	Bratsk	?	?	?	?	?	?	?	gnd. accident
92J.23	24	6.00.92	Aeroflot?	G	Tu-154B	MJW	G	Bratsk	?	?	?	?	?	?	?	gnd. accident
92J.31	32	8.01.92	Afghan Ariana	G	Tu-154M	DES	G	Kabul, AFG	?	?	?	?	?	?	?	gnd. rocket attack, previously W.O. 5.29.92
92J.31	33	8.01.92	Afghan Ariana	G	Yak-40	DES	G	Kabul, AFG	?	?	?	?	?	?	?	gnd. fighting
92J.31	34	8.01.92	Afghan Ariana	G	Yak-40	DES	G	Kabul, AFG	?	?	?	?	?	?	?	gnd. fighting
92J.34	37	8.24.92	Arrow Air	G	DC-8-63F	MJR?	G	Miami Int'l Arpt., FL, USA	0	0	0	0	0	0	0	Hangar collapse, Hurricane Andrew
92J.36	39	8.28.92	Aeroflot?	G	Il-76T	MJW	G	Kabul, AFG	?	?	?	?	?	?	?	gnd. rocket attack
92J.52	55	12.13.92	?	G	DC-8-32/33	DES	G	Buenos Aires Ezeiza Arpt., ARG	0	0	0	0	0	0	0	gnd. fire
93J.29	30	8.04.93	SAM Colombia	G	B727-46	MJW	G	Bogota, COL	0	0	0	0	0	0	0	gnd. eng. fire during maint.
93J.39	40	9.23.93	Transair Georgia	?	Tu-134	DES	G	Sukhumi Arpt., Georgia, CIS	?	?	?	1+	?	?	?	struck by rebel missile while boarding pax
70J.2	2	1.14.70	United Arab AL 755	SP	DH.106-IVC	DES	L	Addis Ababa Bole Arpt., ETH	0	0	0	0	9	5	14	crw err.
70J.16	16	7.05.70	Air Canada 621	SP	DC-8-63	DES	L	Toronto Int'l Arpt., Ontario, CAN	9	100	0	109	9	100	109	Hard lndg, impr. spoiler deployment, crw err., go-around, in-flt. 2-eng. fail., LOC
70J.23	23	8.18.70	C.S.A. (Czechoslovakia)	SP	Tu-124V	DES	L	Zurich Kloten Arpt., SWI	0	0	0	0	6	14	20	crw err., gear-up lndg

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70J.28	30	9.15.70	Alitalia 618 (Italy)	SP	DC-8-62	DES L	New York Kennedy Int'l Arpt., NY, USA	0	0	0	0	10	146	156	Hard lndg, gear collapse, crw err.
70J.29	31	10.07.70	Dan-Air London, Ltd.	T	DH.106-IV	DES L	Newcastle Woolsington Arpt., UK	0	0	0	0	4	5	9	crw err., gear up lndg
70J.35	38	12.18.70	Hamburger Flug	T	HFB-320	DES L	Texel Is., NTL	0	0	0	0	?	?		No details avail.
70J.37	40	12.28.70	Trans Caribbean AW 505	SP	B727-2A7	DES L	St. Thomas Truman Arpt., Virgin Is.	0	2	0	2	7	48	55	Hard lndg, crw err.
71J.11	14	5.23.71	Aviogenex 130	NSP	Tu-134A	DES L	Belgrade Rijeka Arpt., YUG	3	75	0	78	7	76	83	T-storm, wind shear? hard lndg, overturned
71J.25	31	12.15.71	Pakistan Int'l	F	B707-340C	DES L	Urumchi, ROC	0	0	0	0	5	0	5	No details avail.
72J.2	2	1.18.72	Tandy Corp.	EXE	Learjet 25	DES L	Victoria Co.-Foster Arpt., TX, USA	2	7	0	9	2	7	9	Below minima weather
72J.4	4	1.25.72	Bahktar Afghan	?	Yak-40	DES L	Khost, AFG	?	?	?	?	?	?		No details avail.
72J.6	6	1.28.72	British Caledonian AW	?	VC.10-1100	MJW L	London Gatwick Arpt., UK	?	?	?	?	?	?		Hard lndg
72J.21	21	6.16.72	Egyptair	SP	Il-62	DES L	Cairo Almaza Arpt., EGY	?	?	?	?	?	?		lnd@wrong arpt., overran RW
72J.29	29	9.19.72	Nigeria AW	SP	F.28-1000	MJW L	Port Harcourt Arpt., NIG	0	0	0	0	?	?		Overran RW
72J.30	30	9.24.72	Japan AL	SP	DC-8-53	MJW L	Bombay Juhu Arpt., IND	0	0	0	0	14	108	122	crw err., lnd on wrong arpt
72J.32	32	10.27.72	Lider Taxi Aereo	NSP	Learjet 25C	MJR L	Rio de Janeiro, BRA	0	0	0	0	2	3	5	No details avail.
72J.43	44	12.27.72	Fluor Corp.	EXE	L.1329 Jetstar 6	DES L	Adirondack Arpt., NY, USA	3	0	0	3	3	0	3	No details avail.
72J.44	45	12.28.72	Iberia (Spain)	F/T	F.28-1000	MJW L	Bilbao/Sondica, SPN	0	0	0	0	4	0	4	Overran wet RW
73J.3	3	1.19.73	Societe Exec. Transports	?	Learjet 23	MJR L	Essey-les-Nancy, FRA	0	0	0	0	?	?		No details avail.
73J.4	4	1.22.73	Royal Jordanian/ Nigeria	NSP	B707-3D3C	DES L	Kano Arpt., NIG	6	170	0	176	11	198	209	Undershot RW, fog, gear fail., pilgrimage ft. from Mecca
73J.8	8	2.21.73	Air Taxi Services	F	Learjet 24	MJR L	Belleville, MI, USA	2	0	0	2	2	1	3	Bounced, struck lights, overran RW
73J.10	10	2.00.73	J.A.T. (Yugoslavia)	?	SE.210-III	MJW L	Belgrade, YUG	?	?	?	?	?	?		No details avail.
73J.14	15	3.09.73	Midland AC	EXE	HFB-320	DES L	Phoenix Int'l Arpt., AZ, USA	0	0	0	0	2	7	9	No details avail.
73J.20	22	5.10.73	Thai AW Int'l	SP	DC-8-32/33	DES L	Katmandu Arpt., NEP	0	0	1	1	10	100	110	Overran RW
73J.30	32	7.03.73	Indian AL	SP	SE.210-10A/VI	MJW L	Bombay Santa Cruz Arpt., IND	0	0	0	0	7	8	15	crw err., fast lndg, gear collapse
73J.34	36	7.31.73	Delta AL 723	SP	DC-9-31	DES L	Boston Logan Int'l Arpt., MA, USA	6	83	0	89	6	83	89	impr. ILS app., undershot RW04R, crw err., fog, ATC err.
73J.36	38	8.20.73	AVENSA (Venezuela)	SP	SE.210-III	MJW L	Baraquisimeto, VEN	?	?	?	?	?	?		Struck bldg, on lndg
73J.38	40	8.29.73	C.S.A. 531	SP	Tu-104A	DES L	Nicosia Arpt., CYP	0	0	0	0	8	62	70	Diverted, overran RW, crw err.
73J.42	44	9.23.73	Air Algerie	SP	SE.210-III	MJW L	Dar-el-Brieda, ALG	0	0	0	0	?	?		No details avail.
73J.46	48	10.11.73	Avionas Banamex	EXE	HS.125-1A	DES L	Acapulco, MEX	2	6	0	8	2	6	8	No details avail.
73J.47	49	10.13.73	Aeroflot	SP	Tu-104	DES L	Moscow Domodedovo Arpt., USR	?	?	?	28	?	?		No details avail.
73J.52	54	11.27.73	Eastern AL 300	SP	DC-9-31	MJW L	Akron-Canton Region. Arpt, OH, USA	0	0	0	0	5	31	36	Overran wet RW, brake fail.
73J.62	64	12.23.73	Cruzeiro do Sul	SP	SE.210-VIR	DES L	Manaus Arpt., BRA	0	0	0	0	5	53	58	Overran wet RW, crw err., fire

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74J.4	4	1.16.74	Trans World AL 701	SP	B707-131B	MJW	L	Los Angeles Int'l Arpt., CA, USA	0	0	0	0	7	56	63	Hard Indg, gear fail., crw err., fog
74J.5	5	1.19.74	Cauble Enterprises	EXE	D. Falcon 20C	DES	L	Ft. Worth Meacham Field, TX, USA	0	0	0	0	2	0	2	Overran wet RW, crw err.
74J.8	8	2.02.74	Transbrasil	SP	BAC 1-11	DES	L	Sao Paulo Arpt., BRA	0	0	0	0	8	88	96	Overran wet RW
74J.29	31	9.13.74	Conair of Scandinavia	NSP	B720-025	MJW	L	Copenhagen Kastrup Arpt., DEN	?	?	?	?	?	?	?	Hard Indg
74J.39	41	12.26.74	Togo Govt.	EXE	G.1159 GS II	DES	L	Lome Arpt., Togo	0	3	0	3	1	5	6	No details avail.
75J.3	3	2.19.75	General Air (W.	SP	Yak-40EC	DES	L	Saarbrucken, FRG	0	0	0	0	2	14	16	Overran RW
75J.6	6	3.13.75	C. Ribeiro	?	C.500 Citation I	DES	L	Belem, BRA	?	?	0	3	?	?	?	No details avail.
75J.7	7	3.13.75	Jet Travel/Cimarron Ind.	EXE	IAI.1121	DES	L	Tulahoma Arpt., OK, USA	0	0	0	0	2	5	7	Overran wet RW, struck trees
75J.8	8	3.31.75	Western AL 470	SP	B737-247	DES	L	Casper Natrona Co. Arpt., WY, USA	0	0	0	0	6	93	99	impr. app., overran RW
75J.9	9	4.08.75	South African AW	SP?	B747-	?	L	Luanda, ANG	0	0	0	0	?	287	?	gnd. antiaircraft fire
75J.15	15	6.17.75	Indian AL	SP	SE.210-VIN	MJW	L	Bombay Santa Cruz Arpt., IND	0	0	0	0	6	87	93	Overran RW
75J.18	18	7.05.75	Balkan Bulgarian	SP	Tu-154	MAJ	L	Sofia Arpt., BUL	0	0	0	0	?	?	?	GTC failure
76J.2	2	1.02.76	Overseas National	NSP	DC-10-30CF	MJW	L	Istanbul Yesilkoy Arpt., TUR	0	0	0	0	12	361	373	hvy Indg, ran off RW, crw err.
76J.12	13	4.05.76	Alaska AL 60	SP	B727-81	DES	L	Ketchikan Int'l Arpt., AK, USA	0	1	0	1	7	50	57	Fast app., crw err., overran RW
76J.14	15	4.27.76	American AL 625	SP	B727-95	DES	L	St. Thomas Arpt., Virgin Islands	2	35	0	37	7	81	88	crw err., atempt. go-around
76J.20	21	6.29.76	Construcciones Protexa	EXE	Learjet 24D	DES	L	MEX City, MEX	2	2	0	4	2	2	4	No details avail.
76J.24	25	8.16.76	Avianca (Colombia)	SP	B720-047B	MJW	L	MEX City Arpt., MEX	0	0	0	0	?	?	?	Bounced on Indg, rain squall
76J.27	28	9.02.76	Aeromexico	SP	DC-9-15	MJW	L	Leon-Guanajuato Arpt., MEX	0	0	0	0	?	?	?	Overran RW
76J.36	38	11.12.76	Taxi Aereo Jaragua	NSP	C.500 Citation I	DES	L	Rio de Janeiro Dumont Arpt., BRA	0	0	0	0	2	6	8	No details avail.
77J.1	1	1.02.77	C.S.A. (Czechoslovakia)	SP	Tu-134A	DES	L	Prague Ruzyne Arpt., CZK	0	0	0	0	6	42	48	ATC failure
77J.2	3	1.04.77	Trans Brasil	SP	BAC 1-11	MJW	L	Sao Paulo Vira Copos Arpt., BRA	0	0	0	0	5	38	43	hvy Indg
77J.4	5	1.06.77	Jet Aviation	F	Learjet 23	DES	L	Flint Arpt., MI, USA	2	0	0	2	2	0	2	No details avail.
77J.8	9	2.21.77	Air Inter	SP	SE.210-III	MAJ	L	Bordeaux, FRA	0	0	1	1	5	23	28	Struck van on Indg, Ind @ Toulouse
77J.18	20	4.27.77	Rockwell Int'l	EXE	R. Sabreliner	DES	L	Wheeling Walker Arpt., IL, USA	0	0	0	0	2	0	2	3rd touchdown, reverser fail., overran RW
77J.22	24	5.26.77	Ponderosa/Chrysler	EXE	Learjet 25B	DES	L	Detroit, MI, USA	0	0	0	0	2	0	2	Reverser fail., overran RW
77J.24	26	5.28.77	Societa Avio Ligure	?	Yak-40EC	DES	L	Genoa Cristoforo Colombo Arpt., ITA	0	0	0	0	4	0	4	Overran RW
77J.26	28	8.07.77	Pearl Air	F	B707-430	MJW	L	Sana'a Arpt., YEM	0	0	0	0	?	?	?	Hard Indg, go-around, gear fail.
77J.39	41	11.19.77	T.A.P. 425 (Portugal)	SP	B727-282 Adv.	DES	L	Funchal Arpt., Madeira, POR	6	125	0	131	8	156	164	Ind 2000' beyond threshold, overran wet RW 24
77J.43	45	11.22.77	Interflug (E. Germany)	?	Tu-134A	DES	L	E. Berlin Schonefeld Arpt, GDR	0	0	0	0	?	69	?	Ind short of RW
77J.44	46	12.02.77	Balkan Bulgarian	NSP	Tu-154A	DES	L	Labrak AFB, Benghazi, LIB	0	59	0	59	6	159	165	Fuel exhaustion, emer. Indg
78J.2	2	1.12.78	Indian AL 117	SP	B737-2A8	NON	L	Hyderabad Begumpet Arpt., IND	0	0	1	1	6	99	105	struck unauth. person on RW



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								Crw	Pax	Gnd	Tot	Crw	Pax		Tot
78J.4	4	2.11.78	Pacific Western	SP	B737-275	DES L	Cranbrook Arpt., Brit. Columbia, CAN	5	39	0	44	5	45	50	Thrust rev. fail., RW obstacle avoidance
78J.5	5	2.15.78	Sobelair	NSP	B707-329	DES L	Tenerife Santa Cruz Arpt., Canary Is.	0	0	0	0	7	189	196	Ind short of RW, gear fail., fire
78J.13	14	3.24.78	Balkan-Bulgarian	F	Tu-154	DES L	Damascus, Syria	4	0	0	4	4	0	4	No details avail.
78J.15	16	3.30.78	National Jets Inc.	Amb.	Learjet 23	DES L	Burbank Arpt., CA, USA	0	0	0	0	3	2	5	Overran wet RW, brake fail., struck fence, crw err.
78J.16	17	4.02.78	V.A.S.P. (Brazil)	SP	B737-2A1	DES L	Sau Paulo Congonhas Arpt., BRA	0	0	0	0	7	37	44	Gear-up Indg, fire
78J.18	19	4.07.78	Arthur Roland	EXE	Learjet 24	DES L	Soda Springs, ID, USA	0	0	0	0	2	1	3	No details avail.
78J.23	25	5.20.78	Rio Sul Servicos Aereos	?	R. Sabreliner 60	DES L	Sao Paulo Viracorpos Arpt., BRA	0	0	0	0	2	0	2	No details avail.
78J.25	27	5.26.78	Aerobec Ltd.	NSP	IAI.1121	DES L	Winnipeg, Manitoba, CAN	0	0	0	0	2	1	3	No details avail.
78J.29	31	7.09.78	Allegheny AL 453	SP	BAC 1-11	MJW L	Rochester Mncpl. Arpt., NY, USA	0	0	0	0	4	73	77	Fast Indg, overran RW, crw err.
78J.33	36	9.26.78	LACSA (Costa Rica)	T	BAC 1-11 531FS	MAJ L	Miami, FL, USA	0	0	0	0	2	0	2	Gear-up, no-flap Indg, crw err.
78J.38	41	12.04.78	Inlet Marine, Inc.	EXE	Learjet 25C	DES L	Anchorage Int'l Arpt., AK, USA	2	3	0	5	2	5	7	High winds, LOC, crw err.
79J.1	1	1.05.79	Walt Disney	EXE	C.500 Citation I	DES L	Burbank Arpt., CA, USA	0	0	0	0	2	3	5	Overran wet RW, struck fence
79J.3	3	1.26.79	Big 6 General Partnership	EXE	HS.125-3A	DES L	Taos Mncpl. Arpt., NM, USA	0	0	0	0	2	8	10	Hard Indg, ran off RW, struck snowbank, crw err.
79J.20	21	7.06.79	Chapman Commodities	T	Learjet 25B	MJW L	Pueblo Arpt., CO, USA	2	0	0	2	2	1	3	LOC, inverted, crw err.
79J.29	31	8.19.79	Cyprus AW	SP	B707-123B	MJW L	Muharraq Int'l Arpt., BAH	0	0	0	0	8	58	66	Hard Indg, bounced, gear collapse
79J.30	32	8.23.79	Lider Taxi Aereo	?	Learjet 24D	DES L	Sao Paulo Viracorpos Arpt., BRA	0	0	0	0	2	0	2	No details avail.
79J.35	37	10.07.79	Swissair	SP	DC-8-62	DES L	Athens Hellinikon Arpt., GRE	0	14	0	14	12	142	154	Overran RW, brake fail., fire
79J.36	38	10.31.79	Western AL 2605	SP	DC-10-10	DES L	MEX City Int'l Arpt., MEX	11	61	1	73	13	76	89	Ind on wrong RW, crw err., struck dump truck
79J.41	43	11.00.79	Saudia	?	B707-373C	MJW L	Jeddah, SAR	?	?	?	?	?	?	?	Hard Indg
79J.43	45	12.07.79	ALPA S.A.	NSP	HS.125-400B	DES L	Sassandra, Ivory Coast	0	0	0	0	3	7	10	No details avail.
79J.45	47	12.15.79	Venezuelan Govt.	EXE	C.500 Citation I	DES L	Zulia State, VEN	2	0	0	2	2	4	6	No details avail.
80J.2	2	1.13.80	Garuda (Indonesia)	SP	DC-9-32	MJW L	Banjarmasin, Kalimantan, Indonesia	0	0	0	0	5	121	126	Hard Indg, bad weather
80J.4	4	1.23.80	L.O.T. (Poland)	?	Tu-134	MJW L	Warsaw Arpt., POL	?	?	?	?	?	?	?	Overran runway 11
80J.5	5	1.27.80	Avianca (Colombia)	SP	B720-059B	MJW L	Mariscal Sucre Arpt., Quito, ECU	0	0	0	0	?	?	?	Fast Indg, overran RW, crw err.
80J.8	8	2.03.80	Cubana	NSP	Yak-40	DES L	Baracoa, CUB	0	1	0	1	?	37	?	Cause unknown
80J.9	9	2.06.80	Gabon Govt.	EXE	G.1159 GS II	DES L	N'gaoundere, GAB	2	3	0	5	2	3	5	No details avail.
80J.13	13	3.17.80	Texas Int'l	SP	DC-9-14	DES L	Baton Rouge Ryan Arpt., LA, USA	0	0	0	0	4	47	51	Overran short RW
80J.24	24	5.11.80	Zaire Int'l Cargo	F	B707-329C	MJW L	Douala, CAM	0	0	0	0	3	0	3	Skidded on Indg, gear fail.
80J.27	27	6.09.80	Midwest Air Charter	F	SE.210-VIR	MJW L	Atlanta Int'l Arpt., GA, USA	0	0	0	0	3	1	4	Preceding L1011 wake-vortices
80J.29	29	6.19.80	McDonnell Douglas AC	T	MD-81	MJW L	Yuma Int'l Arpt., AZ, USA	0	0	0	0	3	0	3	Siml. hydraulic fail., crw err., further damaged, by crane

