AVIATION RISK MANAGEMENT

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A B S T R A C T

Risk management is considered to be an application of general concepts in scientific management of a particular problem of exposure to risk of loss. It is concerned with identifying objectives, analysing the data regarding the nature of the problem, evaluating the pure risks deriving from the nature of the business and choosing or finding the most suitable method or methods of handling these risks; aiming to control them and their effects as well as minimizing the cost.

The field of aviation has grown very quickly and developed faster in the last few years to reach the present level of operation and technology by introducing more advanced and higher capacity airliners. Therefore, aviation risks and their financial impact exhibit a number of distinguishing characteristics that raise problems for traditional risk management and insurance technique in dealing with such risks. The study reviews, analyses and classifies aviation risks and their characteristics as well as the major hazards involved in aircraft and their operation.

The research undertakes to review the international conventions and agreements affecting air transportation and the limits of liabilities affecting those who operate airlines internationally in respect of death, injury or damage caused to passengers, baggage, cargo and third parties as well as safety and security of aircraft in the air and on the ground.

It also studies and analyses the international jet airliner fleet, their accidents and their causes to provide a basis of choosing suitable risk levels in managing these risks.

KEY TO SYMBOLS AND ABBREVIATIONS

App	Approach
AIOA	Aviation Insurance Offices Association
A/L	Airline
aoa	Any one aircraft/any one accident
aop	Any one passenger/any one person
art	Article
AVN	Aviation
BEA	British European Airways
BOAC	British Overseas Airways Corporation
CAA	Civil Aviation Authority
CAB	Civil Aeronautics Board (U.S.A.)
CII	Chartered Insurance Institute
CSL	Combined Single Limit
CTL	Constructive Total Loss
dta	Date to be advised
ER	En-route
F	Flight
FAA	Federal Aviation Administration (U.S.A.)
FR	Flight Risks
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
ILS	Instrument Landing System
IMF	International Monetary Fund
INS	Internal Navigation System
IR	Ingestion Risks
IUAI	International Union of Aviation Insurers
Km/h	Kilometer per hour

LAD	Lloyd's Aviation Department
LAUA	Lloyd's Aviation Underwriters' Association
L/U	Leading Underwriter
N.T.	New Technology
PML	Probable Maximum Loss
Sch	Schedule
SDR	Special Drawing Right
T/L	Total Loss
TLO	Total Loss Only
TO	Take-off
TR	Taxying Risks

CHAPTER ONE

INTRODUCTION

The distinctive feature of the air transport industry is its rapid development since the early flight in 1919. Very soon the first airliners with converted wartime aircraft were put into service on selected routes in many parts of the world. The aeroplanes were single and twin-engined with wooden construction. The speed of airliners rose from 150 km/h in 1919 to 1000 km/h in 1984 and to 2170 km/h for concorde.

1.1 Aviation Insurance Historical Developments

The Historic Records Working Party of the Insurance Institute of London (1966) recorded that the insurance of the flying machine and its attendant risks cannot be traced back beyond the year 1908. Fire insurance was the first type of cover sought for the aeroplane. The White Cross Insurance Association underwrote insurance of aircraft against the risk of fire while in flight or on the ground and continued to do so until 1911.* Third party cover was also available, but aircraft insurance generally was not at all profitable during those early days.

Third party insurance was fairly widely sought because of the damage involved in landing aircraft and the constant risk of damage to property.

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* It is not clear when it started.

Up to 1914, and for what little business was contracted during war years of 1914-18, both Lloyd's and company underwriters were offering quotations on the following lines:

- Accidental damage to aircraft.

- Fire risks.

- Third party risks.

- Comprehensive insurance.

- Personal accident risks.

- Dirigible insurance.

- Aerodrome liability.

After the first world war (1914-1918) there was great activity in the world of aviation because of the rapid development of the aeroplane during the war and its prospects in a peace-time commercial and sporting role.

On 22nd March 1919, the first regular service for international transport by air started.* On 14th and 15th June, 1919, the Atlantic was crossed non-stop by an aeroplane for the first time.

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* Between Paris and Brussels.

In the same year, the powers assembled in Paris for the Peace Conference, discussed and formulated rules for the regulations of international aviation, which were signed on 13th October, 1919 and became known as the Convention of Paris (Martin et al, 1985).

The Warsaw Convention 1929 proved a useful stimulation of underwriting of aviation risks by establishing standard terms, definitions and limits of liabilities.

The first pool in the United Kingdom was the British Aviation Insurance Group, composed of the Union of Canton and some Lloyd's underwriters. This was expanded in 1931 to include a number of offices and was re-named the British Aviation Insurance Company Limited. A further specialist office, the Aviation and General Insurance Company Limited started operations in 1935 (CII, 75b).

In 1934, the International Union of Aviation Insurers (IUAI) was formed in London as a non-political body through which the interests of aviation insurers world-wide could be represented, protected and advanced. The IUAI's objectives are: (Bett, 1962)

> "To speak and negotiate on behalf of aviation insurance interests, to provide a control office for the circulation of information between members; to co-operate for the better regulation and conduct of aviation insurance and generally to do all such things as may be beneficial to the development and conduct of this branch of insurance."

The Lloyd's Aviation Underwriters' Association (LAUA) was formed in October 1935 according to the suggestion of the committee of Lloyd's to set up an active body representing the Lloyd's aviation market to deal with aviation insurance matters.

In 1949, the Aviation Insurance Offices' Association (AIOA) was formed to represent the aviation insurers in the companies market.

The LAUA and the AIOA work together in close collaboration and co-operation in all matters of common interest to the aviation market * (Working Party, 1966; Margo, 1980).

In 1944, a Conference held in Chicago produced the international agreement which gave effect to the establishment of the International Civil Aviation Organisation (ICAO) in 1945 as an international agency of governments which establishes world standards for the technical regulations of civil aviation.

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* The Joint Technical and Clauses Committee consists of members of both associations. Their responsibility is to review policies and clauses used in the market. The LAUA has published a book of policy forms and clauses for use in aviation business which has a world-wide distribution.

The aims and objectives of the ICAO according to article 44 of the Convention are to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport.

In 1945 also, the International Air Transport Association (IATA) was founded by the airlines of many countries as a non-governmental organisation. The aims of IATA are as follows:

(1) To promote safe, regular and economical air transport for the benefit of the peoples of the world, to foster air commerce and to study the problems connected therewith.

(2) To provide means for collaboration among the air transport enterprises engaged directly or indirectly in international air transport service.

(3) To co-operate with the International Civil Aviation Organisation and other international organisations (IATA, 1984).

Although aviation insurance was introduced just before the first world war, it has developed rapidly. This rapid development can be attributed to the development of the aircraft industry.

1.2 Nature of Aviation Risks

The most distinctive feature of aviation insurance is the high value of jet airliners especially the wide-bodied jets which entered service in 1969 for the first time.*

Therefore, the international airline companies are exposed to the possibility of catastrophic losses for both hull liabilities and those in respect of passengers and third parties.

The second feature is that the growth rate in passengers carried by air transport operators has continued during recent years.

A third factor is the interference between the perils which caused loss or damage to the aircraft itself.

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* - In 1982, international and domestic scheduled air transport operators world-wide, carried 758 million passengers and flew 1137 billion passenger-kilometres. In 1983, they carried 785 million passengers and flew 1187 billion passenger-kilometres.

- Lloyd's aircraft prices in 1983 for wide-bodied jets are: Airbus A300, US$ 53 m; Boeing 747 from US$ 50 m to US$ 90 m: DC-10 US$ 60 m; Lockheed L.1011, US$ 50 m.

- 1984 London Airline Placement (for most airlines):
  Hull limit between US$ 60 m, to US$ 120 m.
  Liability limit between US$ 250 m to US$ 700 m.

  (m = millions).

The fourth feature is that the international airline operators are subject to international rules and regulations as a result of many international conventions and treaties to avoid any contravention of private rules of navigation or custom. Some of these conventions are concerned with the limits of indemnity.

Finally, the technological changes in the aviation industry and the increase in size, speed, and range of the aircraft has influenced the aviation insurance market.

1.2.1 Physical and Moral Hazards in Aviation Insurance

1.2.1.1 Physical Hazards

The physical hazards in insurance can be ascertained by a study of the risks involved. In aircraft hull insurance, the physical hazard is the construction of the aircraft itself and the flight equipment. In passenger legal liability insurance, the physical hazard could be the limits of liabilities to which the insured is exposed according to law. In third party legal liability insurance, the physical hazard could be the speed of aircraft (El Din, 1971; Gerges, 1975-76).

1.2.1.2 Moral Hazards

Moral hazards are related to the behaviour of the pilot and crew or to the engineer in charge of the repair or maintenance of the aircraft (El Din, 1971; Gerges, 1975-76).

It could be said that the physical hazards concern something that can be seen or ascertained and the moral hazards may be described as a risk looked at from the point of view of human nature. It is not possible to differentiate between physical and moral hazards, and the combination of both must be considered when assessing the risk involved.

1.3 Purpose of Study

The airline companies which own the international airlines are considered to be the most important influence in the aviation aircraft industry. For this reason the researcher will deal with these airliners.

He will deal with and analyse the aviation risks which include:

(1) The aircraft hull during the flying phase and on the ground.

(2) The air carrier in respect of the passengers, their checked and accompanied baggage and also cargo.

(3) Third party risks for persons and properties.

The incurrence of the risk increases the overall costs of the airline companies and this financial burden therefore tends to increase with the increase in the occupancy rate (load factor) value of the aircraft hull and the compensation per passenger. Therefore, the researcher will extend his study to the adverse factors which combine to escalate the international airlines exposure to catastrophic losses.

Also, he intends to review the development of aviation risks, and to investigate suitable methods of managing these risks, especially the process of selection in the purchase of aviation insurance as a major way of handling risks.

1.4 Outline of the Study

This research includes six chapters. The first chapter is the introduction which includes the historical development of aviation insurance, the nature of aviation risks, the purpose of the study and an outline of the research.

The aim of chapter two is to investigate and identify the aviation risks.

Chapter three includes a full review of international conventions and agreements affecting the air transportation and the limits of liabilities affecting those who operate airliners internationally.

Chapter four covers the development of jet aircraft generations and analyses the accidents which have occurred to jet airliners and the fatalities through the aircraft operation internationally.

Chapter five deals with the development of a risk management function and the methods which are used to reduce the chance of loss. The researcher will analyse the problem of dealing with risk and insurance from the point of view of the international airline operators.

Chapter six summarises the conclusions of this study.

CHAPTER TWO

AVIATION RISKS

2.1 Introduction

The airline companies, like any other business enterprises, are exposed to a variety of risks where there is a chance of loss or no loss.

The definition of risk, in general, is not the aim of this work. There are many different definitions of risk made by many different workers in the field of risk, risk management and insurance.* But for the purpose of this study risk may be defined as, "the potential effects of a group of factors which influence in an undesirable way the results of a specific situation" (El-Kady, 1984).

This definition contains some concepts about risk in general as the following:

1. it is concerned with risk effects as well as risk hazards or causative factors;

2. it depends on the factors causing doubt and uncertainty, and not the doubt and uncertainty itself;

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* Such as, Willet, 1951; Kulp, 1956; Pfeffer. 1956; Mehr, 1963; Magee, 1967; Greene, 1973; Denenberg, 1974; Riegel, 1976; Gordis 1977 Vaughan, 1978; Dorfman, 1982; Royal Society Study Group, 1983; Kandil, 1983; El-Kady 1984 and many others.

3. it is concerned with financial and economic loss beside the non-financial results, with actual or expected results;

4. the main concern of social, legal, technical and scientific studies of risk is with its causes as well as with seeking to control its existence and to limit its consequences;

5. it helps in distinguishing between risk and risk-taking, where the meaning of risk-taking is wider because it involves the chance of gain and loss, while risk is concerned solely with loss.

Taking the above concepts into consideration, this work is concerned only with the financial and the economic results of risk.

The control of risk and the management of losses are the fundamental objectives of risk management in the business enterprise (Mehr, 1963).

For the airline companies, the first step towards the accomplishment of these objectives is to develop an understanding of the various types of risk that airlines face and to allocate the managerial responsibilities for each type of risk. Therefore, the aim of this chapter is to investigate and identify the aviation risk which face the airline operators.

2.2 Aviation Risk Characteristics

As mentioned in Chapter one, the international airline companies are exposed to the possibility of catastrophic losses for both hull liabilities and those in respect of passengers and third parties. Aviation risk, therefore, share a number of common and distinguishing characteristics that raise problems for traditional risk management and insurance technique. These characteristics present new problems that cannot be necessarily handled by traditional methods.

Anderson, 1979 describes these characteristics as follows:

2.2.1 A single exposure unit can produce catastrophic losses

A fundamental quality of ideally insurable risks is that a large number of independent exposure units are present. It is generally assumed that a loss of any one exposure unit will not produce a catastrophic loss. The condition of independence protects against simultaneous losses to a number of exposure units from a single event. The law of large numbers allows the insurers to make a relatively accurate prediction of the number of units which will sustain losses, so that appropriate premium and reserve levels can be set.

The catastophic loss situations usually negate the law of large numbers and the assumption of independence, since a loss deriving from a single exposure unit can produce catastrophic losses.

2.2.2 Catastrophic Property and Liability Losses can occur simultaneously

Property and liability losses can occur simultaneously, each with catastrophic consequences. A large aircraft accident or two large aircraft in mid-air collision can cost hundreds of millions of both

property and liability in respect of passengers and third parties.

The simultaneous occurrence of catastrophic property and liability losses could strain the financial capacity of the airlines, its insurers and injured third parties. (Appendix One).

2.2.3 Maximum Potential Losses can overwhelm the capacity of the Insurance Market

In the past, it could be assumed that a single unit could be insured to its maximum potential loss. While this was not necessarily done, the option was still available. Today, a number of jumbo risks cannot be insured to their full value. These amounts may exceed not only what any one insurer can provide, but what the entire international insurance industry can realistically make available.

2.2.4 Risks Exhibit low Probabilities

Many risks with large loss potentials exhibit a low probability or frequency of occurrence.

2.2.5 Loss Prevention necessary at all costs

The maximum potential losses of many jumbo risks are so staggering that it is unrealistic to even consider the loss happening. The general attitude is one of loss prevention at all costs. Normally, it is not feasible to consider less expensive systems which may result in an increased probability of the loss occurring.

The sources of these attitudes are both internal and external to the businesses associated with jumbo risks. The enormity of potential losses, often exceeding available insurance, causes the business itself to make substantial efforts to prevent the loss.

Businesses that may be lax for one reason or another will find external pressure from government regulators, consumer groups, environmentalists and other concerned parties. In many cases, these pressures will lead to excessive spending, but it is most likely an unavoidable cost of being committed to technological systems that produce jumbo risks.

2.3 Major Aviation Hazards Involved in the Aircraft and its Operation

The study of aviation insurance and reinsurance requires considerable general knowledge of hazards involved in the aircraft and its operation.

Like any type of insurance it is essential to analyse the physical hazards to which the insured may be exposed.

Generally, there are four counterbalancing forces which act on any aircraft "in flight". Lift generated by the airflow over the wings, overcomes weight and gravity, and drag caused by the resistance of the air opposes the thrust of the engines. When an aircraft is in straight and level flight, thrust counterbalances drag and lift counterbalances weight and gravity.

Aviation insurance underwriters, legal workers, surveyors and adjusters in the field of aviation consider the aircraft "in flight" from the moment when, after the crew has embarked in order to take-off, it first moves under its own power until the moment when it next comes to rest after landing (LAUA, 1980; Martin et al, 1985).

2.3.1 Take-off and Climb

Take-off is the movement of the aircraft from its starting position on the run-way to the point where the climb is established (Navarre, 1971).

The amount of lift which the aircraft needs to generate for take-off depends on its weight. All aircraft have a maximum take-off weight determined by the manufacturer.

Take-off is now requiring more run-way length, especially for jet aircrafts, to provide room for the speed-gathering needed for climb and flight.

If the runway is shorter, the aircrafts capacity for passengers, freight and fuel will be limited. Because wing lift depends on air density, jets at airports in the tropics or high altitudes where the air is thin, have to generate higher speeds for take-off, and run-ways need to be correspondingly longer.

2.3.2 En Route

Any aircraft is exposed to many different physical hazards whilst the aircraft is actually flying. Such as the following.

2.3.2.1 Stalling

There is a minimum speed at which any aircraft can fly steadily. If an aircraft is flying at a speed below this minimum there is insufficient lift to support its own weight in level flight. When an aircraft stalls completely, it becomes a free-falling body and is no longer flying. In a partial stall, the controls are partially effective. Many fatal accidents have occurred due to aircraft stalling. If the aircraft stalls close to the ground especially in take-off and landing there is no height or time available to enable the pilot to make the necessary manoeuvres to regain control of the aircraft.

2.3.2.2 Air-currents

Whilst in flight, all aircraft are exposed to air-currents that can strike it from different angles, forcing its nose to tip up or to turn and sometimes tilting the wings until they are almost vertical (El-Din, 1971).

2.3.2.3 Ice Formation (Airframe Icing)

The effects of ice accretion on aircraft in flight are cumulative; thrust is reduced, drag increases, lift lessens, weight increases and the shape of the wings and leading edges change. The results are an increase in stall speed and deterioration of aircraft performance.

2.3.2.4 Weather and Bad Visibility

Aircraft are subject to more extreme changes in temperature than any other form of transport. Sometimes from the hot sun in the tropics, within thirty minutes of take-off it will be cruising at high altitude where the temperature may be 100 degrees below freezing (Varley, 1978).

Navarre, 1971, considers weather phenomena very serious operational factors in flight operations for all aircrafts. He identifies specifically:

(a) tornados

(b) line of thunderstorms (squall lines)

(c) embedded thunderstorms

(d) hail 3/4" or greater diameter

(e) severe and extreme turbulence

(f) severe icing

(g) windspread duststorms/sandstorms, lowering visibility to less than two miles

On the other hand bad visibility affects the aircraft mainly whilst it is landing or taking-off. The risk of collision arises when other aircrafts are landing, taking-off or taxying in a crowded zone.