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
80J.38	38	9.23.80	Iraqi AW	F	Il-76T	DES	L	Baghdad, IRQ	?	?	?	?	?	?		Shot down during Iranian air raid
80J.44	44	11.21.80	Continental AL 614	SP	B727-92C	DES	L	Yap Arpt., Yap Island, Carolina Is.	0	0	0	0	6	67	73	Gear fail., crw err.
80J.45	45	11.30.80	Trans World AL	SP	B707-131B	MJW	L	San Francisco Int'l Arpt., CA, USA	0	0	0	0	?	133		Gear fail.
80J.46	46	12.03.80	Mexican Govt.	?	HS.125-400A	DES	L	Nogales, Sonora, MEX	0	0	0	0	?	?		No details avail.
81J.1	1	1.08.81	Pakistan Int'l AL	SP	B720-047B	MJW	L	Quetta Arpt., Pakistan	0	0	0	0	7	72	79	Nose gear collapse
81J.3	3	1.21.81	Georgia-Pacific Corp.	EXE	C.500 Citation I	DES	L	Bluefield Mercer Co.Arpt., WV, USA	2	3	0	5	2	3	5	Overran wet RW, atmpd go-around
81J.9	9	2.17.81	Air California 336	SP	B737-293	MJW	L	Orange Co. Int'l Arpt., CA, USA	0	0	0	0	5	95	100	Gear-up lndg, crw err.
81J.11	11	3.11.81	Ghana AW	T	F.28-2000	MJW	L	Accra Int'l Arpt., Ghana	0	0	0	0	2	0	2	hvy lndg
81J.14	14	3.29.81	Alco Aviation	EXE	L.1329 Jetstar 6	DES	L	Luton Arpt., Bedfordshire, UK	0	0	0	0	2	7	9	Overran RW, crw err., fire
81J.19	19	5.31.81	Presidence du Conseil	EXE	D. Falcon 20C	DES	L	Bamako Arpt., Mali	1?	2?	0	3	2?	4?		No details avail.
81J.21	21	6.11.81	VARIG (Brazil)	F	B707-341C	MJW	L	Eduardo Gomes Arpt., Manaus, BRA	?	?	?	?	?	?		No details avail.
81J.22	22	7.27.81	Aeromexico	SP	DC-9-32	DES	L	Chihuahua Villalobos Arpt., MEX	2	48	0	50	6	60	66	T-storm, turbulence
81J.32	32	10.22.81	Middle East AL	F	B707-331C	MJW	L	Tokyo Narita Int'l Arpt., JPN	0	0	0	0	3	0	3	Eng. fail., ret. to field, ran off RW
81J.38	38	12.12.81	Hispaniola AW	Fy	B707-124	MJW	L	Miami Int'l Arpt., FL, USA	0	0	0	0	5	0	5	Gear fail., collapse, fatigue
82J.4	4	1.23.82	World AW 30H	SP	DC-10-30CF	DES	L	Boston Logan Int'l Arpt., MA, USA	0	2	0	2	12	200	212	Overran icy RW
82J.9	9	3.20.82	Garuda (Indonesia)	SP	F.28-1000	DES	L	Branti Arpt., Sumatra, Indonesia	4	23	0	27	4	23	27	Overran wet RW, fire
82J.13	13	5.16.82	T.A.M. (Brazil)	NSP	Learjet 25B	DES	L	Uberaba, BRA	0	0	0	0	2	8	10	No details avail.
82J.16	16	5.24.82	V.A.S.P. (Brazil)	SP	B737-2A1	DES	L	Brasilia Int'l Arpt., BRA	0	2	0	2	7	112	119	T-storm, hard lndg, struc. fail.
82J.22	26	6.22.82	Air India	SP	B707-437	MJW	L	Bombay Santa Cruz Arpt., IND	2	17	0	19	12	99	111	Overran wet RW, crw err.
82J.30	34	8.26.82	Nansei AL	SP	B737-2Q3 Adv.	DES	L	Ishigaki Arpt., JPN	0	0	0	0	5	133	138	Overran RW, brake fail., crw err.
82J.35	39	9.29.82	Aeroflot	SP	Il-62M	DES	L	Findel Arpt., LUX	0	7	0	7	11	66	77	Brake fail., asymmetric reverse thrust
82J.39	43	11.12.82	Cessna AC Co.	?	C.501 Citation I	DES	L	Wichita Mid-Cont. Arpt., KS, USA	0	0	0	0	1	0	1	unauth. flight
83J.10	11	2.27.83	C.A.A.C. (China)	SP	HS.121-2E	MJW	L	Fuzhou Arpt., ROC	0	0	0	0	?	96		Overran RW, gear collapse
83J.11	12	3.11.83	Avensa (Venezuela)	SP	DC-9-32	DES	L	Barquisimeto Arpt., VEN	1	22	0	23	5	45	50	ILS app., fog, hard lndg, gear fail.
83J.16	17	4.14.83	Flight Int'l	?	Learjet 24D	DES	L	Puerto Vallarto, MEX	0	0	0	0	2	2	4	No details avail.
83J.28	30	7.12.83	U.S. Air Force 375 MAW	?	C-9A	MJR	L	Louisville, KY, USA	0	0	0	0	?	?		Overran RW
83J.29	31	7.22.83	Imani & Sons	F	Learjet 25D	DES	L	Lagos, NIG	0	0	0	0	3	0	3	No details avail.
83J.30	32	8.04.83	Pan American AW	SP	B747-121	MJW	L	Karachi Int'l Arpt., Pakistan	0	0	0	0	16	227	243	Overran wet RW, LOC
83J.33	36	9.14.83	Chinese Air Force	Mil.	Il-28 Beagle		L	Giulin Arpt., ROC	?	?	0	?	?	?		GTC failure
83J.36	39	10.05.83	SAM Colombia	SP	B727-21	DES	L	Sesquicentenario Arpt., COL	?	?	0	?	?	?		Gear-up lndg
83J.42	46	12.08.83	Brencham Ltd.	EXE	C.500 Citation I	DES	L	Stornoway, Lewis, Scotland, UK	2	8	0	10	2	8	10	No details avail.
83J.45	49	12.20.83	Ozark AL	SP	DC-9-31	MAJ	L	Sioux Falls Field, SD, USA	0	0	1	1	4	27	31	coll. with snowplow on RW

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								Crw	Pax	Gnd	Tot	Crw	Pax		Tot
84J.3	3	1.30.84	Aviation Business Flts.	T	Learjet 24A	DES L	Santa Catalina Arpt., CA, USA	2	4	0	6	2	4	6	Overran RW down 90' bluff, fire
84J.7	7	3.05.84	Air Zaire	SP	B737-298C	MAJ L	N'Djili Arpt., Kinshasa, ZAI	0	0	0	0	?	?		Gear-up Indg, ran off RW
84J.10	10	3.28.84	Lider Taxi Aereo	NSP	Learjet 24D	DES L	Florianopolis, BRA	2	2	0	4	2	2	4	No details avail.
84J.14	14	6.11.84	Garuda (Indonesia)	F	DC-9-32	MJW L	Jakarta Kemayoran Arpt., Indonesia	0	0	0	0	2	3	5	Hard Indg, fuselage struc. fail.
84J.17	17	7.00.84	Wolf Aviation	?	B707-458	MJW L	Kinshasa	?	?	?	?	?	?		No details avail.
84J.18	18	8.04.84	Philippine AL	SP	BAC 1-11	MAJ L	Tacloban Ronualdez Arpt., PHI	0	0	0	0	5	75	80	Overran RW
84J.21	21	9.18.84	L.A.C. Colombia	F	DC-8-54F	MJW L	Barranquilla Arpt., COL	0	0	0	0	3	2	5	crw err., ran off RW
84J.27	27	10.15.84	Aeroflot	SP	Tu-154	DES L	Omsk Arpt., RFSSR, USR	?	?	?	150	?	150		coll. with fuel truck on RW
84J.30	30	12.30.84	Garuda (Indonesia)	SP	DC-9-32	DES L	Dempasar Arpt., Bali, Indonesia	0	0	0	0	6	69	75	Fast, high app., ran off RW
85J.18	19	6.11.85	Sultan Industries	?	IAI.1121	DES L	Van Nuys Arpt.? CA, USA	0	0	0	0	2	1	3	No details avail.
85J.24	25	7.11.85	Hardee's Food Systems	EXE	HS.125-F400A	DES L	Sparta-White Co. Arpt., TN, USA	0	0	0	0	2	3	5	No details avail.
85J.32	34	8.27.85	A. Searle	EXE	Learjet 35A	DES L	Cape Town Int'l Arpt., SAF	0	0	0	0	2	5	7	No details avail.
85J.39	42	12.02.85	Air France	SP	B747-228B	MJW L	Rio de Janeiro Int'l Arpt., BRA	0	0	0	0	?	273		Overran RW, eng. control fail.
86J.1	1	1.15.86	Soc Cora Revillon, Paris?	?	D. Falcon 10	DES L	Chalon-Vatry, FRA	2	0	0	2	2	0	2	No details avail.
86J.3	3	1.27.86	Aerolineas Argentinas	F	B707-387C	MJW L	Buenos Aires Int'l Arpt., ARG	0	0	0	0	4	1	5	Overran RW, windy, rain
86J.7	7	2.21.86	USAir 499	SP	DC-9-31	MAJ L	Erie Int'l Airport, PA, USA	0	0	0	0	5	18	23	Overran wet RW
86J.16	17	5.07.86	My Wife's Yacht Sales	?	Learjet 24	DES L	Hollywood Arpt., FL, USA	0	0	0	0	2	2	4	No details avail.
86J.20	21	8.02.86	American Agronomics	FY	HS.125-1A/522	DES L	Bedford Mncpl. Arpt., IN, USA	2	0	0	2	2	0	2	Atmpted go-around, overran RW, fire
86J.21	22	8.06.86	Kabo Air	NSP	SE.210-III	MJW L	Calabar Arpt., NIG	0	0	0	0	0	0	0	Overran RW
86J.34	36	10.20.86	Aeroflot	SP	Tu-134A	DES L	Kuybyshev, Tatar ASSR, USR	4	66	0	70	7	85	92	Hard Indg, left RW
86J.36	38	10.26.86	Piedmont AL 467	SP	B737-222	MJW L	Charlotte Int'l Arpt., NC, USA	0	0	0	0	5	114	119	crw err., overran wet RW
86J.37	40	11.06.86	Private AC	PVT	Piper	DES L	Tampa Int'l Arpt., FL, USA	1	0	0	1	1	0	1	GTC failure, crw err.
87J.4	4	1.08.87	Middle East AL	SP	B707-323C	DES L	Beirut Int'l Arpt., LEB	0	0	0	0	?	126		struck by artillery fire
87J.6	6	1.14.87	Fidinam Fiduciaria	?	Learjet 35A	DES L	Agno Arpt., Lugano, SWI	0	0	0	0	?	2?		No details avail.
87J.12	12	2.23.87	S.A.S.	SP	DC-9-41	MJW L	Trondheim Vaernes Arpt., NOR	0	0	0	0	4	103	107	crw err., hard Indg
87J.15	15	4.11.87	Transbrasil	F	B707-330C	MJW L	Manaus Gomes Int'l Arpt., BRA	0	0	0	0	7	0	7	ILS app., rain, gear collapse
87J.26	27	8.04.87	LAN Chile	SP	B737-2A1 Adv.	MJW L	El Loa Arpt., Calama, Chile	0	1	0	1	8	27	35	Undershot RW, gear fail., fire
87J.32	33	9.30.87	Air Truck/DHL	F	D. Falcon 20DC	DES L	Las Palmas Arpt., Canary Is.	0	0	0	0	2	0	2	No details avail.
87J.41	42	12.28.87	Eastern AL 573	SP	DC-9-31	MJW L	Pensacola Regional Arpt., FL, USA	0	0	0	0	4	102	106	Hard Indg
88J.3	3	1.11.88	Ivory Coast Govt.	EXE	G.1159 GS III	DES L	St. Louise Arpt., Senegal	?	?	0	2	?	6		No details avail.
88J.5	5	1.18.88	Aeroflot	SP	Tu-154B-1	DES L	Krasnovodsk, Turkmeniya, USR	0	11	0	11	6	137	143	crw err., hard Indg
88J.31	31	8.27.88	Trans World AL	SP	B727-31	MJW L	Chicago O'Hare Int'l Arpt., IL, USA	0	0	0	0	6	62	68	Gear-up Indg

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
88J.32	32	8.31.88	C.A.A.C. 301 (China)	SP	HS.121-2E	MJW	L	Kai Tak Int'l Arpt., Hong Kong	6	1	0	7	11	78	89	Short app., struck app. lights, ran off RW
88J.34	34	9.06.88	Taxi Aereo Marilia	NSP	C.550 Citation	DES	L	Rio de Janeiro Dumont Arpt., BRA	0	0	0	0	2	5	7	No details avail.
88J.38	38	9.26.88	Aerolineas Argentinas	SP	B737-287 Adv.	MJW	L	Ushuaia Naval Air Base, ARG	6	56	0	62	6	56	62	Overran RW
88J.41	41	10.15.88	Nigeria AW	SP	B737-2F9 Adv.	DES	L	Port Harcourt, NIG	0	0	0	0	7	125	132	hvy rain, ran off RW, gear collapse
89J.3	3	1.30.89	Air Enterprise AL	FY	Learjet 23	MJW	L	Lisbon Arpt., POR	0	0	0	0	2	0	2	Gear-up lndg
89J.5	5	2.09.89	L.A.M. (Mozambique)	SP	B737-2B1 Adv.	MJW	L	Lichinga, Mozambique	0	0	0	0	?	108		Overran wet RW, rainstorm
89J.7	7	2.15.89	Reliant AL	?	D. Falcon 20DC	DES	L	Binghampton Arpt., NY, USA	0	0	0	0	2	0	2	Overran RW, struc. fail.
89J.8	8	2.17.89	S.P.A. (Brazil)	?	D. Falcon 10	DES	L	Guanabara Bay, Rio de Janeiro, BRA	0	0	0	0	2	0	2	No details avail.
89J.11	11	2.27.89	Nynex Corp.	F	C.550 Citation	DES	L	Poughkeepsie Arpt., NY, USA	0	0	0	0	?	?		No details avail.
89J.17	17	4.03.89	Faucett Peru	SP	B737-248	MJW	L	Iquitos, Peru	0	0	0	0	6	133	139	Skidded off wet RW, rainstorm
89J.23	23	7.11.89	Kenya AW	SP	B707-351B	DES	L	Addis Ababa Int'l Arpt., ETH	0	0	0	0	10	66	76	Ret. to field, gear fail., overran wet RW
89J.26	26	7.21.89	Philippine AL	SP	BAC 1-11	DES	L	Manila Int'l Arpt., Philippine Is.	0	1	9	10	7	91	98	Overran RW, hvy rain, struck cars
89J.28	28	8.02.89	Ariana Afghan AL	?	Yak-40	MJW	L	Qala Nua	?	?	?	?	?	?		crsh into hangar
89J.29	29	8.10.89	APISA Air Cargo (Peru)	F	DC-8-32/33F	MJW	L	Iquitos, Peru	0	0	0	0	?	?		Rainstorm, overran wet RW
89J.30	30	8.13.89	L.M. Barbennell	?	BAe.125-3A	DES	L	Houston Hobby Arpt., TX, USA	0	0	0	0	2	6	8	No details avail.
89J.31	31	8.16.89	L.A.D.E. (Argentina)	SP	F.28-1000C	MJW	L	San Carlos Arpt., ARG	0	0	0	0	6	59	65	Overran snow-covered RW, struck embank.
89J.35	35	9.07.89	Okada Air	SP	BAC 1-11	DES	L	Port Harcourt, NIG	0	0	0	0	4	88	92	Gear-up lndg
89J.38	38	9.23.89	Province of Misiones	EXE	Learjet 25D	DES	L	Rio Alto Parana, Posadas, ARG	0	2	0	2	2	5	7	No details avail.
89J.39	39	10.02.89	Harry O'Connor	PVT	C.501 Citation I	DES	L	Sedona Arpt., AZ, USA	0	0	0	0	1	0	1	No details avail.
89J.40	40	10.02.89	GTE South Inc.	F	C.550 Citation	DES	L	Roxboro Person Co. Arpt., NC, USA	2	0	0	2	2	0	2	No details avail.
89J.46	46	10.26.89	Presidencia de la	EXE	R. Sabreliner	DES	L	Saltillo, MEX	0	0	0	0	4	3	7	No details avail.
89J.47	47	11.04.89	Bel-Air Taxi Aereo	?	Learjet 25C	DES	L	Belo Horizonte Arpt., BRA	2	2	0	4	2	2	4	No details avail.
89J.48	48	11.14.89	Air Express AS	F	C.551 Citation	DES	L	Bardufoss, NOR	2	2	0	4	2	2	4	No details avail.
89J.51	51	12.30.89	Air Ivoire	SP	F.28-4000	MJW	L	Man, Ivory Coast	0	0	0	0	4	66	70	Overran RW
90J.1	1	1.05.90	Aerolineas Argentinas	SP	F.28-4000	DES	L	Villa Gesell, ARG	0	0	0	0	5	85	90	Overran wet RW on 2nd app., fire
90J.4	4	1.18.90	Eastern AL 111	SP	B727-225 Adv.	MAJ	L	Atlanta Hartsfield Int'l Arpt., GA, USA	0	0	0	0	8	141	149	GTC failure
90J.6	7	1.19.90	Eastman Kodak Corp.	EXE	G.1159 GS II	DES	L	Little Rock Adams Field, AR, USA	2	5	0	7	2	5	7	Undershot RW, fire
90J.11	12	2.18.90	Aviaco (Spain)	SP	DC-9-32	MJW	L	Mahon, Menorca, SPN	0	0	0	0	?	?		hvy lndg
90J.12	13	2.22.90	Learjet Corp.	T	Learjet 31	DES	L	Taiyuan Arpt., ROC	0	0	0	0	2	5	7	Fuselage struck RW, crw err.
90J.14	15	3.22.90	C.A.A.C. (China)	SP	HS.121-2E	MJW	L	Guilin Arpt., ROC	0	0	0	0	5	102	107	Overran wet RW, lnd long on RW
90J.17	18	4.06.90	Transamerica Taxi Aereo	F	Learjet 25C	DES	L	Serrinha Arpt., Juiz de Fora, BRA	2	0	0	2	4	0	4	Overran wet RW, fire