2.3.2.5 In-flight Fire

The most hazardous risk that can involve the engines of an aircraft in fire whilst in flight.

Hydraulic fluid is sometimes the cause of fire following a crash. The cause of fire in the aircraft cabin may be due to passengers smoking, where inflammable materials are invariably used in the furnishings.

2.3.2.6 Others

There are many more active physical hazards to which aircraft are exposed whilst in flight such as:

- Airframe failure.

- Bird strike.

- Electrical and electronic system failure.

- Engine and mechanical failure.

- Mid-air collision.

2.3.3 Descent, approach and landing

To land aircraft the pilot approaches the airport at the lowest possible speed which still allows the aircraft to fly. The choice of approach speed is defined in exhaustive specifications made by the aircraft's manufacturers under ideal conditions.

The hazardous factors associated with the landing phase are:

- Reducing the speed.

- Operating the landing flaps.

- Adjusting the power.

- Lowering the landing gear.

- Controlling the speed of descent.

- Observing the instruments and following the radio instructions from the tower.

2.4 The Human Error

The term of "human error" can be somewhat referred to the following groups: (Wiener and Curry, 1980).

(a) Cockpit crew error.

(b) Air traffic controllers error.

(c) Weather forecasters error.

(d) Maintenance personnel error.

(e) Dispatchers error.

The basic tenet in aviation industry is that the human behaviour has a vital importance. In this respect, the pilot behaviour activities plays a serious part in determining the safety of civil aviation.

Weston, 1980 contributed in his study that whilst the aircraft captain bears the ultimate responsibility for the safety of his aircraft, in terms of maintaining safe separation from the other traffic, this authority is exercised by the air traffic controller for all practical purposes. The exercise of this authority demands considerable confidence by the pilot in the disembodied voice of the controller and in the integrity of the system of which he is a part. It is the task of the controller and the air traffic network to justify that confidence.

The cockpit crew and ATC are an essential element in the maintenance of the air safety and as human beings, they can make mistakes. The nature of the function they perform is such that any omission or misjudgement on their part can have disastrous consequences.

2.5 The Insurance point of view in the Aircraft design and its equipment

2.5.1 The Aircraft Design

Before an aircraft is designed, the following points must be considered:

(i) the function of the projected aircraft

(ii) the performance and capabilities expected for it.

Originally, building the airframe was the most difficult part of aircraft construction, but modern designs have taken into account the importance of the current installation and location of the power plant. Early jet-engined aircraft continued the principle used in piston-engined planes of incorporating their engines into the wings. Modern development has led to the following advances: (El-Din, 1971).

(a) The installation of turbo-jet engines below the wings. From the insurance point of view, this idea simplifies engine overhaul or replacement and the jettison of engines in cases of fire (provided the aircraft is equipped for such an operation).

However, there is the possibility of damaging such engines in cases of belly landing.* The majority of existing and new jets have their engines located below their wings, for example, the Boeing 707, 720, 737, 747, 757, 767, the DC-8 series and the Airbus A300, 310.

(b) The installation of turbo-jet engines at the rear end of the fuselage (or using the tail unit for installing an engine when the aircraft is powered by three engines), from the insurance point of view there are many clear advantages gained from this method of engine installation, the most important of which is the lessening of possible damage in instances of belly-landing. In the majority of crashes involving aircraft fitted with rear-mounted engines, passengers escape injury from burns as the fire-risks are greatly reduced. There is also less risk of ingestion. Examples of this type of construction are: the Caravelle, the Boeing 727, the VC-10, DC-9 and BAC One-Eleven.

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* (a) Most of jet engines represent about 15% of the value of the aircraft.

(b) Belly-landing is an emergency landing with the undercarriage not lowered.

(c) Every fresh idea creates its own problems from the insurance viewpoint. As an example, following the latest trend for supersonic aircraft, solid thin wings have been constructed in steel. Such wings would need replacement even in a case of slight damage.

(d) The wings are considered the most important component in the aircraft, as they are the source of lift and have to support the machine in flight. They also have to be capable of withstanding the stresses imposed by a change of direction and by vertical air-currents.

The airliners manufacturer's objectives during the design phase are to fulfill their own design criteria with special consideration and understanding of the airline requirements. These requirements are incorporated into the basic design of aircraft (Torosian, 1977).

2.5.2 The Aircraft Equipment

There have been very rapid developments in aircraft equipment aimed mainly at relieving the pilot of all mechanical duties and responsibilities. Thus assisting him in performing those tasks which need to be carried out under human control. Examples of this equipment are:

(1) Auto-pilot system: this is essentially a stabilizing system which takes over the

controls during the climb, cruise and descent-to-destination phases of flight, leaving the pilot free to concentrate on surveillance and communications. In turbulent conditions it relieves him of a fatiguing test of maintaining a smooth ride.

(2) Automatic landing system: this is a super-auto-pilot which detects and responds to Instrument Landing System (ILS) radio beam. In fog and poor visibility (even in zero visibility) it guides the aircraft onto the runway accurately and safely.

(3) Automatic radio system and radar.

(4) Astro-navigation techniques: is used above clouds or under featureless country in some airliners.

(5) Position-fixing techniques.

(6) Internal Navigation System (INS): to give the aircraft exact position.

(7) Anti-icing, de-icing systems.

(8) Power operated controls system.

(9) In flight engine fire fighting techniques.

2.6 Classification of Aviation Risks

Aviation risks other than those called abnormal risks such as sabotage, violence, hi-jacking and war risks could be classified into the following seven categories:-

Category One: Aircraft Risks

(Risks related to the aircraft and its design)

1.1 Airframe structural failure

1.2 Doors, windows opening/failing in flight

1.3 Electrical system failure/malfunction

1.4 Failure of all power units

1.5 Flying control system malfunction

1.6 Instruments - incorrectly set - misread - failure - malfunction - design

1.7 Major powerplant disruption/loss of propeller in flight

1.8 Tyre burst after retraction

Category Two: In-Flight Risks

(Other than aircraft risks)

2.1 Aircraft shot or forced down by fighter aircraft

2.2 Bird strike/ingestion

2.3 Cargo breaking loose

2.4 Hail damage

2.5 Ice/snow accretion - airframe/engine

2.6 In-flight accidents due to the carriage or hiding of bombs on aircraft

2.7 In-flight fire/smoke

2.8 Lightning strike

Category Three: Landing and Landing Area Conditions

3.1 Aquaplaning/hydroplaning

3.2 Overrunning/veering off runway

Category Four: Collisions

4.1 Collision with high ground

4.2 Collision with water

4.3 Mid-air collision

Category Five: Pilot and Crew

5.1 Crew incapacitation

5.2 Crew shot

Category Six: Ground Personnel Error

6.1 Fuel contamination

6.2 Fuel exhaustion, starvation, mismanagement

Category Seven: Miscellaneous

Other than the above and not known.

CHAPTER THREE

THE LEGAL ASPECTS OF THE INTERNATIONAL CARRIAGE BY AIR AND AVIATION INSURANCE

3.1 Nature of International Air Law

International air law is a combination of public and private international law. Its purpose is to provide a system of international regulations of international civil aviation and to eliminate conflicts or inconsistencies in municipal air laws (Martin et al, 1985)

International air law has not eliminated all conflicts between municipal air laws, where all states are not parties to the multilateral agreements which unify these laws. Also, not all problems are the subject of international agreements. States do not always ensure that their municipal air law conform to international standards and recommended practices. Nevertheless, it is to the mutual advantage of states to co-operate in international civil aviation and in practice the extent of the co-operation is impressive.

3.2 International Carriage by Air and Limits of the Carrier's Liability

3.2.1 Superseded Conventions (Paris Convention 1919, Madrid Convention 1926 and Havana Convention 1928)

The Paris Convention 1919 was the first major multilateral convention in the field of air law. This convention established rules governing flight over and between different states as well as affirming the complete and exclusive sovereignty of every state over the airspace above its territory. It also laid down rules for airworthy certificates and

the validity of licences given to pilots, also navigational rules to be followed in cases of flying, landing and departure. Also, the convention established the International Commission for Air Navigation (ICAN). Thirty-eight countries, mostly European, signed it but the United States together with most of the American Republics did not.

The Madrid Convention 1926 was signed by Spain and most Latin American states.

The Havana Convention 1928 was signed as a result of the refusal of the United States and other South American Republics to become parties to the Paris Convention.

Following the considerable development of the aircraft industry and consequently the rapid growth of civil air transport, it was felt that additional air law should be promulgated to give effect to a further unification of regulations applying to air transport. Under the terms of the Chicago Convention 1944 each contracting state was bound to give notice of denunciation of the former conventions and the conventions are now of little more than historical and academic interest.