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
90J.21	22	7.14.90	Trans Arabian AT	F	B707-349C	MJW	L	Khartoum Arpt., Sudan	0	0	0	0	?	?	Gear collapse	
90J.22	23	7.15.90	Concrete Pipe &	F	Learjet 24D	DES	L	Benton Harbor Ross Field, MI, USA	0	0	0	0	2	0	2	Overran RW, poor weather
90J.30	31	9.16.90	Connie Kalita Services	?	Learjet 24	DES	L	Morristown Arpt., TN, USA	0	0	0	0	1	3	4	unauth. flt.
90J.33	34	10.02.90	Xiamen AL 8301	SP	B737-247	DES	L	Canton Arpt., Guangzhou, ROC	7	77	1	85	9	95	104	hij., coll. w/ parked ACs
90J.40	43	11.29.90	Executive Jet Inc.	NSP	C.550 Citation	DES	L	Sebring Regional Arpt., FL, USA	0	0	0	0	1	2	3	No details avail.
90J.41	44	11.30.90	Aeroflot	SP	Yak-40	DES	L	Dikson, USSR	0	0	0	0	4	31	35	No details avail.
91J.1	1	1.10.91	Romavia/TAROM	T	B707-3K1C	MJW	L	Bucharest Otopeni Arpt., Romania	0	0	0	0	13	0	13	hvy lndg, wingtip struck gnd., fire
91J.2	2	1.11.91	Belair Taxi Aereo	F	Learjet 25C	DES	L	Belo Horizonte, BRA	2	3	0	5	2	3	5	crsh in hvy rainstorm
91J.3	3	1.12.91	Vietnam AL	SP	Tu-134A	DES	L	Ho Chi Minh City Arpt., Vietnam	0	0	0	0	4	72	76	Hard lndg
91J.5	11	2.01.91	USAir 1493	SP	B737-3B7	DES	L	Los Angeles Int'l Arpt., CA, USA	2	20	0	22	6	83	89	GTC failure, ATC err.
91J.9	17	2.20.91	LAN Chile	NSP	BAe.146-200A	DES	L	Puerto Williams, Navarion Is., Chile	0	20	0	20	7	65	72	Overran wet RW, crsh into water
91J.22	30	5.01.91	PGA Tour Investments	Exec	IAI.1124A-II	DES	L	Waterbury/Oxford Arpt., CT, USA	0	0	0	0	2	6	8	Hard lndg, gear collapse, ran off RW
91J.25	35	5.09.91	SAM Colombia	?	B727-46	MJW	L	Medellin, COL	0	0	0	0	?	83		Emer. lndg, ret. to field
91J.28	38	5.23.91	Aeroflot 8556	SP	Tu-154B-1	DES	L	Leningrad Pulkovo Int'l Arpt, USSR	0	12	0	12	4	166	170	Eng. fail., crsh in hvy rain
91J.31	41	6.13.91	Korean Air 376	SP	B727-281	MJW	L	Taegu Arpt., RSK	0	0	0	0	7	119	126	Gear-up lndg, crw err.
91J.42	52	9.14.91	Cubana	SP	Tu-154B-2	DES	L	Mexico City Arpt., MEX	0	0	0	0	13	100	113	lnd long, gear fail., overran RW, fire
91J.43	53	9.16.91	Kabo Air	SP	BAC 1-11	MJW	L	Port Harcourt, NIG	0	0	0	0	?	55		Gear-up lndg, crw err.
91J.44	54	9.25.91	Soc Finprogetti	NSP	D. Falcon 20C	DES	L	Kiel, FRG	?	?	0	1	?	11		Overran wet RW, struck trees, high winds
91J.48	58	11.17.91	S.A.H.S.A.	SP	B737-2K6 Adv.	MJW	L	San Jose Arpt., Costa Rica	0	0	0	0	6	36	42	ILS app., fog, gear fail., overran RW
91J.54	64	12.17.91	Alitalia 1212	SP	DC-9-32	MJW	L	Warsaw Okecie Arpt., POL	0	0	0	0	6	90	96	Overran wet RW, gear fail., flt. from Rome
92J.1	1	1.18.92	USAir 305	SP	DC-9-31	MJW	L	Elmira Corning Arpt., NY, USA	0	0	0	0	5	36	41	hvy lndg, flt. from Ithaca, NY
92J.5	5	2.20.92	T.A.A.G. (Angola)	?	B707-349C	MJW	L	Luanda, ANG	0	0	0	0	4	0	4	Gear collapse on lndg, fuselage struc. damage
92J.9	9	3.26.92	Intercontinental de	SP	DC-9-15	MJW	L	Tumaco, COL	0	0	0	0	4	88	92	hvy lndg, fuselage struc. fail.
92J.10	10	3.28.92	Export Air del Peru	?	DC-8-33F	MJW	L	Iquitos Airport, Peru	0	0	0	0	?	?		Nose gear collapse
92J.11	11	3.30.92	AVIACO	SP	DC-9-32	DES	L	Granada, SPN	0	0	0	0	5	94	99	Fuselage aft of wing failed, high winds
92J.14	14	4.29.92	GAS Air Cargo	T	B707-351C	MJW	L	Lagos, NIG	0	0	0	0	?	?		Gear-up lndg
92J.15	15	5.02.92	Transamerica Taxi Aereo	?	Learjet 35A	DES	L	Cumuatillo, Michoacan, MEX	2	0	0	2	2	0	2	Smuggling flt.
92J.19	19	6.05.92	Balkan Bulgarian AL	NSP	Tu-154B	MJW	L	Varna, BUL	0	0	0	0	?	127		Overran RW, damaged front fuselage, nosegear
92J.24	25	6.00.92	Jakutavia?	?	Il-62	DES	L	Yakutsk, Russia, CIS	?	?	?	?	?	?		Overran RW? into ravine, bad weather div.

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92J.32	35	8.23.92	Kabo Air	?	BAC 1-11	MJW	L	Sokoto, NIG	0	0	0	0	4	53	57	Overran RW, Ind@closed arpt., crw err.
92J.37	40	8.29.92	Hold-Trade Air	SP	BAC 1-11	MJW	L	Kaduna, NIG	0	0	0	0	6	66	72	Overran RW into soft gnd.
92J.43	46	10.15.92	LAC Colombia	F	DC-8-F-55	MJW	L	Medellin, COL	0	0	0	0	3	0	3	Overran RW
92J.46	49	11.22.92	Flight Operations, Inc.	Amb.	Learjet 25B	MJW	L	Cleveland Hopkins Int'l Arpt., OH, USA	0	0	0	0	1	3	4	No details avail.
92J.50	53	12.05.92	Armenian AL	?	Tu-154A	MJW	L	Yerevan	0	0	0	0	8	146	154	Overran RW, struck concrete wall, poor visibility
92J.54	57	12.20.92	Martinair Holland 495	NSP	DC-10-30F (CF)	DES	L	Faro, POR	2	54	0	56	11	275	286	Bad weather, hvy rain, high winds, 2nd app., wingtip struck gnd., fire
93J.1	1	1.09.93	Uzbeki/Indian AL	SP	Tu-154B-2	DES	L	Delhi Arpt., IND	0	0	0	0	13	152	165	Missed RW, fog, rolled, inverted, fire
93J.3	3	1.31.93	L.A.D.E.	SP	B707-387B	MJW	L	Recife, BRA	0	0	0	0	12	158	170	Hydraulic, fail., main gear collapse
93J.8	9	4.05.93	T.A.C.A. Int'l 510	SP	B767-2S1	MJR	L	Guatemala City Int'l Arpt., Guatemala	0	0	0	0	9	227	236	Ind long, overran wet RW, struck bldgs., gear collapse, struck embankment
93J.10	11	4.14.93	American AL 102	SP	DC-10-30	MJW	L	Dallas/Ft. Worth Int'l Arpt., TX, USA	0	0	0	0	13	189	202	Ran off RW, nose & lt. gear collapse, emer. evac., flt. from Honolulu, HI
93J.11	12	4.18.93	Japan AS 451	SP	DC-9-41	DES	L	Hanamaki Arpt., JPN	0	0	0	0	5	72	77	Tail, rt. wing struck gnd., 25 kt. crosswind, 32 kt. gusts, crw err., rt. gear collapse, fire, flt. from Nagoya
93J.15	16	5.06.93	SERCA	FY	SE.210-10B3	MJW	L	Cayenne	0	0	0	0	4	0	4	Hard lndg, delivery flt. to Colombia
93J.17	18	5.17.93	Tumenavia	?	Yak-40	MJW	L	Hanty-Mansiysk	0	0	0	0	?	?	?	Overran RW, nose gear collapse
93J.18	19	5.18.93	Biman Bangladesh AL	SP	DC-10-30	MJW	L	Dacca, Bangladesh	0	0	0	0	12	123	135	Ran off wet RW, hvy rain, gear damaged
93J.20	21	5.26.93	City Air	?	C.550 Citation	MJW	L	Southampton, UK	0	0	0	0	2	0	2	Overran wet RW onto road, rain, T-storm
93J.23	24	7.18.93	S.A.S.H.A. 415	SP	B737-2H6 Adv.	MJW	L	Managua Arpt., NIC	0	0	0	0	6	88	94	hvy lndg, ran off RW into ditch, flt. from Tegucigalpa
93J.24	25	7.19.93	SERVIVENSA	?	DC-9-32	MJW	L	Ciudad Bolivar	0	0	0	0	5	60	65	Overran wet RW 24
93J.32	33	9.02.93	TAESA	NSP	Learjet 25D	MJW	L	Tijuana, MEX	0	0	0	0	2	4	6	hvy lndg, ran off RW, flt. from Mexico City
93J.33	34	9.03.93	Aerocondor	?	NA.265-40A	DES	L	Buenos Aires Airport, ARG	0	0	0	0	2	0	2	Overran RW, overturned, thrust rev. fail.
93J.35	36	9.14.93	Lufthansa 2904	SP	A.320-211	DES	L	Warsaw Int'l Arpt., POL	1	1	0	2	6	74	80	Overran wet RW, struck embankment, fire
93J.36	37	9.14.93	Air France	SP	B747-428	MJR?	L	Papette Arpt., TAH	0	0	0	0	16	256	272	Overran RW 04 into shallow lagoon, thrust rev. fail.
93J.40	41	10.26.93	China Eastern 5398	SP	MD-82	DES	L	Fuzhou, ROC	0	2	0	2	9	71	80	Ind long, overran RW into swamp, flt. from Shenzhen

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
93J.41	42	11.04.93	China AL 605	SP	B747-409	MJW	L	Victoria Harbor, Hong Kong Int'l Arpt.	0	0	0	0	?	296		Overran RW 13 during tropical storm Ira, into sea, Taipei-Hong Kong ft.
92J.6	6	3.19.92	Kamchatavia	?	Yak-40	MJW	L/G ?		0	0	0	0	?	?		Declared WO during major overhaul following hard lndg from previous ft.
87J.31	32	9.21.87	Egyptair	T	A.300B4-203	DES	L/T	Luxor, EGY	5	0	0	5	5	0	5	Practice touch & go
70J.9	9	3.17.70	Eastern AL 1320	SP	DC-9-31	NON	LA	Boston, MA, USA	1	0	0	1	5	72	77	In-flt. atmpd hij., shooting
70J.10	10	4.01.70	Royal Air Maroc	SP	SE.210-IIIR	DES	LA	Casablanca Nouasseur Arpt., MOR	5	56	0	61	6	76	82	Fog, lnd 9.7 kms. short of RW
70J.12	12	5.02.70	Antilliaanse	SP	DC-9-33CF	DES	LA	40 kms. ENE of St. Croix, Virgin Is.	1	22	0	23	6	57	63	Missed app., crw err., water lndg
70J.13	13	5.09.70	Executive Jet Aviation	NSP	Learjet 23A	DES	LA	Pellston Emmet Co. Arpt., MI, USA	2	4	0	6	2	4	6	impr. app., instr. fail., crw err.
70J.14	14	6.01.70	C.S.A. (Czechoslovakia)	SP	Tu-104A	DES	LA	Tripoli Int'l Arpt., LIB	10	3	0	13	10	3	13	Fog, undershot RW, crw err.
70J.15	15	7.03.70	Dan-Air London, Ltd.	NSP	DH.106-IV	DES	LA	Arbucias, 50 kms. NE of Barcelona, SPN	7	105	0	112	7	105	112	Fog, struck Montseny mtn., instr. err.
70J.19	19	7.20.70	Condor Flugdienst	SP	B737-130	MIN	LA	Tarragona, SPN	0	0	0	0	5	95	100	ATC failure
70J.21	21	7.27.70	Flying Tiger 45	F	DC-8-63AF	DES	LA	Naha AB, Okinawa, JPN	4	0	0	4	4	0	4	Rain, crw err., undershot RW
70J.22	22	8.08.70	Modern AT	FY	CV.990-30A-8	DES	LA	Acapulco, MEX	0	0	0	0	8	0	8	Undershot RW, VOR/ILS app.
70J.30	32	11.14.70	Southern AW 932	NSP	DC-9-31	DES	LA	Huntington Tristate Arpt., WV, USA	5	70	0	75	5	70	75	instr. err.? crw err.
70J.31	33	11.14.70	Royal Crown Cola	EXE	AC.1121	DES	LA	Lexington, KY, USA	2	0	0	2	2	0	2	Missed app., LOC, crw err.
70J.34	37	12.07.70	TAROM (Rumania)	SP	BAC 1-11	DES	LA	Constanza Arpt., RUM	3	15	0	18	7	20	27	Short app. 4 kms. from RW
70J.38	41	12.28.70	Morrison-Knutson 223	EXE	HS.125-1A	DES	LA	10 mi. NE of Boise Vortac, ID, USA	2	0	0	2	2	0	2	impr. instr. app., crw err.
71J.1	1	1.02.71	United Arab AL	SP	DH.106-IVC	DES	LA	Ben Gashir, Tripoli, LIB	8	8	0	16	8	8	16	Sandstorm, crsh 7 kms. from RW
71J.3	3	1.09.71	American AL 30	SP	B707-323C	MAJ	LA	Newark, NJ, USA	0	0	0	0	7	14	21	ATC failure
71J.10	13	4.17.71	F & S Contracting	EXE	Learjet 24B	DES	LA	Butte, MT, USA	2	2	0	4	2	2	4	struck high gnd., crw err.
71J.13	17	7.05.71	General Transportation	FY	D. Falcon 20C	DES	LA	Boca Raton Arpt., FL, USA	0	0	0	0	2	0	2	In-flt. 2-eng. fail., crw err.
71J.14	18	7.25.71	Pan American AW 6005	F	B707-321C	DES	LA	Mt. Kamun near Manila, PHI	4	0	0	4	4	0	4	hvy rain, instr. fail., crw err.
71J.17	22	9.04.71	Alaska AL 66	SP	B727-193	DES	LA	20 mi. W of Juneau Arpt., AK, USA	7	104	0	111	7	104	111	struck Mt. Fairweather, rain, fog, navigation err., cause unknown
71J.20	25	9.16.71	MALEV (Hungary)	SP	Tu-134A	DES	LA	Kiev, USSR	8	41	0	49	8	41	49	Cause unknown
71J.24	29	12.04.71	Eastern AL 898	SP	DC-9-31	MIN	LA	Raleigh-Durham Arpt., NC, USA	0	0	0	0	4	23	27	ATC failure
71J.24	30	12.04.71	Private AC	PVT	Cessna 206	DES	LA	Raleigh-Durham Arpt., NC, USA	1	1	0	2	1	1	2	ATC failure
72J.1	1	1.07.72	Iberia 602 (Spain)	SP	SE.210-VIR	DES	LA	Ibiza, Balearic Is., SPN	6	98	0	104	6	98	104	struck Rocas Altas Peak on app. crw err.
72J.3	3	1.21.72	T.H.Y. (Turkey)	F	DC-9-32	DES	LA	2 kms. from Adana Arpt., TUR	1	0	0	1	5	0	5	Snow, depress., missed app.
72J.9	9	2.18.72	Olympic AW	EXE	Learjet 25B	DES	LA	Nice Antibes Arpt., FRA	2	0	0	2	2	0	2	crsh @ sea
72J.10	10	2.20.72	Fred-Air AG	EXE	D. Falcon 20D	DES	LA	Samedan, SWI	0	0	0	0	2	3	5	crsh into lake, marginal weather
72J.12	12	3.14.72	Sterling AW 296	NSP	SE.210-10B3	DES	LA	Fujairah, 50 mi. E. of Dubai, UAE	6	106	0	112	6	106	112	T-storms, struck high gnd., crw err.

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72J.13	13	3.19.72	Egyptair 763	SP	DC-9-32	DES	LA	Aden Int'l Arprt., S. YEM	9	21	0	30	9	21	30	Struck Shamsan mts. 4 nmi. SW of arprt.
72J.15	15	5.05.72	Alitalia 112 (Italy)	SP	DC-8-43	DES	LA	3 mi. SE of Punta Raisi Arprt., Palermo, ITA	7	108	0	115	7	108	115	Struck Montagna Lunga mtn., crw err.
72J.17	17	5.18.72	Eastern AL 346	SP	DC-9-31	DES	LA	Ft. Lauderdale Int'l Arprt., FL, USA	0	0	0	0	4	6	10	T-storm, crw err., hard lndg
72J.18	18	5.30.72	Delta AL 9570	T	DC-9-14	DES	LA	Ft. Worth SW Int'l Arprt., TX, USA	4	0	0	4	4	0	4	Preceding DC10 wingtip vortices
72J.19	19	6.14.72	Japan AL 471	SP	DC-8-53	DES	LA	10 mi. from New Delhi Palam Arprt., IND	11	75	4	90	11	78	89	impr. straight-in app. to RW 28, fire, crw err.
72J.24	24	7.06.72	Aviaco (Spain)	Fy	DC-8-52	DES	LA	Las Palmas, Gran Canaria Is., SPN	10	0	0	10	10	0	10	Sea lndg 14 mi. from Gran Canaria Is.
72J.27	27	8.28.72	Vodavia S.A.	EXE	Learjet 23	DES	LA	Innstruck, AUT	2	0	0	2	2	0	2	Struck mtn., ER London-Innsbruck
72J.31	31	10.13.72	Aeroflot	SP	Il-62	DES	LA	Moscow Sheremetyevo Arprt., USR	8	168	0	176	8	168	176	Short 3rd app. 3 mi. from RW, bad weather
72J.38	38	12.08.72	United AL 553	SP	B737-222	DES	LA	Chicago Midway Arprt., IL, USA	3	40	2	45	6	55	61	Fog, crw err., struck houses 1 mi. from arprt.
72J.39	39	12.12.72	Marathon Oil	EXE	HS.125-3A	DES	LA	Findlay, OH, USA	0	0	0	0	2	5	7	3rd app., struck trees, crw err.
72J.42	43	12.23.72	Braathens SAFE	SP	F.28-1000	DES	LA	Asdoeltjern, Asker, NOR	3	37	0	40	3	42	45	struck high gnd.
72J.45	46	12.29.72	Eastern AL 401	SP	L.1011-1	DES	LA	Everglades, Miami, FL, USA	5	98	0	103	13	163	176	crw err., preoccupation w/ nosegear malfunction,
73J.1	1	1.02.73	Pacific Western AL	F	B707-321C	DES	LA	2 mi. from Edmonton Arprt., CAN	5	0	0	5	5	0	5	Undershot RW, snow, high winds
73J.6	6	2.19.73	Aeroflot	SP	Tu-154	DES	LA	Prague, CZK	4	62	0	66	13	87	100	Locked tailplane, crsh 200' short of RW
73J.12	13	3.05.73	Aviaco (Spain)	FY	SE.210-10R	DES	LA	Funchal Arprt., Madeira	3	0	0	3	3	0	3	App. short of RW, ditched @ sea
73J.16	17	4.12.73	N.A.S.A. (U.S.)	T	CV.990-30A-5	DES	LA	Moffett NAS, CA, USA	?	?	0	4?	?	4?		ATC failure
73J.19	21	5.05.73	Lider Taxi Aero	NSP	Learjet 24	DES	LA	Rio de Janeiro Galeao Arprt., BRA	2	1	0	3	2	1	3	struck high gnd., struck powerline, fire
73J.22	24	5.31.73	Indian AL	SP	B737-2A8	DES	LA	6 kms. S of Delhi Palam Arprt., IND	5	43	0	48	7	58	65	Short app., crw err., fire
73J.23	25	6.01.73	Cruzeiro do Sul	SP	SE.210-VIR	DES	LA	Sao Luis, BRA	7	16	0	23	7	16	23	atmptd go-around
73J.25	27	6.09.73	VARIG (Brazil)	F	B707-327C	DES	LA	Rio de Janeiro Galeao Arprt., BRA	2	0	0	2	4	0	4	crw err., control fail.
73J.26	28	6.18.73	Philip Holzmann	EXE	Learjet 24B	DES	LA	Mariensiel, FRG	2	2	0	4	2	2	4	impr. app., struck trees, fire
73J.27	29	6.20.73	Aeromexico	SP	DC-9-15	DES	LA	Puerto Vallarta, MEX	5	22	0	27	5	22	27	struck high gnd., 32 kms. SE of arprt.
73J.31	33	7.11.73	VARIG 820 (Brazil)	SP	B707-345C	DES	LA	Paris Orly Arprt., FRA	7	116	0	123	17	117	134	In-flt. fire, emer. lndg
73J.35	37	8.13.73	Aviaco (Spain)	SP	SE.210-10R	DES	LA	Corunna, SPN	6	79	1	86	6	79	85	4th app., bad weather, crw err.
73J.37	39	8.28.73	Trans World AL 742	SP	B707-331B	NON	LA	Los Angeles, CA, USA	0	1	0	1	8	141	149	instr. fail., AC oscillations
73J.39	41	9.08.73	World AW 802	F	DC-8-63CF	DES	LA	24 kms. S of Cold Bay, AK, USA	6	0	0	6	6	0	6	Struck Mt. Dutton, crw err., drizzle
73J.40	42	9.10.73	American Jet Ind.	F	CV.990-30A-5	DES	LA	Agana Field, Guam, Marianas Is.	0	0	0	0	3	1	4	Overran wet RW
73J.41	43	9.11.73	J.A.T. (Yugoslavia)	SP	SE.210-VIN	DES	LA	35 kms. N of Titograd, YUG	6	35	0	41	6	35	41	struck high gnd.
73J.48	50	10.20.73	Mexicana	SP	B727-14	MJW	LA	Mazatlan Buena Arprt., MEX	0	0	0	0	6	117	123	crsh 1.5 mi. from arprt., gear fail.
73J.53	55	11.27.73	Delta AL 516	SP	DC-9-32	DES	LA	Chattanooga Mncpal. Arprt., TN, USA	0	0	0	0	5	74	79	hvy rain, wind shear, crw err., fire