3.2.2 The Chicago Convention 1944 ("Convention on International Civil Aviation", "International Air Services Transit Agreement", and "International Air Transport Agreement")

3.2.2.1 Introduction

The Chicago Convention was held in 1944 for the purpose of revising the provisions and regulations of the Paris Convention 1919 and to examine the role of ICAN. The Chicago Convention, having been signed and

ratified by many states, gave effect to the establishment of ICAO the body which replaced ICAN.

The Convention made quite clear that every state has complete and exclusive sovereignty over the airspace above its territory.

The Convention deals with the rights of non-scheduled international flights. It gives a right for aircraft not engaged in scheduled international air services to make flights into or in transit non-stop across the territory of a contracting state and to make stops for non-traffic purposes without the necessity of obtaining prior permission, but subject to the safety rules established by that state.

The Convention provides that a state may refuse to allow flights for remuneration, but a state may not enter into any agreement which gives one operator any privileges or exclusive rights over any other operator, as far as its own airspace is concerned.

The Convention does not define "scheduled international air service" but the ICAO Council has presented the following definition for the guidance of contracting states: (ICAO Doc. 7278, 1952)
"A scheduled international air service is a series of flights that possesses all the following characteristics:

(a) it passes through the airspace over the territory of more than one state;

(b) it is performed by aircraft for the transport of passenger, mail or cargo for remuneration, in such a manner that each flight is open to use by members of the public;

(c) it is operated, so as to serve traffic between the same two or more points, either,

(i) according to a published time-table or,

(ii) with flights so regular or frequent that they constitute a recognisable systematic series".

The scheduled international operators can only operate in accordance with agreements negotiated between the states concerned with the traffic right or in accordance with the "Two Freedoms" and "Five Freedoms" Agreements.

3.2.2.2 Summary of Terms of the Convention

Many of the terms to be observed in making an international flight are applicable to non-international flights, having been incorporated in rules laid down by many countries as applying to all their aircrafts.

Every aircraft engaged in international air navigation must bear its appropriate nationality and registration marks and such marks must be those of the state in which the aircraft is registered.

To assist air navigation each contracting state agrees to prevent all unnecessary delays and to issue regulations to facilitate and expedite the passage of aircraft between territories of contracting states.

In the event of an accident to an aircraft of a contracting state occurring in the territory of another contracting state, the state in which the accident occurred carries out the investigation. The state in which the aircraft is registered or manufactured shall be given the opportunity to appoint observers to be present at the inquiry. The report and findings of the inquiry must be sent to the state of registration.

To aid air navigation each contracting state, so far as it may find it practicable, undertakes to provide all facilities in accordance with recommendations made from time to time.

Every aircraft of a contracting state, engaged in international navigation should carry, according to the convention, the following documents:

(a) its certificate of registration;

(b) its certificate of airworthiness;

(c) the appropriate licences for each member of the crew;

(d) its journey log book;

(e) if it is equipped with radio apparatus, the aircraft radio station licence;

(f) if it carries passengers, a list of their names and places of embarkation and destination;

(g) if it carries cargo, a manifest and detailed declaration of the cargo.

Each contracting state undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standard, procedures and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation.

According to the Convention's terms, the ICAO should adopt and amend from time to time, when necessary, international standards and recommended practices and procedures dealing with:

(a) Communications systems and air navigation aids, including ground marking.

(b) Characteristics of airports and landing areas.

(c) Rules of the air and air traffic control practices.

(d) Licensing of operating and mechanical personnel.

(e) Airworthiness of aircraft.

(f) Registration and identification of aircraft.

(g) Collection and exchange of meteorological information.

(h) Log books.

(i) Aeronautical maps and charts.

(j) Customs and immigration procedures.

(k) Aircraft in distress and investigation of accidents.

3.2.2.3 The Freedoms Agreements

Subsequent to the Convention there were the "Two Freedoms" Agreement 1944 (The International Air Services Transit Agreement) and the "Five Freedoms" Agreement 1944 (The International Air Transport Agreemnt). The "Two Freedoms" Agreement provided in respect of scheduled international air services the privileges to fly across the territory of another contracting state and to land for non-traffic purposes. The "Five Freedoms" Agreement added the following three privileges:

(i) to put down passengers, mail and cargo taken on in the territory of the state the

nationality of which the aircraft possesses;

(ii) to take on passengers, mail and cargo destined for the territory of the state nationality of which the aircraft possesses;

(iii) to take on passengers, mail and cargo destined for the territory of any other contracting state and the privilege to put down passengers, mail and cargo coming from any such territory.

Where states are parties to the Chicago Convention but not to the Freedoms Agreements, the permission or authorisation requirements of the Convention are granted by means of bilateral agreements.

3.2.3 The Warsaw Convention 1929 "The Convention for the Unification of certain Rules relating to International Carriage by Air"

3.2.3.1 Introduction

Prior to the Warsaw Convention no uniform rules or laws governing the rights of passengers or the consignor of goods by air were in existence. The Convention defined and limited the rights of passengers and owners of cargo. The corresponding liabilities of the air carrier were also regulated. It is this area that is the daily concern of insurers.

The Convention has been widely accepted, having been ratified by most countries in the world, and applies to all international carriage of persons, baggage or goods performed by aircraft for reward or to gratuitous carriage by aircraft performed by an air transport undertaking.

The Convention applies also to carriage performed by the state or by legally constitute public bodies. State transport could be excluded provided such exclusion is declared by the interested high contracting party. On the other hand, it does not apply to carriage performed under the terms of any international postal agreement.

The Convention also provided that successive carriage, i.e. carriage performed by several successive air carriers, is deemed to be one undivided carriage, provided it has been regarded by the parties as a single operation, and provided also that it does not lose its international character.

3.2.3.2 Summary of terms of the Convention

I Liability of the Carrier

(a) For Passengers

According to Articles 17 & 19, the carrier is liable for death, injury or delay suffered by the passenger whilst in the aircraft or during the course of any operations of embarking or disembarking.

(b) For luggage

According to Articles 18 & 19, the carrier is liable for loss, damage, or delay to registered luggage. A damage claim must be lodged within three days of receipt of the luggage and in the case of delay within fourteen days from the date on which the luggage has been placed at the disposal of the receiver and must be in writing (Article 26).

(c) For goods

The carrier is liable for loss, damage or delay to any goods during carriage by air. This liability refers to the time the goods are in the charge of the carrier (Articles 18 & 19). In respect of damage, a written complaint must be made to the carrier within seven days, while for delay the period is fourteen days (Article 26).

II Limit of Liability

(a) For passengers

The liability of the carrier for each passenger is limited to the sum of 125,000 gold francs.* This sum is a limit, but within this limit the quantum of damage has to be established (Article 22(i)).

* The gold franc refers to the French franc consisting of 65½ milligrams of gold of millesimal fineness 900. The gold franc referred to is an international standard used as a basis. Therefore, the sums mentioned in the Convention may be converted into any national currency in round figures.

(b) For luggage

In the carriage of registered luggage, the liability of the carrier is limited to a sum of 250 gold francs per kilogram, unless there has been a special declaration of the value at delivery (Article 22(2)). For objects of which the passenger takes charge himself the limit is 5,000 gold francs per passenger (Article 22(3)).

(c) For goods

The carrier's liability is limited to 250 gold francs per kilogram, unless a special declaration of the value at delivery has been made and any extra charge required has been paid (Article 22(2)).

III Defences available to the Carrier

(a) For Passengers

The defences that are available to the carrier in the case of death, injury or delay suffered by the passenger are as follows:

(1) There is no liability on the carrier if he proves that he and his servants or agents took all necessary measures to avoid the damage, or that it was impossible for him or them to take such measures.

(2) If the carrier proves contributory negligence on the part of the injured person, the rules of complete or partial contribution apply in accordance with the provisions of the law applying to the court involved.

(3) No right of action lies two years after the date of arrival at the destination or the date on which the aircraft should have arrived, or the date on which the carriage stopped.

(4) No liability devolves on the carrier under the Convention if he proves that the loss or damage did not occur on the aircraft or in the course of its operations.

(b) <u>For Luggage</u>

As far as objects which remain in the charge of the passenger are concerned, the defences are similar to those for passengers. In respect of registered luggage the defences are:

(1) that the loss or delay or damage did not occur while the luggage was in the charge of the carrier during the carriage by air;

(2) that in the case of damage the person entitled to delivery did not complain in writing to the carrier within three days of receipt of the luggage;

(3) that in the case of delay a written complaint was not made within fourteen days;

(4) that the carrier, his servants or agents had taken all necessary measures to avoid the damage, or that it was impossible to take such measures;

(5) that the damage was occasioned by negligent pilotage or navigation;

(6) that the damage was caused by or contributed to by the negligence of the injured person (contribution may apply in the latter case);

(7) that the action was not brought within two years.

It should be noted that defence (5) will not prove of any assistance where injury to passengers has also occurred.

(c) For goods

These are the same as for registered luggage.

IV Loss of Protection

The carrier may lose the protection of limited liability if:

(a) he accepts the goods without an air consignment note having been made out, or if the air consignment note does not contain all the obligatory particulars (Article 9);

(b) the damage is caused by the wilful misconduct of the carrier, his servants, or agents (Article 25);

(c) he accepts a passengers without a passenger ticket having been delivered (Article 3(2));

(d) he accepts luggage without a luggage ticket having been delivered, or the luggage ticket does not contain all obligatory particulars (Article 4(4)).