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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
73J.55	57	12.08.73	Aeroflot	SP	Tu-104	DES	LA	Moscow Domodedovo Arpt., USSR	?	?	?	13	?	72		Undershot RW, bad weather
73J.57	59	12.16.73	Aeroflot	SP	Tu-124	DES	LA	Vilnius, Lithuania, USSR	?	?	?	?	?	?		No details avail.
73J.59	61	12.17.73	Iberia 933 (Spain)	SP	DC-10-30	DES	LA	Boston Logan Int'l Arpt., MA, USA	0	0	0	0	14	153	167	ILS app., struck app. lights, crw err.
73J.60	62	12.19.73	Lufthansa	SP	B707-330B	DES	LA	Delhi Palam Arpt., IND	0	0	0	0	11	98	109	Undershot RW, crw err.
73J.61	63	12.22.73	Royal Air Maroc	NSP	SE.210-VIN	DES	LA	20 kms. from Tetuanm, MOR	7	99	0	106	7	99	106	Struck Mt. Mellaline, crw err., rain
74J.1	1	1.01.74	Itavia 897 (Italy)	SP	F.28-1000	DES	LA	Torino/Turin, ITA	3	36	0	39	4	38	42	Undershot RW, fog, hvy rain
74J.3	3	1.15.74	Kerr-McGee Corp.	EXE	R. Sabreliner	DES	LA	Oklahoma City, OK, USA	2	0	0	2	2	0	2	impr. ILS app., crw err.
74J.7	7	1.30.74	Pan American AW 806	SP	B707-321B	DES	LA	Pago, Pago Int'l Arpt., Amer. Samoa	10	87	0	97	10	91	101	Windshear, rain, crw err., lnd short of RW
74J.21	22	4.22.74	Pan American AW 812	SP	B707-321B	DES	LA	Denpasar, Bali Is., Indonesia	11	96	0	107	11	96	107	Struck 4000' mtn., instr. fail., navigation err.
74J.28	30	9.11.74	Eastern AL 212	SP	DC-9-31	DES	LA	Charlotte Municipal Arpt., NC, USA	2	70	0	72	4	78	82	impr. IFR app., crw err., fire
74J.32	34	11.21.74	Iran Govt./Air Taxi Co.	EXE	D. Falcon 20E	DES	LA	Kermanshah Arpt., IRN	2	0	0	2	3	0	3	struck gnd. 3 kms. short of RW, crw err.
74J.34	36	11.23.74	J.A.T. (Yugoslavia)	SP	DC-9-32	MJW	LA	Belgrade Surcin Arpt., YUG	0	0	0	0	6	44	50	lnd short of RW, crw err.
74J.35	37	12.01.74	Trans World AL 514	SP	B727-231	DES	LA	Berryville, VA, USA	7	85	0	92	7	85	92	App. control fail., struck Mt. Weather 30 mi. NW of IAD
74J.37	39	12.04.74	Garuda Indonesian AW	NSP	DC-8-55F	DES	LA	Maskeliya, Colombo, Sri Lanka	9	182	0	191	9	182	191	Struck high gnd. 45 mi, ESE of arpt., navigation err.
74J.40	42	12.27.74	Anchor Hocking	F	R. Sabreliner 60	DES	LA	Lancaster, OH, USA	3	0	0	3	3	0	3	struck trees, mtn., impr. IFR app.
75J.1	1	1.30.75	T.H.Y. (Turkey)	SP	F.28-1000	DES	LA	Istanbul Yesilkoy Arpt., TUR	4	38	0	42	4	38	42	Overshot RW, RW lighting fail.
75J.4	4	2.23.75	General Motors	EXE	R. Sabreliner	DES	LA	Pontiac, MI, USA	1	0	0	1	2	0	2	struck tree, impr. IFR app., rain, fog
75J.12	12	6.06.75	Philippine AL	SP	BAC 1-11 524FF	MAJ	LA	Manila, PHI	0	1	0	1	5	59	64	In-flt. bombing
75J.16	16	6.24.75	Eastern AL 66	SP	B727-225	DES	LA	New York JFK Int'l Arpt., NY, USA	6	109	0	115	8	116	124	T-storms, hvy rain, wind shear, struck app. lights
75J.21	22	8.03.75	Alia Royal Jordanian AL	NSP	B707-321C	DES	LA	Imzezem Immouzer, Agadir, MOR	7	181	0	188	7	181	188	Struck mtn. 25 mi. NW of Agadir, crw err.
75J.23	24	8.20.75	C.S.A. (Czechoslovakia)	SP	Il-62	DES	LA	Damascus, Syria	11	115	0	126	11	117	128	struck sand hill on app., cause unknown
75J.25	26	9.01.75	Interflug (E. Germany)	SP	Tu-134	DES	LA	Leipzig Schkeuditz Arpt., GDR	3	23	0	26	6	28	34	lnd short of RW, flt. from Stuttgart
75J.27	28	9.24.75	Garuda (Indonesia)	SP	F.28-1000	DES	LA	Palembang, Sumatra, Indonesia	4	21	1	26	4	57	61	lnd short of RW, struck trees
75J.29	30	9.30.75	MALEV (Hungary)	SP	Tu-154	DES	LA	Beirut, LEB	10	50	0	60	10	50	60	crsh into sea, flt. to Budapest
75J.30	31	9.30.75	Avianca (Colombia)	F	B727-24C	DES	LA	Barranquilla Cortissoz Arpt, COL	4	0	0	4	4	0	4	2nd app., lnd short of RW
75J.31	32	10.30.75	Inex Adria (Yugoslavia)	NSP	DC-9-32	DES	LA	Prague, CZK	4	71	0	75	5	115	120	lnd short of RW
75J.33	34	11.15.75	Aerolineas Argentinas	SP	F.28-1000	DES	LA	6 kms. from Concordia, ARG	0	0	0	0	4	56	60	lnd short of RW, struck trees
75J.36	37	12.22.75	Trans World AL	SP	B707-331B	DES	LA	Milan Malpensa Arpt., ITA	0	0	0	0	8	117	125	2nd app., lnd short of RW

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76J.4	4	1.03.76	Winship AS	NSP	Learjet 24A	MJR	LA	Anchorage Int'l Arpt., AK, USA	2	4	0	6	2	6	8	impr. ILS app.
76J.8	8	2.22.76	Faberge Inc.	EXE	G.1159 GS II	DES	LA	Burlington Int'l Arpt., VT, USA	0	0	0	0	3	1	4	Oscillating roll, wing struck RW, cartwheeled
76J.10	10	3.18.76	Cubana	SP	DC-8-43	MJW	LA	Havana, CUB	0	0	0	0	16	13	29	ATC failure
76J.13	14	4.22.76	Int'l Travel	F	B720-022	DES	LA	Barranquilla Arpt., COL	0	0	0	0	3	1	4	Undershot RW
76J.15	16	5.09.76	Imp. Iranian AF ULF48	F	B747-131F	DES	LA	80 kms. SE of Madrid, SPN	10	7	0	17	10	7	17	Lightning strike, in-flt. fire
76J.18	19	6.23.76	Allegheny AL 121	SP	DC-9-31	MJW	LA	Philadelphia Int'l Arpt., PA, USA	0	0	0	0	4	102	106	Windshear, atmpt. go-around
76J.23	24	8.07.76	Hansa Jet / Colonial	NSP	D. Falcon 20C	DES	LA	Acapulco, MEX	1	2	0	3	1	2	3	Struck mtn., bad weather
76J.30	32	9.19.76	T.H.Y. (Turkey)	SP	B727-2F2	DES	LA	Karatepe Mtns., Isparta, TUR	8	147	0	155	8	147	155	Struck mtn. 65 mi. N of Antalya, navigation err.
76J.31	33	9.26.76	Johnson & Johnson	EXE	G.1159 GS II	DES	LA	Hot Springs Ingalls Field, VA, USA	3	8	0	11	3	8	11	impr. ILS app., cause unknown, fire
76J.32	34	9.26.76	S.P.A. (Brazil)	EXE	Learjet 25C	DES	LA	Campinas/Viracops Arpt., BRA	2	5	0	7	2	5	7	impr. instr. app., struck trees, rain
76J.43	45	12.25.76	Egyptair 864	SP	B707-366C	DES	LA	Bangkok Arpt., THL	9	44	19	72	9	44	53	impr. app., crw err., struck textile mill
77J.5	6	1.13.77	Aeroflot	SP	Tu-104B	DES	LA	Alma Ata, Kazakhstan, USR	6	90	0	96	6	90	96	In-flt. 2 eng. fail.
77J.7	8	1.18.77	Yugoslav Govt.	EXE	Learjet 25B	DES	LA	Inac Mtn., Sarajevo, YUG	3	5	0	8	3	5	8	impr. app., struck 4480' mtn.
77J.9	10	3.03.77	?	?	R. Sabreliner	DES	LA	Nassau, Bahamas	1	0	0	1	1	0	1	hvy rain
77J.10	11	3.04.77	Overseas National	F	DC-8-63CF	DES	LA	Niamey, Niger	2	0	0	2	4	0	4	Ind 800 m. short of RW
77J.13	15	4.02.77	Aviogenex (Yugoslavia)	F	Tu-134A-3	DES	LA	Libreville Arpt., GAB	6	2	0	8	6	2	8	Missed app., Ind short of RW
77J.21	23	5.14.77	Dan-Air	F	B707-321C	DES	LA	Lusaka Int'l Arpt., Zambia	5	1	0	6	5	1	6	In-flt. tailplane struc. fail.
77J.23	25	5.27.77	Aeroflot	SP	Il-62	DES	LA	Havana Arpt., CUB	9	60	0	69	9	61	70	Undershot RW, struck powerlines
77J.25	27	7.25.77	A. Blattner?	F?	HFB-320	DES	LA	Adjivou, Ivory Coast	2	1	0	3	2	1	3	crsh into Atlantic Ocean
77J.31	33	9.21.77	MALEV (Hungary)	SP	Tu-134	DES	LA	6.3 kms. SW of Urziceni, Romania	8	21	0	29	8	45	53	Reduced power, emer. lndg
77J.33	35	9.27.77	Japan AL	SP	DC-8-62H	DES	LA	32 kms. from Kuala Lumpur, Malaysia	8	26	0	34	10	69	79	T-storm, struck hill, crw err.
77J.42	44	11.21.77	Austral SPL-9	NSP	BAC 1-11	DES	LA	San Carlos de Bariloche, ARG	5	41	0	46	5	74	79	VOR fail., VFR app., crw err.
77J.45	47	12.04.77	Malaysian AL System 653	SP	B737-2H6 Adv.	DES	LA	Johore Strait, Malaysia	7	93	0	100	7	93	100	hij., in-flt. shooting of crw
77J.47	49	12.09.77	Churchill Falls Corp.	EXE	HS.125-400A	DES	LA	Churchill Falls, Labrador, Nfndlnd. CAN	2	6	0	8	2	6	8	impr. app., crw err.
77J.49	51	12.18.77	S.A.T.A. 730 (Portugal)	NSP	SE.210-10R	DES	LA	Funchal Arpt., Madeira, POR	1	35	0	36	5	52	57	Short app., crw err., water lndg
77J.50	52	12.18.77	United AL 2860	F	DC-8-54F	DES	LA	NE of Salt Lake City, UT, USA	3	0	0	3	3	0	3	crw err., holding, struck Wasatch Mtns.
78J.6	6	2.22.78	Maniglia Costruzioni	EXE	Learjet 35A	DES	LA	Palermo, Sicily, ITA	1	2	0	3	1	2	3	crsh @ sea
78J.7	7	2.26.78	?	PVT	F-104	DES	LA	Mojave, CA, USA	0	0	0	0	1	0	1	lndg gear fail., crw ejected
78J.9	9	3.01.78	Nigeria AW	SP	F.28-1000	DES	LA	Kano Arpt., NIG	5	11	0	16	5	11	16	ATC failure
78J.9	10	3.01.78	Military AC	Mil.	MiG-21	DES	LA	Kano Arpt., NIG	2	0	0	2	2	0	2	ATC failure

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78J.10	11	3.03.78	Iberia (Spain)	SP	DC-8-63	MJW	LA	Santiago De Compostela, SPN	0	0	0	0	11	211	222	High final app., overran RW, fire
78J.21	22	5.08.78	National AL 193	SP	B727-235	MJW	LA	Escambia Bay, Pensacola, FL, USA	0	3	0	3	6	52	58	Fog, crw err., crsh @ sea
78J.30	32	8.03.78	LAN-Chile	SP	B707-351B	DES	LA	Buenos Aires Ezeiza Arpt., ARG	0	0	0	0	8	55	63	Ind short of RW, fog
78J.32	34	9.25.78	Pacific SW AL 182	SP	B727-214	DES	LA	San Diego, CA, USA	7	128	13	148	7	128	135	ATC failure, crw err.
78J.37	40	11.15.78	Icelandic/Garuda	NSP	DC-8-63CF	DES	LA	Colombo Katunayake Arpt., Sri Lanka	8	176	0	184	13	249	262	struck coconut plantation 1 mi. from RW on ILS app., crw err., ILS fail., hvy rain, wind shear
78J.41	44	12.23.78	Alitalia 4128 (Italy)	SP	DC-9-32	DES	LA	3 kms. N of Palermo, Sicily, ITA	5	103	0	108	5	124	129	crsh @ sea 3.5 mi. short of RW, crw err.
78J.43	46	12.28.78	United AL 173	SP	DC-8-61	DES	LA	10 kms. N of Portland, OR, USA	2	8	0	10	8	181	189	crw err., fuel exhaust., gear fail.
79J.2	2	1.19.79	Massey-Ferguson	EXE	Learjet 25D	DES	LA	Detroit Metro. Arpt., MI, USA	2	4	0	6	2	4	6	LOC, preceding DC9 wake-vortices, icing
79J.6	6	2.17.79	Trans Mediterranean AW F	F	B707-321C	MAJ	LA	Taoyuan, TWN	0	0	0	0	5	0	5	ATC failure
79J.7	8	3.06.79	Garuda (Indonesia)	F	F.28-1000	DES	LA	Ngadirefo, Sukapur, Java, Indonesia	4	0	0	4	4	0	4	struck high gnd.
79J.9	10	3.14.79	Alia-Royal Jordanian 600	SP	B727-2D3	DES	LA	Doha Int'l Arpt., QTR	3	42	0	45	15	49	64	T-storm, windshear, missed app.
79J.15	16	4.26.79	Indian AL	SP	B737-2A8	DES	LA	St. Thomas Mt. Arpt., Madras, IND	0	0	0	0	6	61	67	In-flt. bombing
79J.22	23	7.11.79	Garuda (Indonesia)	SP	F.28-1000	DES	LA	Medan Airfield, Sumatra, Indonesia	4	57	0	61	4	57	61	Struck mtn.
79J.26	27	8.02.79	Thurman Munson	T	C.501 Citation I	DES	LA	Canton, OH, USA	1	0	0	1	1	2	3	Touch-&-go short of RW, crw err.
79J.31	33	9.03.79	Sterling AW	NSP	SN.601-100	DES	LA	Nice, FRA	2	8	0	10	2	8	10	In-flt. 2-eng. fail., LOC
79J.34	36	9.14.79	Aero Transporti Italiani	SP	DC-9-32	DES	LA	Sarroch, Cagliari, Sardinia	4	27	0	31	4	27	31	struck high gnd., crw err., bad weather
79J.37	39	11.19.79	National Jet Industries	F	C.500 Citation I	DES	LA	Castle Rock, CO, USA	1	1	0	2	2	1	3	impr. IFR op., icing, crw err.
79J.44	46	12.10.79	Ferruzzi SpA	EXE	Learjet 36A	DES	LA	Forli, Arcona, ITA	2	1	2	5	2	4	6	Struck tower, house 2 kms. from RW
79J.46	48	12.23.79	T.H.Y. (Turkey)	SP	F.28-1000	DES	LA	Cucuk Koy, Ankara, TUR	3	38	0	41	4	41	45	High high gnd.
80J.3	3	1.21.80	Iran Air	SP	B727-86	DES	LA	Elburz Mtns., 20 mi. N of Tehran, IRN	8	120	0	128	8	120	128	struck high gnd. on ILS app., inoperative ILS
80J.7	7	1.30.80	L'Armee de l'Air	?	D. Falcon	DES	LA	Toul-Rosieres, FRA	?	?	?	?	?	?	?	No details avail.
80J.10	10	2.27.80	China AL (Taiwan)	SP	B707-309C	DES	LA	Manila Int'l Arpt., PHI	0	2	0	2	11	122	133	Undershot RW, cause unknown
80J.11	11	3.03.80	Bass Aviation	EXE	Learjet 25	DES	LA	Port au Prince, HAI	2	1	3	6	3	1	4	Struck mtns., houses 13 mi. N of arpt.
80J.12	12	3.14.80	L.O.T. 007 (Poland)	SP	Il-62	DES	LA	Warsaw Okęcie Arpt., POL	10	77	0	87	10	77	87	atmptd go-around, in-flt. eng. fail., LOC
80J.14	14	3.26.80	Air Traffic Exec. Jet AS	EXE	Learjet 36	DES	LA	Sebha, Tripoli, LIB	0	0	0	0	2	1	3	IFR app.
80J.19	19	4.12.80	Transbrasil	SP	B727-27C	DES	LA	Florianopolis Arpt., BRA	8	47	0	55	8	50	58	T-storm, struck high gnd.
80J.21	21	4.25.80	Dan-Air 1008	NSP	B727-46	DES	LA	5 mi. SW of Tenerife Arpt., Canary Is., SPN	8	138	0	146	8	138	146	Struck mtns. on impr. app., navigation err.
80J.22	22	5.06.80	Kennedy Flt. Center	T	Learjet 23	DES	LA	Richmond Byrd Int'l Arpt., VA, USA	2	0	0	2	2	0	2	impr. ILS app., crw err., fatigue

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									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
80J.32	32	8.01.80	Aeronaves del Peru	F	DC-8-42/43F	DES	LA	Cerro Lilio, MEX City, MEX	3	0	0	3	7	0	7	Fog, struck mtn.
80J.33	33	8.07.80	TAROM (Romania)	SP	Tu-154B-1	DES	LA	Nouadhibou, Mauritania	0	2	0	2	16	152	168	Short app., ditched @ sea
80J.34	34	8.13.80	Spantax	NSP	Learjet 35A	DES	LA	Tetuan, Majorca, Balearic Is., SPN	2	2	0	4	2	2	4	Visual night app., struck mtn.
80J.36	36	9.03.80	Pan American AW	SP	B727-21	MJW	LA	San Jose Int'l Arpt., Costa Rica	0	0	0	0	6	67	73	Ind short of RW, gear fail.
80J.37	37	9.12.80	Aeronaves del Peru	F	DC-8-32/33F	DES	LA	Iquitos, Peru	4	0	0	4	4	0	4	crsh into jungle, cause unknown
80J.39	39	10.01.80	Penarth Commercial	F	C.500 Citation I	DES	LA	St. Peters Arpt., Jersey Is., UK	1	0	0	1	1	0	1	Missed app., struck house, crw err.
80J.42	42	11.04.80	T.A.A.G. (Angola)	SP	B737-2M2C	DES	LA	Benguela, ANG	0	0	0	0	6	128	134	App. short of RW, gear collapse
80J.43	43	11.19.80	Korean AL	SP	B747-2B5B	DES	LA	Seoul Kimpo Int'l Arpt., RSK	6	9	0	15	14	212	226	Undershot app., gear fail., crw err.
80J.47	47	12.19.80	W.K. McWilliams	EXE	AC.1121	DES	LA	Many, Gretna, LA, USA	2	1	0	3	2	2	4	struck trees on final app.
80J.48	48	12.20.80	Aero.Territ. del Colombia	F	B707-321(F)	DES	LA	Bogota El Dorado Arpt., COL	0	0	0	0	4	0	4	Rain, crw err.
81J.7	7	2.11.81	Texas Gulf Aviation	EXE	L.1329-731	DES	LA	Westchester Co. Arpt., NY, USA	2	6	0	8	2	6	8	In-flt. elec. sys. fail, ILS app.
81J.16	16	5.02.81	SARSA	NSP	HS.125-700A	DES	LA	Monterrey Norte Arpt., MEX	2	2	0	4	2	2	4	instr. app., bad weather, instr. fail.
81J.17	17	5.07.81	Austral L.A.	SP	BAC 1-11	DES	LA	River Plate Estuary, ARG	5	26	0	31	5	26	31	T-storm, wind shear?
81J.31	31	10.21.81	MALEV (Hungary)	SP	Tu-154B	MJW	LA	Prague Ruzyne Arpt., CZK	0	0	0	0	?	81		Rain, hard lndg short of RW
81J.35	35	11.16.81	TAB/Air Benin	?	SN.601-100	DES	LA	Lagos, NIG	2	2	0	4	2	2	4	No details avail.
81J.36	36	12.01.81	Inex Adria (Yugoslavia)	NSP	MD-81	DES	LA	Ajaccio, Corsica, FRA	7	173	0	180	7	173	180	struck Mt. San Pietro, clouds, turbulence, crw err.
81J.37	37	12.10.81	Servicios Ejecutivos	NSP	HS.125	DES	LA	Laredo, TX, USA	0	0	0	0	2	8	10	Ind short of RW, crw err., alcohol
82J.3	3	1.19.82	Alyemda (P.D.R. Yemen)	F	B707-348C	MJW	LA	Damascus, Syria	?	?	?	?	?	?		Gunfire
82J.6	6	2.09.82	Japan AL	SP	DC-8-61	DES	LA	Tokyo Haneda Int'l Arpt., JPN	0	24	0	24	8	166	174	Short app., water lndg, crw err.
82J.10	10	4.26.82	C.A.A.C. 3303 (China)	SP	HS.121-2E	DES	LA	Yangshuo, Guilin, Guangxi, ROC	8	104	0	112	8	104	112	Struck Mt. Yangsu 30 mi. SE of Kweilin, rain
82J.14	14	5.19.82	Hurler Flugdienst	EXE	C.551 Citation	DES	LA	Kassel, FRG	2	6	0	8	2	6	8	struck high gnd., impr. app., crw err.
82J.20	20	6.08.82	V.A.S.P. 168 (Brazil)	SP	B727-212 Adv.	DES	LA	15 mi. SW of Fortaleza, BRA	9	128	0	137	9	128	137	Struck 2000' Serra da Pacatuba mtns., crw err.
82J.31	35	9.03.82	T.A.M. (Brazil)	NSP	Learjet 25B	DES	LA	Rio Branco, BRA	2	8	0	10	2	8	10	3rd app., bad weather, fuel exhaustion
82J.32	36	9.10.82	Sudan AW	FY	B707-348C	DES	LA	5 kms. S of Khartoum Arpt., Sudan	0	0	0	0	11	0	11	T-storm, ditched in Nile river
82J.36	40	10.17.82	Egyptair	SP	B707-366C	DES	LA	Geneva, SWI	0	0	0	0	10	172	182	impr. app., crw err.
83J.1	1	1.03.83	A.E. Staley Manuf. Co.	Fy	CL.600	DES	LA	Hailey, Sun Valley, ID, USA	2	0	0	2	2	0	2	Missed app., struck mtn., crw err.
83J.4	4	1.11.83	Sun Oil Co.	EXE	R. Sabreliner 65	DES	LA	Toronto Int'l Arpt., CAN	2	3	0	5	2	3	5	In-flt. eng. fail., icing, LOC
83J.5	5	1.16.83	T.H.Y. (Turkey)	SP	B727-2F2 Adv.	MJW	LA	Ankara Esenboga Arpt., TUR	0	47	0	47	7	60	67	Snow, windshear, undershot RW
83J.13	14	3.28.83	L.A.M. (Mozambique)	SP	B737-2B1	MJW	LA	Quelimane, Mozambique	0	0	0	0	6	104	110	Ind short of RW, crw err.
83J.14	15	3.30.83	Central AL 27	F	Learjet 25XR	DES	LA	Newark Int'l Arpt., NJ, USA	2	0	0	2	2	0	2	crw err.

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ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
83J.15	16	3.31.83	Winn Exploration	EXE	C.500 Citation I	DES	LA	Eagle Pass, TX, USA	2	2	0	4	2	2	4	Cause unknown, smoke, haze, dust
83J.27	29	7.11.83	T.A.M.E./Ecuador A.F.	SP	B737-2V2 Adv.	DES	LA	Cuenca Bashum, ECU	8	111	0	119	8	111	119	struck high gnd. 1 mi. short of RW, crw err.
83J.31	33	8.30.83	Aeroflot	SP	Tu-134	DES	LA	Alma Ata, Kazakhstan SSR, USSR	?	?	?	?	?	?		No details avail.
83J.34	37	9.23.83	Gulf Air 771	SP	B737-2P6 Adv.	DES	LA	Mino Jobel Ali, 30 mi. NE of Abu Dhabi	6	105	0	111	6	105	111	In-flt. bombing, cargo hold fire
83J.39	42	11.27.83	Avianca 11 (Colombia)	SP	B747-283B	DES	LA	Mejorado Del Campo, Madrid, SPN	19	162	0	181	19	173	192	crsh 7.5 mi. SE of arpt., navigation err.
83J.40	43	11.28.83	Nigeria AW	SP	F.28-2000	DES	LA	Enugu Arpt., NIG	2	51	0	53	6	66	72	Poor visibility, short app., fire
83J.44	48	12.18.83	Malaysian AL System	SP	A.300B4-120	DES	LA	Kuala Lumpur Int'l Arpt., Malaysia	0	0	0	0	14	233	247	T-storm, ILS fail., crw err., fire
84J.1	1	1.10.84	Balkan Bulgarian	SP	Tu-134A	DES	LA	4 kms. from Sofia Arpt., BUL	5	45	0	50	5	45	50	Snow, overshot RW
84J.6	6	2.20.84	Flight Safety Australia	F	C.500 Citation I	DES	LA	Prosperine, Queensland, AUS	2	0	0	2	2	0	2	crsh 5 kms short of RW, cause unknown
84J.11	11	5.15.84	Argentine Government	EXE	Learjet 35A	DES	LA	Ushuaia, Tierra del Fuego, ARG	2	10	0	12	2	10	12	crsh into water, crw err.
84J.13	13	6.04.84	Air Continental 4	F	Learjet 23	DES	LA	Windsor Locks Int'l Arpt., CT, USA	2	1	0	3	2	1	3	LOC, cause unknown
84J.15	15	7.20.84	?	EXE	R. Sabreliner	DES	LA	Wilson Arpt., KEN	0	0	0	0	1	5	6	crsh short of RW, crw err.
84J.28	28	11.10.84	Combs Gate/Lisle AC	EXE	Learjet 24E	DES	LA	St. Thomas Field, Virgin Islands	1	1	0	2	2	2	4	3rd app., crsh 2 mi. short of RW
85J.1	1	1.01.85	Eastern AL	SP	B727-225 Adv.	DES	LA	Mt. Illimani near La Paz, BOL	8	21	0	29	8	21	29	Navigation err., struck mtn @ 19600'
85J.2	2	1.23.85	Lloyd Aereo Boliviano	SP	B727-2K3 Adv.	MAJ	LA	Santa Cruz, BOL	0	1	0	1	7	120	127	In-flt. bombing, pax suicide
85J.5	5	2.07.85	TAG Int'l	EXE	CL.601	DES	LA	Paris Le Bourget Arpt., FRA	0	0	0	0	3	9	12	Missed app., struck short of RW, gear fail.
85J.6	6	2.19.85	Iberia 610 (Spain)	SP	B727-256 Adv.	DES	LA	Monte Oiz, Sondica, Bilbao, SPN	7	141	0	148	7	141	148	Struck high gnd., antenna, 20 mi. SE of arpt., crw err.
85J.10	10	3.28.85	SATENA (Colombia)	NSP	F.28-3000	DES	LA	Florencia, COL	6	40	0	46	6	40	46	Clouds, struck mountain
85J.11	11	4.11.85	YPF (Argentina)	NSP	HS.125-700B	DES	LA	Salta, Uruguay	2	5	0	7	2	5	7	Struck mtn. on missed app.
85J.12	12	4.15.85	Thai AW	NSP	B737-2P5 Adv.	DES	LA	Phuket Arpt., Phang-Nga, THL	7	4	0	11	7	4	11	Emer. Indg, instr. fail., struck high gnd.
85J.14	14	5.03.85	Aeroflot	SP	Tu-134	DES	LA	Snilow Airport, Lvov, Ukraine, USSR	?	?	0	70	?	?		ATC failure
85J.14	15	5.03.85	Soviet Military Flight	Mil.	An-2	DES	LA	Snilow Airport, Lvov, Ukraine, USSR	?	?	0	8	?	?		ATC failure
85J.15	16	5.12.85	Getty Refining & Market.	EXE	D. Falcon 50	DES	LA	Lake Geneva, WI, USA	0	0	0	0	2	4	6	Ind short of RW, gear fail., fire
85J.16	17	5.21.85	Target Development	FY	C.501 Citation I	DES	LA	Harrison Boone Co. Arpt., AR, USA	2	0	0	2	2	0	2	2nd app., crsh 3.5 nmi. WSW of arpt.
85J.26	27	8.02.85	Delta AL 191	SP	L.1011-385-1	DES	LA	Dallas/Ft. Worth Arpt., TX, USA	8	126	1	135	11	152	163	T-storm, wind shear, struck water tanks
85J.29	30	8.20.85	ERA Jet Alaska	F	Learjet 24DXR	DES	LA	Gulkana, AK, USA	2	1	0	3	2	1	3	Cause unknown
85J.34	36	9.22.85	Louisiana Pacific	EXE	Learjet 35A	DES	LA	Auburn Pitts Arpt., AL, USA	1	0	1	2	2	4	6	In-flt. coll. w/ ultralight AC
85J.36	38	10.22.85	ERA Jet Alaska	Amb.	Learjet 24DXR	DES	LA	243 nmi. WSE of Juneau, AK, USA	2	2	0	4	2	2	4	Struck high gnd., premature descent
85J.37	39	11.10.85	Nabisco Inc.	Fy	D. Falcon 50	DES	LA	Cliffside Park, NJ, USA	2	0	1	3	2	0	2	ATC failure
85J.40	43	12.08.85	Corporate Air Inc.	T	Learjet 35A	DES	LA	Minneapolis Int'l Arpt., MN, USA	2	1	0	3	2	1	3	5th app., touch-&-go, LOC

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ACC Code	#	Date	AC Operator	FLT Type	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
85J.44	47	12.31.85	President of Nigeria	EXE	HS.125-700B	DES	LA	Kaduna, NIG	3	4	0	7	3	4	7	No details avail.
86J.2	2	1.18.86	Aerovias de Guatemala	NSP	SE.210-VIN	DES	LA	Flores Santa Elena Arpt., Guatemala	6	81	0	87	6	81	87	Missed app., low clouds, struck hills
86J.6	6	2.16.86	China AL (Taiwan)	SP	B737-281	DES	LA	Makung, Pescadores Is., TWN	7	6	0	13	7	6	13	atmptd. go-around
86J.12	13	4.02.86	Trans World AL 840	SP	B727-231 Adv.	MAJ	LA	near Corinth, GRE	0	4	0	4	7	114	121	In-flt. bombing
86J.24	25	8.31.86	Aero Mexico 498	SP	DC-9-32	DES	LA	Cerritos, CA, USA	6	58	15	79	6	58	64	ATC failure
86J.30	32	10.02.86	Swaziland Tobacco Co.	EXE	D. Falcon 10	DES	LA	Tzaneen, Transvall, SAF	2	2	0	4	2	2	4	impr. app., crw err.
86J.33	35	10.19.86	Mozambique	NSP	Tu-134A	DES	LA	Komatipoort, SAF	8	26	0	34	9	35	44	crw err., navigation err.
86J.40	43	12.12.86	Aeroflot	SP	Tu-134A	DES	LA	E. Berlin Schoenfeld Arpt., GDR	9	61	0	70	9	73	82	crw err., fog
86J.41	44	12.15.86	RCC of Nigeria	?	HS.125-600B	DES	LA	Casablanca Arpt., MOR	2	6	2	10	2	6	8	Undershot RW, struck house
87J.1	1	1.02.87	Pelita AS	NSP	F.28-1000	MAJ	LA	Dumai Arpt., Sumatra, Indonesia	0	0	0	0	6	64	70	Undershot RW, gear collapse
87J.13	13	3.27.87	Connie Kalitta Services	Amb.	Learjet 24A	DES	LA	Eagle Co. Arpt., CO, USA	2	1	0	3	2	1	3	crsh into mtn., cause unknown
87J.14	14	4.04.87	Garuda (Indonesia)	SP	DC-9-32	DES	LA	Medan Polonia Arpt., Indonesia	4	23	0	27	8	37	45	hvy rain, struck aerial, pylon, windshear?
87J.16	16	4.13.87	Buffalo AW/Burlington	F	B707-351CF	DES	LA	Kansas City Int'l Arpt., MO, USA	3	1	0	4	3	1	4	ILS app., fog, rain, crw err.
87J.19	19	5.31.87	Travel Air GmbH	EXE	C.501 Citation I	DES	LA	Lubeck Blankensee Arpt., FRG	2	0	0	2	2	2	4	VFR night app., struck radio tower
87J.21	21	6.16.87	C.A.A.C. (China)	NSP	B737-2T4 Adv.	MAJ	LA	Fuzhou Arpt., ROC	0	0	0	0	?	?		ATC failure, lnd safely
87J.25	26	7.31.87	Trans Latin Air	F	Learjet 23	DES	LA	Guatemala City, Guatemala	2	1	0	3	2	1	3	Poor weather
87J.28	29	8.31.87	Thai AW 365	SP	B737-2P5 Adv.	DES	LA	1 mi. E of Phuket Arpt., THL	9	74	0	83	9	74	83	Stalled on app., crsh @ sea, crw err., ATC err.
87J.36	37	11.19.87	Air Karelia	NSP	C.500 Citation I	DES	LA	Tuusula, Helsinki, Finland	0	0	0	0	2	4	6	In-flt. 2-eng fail., fuel exhaustion
87J.37	38	11.28.87	South African AW 295	SP	B747-244B	DES	LA	Indian Ocean 220 kms. NE of Mauritius	19	140	0	159	19	140	159	In-flt. upper cargo hold fire
87J.39	40	12.05.87	Scott Cable	EXE	HS.125-400A	DES	LA	Lexington Blue Grass Field, KY, USA	2	0	0	2	2	2	4	In-flt. eng. fire
88J.1	1	1.04.88	Condor	NSP	B737-230 Adv.	DES	LA	Izmir, TUR	5	11	0	16	5	11	16	struck high gnd., ILS fail.?
88J.2	2	1.08.88	Phoenix Air	F	Learjet 36A	DES	LA	Monroe, LA, USA	2	0	0	2	2	0	2	crsh 8 nmi SW of arpt, cause unknwn
88J.6	6	1.18.88	Aero Astro	EXE	HS.125-600B	DES	LA	Houston Hobby Arpt., TX, USA	1	0	0	1	2	6	8	Low app., struck powerlines
88J.8	8	2.08.88	T.A.A.G. (Angola)	F	B707-349C	MJW	LA	Luanda Arpt., ANG	0	0	0	0	9	0	9	Low app., overran RW
88J.10	10	2.24.88	Cia Comercio &	T	Learjet 24F	DES	LA	Macre, BRA	2	0	0	2	2	0	2	In-flt. 2-eng. fail.
88J.11	11	2.27.88	Aeroflot	SP	Tu-134A	DES	LA	Surgut, Tyumenskaya Oblast, USR	3	17	0	20	6	45	51	crw err., hard lndg short of RW
88J.12	12	2.27.88	Talia AW	Fy	B727-2H9 Adv.	DES	LA	Mt. Bufavento, Kyrenia, CYP	14	0	0	14	14	0	14	Poor visability, struck mountain
88J.21	21	5.24.88	United Executive	FY	Learjet 35A	DES	LA	W. Patterson, Teterboro, NJ, USA	2	2	0	4	2	2	4	crsh in vacant lot in residential area
88J.23	23	6.12.88	Austral Lineas Aereas	SP	MD-81	DES	LA	Posadas Arpt., ARG	6	16	0	22	6	16	22	Fog, struck high trees 3 mi. from RW
88J.24	24	6.26.88	Air France 296	T	A.320-111	DES	LA	Mulhouse Habsheim Arpt., FRA	0	3	0	3	6	130	136	atmptd. go-around, crw err.
88J.27	27	7.21.88	T.A.A.G. (Angola)	F	B707-328C	DES	LA	25 kms. from Lagos Arpt., NIG	6	0	0	6	6	0	6	Poor visability