3.2.4 The Hague Protocol 1955 "Protocol to amend the Convention for the Unification of certain Rules relating to International Carriage by Air"

3.2.4.1 Introduction

In 1955 a conference was held at the Hague principally to revise the limits under the Warsaw Convention 1929 in an attempt to bring them in line with the developing commercial and legal trends. The opportunity was also taken to make certain amendments to the original convention where these had been shown to be necessary.

Although the Protocol was signed on behalf of twenty-seven states in 1955* it came into force between states ratifying it in 1963 (after the thirtieth state had ratified the Protocol according to Article 22).

The Protocol amended and added certain provisions to the Warsaw Convention 1929. These amendments affected, in the main, the following:

(1) limits of liability in respect of the carriage of passengers;

(2) simplification of documents of carriage;

(3) liability towards servants and agents;

(4) wording of the Convention.

3.2.4.2 Principal changes in respect of the limitation of liability

This is probably the most important change. The limits have been increased and at the same time the ticket requirements have been reduced. In addition, the court may, in accordance with its own law, award the whole or part of the court costs and of the expenses of the litigation incurred by the plaintiff.

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* The United States has refused to ratify the Protocol because of its dissatisfaction with the limits of liability fixed by the Protocol.

The foregoing provision shall not apply if the amount of damage awarded, excluding court costs and other expenses, does not exceed the sum which the carrier has offered in writing to the plaintiff within a period of six months from the date of the occurrence causing the damage or before the commencement of the action, if that is later (Article 11 (4)).

(a) For Passengers

The liability of the carrier for each passenger is limited to the sum of 250,000 gold francs.* (Article 11 (1)).

(b) For Baggage**

In the carriage of registered baggage, the liability of the carrier is limited to a sum of 250 gold francs per kilogramme, unless a special declaration is made and any supplementary fee, if required, is paid when handing over the package (Article 11 (2)). As regards objects of which the passenger takes charge himself the liability of the carrier is limited to 5000 gold francs per passenger (Article 11 (3)).

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* This limit was increased from 125,000 gold francs fixed by the Warsaw Convention 1929.

** It will be noted that the carrier's liability for registered baggage and cargo has still the same limits as in the Warsaw Convention 1929.

(c) For Cargo*

The carrier's liability is limited to 250,000 gold francs per kilogramme, unless a special declaration is made and any supplementary fee, if required, is paid when handing over the package (Article 11 (2)).

3.2.5 The Guadalajara Convention 1961 "Convention supplementary to the Warsaw Convention, for the Unification of certain Rules relating to International Carriage by Air performed by a Person other than the Contracting Carrier"

3.2.5.1 Introduction

The Guadalajara Convention was drawn up to provide rules to govern the international carriage by air performed by an actual carrier who is not also the contracting carrier. The object of the Convention is to give to an actual carrier the same rights and liabilities as a contracting carrier under the Warsaw Convention system, whereas the Warsaw Convention and the Hague Protocol are concerned with a carrier's liability to passengers and cargo, namely, the liability of the aircraft operator. In many cases the actual operator is not the one who enters into a contract with the passenger.

The Convention was signed in 1961 and came into force in 1964.

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* It will be noted that the carrier's liability for registered baggage and cargo has still the same limits as in the Warsaw Convention 1929.

3.2.5.2 The main provisions of the Convention

Both the contracting carrier and the actual carrier have been defined by the Convention as follows:

> (a) "contracting carrier" means a person who as a principal makes an agreement for carriage governed by the Warsaw Convention with a passenger or consignor or with a person acting on behalf of the passenger or consignor (Article 1(b));
>
> (b) "actual carrier" means a person, other than the contracting carrier, who, by virtue of authority from the contracting carrier, performs the whole or part of the carriage contemplated in the previous paragraph but who is not with respect to such part a successive carrier within the meaning of the Warsaw Convention. Such authority is presumed in the absence of proof to the contrary (Article 1(c)).

The Convention applies to any actual carrier performing a part or the whole of a contract of international carriage by air governed by either the Warsaw Convention or the Warsaw Convention as amended at The Hague.

According to the provision of the Convention, in cases of passenger injury or loss of baggage or cargo, and where the Warsaw Convention applies, a claim may be made against either the contracting carrier or the actual carrier or both at the option of the plaintiff. Either carrier, if used alone, is entitled to require that the other be joined in the proceeding following the provisions of the Warsaw Convention (Articles 7 and 8).

There is no provision that affects the rights of the contracting carrier and the actual carrier as between themselves (Article 10).

3.2.6 The Montreal Agreement 1966 "CAB No 18900"

3.2.6.1 Introduction

The Montreal Agreement is not an international Convention but the result of a unilateral decision by the United States to denounce the Warsaw Convention owing to its dissatisfaction with the law limits of liability of both the Convention and the Hague Protocol. However, through the efforts of IATA an interim agreement was entered into whereby the United States agreed to withdraw its notice of denunciation (Martin et al, 1985), provided that: (C11, 74b)

(a) IATA worked out the detailed provision, including adequate notice to the public;

(b) all carriers operating to or from the United States filed with the Civil Aeronautics Board their arrangements;

(c) that governments whose carriers operate to or from the United States give assurances to the U.S. Government that they accept the arrangement and will only terminate by giving twelve months' notice.

The majority of IATA and non-IATA members have accepted the Agreement limits.

3.2.6.2 Principles of the Agreement

(1) The carrier signing the agreement shall avail itself of the limitation of liability provided in the Warsaw Convention or the Hague Protocol.
The carrier agrees that as to all international transportation by the carrier as defined in the said Convention or said Convention as amended at the Hague which, according to the contract of carriage, includes a point in the United States as a point of origin, point of destination, or agreed stopping place.

(a) The limit of liability for each passenger for death, wounding, or other bodily injury shall be the sum of U.S.$ 75,000, inclusive of legal fees and costs, except that, in the case of a claim brought in a State where provision is made for a separate award of legal fees and costs, the limit shall be the sum of U.S.$ 58,000 exclusive of legal fees and costs.

(b) The carrier shall not, with respect to any claim arising out of the death, wounding or other bodily injury of a passenger, avail itself of any defence under Article 20 (1) of the said Convention or said Convention as amended by the said Protocol.

(2) Each carrier shall, at the time of delivery of the ticket, furnish to each passenger whose transportation is governed by the Warsaw Convention or the Hague Protocol and by the Montreal Agreement a notice stating the following:

(a) that a passenger on a journey to, from or with an agreed stopping place in the U.S.A. shall be subject to a limit not to exceed U.S,$ 75,000 not depending on negligence on the part of the carrier;

(b) additional protection can usually be obtained by purchasing separate insurance, which is not affected by any limitation of liability under the Warsaw Convention or such contracts of carriage.

3.2.7 The Guatemala City Protocol 1971 "Protocol to amend the Convention for the Unification of certain Rules relating to International Carriage by Air"

3.2.7.1 Introduction

A further Protocol to amend the Warsaw Convention amended by the Hague Protocol was signed at Guatemala City in 1971. The Protocol is a result of the continued efforts by the United States to increase the limits of liability imposed by the Warsaw Convention and to impose a regime of absolute liability on the carrier (Martin et al, 1985). The Protocol is not yet in force.

3.2.7.2 The Important Amendments

The Protocol makes major changes in the general scheme of the carrier's liability in respect of the carriage of passengers and baggage. These changes are as follows:

(a) For Passengers

The Protocol provides a limit of 1,500,000 gold francs for the aggregate of the claims in respect of damage suffered as a result of the death or personal injury of each passenger (Article VIII). In the case of delay in the carriage of persons, the liability of the carrier for each passenger is limited to 62,500 gold francs (Article VIII).

(b) For Baggage

In the carriage of baggage, the liability of the carrier in case of destruction, loss, damage or delay is limited to 15,000 gold francs for each passenger (Article VIII).

(c) For Cargo

In the carriage of cargo, the liability of the carrier is limited to 250 gold francs per kilogramme unless a special declaration is made and any supplementary fee, if required, is paid when handing over the package (Article VIII).

To provide for inflation, the Protocol contains provision that during the fifth and tenth years after the Protocol comes into force further

meetings will be held. The purpose of these meetings will be to review the limits to see that they truly reflect the current situation but not exceeding an additional amount of 187,500 gold francs at each meeting. This amount will be an automatic increase in the fifth and in the tenth years unless the conferences, by a two-thirds majority of the parties present and voting, decide otherwise (Article XV).

3.2.8 The Montreal Additional Protocols, 1975

3.2.8.1 Montreal Additional Protocol No. 1, 1975 "Additional Protocol No. 1 to amend the Convention for the Unification for certain Rules relating to International Carriage by Air signed at Warsaw 1929"

The Protocol amends the original version of the Warsaw Convention 1929 by substituting Article 22 of the said Convention. The liability limits are expressed in the Special Drawing Rights (SDR) instead of the gold francs, where one SDR equalled 0.888671 grams of pure gold, thus one SDR equalled 15 gold francs.

The new Article fixed the limits of the carrier's liability as follows:

(a) For Passengers

In the carriage of passengers the liability of the carrier for each passenger is limited to the sum of 8,300 SDRs (125,000 monetary units equivalent to the gold francs). (Article II).

(b) For Baggage and Cargo

In the carriage of registered baggage and cargo, in the absence of a special declaration of the value, the liability of the carrier is limited to a sum of 17 SDRs per kilogramme (250 monetary units) and for

objects of which the passenger takes charge himself the liability of the carrier is limited to 332 SDRs per passenger (5000 monetary units). (Article II). The Protocol is not yet in force.

3.2.8.2 Montreal Additional Protocol No. 2 1975
"Additional Protocol No. 2 to amend the Convention for the Unification of certain Rules relating to International carriage by Air signed at Warsaw 1929 as amended by the Protocal done at the Hague 1955"

This Protocol, agreed at the Montreal Conference 1975, follows very closely the pattern of Additional Protocol No. 1. The Protocol is designed to express the limits on the carrier's liability in terms of SDR as follows:

(a) For Passenger

In the carriage of persons the liability of the carrier for each passenger is limited to the sum of 16,600 SDRs (250,000 monetary units). (Article II).

(b) For Baggage and Cargo

In the carriage of registered baggage and of cargo, in the absence of a special declaration of the value, the liability of the carrier is limited to a sum of 17 SDRs per kilogramme (250 monetary units), and for objects of which the passenger takes charge himself the liability of the carrier is limited to 332 SDRs per passenger (5000 monetary units). (Article II). The Protocol is not yet in force.

3.2.8.3 Montreal Additional Protocol No. 3 1975 "Additional Protocol No. 3 to amend the Convention for the Unification of certain Rules relating to International carriage by Air signed at Warsaw 1929 as amended by the Protocols done at The Hague 1955 and at Guatemala City 1971"

Again, this Protocol follows very closely the pattern of Additional Protocols Numbers 1 and 2. It is designed to express the limits of the carrier's liability in terms of SDR rather than the gold franc. It substitutes a new Article expressing the limits as follows:

(a) For Passengers

In the carriage of persons, the liability of the carrier, in respect of the death or personal injury, is limited to the sum of 100,000 SDRs for each passenger (1,500,000 monetary units).
In the case of delay in the carriage of persons the liability of the carrier for each passenger is limited to 4,150 SDRs (62,500 monetary units). (Article II).

(b) For Baggage and Cargo

In the carriage of baggage, the liability of the carrier in the case of destruction, loss, damage or delay is limited to 1000 SDRs for each passenger (15,000 monetary units), and for cargo, in the absence of a special declaration of value, 17 SDRs per kilogramme (250 monetary units). (Article II).
Corresponding amendments are made to deal with the increase in the limit applying to cases of death or personal injury of passengers after

five and ten years after the date of entry into force of the Protocol (Article III). The Protocol is not yet in force.

3.2.8.4 Montreal Additional Protocol No. 4, 1975
"Additional Protocol No. 4 to amend the Convention for the Unification of certain Rules relating to International carriage by Air signed at Warsaw 1929 as Amended by the Protocol done at The Hague 1955"

The Guatemala City Conference 1971 modernised those provisions of the Warsaw Convention as amended at The Hague which governed the carriage of passenger and baggage. The Montreal Conference 1975 carried out a similar task in respect of cargo, and many of the provisions of the resulting Additional Protocol No. 4 correspond exactly to provisions agreed at Guatemala City (Martin et al 1985). However, additional Protocol No. 4 is quite independant of the Guatemala City Protocol. It amends the Warsaw Convention as amended at The Hague in respect of the carriage of postal items and cargo. The Protocol contains no provisions as to jurisdiction, or as to costs and lawyers' fees and makes no changes in the maximum limits on liability other than inserting a provision corresponding to a provision in the Guatemala Protocol, making it clear that the limits are unbreakable.

The carrier's liability limits in the carriage of cargo is not changed by the Protocol, but expressed in SDR. In the absence of special declaration of value, the limit is 17 SDRs per kilogramme (250 monetary units) (Article VII). The Protocol is not yet in force.

3.3 International Conventions on Offences against the Safety of Civil Aviation

3.3.1 Introduction

Safety and security, in the air for aircraft and on the ground for both aircraft and aerodrome are the first requirements of air transport. Recently, one of the most serious problems in aviation generally has been that of protecting passengers, goods, staffs and property involved, from one or more of series of acts committed against the safety of air transport. Examples of these acts are:

- Unlawful seizure of aircraft, hijacking, air piracy.

- Sabotage; acts against the safety of aircraft.

- Violence against protected persons.

- Kidnapping, abduction, assassination.

- Taking of hostages.

- Terrorism, possession of firearms, weapons, explosives etc on board aircraft or on an aerodrome without reasonable authority.

Much consideration has been given to this problem which has drawn world-wide attention. As a result of work started by the legal committee of the ICAO, three Conventions were produced concerning this problem.

3.3.2 The Tokyo Convention, 1963 "Convention on Offences and certain other Acts committed on board Aircraft, Tokyo, 1963"

The Tokyo Convention applies to criminal offences committed on board aircraft registered in contracting states, while that aircraft is in flight or on the surface of the high seas or of any other area outside the territory of any state (Article 1).

The Convention deals with the punishment of offences committed on board aircraft.

The Convention empowers the aircraft commander to prevent the commission of crimes and to disembark persons committing them (Article 6). It also obliges states to take all possible steps to restore control to the commander and to preserve his control (Article 11). Generally, the Convention deals with crime on board aircraft, but it is more concerned with the return of the aircraft and passengers than with dealing with the criminal and is inadequate to control the unlawful seizure of aircraft (Dorey, 1983).

The Convention entered into force on 4th December, 1969.

3.3.3 The Hague Convention, 1970 "Convention for the suppression of unlawful seizure of Aircraft, The Hague 1970"

The Hague Convention deals specifically with hijacking as an international criminal act and makes hijackers subject to extradition and punishable nationally (Article 8).

The Convention makes it an offence, on board an aircraft in flight, unlawfully, by force, or by other forms of intimidation, to seize or exercise control of that aircraft, to attempt to do so, or to be an accomplice in such offence or attempt (Article 1).

The Convention entered into force on 14th October, 1971.

3.3.4 The Montreal Convention, 1971 "Convention for the suppression of unlawful Acts against the safety of Civil Aviation, Montreal, 1971"

The Montreal Convention is complementary to the Hague Convention in that it introduces and deals with the offence of sabotage.

According to Articles 1 and 2, the Convention makes it an offence unlawfully and intentionally to perform, on board aircraft in flight, an act of violence against a person which is likely to endanger the safety of the aircraft, to destroy an aircraft in service, or so to damage it as to make flight unsafe or impossible; to place or cause to be placed on board an aircraft in service, by whatever means, a substance likely to destroy it, or so to damage it that it cannot fly or that its safety in flight is likely to be endangered; to destroy, damage or interfere with the operation of air navigation facilities if this is likely to endanger the safety of an aircraft in flight; or knowingly to communicate false information, thereby endangering the safety of such an aircraft. To attempt to do any of these things it is also an offence, as it is to be an accomplice in such offence or attempt.

The position as to extradition is exactly the same as under the Hague Convention.

The Convention entered into force on 26th January 1973.

3.4 Compulsory Insurance and International Law

3.4.1 Introduction

The possibility of introducing a form of compulsory insurance at an international level against the liability of an aircraft owner or operator for damage caused to passengers, baggage, cargo and mail was raised in the Warsaw Convention 1929.

In respect of the liability for injury or damage caused to persons and property on the surface, the Rome Convention 1933 relating to damage caused by aircraft to third parties on the surface as supplemented by the Brussels Insurance Protocol 1938, and the Rome Convention 1952 relating to damage caused by foreign aircraft to third parties on the surface as supplemented by the Montreal Protocol 1978, contain compulsory insurance requirements against legal liability to such third parties.

3.4.2 The Rome Convention, 1933 "International Convention for the Unification of certain Rules relating to damage caused by Aircraft to third parties on the surface signed at Rome, 1933"

The Convention provides that damage caused by an aircraft in flight to persons or property on the surface gives a right to compensation on proof only that the damage exists and that it is attributable to the aircraft (Article 2). The Convention provides further that the operator shall not be entitled to avail himself of the limitation of

liability:

(a) if it is proved that the damage results from the gross negligence or wilful misconduct of the operator, or his servants or agents, except where the operator proves that the damage results from negligence in the pilotage, handling or navigation of the aircraft, or where his servants or agents are concerned, that he has taken all proper steps to prevent the damage, or,

(b) if the insurance or guarantee called for by the Convention has not been effected (Article 14).

As for the limits of liability, the operator is liable for each occurrence up to an amount determined at the rate of 250 gold francs for each kilogramme of the weight of the aircraft, but this limit must not be less than 600,000 gold francs, nor greater than 2,000,000 gold francs. One-third of the amount of the maximum liability must be appropriated to damage to property, and the other two-thirds to injury to or death of persons, but the compensation payable in respect of persons must not exceed 200,000 gold francs per person (Article 10).