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
88J.28	28	7.26.88	Northeast Jet Co.	FY	Learjet 35A	DES	LA	Morristown Arpt., NJ, USA	1	0	0	1	2	0	2	NDB app., struck fence, fire
88J.29	29	7.30.88	Jet Management	FY	Learjet 23	DES	LA	March AFB, Perris, CA, USA	2	0	0	2	2	0	2	LOC? crsh 1 nmi. S of RW
88J.35	35	9.09.88	Hang Khong (Vietnam)	SP	Tu-134A	DES	LA	Bangkok Int'l Arpt., THL	3	73	0	76	6	84	90	hvy rain, turbulence, undershot RW
88J.42	42	10.17.88	Uganda AL 755	SP	B707-338C	DES	LA	Rome Leonardo Da Vinci Arpt., ITA	7	25	0	32	7	45	52	Fog, 3rd app., undershot RW
88J.43	43	10.19.88	Indian AL 113	SP	B737-2A8	DES	LA	Ahmadebad Arpt., Gujarat, IND	6	124	0	130	6	129	135	Undershot 5 mi. from RW, struck powerlines
88J.48	50	12.14.88	G.A.S. Air Nigeria	F	B707-351C	DES	LA	Kom-Omran, Luxor, EGY	5	3	5	13	5	3	8	Forced lndg, fuel exhaustion
89J.4	4	2.08.89	Independent Air 1851	NSP	B707-331B	DES	LA	Mt. Pico Alto, Santa Maria, Azores Is.	7	137	0	144	7	137	144	struck high gnd., fog, crw & ATC err.
89J.9	9	2.18.89	Flying Tiger	F	B747-249F	DES	LA	Puchong, Kuala Lumpur, Malaysia	4	0	0	4	4	0	4	Misty, struck high gnd., crw & ATC err.
89J.15	15	3.21.89	Transbrasil	F	B707-349C	DES	LA	Sao Paulo Int'l Arpt., BRA	3	0	18	21	3	0	3	Emer. lndg 2 mi. short of RW
89J.20	20	6.07.89	Surinam AW 764	SP	DC-8-62	DES	LA	Paramaribo Int'l Arpt., Surinam	10	167	0	177	10	177	187	3rd app., fog, crsh 1 mi. short of RW
89J.27	27	7.27.89	Korean Air 803	SP	DC-10-30	DES	LA	Tripoli Int'l Arpt., LIB	4	68	0	72	18	181	199	Short app., fog, ILS fail., crw err.
89J.43	43	10.20.89	Aeroflot	F	Il-76T	DES	LA	Leninakan, Armenian SSR, USR	10	7	0	17	10	7	17	Struck mountain
90J.7	8	1.25.90	Avianca 52 (Colombia)	SP	B707-321B	DES	LA	Cove Neck, Long Island, NY, USA	8	65	0	73	9	152	161	In-flt. fuel exhaustion, crw err.
90J.10	11	2.14.90	Indian AL 605	SP	A.320-231	DES	LA	Bangalore, Karnataka, IND	5	87	0	92	7	139	146	Undershot app. 0.5 km short of RW, crw err.
90J.15	16	3.27.90	Aeroflot	F	Il-76	DES	LA	Kabul, AFG	10	0	0	10	10	0	10	struck high gnd., mech. fail.
90J.19	20	5.11.90	Air North Queensland	NSP	C.500 Citation I	DES	LA	Cairns, Mataeba, Queensland, Aust.	1	10	0	11	1	10	11	struck high gnd. during T-storm
90J.20	21	6.02.90	Markair	FY	B737-2X6C	MJW	LA	Unalakleet, AK, USA	0	0	0	0	4	0	4	Fog, struck hillside 11 km. from airfield
90J.25	26	8.01.90	Aeroflot	SP	Yak-40	DES	LA	Agdam Azerbaidzhan, USR	4	26	0	30	4	26	30	Struck mountain, bad weather, Verevan-Stepanakert flt.
90J.26	27	8.13.90	Aviex Jet	NSP	IAI.1121	DES	LA	Cozumel, MEX	1	0	0	1	2	6	8	Undershot app. short of RW, struck ILS
90J.29	30	9.14.90	Aeroflot	SP	Yak-42	DES	LA	Sverdlovsk Koltsovo Arpt., USR	0	4	0	4	?	124		In-flt. eng. fail.
90J.32	33	9.24.90	Hi-Tech Helicopters Inc.	?	C.500 Citation I	DES	LA	San Luis Obispo, CA, USA	4	0	0	4	4	0	4	No details avail.
90J.36	39	10.24.90	Cubana	NSP	Yak-40	DES	LA	Punta Jardinero, Santiago de CUB	2	8	0	10	7	29	36	struck high gnd., poor weather
90J.37	40	11.14.90	Alitalia 404	SP	DC-9-32	DES	LA	Zurich, SWI	6	40	0	46	6	40	46	ILS app., struck hills 8 kms from arpt.
90J.39	42	11.21.90	Aeroflot	SP	Il-62	DES	LA	Yakutsk, Yakut S.S.R., USR	0	0	0	0	10	174	184	struck ravine 1 km. from RW, explosion
90J.44	48	12.04.90	Sudania Aviation Co.	F	B707-321C	DES	LA	Nairobi KENTta Int'l Arpt., KEN	7	3	0	10	7	3	10	Undershot 2nd app., struck powerlines
91J.6	13	2.14.91	Seanaire Inc.	EXE	Learjet 35A	DES	LA	Aspen Pitkin Co. Arpt., CO, USA	2	1	0	3	2	1	3	LOC, stalled, crw err.
91J.11	19	3.03.91	United AL 585	SP	B737-291 Adv	DES	LA	Colorado Springs, CO, USA	5	20	0	25	5	20	25	Windshear? crsh 3.5 nmi. S of arpt.
91J.16	24	3.15.91	Lider Taxi Aereo SA	F	Learjet 35A	DES	LA	Uberlandia, BRA	0	0	0	0	2	2	4	Flt. from Sao Paulo
91J.18	26	3.18.91	Air Conesul Taxi Aereo	NSP	Learjet 25D	DES	LA	Brasilia, BRA	2	5	0	7	2	5	7	Night app., crsh & exploded
91J.27	37	5.21.91	Ashaka Cement Co.	EXE	C.550 Citation	DES	LA	Bauchi, NIG	2	1	0	3	2	1	3	atmptd missed app., poor weather

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
91J.29	39	5.24.91	Metro Cargo/Sigi Air	FY	Il-76TD	DES	LA	Sighkamar, Bakhtaran, IRN	6	0	0	6	10	0	10	Emer. Indg, fuel exhaust., relief ft.
91J.32	42	6.17.91	Air Waves Corp.	?	GS-A.1159 GS	DES	LA	18 mi. S of Caracas, VEN	4	0	0	4	4	0	4	crsh in mtns.
91J.33	43	6.26.91	Okada Air	SP	BAC 1-11	DES	LA	Sokoto, NIG	0	3	0	3	5	48	53	Weather div., emer. Indg
91J.39	49	8.15.91	Indian AL 257	SP	B737-2A8 Adv.	DES	LA	Lake Lok Tak, Imphal, IND	6	63	0	69	6	63	69	struck high gnd., bad weather? sabotage?
91J.41	51	9.05.91	Conoco Inc., Houston	EXE	G.1159 GS II	DES	LA	30 mi. S of Kota Kinabalu, Indonesia	3	9	0	12	3	9	12	crsh in jungle, struck high gnd.
91J.46	56	11.07.91	Azerbaijan AL/Aeroflot	SP	Yak-40	DES	LA	Makhachkala, CIS	4	30	0	34	4	30	34	struck high gnd. 12 mi. short, ft. from Elista
92J.2	2	1.20.92	Air Inter 5148	SP	A.320-111	DES	LA	Baar, 30 mi. SW of Strasbourg, FRA	5	82	0	87	6	90	96	struck Mt. St. Odile, fog, crw err.
92J.3	3	2.15.92	MK Air Cargo	F	DC-8-54F	MJW	LA	8 mi. from Kano Arpt., NIG	0	0	0	0	5	0	5	crsh 8 kms. short of RW
92J.4	4	2.15.92	Burlington AE/ ATI	F	DC-8-63(F)	DES	LA	Toledo, OH, USA	4	0	0	4	4	0	4	Undershot 3rd app. 3 kms. from RW, fog, rain, ft. from Seattle, WA
92J.8	8	3.24.92	Golden Star AC/Sudan	F	B707-321C	DES	LA	Mt. Mymittus, Athens, GRE	7	0	0	7	7	0	7	struck high gnd. 5 mi. short of arpt., fog, instr. fail.
92J.17	17	5.13.92	Turkmenavia	SP	Yak-40	DES	LA	Cardzhou, Turkmenia	0	0	0	0	4	34	38	atmptd go-around, struck radio mast, fire
92J.18	18	5.29.92	Arghan Ariana	?	Tu-154M	MJW	LA	Kabul, AFG	0	0	0	0	?	?	?	struck by surface-to-air missile, emer. Indg
92J.22	22	6.22.92	V.A.S.P. (Brazil)	F	B737-2A1C	DES	LA	15 kms. from Curzeiro del Sul, BRA	3	0	0	3	3	0	3	In-flt. fire, crsh in jungle near Moa River
92J.29	30	7.31.92	Thai AW Int'l 311	SP	A.310-304	DES	LA	Katmandu Tribhuvan Int'l Arpt., NEP	14	99	0	113	14	99	113	Bad weather, struck forested high gnd., 3rd app., crw err.
92J.35	38	8.27.92	Mineral-Vodskoe PO?	SP	Tu-134A	DES	LA	Ivanovo, Russia, CIS	7	77	0	84	7	77	84	crsh 3 km. short of arpt., rain, fog, crw err.
92J.39	42	9.28.92	Pakistan Int'l AL 268	SP	A.300B4-203	DES	LA	Katmandu Tribhuvan Int'l Arpt., NEP	12	155	0	167	12	155	167	crsh 8 nmi. short of RW 02, 1500' low on app., crw err.
92J.44	47	11.14.92	Vietnam AL 474	SP	Yak-40	DES	LA	Nha Trang, Vietnam	6	24	0	30	6	25	31	Tropical storm Forest, ft. from Ho Chi Minh City
92J.47	50	11.24.92	China Southern AL 3943	SP	B737-3Y0	DES	LA	Yangti, Guilin, ROC	8	133	0	141	8	133	141	In-flt. eng. fail., LOC, crsh 20 kms. short of RW, ft. from Guangzhou
92J.48	51	11.25.92	DAS Air Cargo	F	B707-321C	DES	LA	Kano, NIG	0	0	0	0	3	0	3	struck trees, crsh 2 mi short of RW, DME, ILS fail.
92J.53	56	12.19.92	U.S. Dept. of Energy	EXE	C.550 Citation	DES	LA	Billings Logan Int'l Arpt., MT, USA	2	6	0	8	2	6	8	struck warehouse, fire, wake-vortices? in-flt. eng. fail? wind shear? Watertown, SD-Billings, MT ft.
92J.55	58	12.22.92	Libyan Arab AL 1103	SP	B727-2L5 Adv.	DES	LA	Suq-es-Sebt, 30 mi. SE of Tripoli, LIB	10	147	0	157	10	147	157	ATC fail., ft. from Benghazi



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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
93J.2	2	1.15.93	Air Afrique (TAROM)	153 F	B707-321C	MJW	LA	Abidjan, Ivory Coast	0	0	0	0	3	0	3	Undershot RW 21, night app., fog, gear collapse
93J.19	20	5.19.93	SAM Colombia	505	SP B727-46	DES	LA	Mt. Frontino, Medellin, COL	7	125	0	132	7	125	132	App. guidance destr. by terrorists, night, bad weather, struck mtn. @ 12300'
93J.21	22	6.01.93	Merpati Nusantara	AL	SP F.28-3000R	DES	LA	Sorong, Irian Jaya, Indonesia	4	37	0	41	4	39	43	crsh @ sea 0.6 km. short of RW, hvy rainstorm
93J.26	27	7.26.93	Asiana	AL 733	SP B737-5L9	DES	LA	4.5 mi. S of Makpo Arpt., RSK	3	63	0	66	6	110	116	struck high gnd., 3rd app., bad weather, Seoul-Makpo flt.
93J.30	31	8.18.93	American Int'l	AW/ KFS	F DC-8-61F	MJW	LA	Guantanamo Bay NAS, CUB	0	0	0	0	3	0	3	R. wing struck gnd. on steep app., cartwheeled, fire, short of RW, flt. from Norfolk NAS
93J.37	38	9.21.93	Transair Georgia/Aeroflot	?	Tu-134A	DES	LA	Sukhumi, Georgia, CIS	5	22	0	27	5	22	27	struck by rebel SAM, crsh in Black Sea
93J.38	39	9.22.93	Transair Georgia/Aeroflot	NSP	Tu-154B	DES	LA	Sukhumi Arpt., Georgia, CIS	?	?	?	80?	12	120	132	struck by rebel gunfire, SAM, explosion
93J.42	43	11.11.93	Aviastar/Magistralnye	?	An-124	DES	LA	Joupar Mtns., 40 kms. E of Kerman, IRN	?	?	0	17	?	17		struck mtn., emer. refueling div., Dubain-Tashkent flt.
93J.43	44	11.13.93	China Northern	6901	SP MD-82	DES	LA	Urumqi, Xinjiang, ROC	4	8	0	12	9	92	101	crsh short of app., poor visibility, Beijing-Urumqi flt.
93J.45	46	11.21.93	Avioimpex		NSP Yak-42D	DES	LA	4 mi. E of Ohrid Arpt., MCD	8	107	0	115	8	108	116	struck Mt. Trojani, 2nd app., Geneva-Skopje flt.
93J.46	47	12.15.93	?		EXE IAI.1124	DES	LA	Santa Ana, CA, USA	1	4	0	5	1	4	5	crsh in field, preceding B.757 wake-vortices
74J.24	25	7.10.74	Egyptair		T Tu-154	DES	LA	Cairo, EGY	6	0	0	6	6	0	6	Overshoot RW, LOC
72J.41	42	12.20.72	Delta	AL 954	SP CV.880-22-2	DES	Taxi	Chicago O'Hare Int'l Arpt., IL, USA	0	0	0	0	7	81	88	GTC failure, fog
74J.16	16	3.15.74	Sterling	AW	NSP SE.210-10B3	DES	Taxi	Teheran, IRN	0	15	0	15	4	92	96	Taxiing fire, gear collapse
74J.19	20	4.18.74	Private	AC	PVT Piper Aztec	MAJ	Taxi	Luton, UK	1	0	0	1	1	1	2	GTC fail., crw err.
76J.28	29	9.07.76	Air France		SP B707-328	DES	Taxi	Ajaccio, Corsica	0	0	0	0	?	181		Terr.ist gnd. bombing
77J.12	13	3.27.77	Pan American	AW 1736	NSP B747-121	DES	Taxi	Los Rodeos Arpt, Tenerife, Canary Is.	9	326	0	335	16	380	396	GTC failure
77J.27	29	8.13.77	China	AL (Taiwan)	SP B747-132	NON	Taxi	Honolulu Int'l Arpt., HI, USA	0	0	1	1	22	345	367	gnd. personnel run over by AC on pushback from jetway
77J.46	48	12.09.77	Aerotour		NSP SE.210-VIN	MJW	Taxi	Oujda, MOR	0	0	0	0	?	?		Gear fail.
78J.14	15	3.28.78	Aerocondor	Colombia	SP A.300B4-102	NON	Taxi	Miami Int'l Arpt., FL, USA	0	0	1	1	11	191	202	gnd. industrial accident
83J.2	2	1.07.83	Iran Air		T B727-86	DES	Taxi	Tehran Mehrabad Arpt., IRN	0	0	0	0	?	0		Ran off RW, flt. mechanic crw
83J.7	8	2.06.83	Weatherford Int'l		EXE C.550 Citation	MAJ	Taxi	Houston Hobby Arpt., TX, USA	0	0	0	0	2	1	3	GTC failure
83J.23	25	6.29.83	?		PVT Gulfstream	?	Taxi	Houston Hobby Arpt., TX, USA	2	0	0	2	2	0	2	Waiting AC
83J.33	35	9.14.83	C.A.A.C. (China)		SP HS.121-2E	MJW	Taxi	Giulin Arpt., ROC	0	11	0	11	6	100	106	GTC failure

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83J.35	38	9.25.83	R&N Cargo of Nigeria	F	B707-336C	DES	Taxi	Kotoka Arpt., Accra, Ghana	0	0	0	0	4	0	4	AC fire, sabotage?
83J.41	45	12.07.83	Aviaco 134 (Spain)	SP	DC-9-32	DES	Taxi	Madrid Barajas Arpt., SPN	5	37	0	42	5	37	42	GTC fail., crw err.
83J.46	51	12.23.83	Southcentral Air 59	SP	Piper	DES	Taxi	Anchorage Int'l Arpt., AK, USA	0	0	0	0	1	8	9	GTC failure
84J.4	4	1.31.84	Aerolineas Argentinas	SP	B727-287	NON	Taxi	Rio Grande, ARG	0	0	1	1	7	121	128	Bldg. collapse caused by jet exhaust
86J.37	39	11.06.86	Pan American AW 301	SP	B727-235	MAJ	Taxi	Tampa Int'l Arpt., FL, USA	0	0	0	0	6	17	23	GTC failure
87J.20	20	6.09.87	Alaska AL	?	B727-90C	DES	Taxi	Anchorage Int'l Arpt., AK, USA	0	0	0	0	2	0	2	Wing struck loading ramp, fire
89J.24	24	7.12.89	American AL	SP	A.300B4-605R	NON	Taxi	San Juan Int'l Arpt., Puerto Rico	0	0	1	1	?	?	?	gnd. industrial accident
90T.8	5	1.18.90	Epps AS	FY	Bch. A100 King	MJW	Taxi	Atlanta Hartsfield Int'l Arpt., GA, USA	1	0	0	1	1	1	2	GTC failure
90J.18	19	5.11.90	Philippine AL 143	SP	B737-3Y0	DES	Taxi	Manila Int'l Arpt., PHI	0	8	0	8	6	121	127	gnd. explosion, fire on pushback
90J.33	35		China Southern AL	SP	B757-21B	DES	Taxi	Canton Arpt., Guangzhou, ROC	0	47	0	47	12	106	118	Parked on taxiway, flt. to Shanghai
90J.43	46	12.03.90	Northwest AL 1482	SP	DC-9-14	DES	Taxi	Detroit Wayne Co. Metro. Arpt., MI, USA	1	7	0	8	5	39	44	GTC failure, crw err.
91T.9	12	31778	Skywest / Delta	SP	SA.227AC	DES	Taxi	Los Angeles Int'l Arpt., CA, USA	2	10	0	12	2	10	12	GTC failure, ATC err.
92J.13	13	4.08.92	Trans World AL	SP	DC-9-32	MIN	Taxi	Dayton Cox Int'l Arpt., OH, USA	0	0	1	1	?	28	?	Damaged tire during pushback, failed killing gnd. personnel
92J.16	16	5.04.92	United AL	SP	B757-222	NON	Taxi	Denver Stapleton Int'l Arpt., CO, USA	1	0	0	1	?	62	62	Pilot heart attack
92J.33	36	8.23.92	Korean AL	SP	B747-385	NON	Taxi	Chicago O'Hare Int'l Arpt., IL, USA	1	0	0	1	?	276	276	No details avail.
92J.51	54	12.08.92	USAir	SP	B737-3B7	NON	Taxi	New York LaGuardia Arpt., NY, USA	0	0	1	1	?	60	60	AC struck gnd. personnel on pushback from jetway
93J.13	14	4.24.93	Air Inter	?	A.300B2-21C	MJW	Taxi	Montpellier	0	0	0	0	?	?	?	Tail struck light std. during pushback
93J.27	28	7.26.93	Trans Mediterranean	?	B707-327C	MJW	Taxi	Amsterdam Schiphol Intl. Arpt., NTL	0	0	0	0	?	?	?	Indg gear fail.
93J.34	35	9.05.93	Dominicana de Aviacion	?	B727-281 Adv.	MJW	Taxi	Santo Domingo	0	0	0	0	?	?	?	Fire @ terminal upon arr. from San Juan
70J.11	11	4.19.70	S.A.S.	SP	DC-8-62	DES	TO	Rome Leonardo da Vinci Arpt., ITA	0	0	0	0	11	54	65	Eng. fail., RTO
70J.17	17	7.19.70	Bavaria Flug.	NSP	BAC 1-11	MJR	TO	Gerona Arpt., SPN	0	0	0	0	5	80	85	RTO, crw err.
70J.18	18	7.19.70	United AL 611	SP	B737-222	MJW	TO	Philadelphia Int'l Arpt., PA, USA	0	0	0	0	6	55	61	RTO, crw err.
70J.32	34	11.27.70	Capitol Int'l C2C3/26	NSP	DC-8-63CF	DES	TO	Anchorage Int'l Arpt., AK, USA	1	46	0	47	10	219	229	Locked wheels, RTO
70J.33	35	11.30.70	Trans World AL	F	B707-373C	DES	TO	Tel Aviv Int'l Arpt., ISR	0	0	0	0	7	0	7	GTC fail.
70J.39	42	12.30.70	Alitalia-LAI	SP	SE.210-VIN	MAJ	TO	Turin Arpt., ITA	0	0	1	1	5	33	38	coll. w/ snow removal truck on TO
71J.6	7	1.23.71	Air India	T	B707-437	DES	TO	Bombay Santa Cruz Arpt., IND	0	0	0	0	5	0	5	Siml. 3-eng. TO, crw err.
71J.22	27	10.13.71	Aeroflot	SP	Tu-104	DES	TO	Moscow, USR	2	18	0	20	2	18	20	No details avail.
71J.26	32	12.27.71	Swissair	SP	DC-9-32	MAJ	TO	Vienna Arpt., AUT	0	0	0	0	5	69	74	GTC failure
72J.8	8	2.01.72	Wihuri-Yhtyma OY	EXE	D. Falcon 20F	DES	TO	Montreal, Quebec, CAN	0	0	0	0	2	4	6	No details avail.
72J.14	14	4.18.72	East African	SP	VC.10-1154	MJW	TO	Addis Ababa Bole Arpt., ETH	8	35	0	43	11	96	107	RTO, overran RW, fire, struck farmhouse