The Convention entered into force on 13th February, 1942.

3.4.3 The Brussels Insurance Protocol, 1938 "Additional Protocol to the International Convention for the Unification of certain Rules relating to damage caused by Aircraft to third parties on the surface, signed at Brussels, 1938"

The Rome Convention 1933 was supplemented by the Brussels Insurance Protocol 1938 which stipulates the defences that can be relied upon by insurers in defending claims brought under the former Convention. These are:

(a) that the damage occurred after the insurance ceased to have effect (Article 1 (1) (a));

(b) that the damage occurred outside the territorial limits prescribed in the insurance contract, unless flight outside such limits was due to force majeure or to a justifiable deviation for the purpose of assistance, or salvage, or to negligence in piloting, in the handling of the aircraft, or in navigation;

(c) that the damage was the direct consequence of international armed conflict or civil disorder.

The Protocol also provides that with the exception of the above defences, an insurer shall not, with respect to third parties, avail himself of any plea of nullity or of any right to retroactive cancellation (Article 1 (2)).

To date the Brussels Insurance Protocol has not entered into force.

3.4.4 The Rome Convention, 1952 "Convention on Damage caused by Foreign aircraft to third parties on the surface, Rome, 1952"

3.4.4.1 Introduction

According to Article 29, the Rome Convention, 1952 is designed to supersede the earlier instrument, and does so as between states which have ratified both. The Convention adopts the same general principles as the earlier convention, but at almost all points its text is fuller and clearer than the Rome Convention 1933.

The provisions of the Convention are contained in certain chapters dealing with: principles of liability; extent of liability; security for operator's liability; rules of procedure and limitation of actions; application of the convention and general provisions, and final provisions.

The Convention came into force on 4th February, 1958.

Despite the fact that the members of parties to the Rome Convention is small, the potential liability of civil aircraft operators for air transport services on international and domestic flights is such that third party legal liability insurance against damage to persons and property on the ground and in the air is generally regarded as essential, not only to protect the financial position of the operator but also in many countries to meet the requirements of the national air transport licensing authority of the state of registration (Martin et al 1985).

3.4.4.2 Extent of liability

According to Article 11, the liability for damage giving a right for compensation for each aircraft and incident, in respect of all persons liable under the Convention, shall not exceed:

(a) 500,000 gold francs for aircraft weighing* 1,000 kilogrammes or less;

(b) 500,000 gold francs plus 400 gold francs per kilogramme over 1,000 kilogrammes for aircraft weighing more than 1,000 but not exceeding 6,000 kilogrammes;

(c) 2,500,000 gold francs plus 250 gold francs per kilogramme over 6,000 kilogrammes for aircraft weighing more than 6,000 but not exceeding 20,000 kilogrammes.

(d) 6,000,000 gold francs plus 150 gold francs per kilogramme over 20,000 kilogrammes for aircraft weighing more than 20,000 but not exceeding 50,000 kilogramme;

(e) 10,500,000 gold francs plus 100 gold francs per kilogramme over 50,000 kilogrammes for aircraft weighing more than 50,000 kilogrammes.

* "weight" means the maximum weight of the aircraft authorised by the certificate of airworthiness for take-off, excluding the effect of lifting gear when used (Article 11 (3)).

The liability in respect of loss of life or personal injury shall not exceed 500,000 gold francs per person killed or injured.

In accordance with Article 12, the liability of the operator shall be unlimited in the following cases:

(1) if the person who suffers damages proves that it was caused by a deliberate act or omission of the operator, his servants or agents, done with intent to cause damage;

(2) if a person wrongfully takes and makes use of an aircraft without the consent of the person entitled to use it. Provisions have been made by the Convention if the total amount of the claims established exceeds the limits of the liability applicable under the provisions of the Convention.

3.4.4.3 Security for Operator's Liability

To make certain that the operator of an aircraft is able to meet his commitments, any contracting state may require him to carry insurance in respect of his liability up to the Convention limit with approved insurers in his own state (Article 15).

Instead of the insurance required by the Convention, any of the following securities shall be deemed satisfactory (Article 15 (4)).

(a) a cash deposit in a depository;

(b) a guarantee given by a bank authorized to do so;

(c) a guarantee given by the contracting state.

3.4.5 The Montreal Protocol, 1978
"Protocol to amend the Convention on damage caused by Foreign Aircraft to third parties on the surface, Rome 1952, signed in Montreal 1978"

With the passage of time, the limits of liability established by the Rome Convention 1952 have become increasingly inadequate and unrealistic (Margo, 1982).

The limits are expressed in gold francs, and jurisdiction under the Convention is limited to the courts of the state where the damage occurred (Rome Convention, 1952, Article 20). However, the prospect of more states adhering to the Convention has become increasingly remote. A diplomatic conference was thus convened by ICAO in Montreal in 1978 to consider the desirability of amending the Rome Convention, and this resulted in the adoption of the Montreal Protocol.

3.4.5.1 Principal changes in respect of the limitation of liability

The main changes brought about by the Protocol are the substantial increase of the liability limits, and the expression of such limits in terms of Special Drawing Rights as defined by the International Monetary Fund rather than in gold francs.

The liability for each aircraft and incident, in respect of all persons liable under the Convention must not exceed: (Article III)

(a) 3000,000 SDRs (or 4,500,000 monetary units) for aircraft weighing 2,000 kilogrammes or less;

(b) 300,000 SDRs (4,500,000 monetary units)
plus 175 SDRs (2,625 monetary units) per kilogramme
over 2,000 kilogrammes for aircraft weighing more
than 2,000 but not exceeding 6,000 kilogrammes;

(c) 1,000,000 SDRs (15,000,000 monetary units) plus
62.5 SDRs (837.5 monetary units) per kilogramme
over 6,000 kilogrammes for aircraft weighing
more than 6,000 but not exceeding 30,000 kilogrammes;

(d) 2,500,000 SDRs (37,500,000 monetary units) plus
65 SDRs (975 monetary units) per kilogramme over
30,000 kilogrammes for aircraft weighing more than
30,000 kilogrammes.

3.4.5.2 Operation of Limits

The limit of liability in respect of loss of life or personal injury is raised to 125,000 SDRs (1,875,000 monetary units) per person killed or injured (Article III (2)).

If the total amount of the claims established exceed the limit of liabilty applicable under the provisions of the Convention, the following rules shall apply (Article IV).

(a) if the claims are exclusively in respect of the loss of life or personal injury or exclusively in respect of damage to property, such claims shall be reduced in proportion to their respective amounts;

(b) if the claims are both in respect of loss of life or personal injury and in respect of damage to property, the total sum distributable* shall be appropriated preferentially to meet proportionately the claims in respect of loss of life and personal injury. The remainder, if any, of the total sum distributable shall be distributed proportionately among the claims in respect of damage to property.

The amended Convention is not yet in force. There appears to be little prospect of the amended Convention being ratified by the leading aviation states, for even though some states generally supported the amendments to the Convention, the prevailing view appears to be that the limit for death and personal injury is still too low.

3.5 IATA General Conditions of Carriage

The Warsaw system of international legal instruments does not apply to carriage which falls outside the definitions of international carriage incorporated in those instruments, and it does not provide a fully comprehensive set of rules covering all points concerning international carriage (Martin et al, 1985). To extend the area covered by uniform rules, the IATA member airlines agreed to introduce general conditions of carriage and uniform documents of carriage as the standard form of conditions of contract specified in IATA Resolution 724 (Passenger Tickets)** and IATA Resolution 600b (Air Waybills)***

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* Not one-half as under the unamended Convention.

** Appendix Two (A)

*** Appendix Two (B)

3.6 Summary

The carrier's limits of liability according to the different Conventions and agreements are as follows:

(1) Warsaw Convention 1929

125,000 G.FF for each passenger in case of death or injury

5,000 G.FF per passenger for accompanied baggage

250 G.FF per kilogram for registered baggage and cargo

(2) The Hague Protocol 1955

250,000 G.FF for each passenger in case of death or injury

5,000 G.FF per passenger for accompanied baggage

240 G.FF per kilogramme for registered baggage and cargo

(3) The Montreal Agreement 1966 "CAB No. 18900"

75,000 U.S.$ for each passenger in case of death or injury (inclusive of legal fees and costs), or,

58,000 U.S.$ for each passenger in case of death or injury (exclusive of legal fees and costs)

(4) The Guatemala City Protocol 1971

1,500,000 G.FF for each passenger in case of death or injury

15,000 G.FF per passenger for accompanied baggage

250 G.FF per kilogram for registered baggage and cargo

62,500 G.FF for each passenger in case of delay plus 187,500 G.FF an automatic increase in the fifth and the tenth years for the limit of liability in respect of death or injury for each passenger.

(5) The Montreal Additional Protocols 1975

(a) Additional Protocal No. 1

Amending the Warsaw Convention 1929.