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72J.23	23	6.29.72	Inter-City Flug	NSP	HFB-320	DES	TO	Blackpool Arpt., UK	2	5	0	7	2	6	8	RTO, LOC, overran RW
72J.25	25	7.19.72	British Caledonian AL	NSP	BAC 1-11	MAJ	TO	Corfu, GRE	0	1	0	1	6	79	85	Engine fail., RTO
72J.28	28	9.13.72	Trans World AL 604	F	B707-331C	DES	TO	San Francisco Int'l Arpt., CA, USA	0	0	0	0	3	0	3	RTO, overran RW
72J.41	41	12.20.72	North Central AL 575	SP	DC-9-31	DES	TO	Chicago O'Hare Int'l Arpt., IL, USA	0	10	0	10	4	41	45	GTC failure, fog
73J.5	5	1.30.73	S.A.S.	SP	DC-9-21	MJW	TO	Oslo Fornebu Arpt., NOR	0	0	0	0	4	29	33	RTO, overran RW, instr. err.
73J.29	31	6.30.73	Aeroflot	SP	Tu-134A	DES	TO	Amman Arpt., JOR	1	1	7	9	7	77	84	RTO, overran RW, crw err.
73J.54	56	12.04.73	Austral	SP	BAC 1-11	MJW	TO	Bahia Blanca Esport Arpt., ARG	0	0	0	0	6	68	74	RTO, loss of power
73J.56	58	12.12.73	Fred Olsen	EXE	D. Falcon 20C	DES	TO	Norwich, UK	0	0	0	0	3	6	9	No details avail.
74J.19	19	4.18.74	Court Line	NSP	BAC 1-11	MAJ	TO	Luton, UK	0	0	0	0	5	86	91	GTC failure
74J.33	35	11.22.74	Alpa S.A.	NSP	C.500 Citation I	DES	TO	Barcelona, SPN	2	2	0	4	2	2	4	No details avail.
75J.2	2	2.09.75	Jet Travel	NSP	BAC 1-11	MJW	TO	South Lake Tahoe Arpt., CA, USA	0	0	0	0	6	45	51	Runway snow, LOC
75J.5	5	3.03.75	LTV Aerospace	EXE	D. Falcon 20C	DES	TO	Dallas NAS, TX, USA	0	0	0	0	2	3	5	No details avail.
75J.10	10	4.09.75	Aerolinee Itavia	SP	F.28-1000	MJW	TO	Bergamo Orio Al Serio Arpt., ITA	0	0	0	0	?	?		No details avail.
75J.13	13	6.12.75	Air France	SP	B747-128	DES	TO	Bombay Santa Cruz Arpt., IND	0	0	0	0	18	376	394	Tire fail. on TO
75J.17	17	7.03.75	Danair Inc.	EXE	Learjet 25B	DES	TO	Richmond, IN, USA	0	0	0	0	2	6	8	No details avail.
75J.24	25	8.23.75	Alpine AC Charters	T	Learjet 24	MJR	TO	Englewood Arpt., CO, USA	0	0	0	0	2	0	2	No details avail.
75J.26	27	9.15.75	British AW	SP	HS.121-1E	MJW	TO	Bilbao Arpt., SPN	0	0	0	0	7	110	117	Skidded off RW
75J.28	29	9.27.75	Federal Express	F	D. Falcon 20DC	MJR	TO	Warwick Green Arpt., RI, USA	0	0	0	0	3	0	3	No details avail.
75J.32	33	11.12.75	Overseas National 32	SP	DC-10-30CF	DES	TO	New York JFK Int'l Arpt., NY, USA	0	0	0	0	11	128	139	Bird strike, RTO
76J.7	7	2.02.76	Estramed SpA	EXE	Learjet 24D	DES	TO	Bari Palese Arpt., ITA	0	0	0	0	2	1	3	No details avail.
76J.11	12	3.25.76	Int'l AS	FY	L.1329 Jetstar 6	DES	TO	Chicago Midway Arpt., IL, USA	2	2	0	4	2	2	4	Overran RW, failed to rotate, struck ILS
76J.25	26	8.21.76	Airtrust (Singapore)	F	CV.880-22M-3	DES	TO	Seletar Arpt., SIN	0	0	0	0	4	5	9	RTO, misloaded cargo
76J.39	41	11.16.76	Texas Int'l 987	SP	DC-9-15	DES	TO	Denver Int'l Arpt., CO, USA	0	0	0	0	5	79	84	RTO, instr. fail., overran RW
76J.42	44	12.16.76	Air Trine/Batch Air?	F	CV.880-22M-22	MJW	TO	Miami Int'l Arpt., FL, USA	0	0	0	0	3	0	3	RTO, misloaded cargo
77T.1	2	1.02.77	C.S.A. (Czechoslovakia)	?	Il-18V	MAJ	TO	Prague Ruzyne Arpt., CZK	0	0	0	0	6	0	6	ATC failure
77J.12	14		K.L.M. 4806	NSP	B747-206B	DES	TO	Los Rodeos Arpt, Tenerife, Canary Is.	14	234	0	248	14	234	248	GTC failure, crw err.
77J.14	16	4.03.77	Mountain Bell Telephone	EXE	D. Falcon 10	DES	TO	Denver Int'l Arpt., CO, USA	2	2	0	4	2	3	5	In-flt. hydraulic fail., LOC
77J.20	22	4.28.77	Arab Wings	F	Learjet 35	DES	TO	Riyadh Int'l Arpt., SAR	2	0	0	2	2	0	2	1-eng. TO, LOC
77J.28	30	8.16.77	Bass Aviation	?	Learjet 24	DES	TO	Baton Rouge Arpt., LA, USA	0	0	0	0	2	6	8	No details avail.
77J.41	43	11.19.77	T.A.M. (Brazil)	F	Learjet 25B	DES	TO	Rio de Janeiro Dumont Arpt., BRA	0	0	0	0	2	0	2	RTO, eng. fail., overran wet RW
78J.8	8	3.01.78	Continental AL 603	SP	DC-10-10	DES	TO	Los Angeles Int'l Arpt., CA, USA	0	2	0	2	14	186	200	Tire fail., RTO on wet RW, overran RW, fire
78J.17	18	4.04.78	Sabena (Belgium)	T	B737-229C	DES	TO	Gosselies Arpt., Charleroi, BEL	0	0	0	0	3	0	3	Bird strike, RTO

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									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
78J.24	26	5.25.78	Groth AS	F	CV.880-22-2	MJW	TO	Miami Int'l Arpt., FL, USA	0	0	0	0	3	3	6	RTO, cargo misloaded, gear collapse, overran RW
78J.27	29	6.26.78	Air Canada 189	SP	DC-9-32	DES	TO	Toronto Int'l Arpt., Ontario, CAN	0	2	0	2	5	102	107	RTO, tire fail, fog
78J.36	39	10.24.78	National Jets	T	Learjet 24D	MJW	TO	Las Vegas Int'l Arpt., NV, USA	0	0	0	0	2	0	2	gnd. looped on TO run, LOC, crw err.
78J.42	45	12.26.78	Lider Taxi Aereo/TAM	?	Learjet 25C	DES	TO	Sao Paulo Congonhas Arpt., BRA	0	0	0	0	2	?	?	Overran RW
79J.11	12	3.17.79	Aeroflot	SP	Tu-104	DES	TO	Moscow Vnukovo Arpt., USR	?	90	0	90	?	90	?	Freezing rain, fog
79J.12	13	3.30.79	Aeroservice Cargo	?	SN.601-100	DES	TO	Nkayi, Congo	0	0	0	0	2	0	2	No details avail.
79J.14	15	4.22.79	Tunis Air	SP	B727-2H3	MAJ	TO	Jeddah Arpt., SAR	0	0	1	1	2	8	10	TO on wrong RW, crw err., struck excavation
79J.21	22	7.09.79	?	PVT	T-33	DES	TO	Sebring, FL, USA	0	0	0	0	1	1	2	Takeoff run on taxiway, struck cows, crw err.
79J.39	41	11.27.79	Irish Air Corps	F	HS.125-600B	DES	TO	Baldonnel AB, Dublin, IRE	0	0	0	0	3	0	3	No details avail.
79J.42	44	12.02.79	ERA Helicopters	NSP	Learjet 24D	DES	TO	Dutch Harbor, AK, USA	0	0	0	0	2	4	6	RTO, skidded off wet, icy RW, struck rocks
80J.6	6	1.30.80	Kellogg Co.	EXE	D. Falcon 10	DES	TO	Chicago Meigs Field, IL, USA	1	1	0	2	2	4	6	Overran RW, parking brake on, crw err.
80J.15	15	3.29.80	Monarch Aviation/Inair	F	CV.880-22-2(F)	MJW	TO	PAN City Int'l Arpt., PAN	?	?	?	?	?	?	?	No details avail.
80J.41	41	11.03.80	Latin. Aerea de Carga	T	CV.880-22-2(F)	DES	TO	Caracas Int'l Arpt., VEN	4	0	0	4	4	0	4	Eng. fail. on TO
81J.6	6	2.07.81	Aeroflot	NSP	Tu-134	DES	TO	Leningrad, USR	?	?	?	70	?	?	?	No details avail.
81J.27	27	9.15.81	Korean AL	SP	B747-230B	MAJ	TO	Manila Int'l Arpt., PHI	0	1	0	1	26	352	378	Eng. fire, RTO, overran RW
82J.5	5	1.23.82	Aeroflot	SP	Tu-154	DES	TO	Krasnoyarsk Arpt., RFSSR, USR	?	?	0	110	?	?	?	Eng. fail., fatigue fail. of compressor disc
82J.8	8	3.17.82	Air France	SP	A.300B4-203	DES	TO	Sanaa El-Rahaba Int'l Arpt., YEM	0	0	0	0	13	111	124	Eng. fail., RTO, fire
82J.33	37	9.13.82	Spantax (Spain)	NSP	DC-10-30CF	DES	TO	Malaga Arpt., SPN	3	48	0	51	13	380	393	Tire fail., RTO, overran RW, struck vehicles, fire
82J.41	45	12.04.82	Global Int'l	NSP	B707-323B	MJW	TO	Brasilia Int'l Arpt., BRA	0	0	0	0	8	49	57	Struck ILS aerials, emer. lndg
82J.42	46	12.06.82	Transair S.A.	NSP	Learjet 35A	DES	TO	Paris Le Bourget Arpt., FRA	0	0	0	0	2	2	4	RTO, birdstrikes, overran RW
83J.7	7	2.06.83	Weatherford Int'l	EXE	C.550 Citation	DES	TO	Houston Hobby Arpt., TX, USA	0	0	0	0	2	3	5	GTC failure
83J.17	18	4.26.83	Cessna AC Co.	T	C.500 Citation I	DES	TO	Wichita Mid-Cont. Arpt., KS, USA	0	0	0	0	2	3	5	No details avail.
83J.21	22	6.02.83	Garuda (Indonesia)	SP	F.28-3000RC	MAJ	TO	Branti Arpt., Sumatra, Indonesia	2	1	0	3	4	57	61	Eng. fail., RTO, crw err.
83J.23	24	6.29.83	Erasmus Inc.	T	HS.125-1A/522	DES	TO	Houston Hobby Arpt., TX, USA	0	0	0	0	2	0	2	Siml. eng. fail., struck waiting AC
83J.26	28	7.01.83	Altair Linee Aeree	NSP	SE.210-III	MJW	TO	Milan Malpensa Arpt., ITA	0	0	0	0	7	82	89	RTO, eng. fail.
83J.41	44	12.07.83	Iberia 350 (Spain)	SP	B727-256 Adv.	DES	TO	Madrid Barajas Arpt., SPN	1	50	0	51	9	84	93	GTC failure
83J.46	50	12.23.83	Korean AL 84	F	DC-10-30CF	DES	TO	Anchorage Int'l Arpt., AK, USA	0	0	0	0	3	0	3	GTC fail., crw err.
84J.5	5	2.09.84	T.A.A.G. (Angola)	SP	B737-2M2 Adv.	DES	TO	Huambo-Albano Machado, ANG	0	0	0	0	6	136	142	gnd. bombing, emer. lndg
84J.9	9	3.22.84	Pacific Western	SP	B737-275 Adv.	DES	TO	Calgary Mncpl. Arpt., Alberta, CAN	0	0	0	0	5	114	119	Engine fail., RTO, fire

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: LISTED BY PHASE OF FLIGHT**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities			Aboard AC			Cause, Remarks, Details	
									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
84J.24	24	10.04.84	McCullum Aviation	EXE	HFB-320	DES	TO	Aberdeen Arpt., SD, USA	2	1	0	3	2	1	3	TO on wrong RW, crw err.
84J.29	29	12.20.84	Jet East Inc.	T	Learjet 35	DES	TO	Waco Arpt., TX, USA	1	0	0	1	3	0	3	Siml. 1-eng. TO, LOC
85J.20	21	6.13.85	Trans. Aeriens du Benin	F	B707-336B	DES	TO	Sebah, LIB	0	0	0	0	?	0		RTO, overran RW
85J.25	26	7.17.85	N.A.S.A. (U.S.A.)	T	CV.990-30A-5	DES	TO	March AFB, CA	0	0	0	0	?	19		Tire fail. on TO, fuel tank puncture
85J.31	33	8.22.85	British Airtours 328	NSP	B737-236 Adv.	DES	TO	Manchester Ringway Int'l Arpt., UK	2	53	0	55	6	131	137	Eng. fail. on TO run, RTO, fire
86J.4	4	1.28.86	V.A.S.P. (Brazil)	SP	B737-2A1	DES	TO	Sao Paulo Int'l Arpt., BRA	0	1	0	1	5	67	72	crw err., TO from taxiway, fog
86J.17	18	6.22.86	Aeroflot	SP	Tu-134A	DES	TO	Penza, USSR	0	1	0	1	6	53	59	RTO, eng. fail., overran RW
86J.22	23	8.06.86	Federal Paper Board Co.	EXE	Learjet 55 ER	DES	TO	Rutland Arpt., VT, USA	0	0	0	0	2	1	3	RTO, TO on wrong RW, crw err.
86J.28	30	9.29.86	Indian AL	SP	A.300B2-1C	MJW	TO	Madras Meenamabakham Arpt., IND	0	0	0	0	10	185	195	Eng. fail., RTO, overran RW
86J.39	42	11.27.86	Aerosucre (Colombia)	F	SE.210-11R	MJW	TO	Arauca, COL	0	0	0	0	3	2	5	RTO, control fail., overran RW
87J.5	5	1.10.87	Nigeria AW	T	DC-10-30	DES	TO	Illorin, NIG	0	0	0	0	9	0	9	Touch-&-go, RTO, overran RW
87J.7	7	1.15.87	U.S. Air Force 1402 MAS	?	Learjet	DES	TO	Maxwell AFB, Montgomery, AL, USA	?	?	0	2	?	3		No details avail.
87J.22	23	6.19.87	Aeroflot	SP	Yak-40	DES	TO	Berdiansk, USSR	2	6	0	8	5	24	29	atmptd go-around, overran RW
87J.23	24	7.16.87	Trans Aero Corp.	F	IAI.1121	DES	TO	Jackson Thompson Arpt., MS, USA	0	0	0	0	2	3	5	No details avail.
87J.29	30	9.08.87	Brazil Air Force	?	HS.125-403B/	DES	TO	Carajas, BRA	?	?	0	9	?	9		No details avail.
87J.35	36	11.15.87	Continental AL 1713	SP	DC-9-14	DES	TO	Denver Int'l Arpt., CO, USA	3	25	0	28	5	77	82	Icing, crw err.
88J.4	4	1.15.88	Air Material Exec. Jets	EXE	D. Falcon 20F	DES	TO	Lugano Agno Arpt., SWI	0	0	0	0	2	0	2	RTO, overran wet RW, struck embank.
88J.16	16	3.31.88	Arax AL	F	DC-8-55CF	DES	TO	Cairo Int'l Arpt., EGY	4	0	0	4	4	0	4	RTO, 2nd attempt, eng. fire
88J.19	19	5.21.88	American AL 70	SP	DC-10-30	DES	TO	Dallas/Ft. Worth Arpt., TX, USA	0	0	0	0	14	240	254	RTO, overran RW, brake fail.
88J.20	20	5.23.88	L.A.C.S.A. (Costa Rica)	SP	B727-22	DES	TO	San Jose Int'l Arpt., Costa Rica	0	0	0	0	9	16	25	RTO, overran RW
88J.46	47	10.29.88	Griffin Records	EXE	CL.600	DES	TO	Aspen Pitkin Co. Arpt., CO, USA	0	0	0	0	3	4	7	No details avail.
89J.2	2	1.13.89	Aeroflot	F	Tu-154C	DES	TO	Monrovia Roberts Int'l Arpt., Liberia	0	0	0	0	?	?		No details avail.
89J.6	6	2.09.89	TAROM (Rumania)	T	Tu-154B-2	DES	TO	Bucharest Otopeni Arpt., RUM	5	0	0	5	5	0	5	No details avail.
89J.19	19	5.17.89	Somali AL	SP	B707-330B	MJW	TO	Nairobi KENtta Int'l Arpt., KEN	0	0	0	0	13	57	70	RTO, overran RW
89J.21	21	6.17.89	Interflug (E. Germany)	SP	Il-62M	DES	TO	Berlin Schonefeld Arpt., GDR	0	20	1	21	10	103	113	RTO, overran RW, control fail.
89J.22	22	6.29.89	Phoenix Air Group Inc.	F	D. Falcon 20DC	DES	TO	Cartersville Arpt., GA, USA	2	0	0	2	2	0	2	No details avail.
89J.32	32	8.25.89	Torosair (Turkey)	NSP	B727-247	DES	TO	Ankara Esenboga Arpt., TUR	0	0	0	0	8	157	165	No details avail.
89J.37	37	9.20.89	USAir 5050	SP	B737-401	DES	TO	New York LaGuardia Arpt., USA	0	2	0	2	6	55	61	RTO, crw err., overran RW
90J.2	2	1.06.90	Greco Air	FY	L.1329	DES	TO	Miami Int'l Arpt., FL, USA	1	0	0	1	2	0	2	RTO, 3-eng. flt., 1-eng. fail., struck ILS
90J.13	14	3.11.90	Alaska AL	SP	B727-227 Adv.	MIN	TO	Phoenix Sky Harbor Arpt., AZ, USA	0	0	1	1	6	35	41	Struck person on RW during TO run
90J.16	17	4.02.90	Flight Int'l Inc.	T	Learjet 35	DES	TO	Carlsbad Arpt., CA, USA	0	0	0	0	2	0	2	Eng. fail., LOC, flt. for U.S. Navy
90J.23	24	7.22.90	USAir	SP	B737-222	MJW	TO	Kinston Arpt., NC, USA	0	0	0	0	5	22	27	RTO, eng. fail., nose gear failure

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: LISTED BY PHASE OF FLIGHT**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC FLT Dmg PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
								Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
90J.24	25	7.25.90	Ethiopian AL	F	B707-379C	MJW TO	Addis Ababa Bole Arpt., ETH	0	0	0	0	5	0	5	RTO, birdstrike? skidded off RW
90J.43	47	12.03.90	Northwest AL 299	SP	B727-251 Adv.	MAJ TO	Detroit Wayne Co. Metro. Arpt., MI, USA	0	0	0	0	10	146	156	GTC failure
91J.15	23	3.12.91	Air Transport Int'l / DHL	F	DC-8-62H AF	DES TO	New York Kennedy Int'l Arpt., NY, USA	0	0	0	0	5	0	5	RTO, attmptd. to steer onto other RW, gear collapse, engs. torn off, fire, overload AC
91J.23	31	5.03.91	Ryan Int'l/Emery	F	B727-22C	MJW TO	Hartford Int'l Arpt., CT, USA	0	0	0	0	3	0	3	Eng. explosion on TO roll, RTO
91J.45	55	9.29.91	Aerosucre (Colombia)	F	SE.210-11R	MJW TO	Bogota Eldorado Arpt., COL	0	0	0	0	3	0	3	R. gear collapse on TO run
91J.52	62	12.09.91	Libyan Arab AL	SP?	B707-351C	MJW TO	Tripoli Arpt., LIB	0	0	0	0	10	189	199	Ran off RW, broke into 3 sections
92J.7	7	3.22.92	USAir 405	SP	F.28-4000	DES TO	New York LaGuardia Arpt., NY, USA	2	25	0	27	4	47	51	RTO, snow, icing, crw err., early rotation, crsh into Flushing Bay, NYC
92J.21	21	6.12.92	Delmarva AC/Jet	EXE	Learjet 25B	DES TO	Sheboygan, WI, USA	2	0	0	2	2	0	2	No details avail.
92J.26	27	7.20.92	Georgian CAD	F	Tu-154B	DES TO	Novoalexeyevko, Tblisi, Georgia, CIS	8	16	30	54	8	16	24	Overran RW, struck bldg., overloaded AC
92J.38	41	9.21.92	Time Air Sweden	EXE	IAL.1124	MJW TO	Umea, SWE	0	0	0	0	?	?		Uncontained eng. fail. on TO roll, fuselage damaged
92J.42	45	10.13.92	Belarus Air	NSP	Tu-154B-2	DES TO	Vladivostok, Russia, CIS	0	0	0	0	6	62	68	RTO, overran RW, overloaded AC
92J.45	48	11.20.92	Aerolineas Argentinas	SP	B737-287C	MJW TO	San Luis, ARG	0	0	0	0	6	107	113	RTO, tire fail., overran RW
93J.16	17	5.06.93	VARIG	SP	B747-	MJW TO	Lima, Peru	0	0	0	0	?	?		RTO, FOD eng. fail.
93J.25	26	7.23.93	China Northwest AL	SP	BAe.146-300	DES TO	Yinchuan Arpt., Ningxia, ROC	0	55	0	55	5	108	113	Ran off RW on 2nd TO run, ran into lake
93J.31	32	8.27.93	Tadzhikistan National AL	SP	Yak-40	DES TO	Khorog, Tadzhikistan	5	77	0	82	5	77	82	Eng. fail.? overloaded AC, overran RW into river
<b>SUMMARY STATISTICS:</b>			<b>Tot. Aircraft Involved</b>			<b>1,133</b>									
			<b>Tot. Aircraft Destroyed</b>			<b>848</b>									
			<b>Tot. Aircraft Written Off</b>			<b>170</b>									

## **Appendix D**

### **World Jet Transport Accidents 1970-1992: Mid-Air Collisions**

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: MID-AIR COLLISIONS**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
70J.19	20	7.20.70	Private AC	PVT	Piper	DES	?	Tarragona, SPN	1	2	0	3	1	2	3	ATC failure
71J.15	20	7.30.71	Japan.Air Self Def. Force	Mil.	F-86F Sabre	DES	?	Morioko, Shizukuishi, Honshu, JPN	0	0	0	0	1	0	1	ATC failure
73J.16	18	4.12.73	United States Navy	Mil.	P-3C Orion	DES	?	Moffett NAS, CA, USA	?	?	0	12?	?	13?		ATC failure
78J.22	24	5.18.78	Private AC	PVT	Cessna 150M	DES	?	3.7 mi. W of Memphis Int'l Arpt., TN, USA	1	1	0	2	1	1	2	ATC failure
79J.6	7	2.17.79	Taiwan Air Force	Mil.	Northrop F-5	DES	?	Taoyuan, TWN	1	0	0	1	1	0	1	ATC failure
87J.21	22	6.16.87	Chinese Air Force	Mil.	J-6 (MiG-19)	DES	?	Fuzhou Arpt., ROC	1	0	0	1	1	0	1	ATC failure
88J.45	46	10.26.88	Private AC	PVT	Cessna 172	DES	?	Salzburg, AUT	1	3	0	4	1	3	4	ATC failure
71J.12	15	6.06.71	Huges Air West 706	SP	DC-9-31	DES	C	Duarte, 20 mi. NE of Los Angeles, CA, USA	5	44	0	49	5	44	49	ATC failure
76J.29	31	9.10.76	Inex Adria 550	NSP	DC-9-31	DES	C	Zagreb, YUG	5	108	0	113	5	108	113	ATC failure
78J.22	23	5.18.78	Flight Safety Int'l	T	D. Falcon 20C	DES	C	3.7 mi. W of Memphis Int'l Arpt., TN, USA	4	0	0	4	4	0	4	ATC failure
78J.32	35	9.25.78	Gibbs Flite Center	PVT	Cessna 172M	DES	C	San Diego, CA, USA	2	0	0	2	2	0	2	ATC failure
88J.45	45	10.26.88	Aero-Technik	?	C.501 Citation I	DES	C	Salzburg, AUT	2	0	0	2	2	0	2	ATC failure
71J.3	4	1.09.71	Linden Flight Service	PVT	Cessna 150	DES	ER	Newark, NJ, USA	2	0	0	2	2	0	2	ATC failure
71J.12	16	6.06.71	U.S. Marine Corps	T	F-4B Phantom	DES	ER	Duarte, 20 mi. NE of Los Angeles, CA, USA	1	0	0	1	2	0	2	ATC failure
71J.15	19	7.30.71	All Nippon AW 58	SP	B727-2E2/281	DES	ER	Morioko, Shizukuishi, Honshu, JPN	7	155	0	162	7	155	162	ATC failure
73J.11	11	3.05.73	Iberia 504 (Spain)	SP	DC-9-32	DES	ER	Nantes, FRA	7	61	0	68	7	61	68	ATC failure
73J.11	12	3.05.73	Spantax (Spain)	NSP	CV.990-30A-5	MAJ	ER	Nantes, FRA	0	0	0	0	9	99	108	ATC failure
76T.15	11	3.18.76	Cubana	T	An-24V	DES	ER	Havana, CUB	5	0	0	5	5	0	5	ATC failure
76J.29	30	9.10.76	British AW 476	SP	HS.121-3B	DES	ER	Zagreb, YUG	9	54	0	63	9	54	63	ATC failure
79J.27	28	8.11.79	Aeroflot	SP	Tu-134	DES	ER	Dneprodzerzhinsk, Ukraine, USSR	?	?	?	?	?	?		ATC failure
79J.27	29	8.11.79	Aeroflot	SP	Tu-134	DES	ER	Dneprodzerzhinsk, Ukraine, USSR	?	?	?	173	?	173		ATC failure
85J.37	40	11.10.85	Air Pegasus Corp.	PVT	Piper PA.28	DES	ER	Cliffside Park, NJ, USA	1	2	0	3	1	2	3	ATC failure
86J.24	26	8.31.86	Private AC	PVT	Piper	DES	ER	Cerritos, CA, USA	1	2	0	3	1	2	3	ATC failure, crw err.
77J.1	1	1.02.77	C.S.A. (Czechoslovakia)	SP	Tu-134A	DES	L	Prague Ruzyne Arpt., CZK	0	0	0	0	6	42	48	ATC failure
91J.5	11	2.01.91	USAir 1493	SP	B737-3B7	DES	L	Los Angeles Int'l Arpt., CA, USA	2	20	0	22	6	83	89	GTC failure, ATC err.
70J.19	19	7.20.70	Condor Flugdienst	SP	B737-130	MIN	LA	Tarragona, SPN	0	0	0	0	5	95	100	ATC failure
71J.3	3	1.09.71	American AL 30	SP	B707-323C	MAJ	LA	Newark, NJ, USA	0	0	0	0	7	14	21	ATC failure
71J.24	29	12.04.71	Eastern AL 898	SP	DC-9-31	MIN	LA	Raleigh-Durham Arpt., NC, USA	0	0	0	0	4	23	27	ATC failure
71J.24	30	12.04.71	Private AC	PVT	Cessna 206	DES	LA	Raleigh-Durham Arpt., NC, USA	1	1	0	2	1	1	2	ATC failure
73J.16	17	4.12.73	N.A.S.A. (U.S.)	T	CV.990-30A-5	DES	LA	Moffett NAS, CA, USA	?	?	0	4?	?	4?		ATC failure
76J.10	10	3.18.76	Cubana	SP	DC-8-43	MJW	LA	Havana, CUB	0	0	0	0	16	13	29	ATC failure
78J.9	9	3.01.78	Nigeria AW	SP	F.28-1000	DES	LA	Kano Arpt., NIG	5	11	0	16	5	11	16	ATC failure



**WORLD JET TRANSPORT ACCIDENTS 1970-1993: MID-AIR COLLISIONS**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC FLT Dmg	PHS	Accident Location	Fatalities			Aboard AC			Cause, Remarks, Details	
									Crw	Pax	Gnd	Tot	Crw	Pax		Tot
78J.9	10	3.01.78	Military AC	Mil.	MiG-21	DES	LA	Kano Arpt., NIG	2	0	0	2	2	0	2	ATC failure
78J.32	34	9.25.78	Pacific SW AL 182	SP	B727-214	DES	LA	San Diego, CA, USA	7	128	13	148	7	128	135	ATC failure, crw err.
79J.6	6	2.17.79	Trans Mediterranean AW F	F	B707-321C	MAJ	LA	Taoyuan, TWN	0	0	0	0	5	0	5	ATC failure
85J.14	14	5.03.85	Aeroflot	SP	Tu-134	DES	LA	Snilow Airport, Lvov, Ukraine, USSR	?	?	0	70	?	?		ATC failure
85J.14	15	5.03.85	Soviet Military Flight	Mil.	An-2	DES	LA	Snilow Airport, Lvov, Ukraine, USSR	?	?	0	8	?	?		ATC failure
85J.37	39	11.10.85	Nabisco Inc.	Fy	D. Falcon 50	DES	LA	Cliffside Park, NJ, USA	2	0	1	3	2	0	2	ATC failure
86J.24	25	8.31.86	Aero Mexico 498	SP	DC-9-32	DES	LA	Cerritos, CA, USA	6	58	15	79	6	58	64	ATC failure
87J.21	21	6.16.87	C.A.A.C. (China)	NSP	B737-2T4 Adv.	MAJ	LA	Fuzhou Arpt., ROC	0	0	0	0	?	?		ATC failure, lnd safely
91T.9	12	31778	Skywest / Delta	SP	SA.227AC	DES	Taxi	Los Angeles Int'l Arpt., CA, USA	2	10	0	12	2	10	12	GTC failure, ATC err.
77T.1	2	1.02.77	C.S.A. (Czechoslovakia)	?	Il-18V	MAJ	TO	Prague Ruzyne Arpt., CZK	0	0	0	0	6	0	6	ATC failure
<b>SUMMARY STATISTICS:</b>			<b>Tot. Aircraft Involved</b>		42											
			<b>Tot. Aircraft Destroyed</b>		34											
			<b>Tot. Aircraft Written Off</b>		1											

## **Appendix E**

### **World Jet Transport Accidents 1970-1992: In-Flight Fires**

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: IN-FLIGHT FIRES**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
70J.6	6	2.21.70	Swissair 330	SP	CV.990-30A-6	DES	C	Wuerenlingen, SWI	9	38	0	47	9	38	47	In-flt. bombing, in-flt. fire
72J.26	26	8.14.72	Interflug (E. Germany)	NSP	Il-62	DES	C	Berlin Schoenefeld Arpt., GDR	8	148	0	156	8	148	156	In-flt. fuselage fire, LOC
74J.15	15	3.05.74	?	F	Learjet 24	DES	C	Normandia, BOL	0	0	0	0	2	0	2	In-flt. eng. fire, emer. lndg
76J.3	3	1.03.76	Aeroflot	SP	Tu-134	DES	C	Moscow Vnukovo Arpt., USR	4	83	0	87	4	83	87	In-flt. fire, Moscow-Brest, Belorussia flt.
76J.34	36	10.12.76	Indian AL	SP	SE.210-VIN	DES	C	Bombay Santa Cruz Arpt., IND	6	89	0	95	6	89	95	In-flt. engine fire, atmpd. emer. lndg
77J.30	32	9.08.77	Champion Home	EXE	Learjet 25B	DES	C	Sanford, NC, USA	2	3	0	5	2	3	5	In-flt. fire, explosion
78J.20	21	4.27.78	John Cassidy Jr.	EXE	IAL.1121A	DES	C	Flatwoods, LA, USA	2	0	0	2	2	0	2	In-flt. explosion, fire, cause unknown
79J.38	40	11.26.79	Pakistan Int'l AL 740	SP	B707-340C	DES	C	145 kms. E of Jeddah, SAR	11	145	0	156	11	145	156	In-flt. cabin fire, atmpd. emer. lndg, crw err.
80J.35	35	8.19.80	Saudia 163	SP	L.1011-200	DES	C	Riyadh, SAR	14	287	0	301	14	287	301	In-flt. cargo bay fire, emer. lndg, crw err., failure to evacuate AC
86J.11	12	3.31.86	Mexicana 940	SP	B727-264 Adv.	DES	C	Maravatio, 100 mi. NW of MEX City,	8	159	0	167	8	159	167	Overheated tires during TO roll, in-flt. tire explosion, fire, hydraulic system fail., LOC
88J.30	30	8.02.88	Balkan Bulgarian	SP	Yak-40	DES	C	Sofia Vrajdebna Arpt., BUL	?	?	0	27	4	33	37	In-flt. fire, crw err.?
91J.36	46	7.11.91	Nigeria AW 2120/	NSP	DC-8-61	DES	C	Jiddah Int'l Arpt., SAR	14	247	0	261	14	247	261	In-flt. fire in wheelwell, tire fail. during TO, ret. to field, crsh 3 kms. from RW
73J.49	51	11.03.73	Pan American AW 160	F	B707-321CF	DES	ER	ER New York, NY-Boston, MA, USA	3	0	0	3	3	0	3	In-flt. fire, emer. lndg @ Boston, MA
75J.19	20	7.15.75	National AL	SP	DC-10-30	MIN	ER	ER, Diverted Jacksonville, FL, USA	0	1	0	1	13	58	71	Passenger suicide, in-flt. fire
83J.22	23	6.02.83	Air Canada 797	SP	DC-9-32	DES	ER	Cincinnati Int'l Arpt., KY, USA	0	23	0	23	5	41	46	In-flt. cabin fire
86J.18	19	7.02.86	Aeroflot	SP	Tu-134A	DES	ER	Syktivkar, Komi ASSR, USR	2	52	0	54	8	86	94	In-flt. fire, emer. lndg
86J.32	34	10.16.86	Aeroflot	SP	Tu-134	DES	ER	Syktivkar, USR	?	?	0	2	?	82		In-flt. fire in cargo bay, emer. lndg
90J.3	3	1.13.90	Aeroflot	SP	Tu-134	DES	ER	Ufa, Bashkir, A.S.S.R., USR	3	22	0	25	6	66	72	In-flt. eng. fire, atmp. emer. lndg
90J.38	41	11.19.90	Aeroflot	F	Tu-154M	MJW	ER	Trutnov, Prague, CZK	0	0	0	0	6	0	6	In-flt. fire, ER Basel-Moscow, emer lndg
73J.31	33	7.11.73	VARIG 820 (Brazil)	SP	B707-345C	DES	LA	Paris Orly Arpt., FRA	7	116	0	123	17	117	134	In-flt. fire, emer. lndg
76J.15	16	5.09.76	Imp. Iranian AF ULF48	F	B747-131F	DES	LA	80 kms. SE of Madrid, SPN	10	7	0	17	10	7	17	Lightning strike, in-flt. fire
83J.34	37	9.23.83	Gulf Air 771	SP	B737-2P6 Adv.	DES	LA	Mino Jobel Ali, 30 mi. NE of Abu Dhabi	6	105	0	111	6	105	111	In-flt. bombing, cargo hold fire
87J.37	38	11.28.87	South African AW 295	SP	B747-244B	DES	LA	Indian Ocean 220 kms. NE of Mauritius	19	140	0	159	19	140	159	In-flt. upper cargo hold fire
87J.39	40	12.05.87	Scott Cable	EXE	HS.125-400A	DES	LA	Lexington Blue Grass Field, KY, USA	2	0	0	2	2	2	4	In-flt. eng. fire
92J.22	22	6.22.92	V.A.S.P. (Brazil)	F	B737-2A1C	DES	LA	15 kms. from Curzeiro del Sul, BRA	3	0	0	3	3	0	3	In-flt. fire, crsh in jungle near Moa River
92J.53	56	12.19.92	U.S. Dept. of Energy	EXE	C.550 Citation	DES	LA	Billings Logan Int'l Arpt., MT, USA	2	6	0	8	2	6	8	struck warehouse, fire, wake-vortices? in-flt. eng. fail? wind shear? Watertown, SD-Billings, MT flt.

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: IN-FLIGHT FIRES**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC FLT Dmg PHS	Accident Location	Fatalities			Aboard AC			Cause, Remarks, Details
								Crw	Pax	Gnd	Tot	Crw	Pax	
<b>SUMMARY STATISTICS:</b>				<b>Tot. Aircraft Involved</b>		26								
				<b>Tot. Aircraft Destroyed</b>		24								
				<b>Tot. Aircraft Written Off</b>		1								

## **Appendix F**

### **World Jet Transport Accidents 1970-1992: Wake-Vortex Accidents**

**WORLD JET TRANSPORT ACCIDENTS 1970-1993: WAKE-VORTEX UPSET**

ACC Code	#	Date	AC Operator	FLT Typ	AC Type	AC Dmg	FLT PHS	Accident Location	Fatalities				Aboard AC			Cause, Remarks, Details
									Crw	Pax	Gnd	Tot	Crw	Pax	Tot	
87J.8	8	1.16.87	Aeroflot	SP	Yak-40	DES	C	Tashkent, USR	4	5	0	9	4	5	9	preceding I1-76 wake-vortices
80J.27	27	6.09.80	Midwest Air Charter	F	SE.210-VIR	MJW	L	Atlanta Int'l Arpt., GA, USA	0	0	0	0	3	1	4	Preceding L1011 wake-vortices
79J.2	2	1.19.79	Massey-Ferguson	EXE	Learjet 25D	DES	LA	Detroit Metro. Arpt., MI, USA	2	4	0	6	2	4	6	LOC, preceding DC9 wake-vortices, icing
92J.53	56	12.19.92	U.S. Dept. of Energy	EXE	C.550 Citation	DES	LA	Billings Logan Int'l Arpt., MT, USA	2	6	0	8	2	6	8	struck warehouse, fire, wake-vortices? in-flt. eng. fail? wind shear? Watertown, SD-Billings, MT flt.
93J.46	47	12.15.93	?	EXE	IAI.1124	DES	LA	Santa Ana, CA, USA	1	4	0	5	1	4	5	crsh in field, preceding B.757 wake-vortices
<b>SUMMARY STATISTICS:</b>		<b>Tot. Aircraft Involved</b>				<b>5</b>										
		<b>Tot. Aircraft Destroyed</b>				<b>4</b>										
		<b>Tot. Aircraft Written Off</b>				<b>1</b>										