The liability limits are expressed in SDRs instead of G.FF as follows:

8,300 SDRs for each passenger in case of death or injury

332 SDRs per passenger for accompanied baggage

17 SDRs per kilogram for registered baggage and cargo

(b) Additional Protocol No. 2

Amending the Warsaw Convention 1929 as amended by the Hague Protocol 1955 as follows:

16,600 SDRs for each passenger in case of death and injury

332 SDRs per passenger for accompanied baggage

17 SDRs per kilogram for registered baggage and cargo

(c) Additional Protocol No. 3

Amending the Warsaw Convention 1929 as amended by The Hague Protocol 1955 and Guatemala City Protocol 1971 as follows:

100,000 SDRs for each passenger in case of death and injury

1,000 SDRs per passenger for accompanied baggage

17 SDRs per kilogram for registered baggage and cargo

4,150 SDRs for each passenger in case of delay

STERLING EQUIVALENT IN RESPECT OF THE WARSAW CONVENTION GOLD FRANC

The Government of the United Kingdom introduced the carriage by air (Sterling Equivalent) (No. 2) Order 1983 effective from 9th May, 1983 amending the Sterling equivalent of the Warsaw Convention Franc as follows:

Convention Franc	Sterling Equivalent
	£
250	11.80
5,000	236.00
125,000	5,900.00
250,000	11,790.00

CHAPTER FOUR

ANALYSIS OF AVIATION RISKS

4.1 Introduction of Jet Airliners

The first jet airliner in the world designed in Britain by the de Havilland Aircraft Company, as such the Comet 1, made its initial flight on July 1949, and on May 1952 operated the world's first jet service.

Comet 1 was a low-wing monoplane with four turbo-jet engines buried in the wing roots. There was accommodation for 36 passengers in two pressurised cabins enabling the plane to fly at a level of over 12,190 m with a cruising speed of 788 km/h (Brooke, P.W., 1961; Mondey, D., 1977).

Although the weakness in the Comet's original structural design made it impossible for de Havilland to maintain the leading position in jet transport production that it so richly deserved, the type did achieve further modest success after being thoroughly redesigned and stretched into the Comet 4 series* (Taylor, J. and Manson, K. 1972).

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* A total of 22 Comets were built and 17 aircraft had been delivered to civil operators. But following the loss of G-ALYP (BOAC) on 10/1/54 and G-ALYY (South African Airways) on 8/4/54, both disintegrated and fell into the Mediterranean Sea shortly after reaching cruising altitude, the certificates of Airworthiness were cancelled and although some aircraft were modified and used for experiemental or military operations this brought to an end the commercial career of the Comet srs. 1.

By the time the new Comet was ready, however, its lead had been lost to the Boeings.

4.1.1 Introduction of First Generation

The first generation of jet airliners began to make its appearance and entered service on the world scheduled airlines during the period between 1958 and 1962. During this time the following jet aircraft appeared and entered service for the first time as a jet airliner:

Aerospatial Caravelle

Boeing 707

Boeing 720

Convair CV-880

Convair CV-990

Douglas DC-8

H.S. Comet 4

Tables 4.1 and 4.2 show the development time scale, number of engines, maximum weight for take-off, seating capacity including crew, year when constructed and the range of values for each type of the above aircraft. It will be noted that each of them was the first type of jet airliner produced by the particular manufacturer.

4.1.2 Introduction of Second Generation

The second generation of jet aircraft began to make its appearance on the scheduled airlines worldwide during the period between 1963 and 1968.

TABLE 4.1

FIRST GENERATION JET AIRLINERS

DEVELOPMENT TIME SCALE

AIRCRAFT TYPE	FIRST FLIGHT	FIRST AIRLINE SERVICE
Comet 4	27th April 1958	4th October 1958
Boeing 707-120	20th December 1957	26th October 1958
Caravelle	27th May 1955	12th May 1959
Boeing 707-320	11th January 1959	26th August 1959
DC 8-10	30th May 1958	18th September 1959
Comet 4B	27th June 1959	1st April 1960
DC 8-30	29th November 1958	27th April 1960
CV 880	27th January 1959	15th May 1960
Boeing 720	23rd November 1959	5th July 1960
CV 990	24th January 1961	7th January 1962

TABLE 4.2.

FIRST GENERATION JET AIRLINERS

Aircraft Types and Value

Aircraft Type	No.of Engines	Max.Weight for Take-off (lbs)	Seats	Built	Price US$* Min.	Max
Caravelle SE 210	2	127870	130-131	1958-75	200,000	1,200,000
Boeing 707-120	4	257000	185	1957-69		1,000,000
-220	4	247000	185	1959-60		1,000,000
-320	4	312000	206	1959-63		Low Value
-320C	4	331000	219	1963-78	1,000,000	5,000,000
-420	4	312000	206	1960-64		250,000
720	4	229000	161	1960-63		500,000
720B	4	234000	161	1961-67		350,000
Convair 880	4	184500	85-115	1960-64	100,000	250,000
880-22M	4	193000	93-115	1961-64	250,000	500,000
990	4	253000	104-131	1962-64	300,000	450,000
Douglas DC-8-10	4	273000	189	1959-60		500,000
-20	4	276000	189	1960-61		500,000
-30	4	310000	189	1960-61		500,000
-40	4	310000	189	1960-63	650,000	1,000,000
-50	4	315000	189	1961-68	500,000	1,000,000
-61	4	325000	251	1966-71		4,500,000
-63	4	335000	251	1967-71	4,000,000	12,000,000
-71	4	325000	251	1980-	15,000,000	22,000,000
H.S.Comet 4	4	162000	60-92	1958		No Price

* Lloyds' Aviation Department, 1983.

During this time, the following aircraft came on line:

BAC One-Eleven

BAC VC-10

Boeing 727

Boeing 737

Douglas DC-9

H.S. Trident

These aircraft benefitted from the first generation experience and normally had short hauls and medium hauls (Table 4.3).

The period 1963-1968 was one in which all of the trend lines seemed to be moving upward for world air transport (international and domestic scheduled airlines*) traffic. In numbers, kilometres flown rose from 3430 millions in 1963 to 6000 millions in 1968. Hours flown increased from 7.9 millions in 1963 to 11 millions in 1968.

Passenger-kilometres rose from 147,000 millions in 1963 to 310,000 millions in 1968.

During this period also, the available seat-kilometres jumped from 274,000 millions in 1963 to 580,000 millions in 1968, while the passenger load factor rose during 1963-1966 from 53.8% to 57.6% but fell to 53.4% in 1968.

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* IATA and non-IATA members, jet and non-jet operators excluding USSR and China.

TABLE 4.3.

SECOND GENERATION JET AIRLINERS

Aircraft Types and Value

Aircraft Type	No.of Engines	Max.Weight for Take-Off (lbs)	Seats	Built	Price US$* Min.	Max.
BAC One-Eleven 200	2	79000	91	1965-74	1,000,000	2,300,000
400	2	88500	91	1965-74	2,000,000	3,750,000
500	2	99650	121	1975-81	3,750,000	9,000,000
BAC VC-10	4	312000	151	1963-70	No Price	
Super VC-10	3	335000	168-179	1965-71	No Price	
Boeing 727-100	3	169000	134	1963-71		2,000,000
-100C	3	169000	134	1966-71		2,500,000
-100QC	3	169000	131	1966-68		2,250,000
-200	3	184000	192	1968-80	5,750,000	21,000,000
-200C	3	197500	192	1978-	5,500,000	18,000,000
Advanced 200	3	210000	192	1979-	6,750,000	20,000,000
Boeing 737-100	2	97000	118	1967-69		4,500,000
-100C	2	97000	118	1967-69	3,700,000	4,500,000
-200	2	107000	133	1967-	6,000,000	18,000,000
-200C	2	107000	133	1967-	6,250,000	10,000,000
Advanced 200	2	115000	133	1971-		8,750,000
Advanced 200C	2	117000	133	1971-		10,000,000
-300	2	124500	149	1984-		22,000,000
Douglas DC-9-10	2	77700	92	1965-68		2,500,000
-20	2	98000	92	1968-69		2,750,000
-30	2	121000	121	1967-	5,000,000	11,000,000
-40	2	121000	134	1968-	6,000,000	14,000,000
-50	2	121000	149	1974-	9,500,000	14,000,000
- Super 81	2	140000	174	1980-	17,500,000	22,000,000
- Super 82	2	147000	174	1981-	17,500,000	22,000,000
H.S.Trident 1E	3	130000	142	1964-72		No market
2E	3	143000	125	1968-72		No market
3B	3	150000	180	1970-80		1,000,000

* Lloyds Aviation Department, 1983

4.1.3 Introduction of Wide-bodied Generation

In 1963 the world's airliners* carried 135 million passengers and in 1968 this figure had nearly doubled, standing at 261 millions.

This rapid increase in traffic called for larger fleets of aircraft, and this added to the airports and the airways congestion. Having regard to environmental consideration, one way of absorbing the traffic growth without increasing aircraft movements was to build much bigger aircraft. At the same time these aircraft would reduce seat-kilometre costs and ease the noise problems in the vicinity of airports.

The aircraft in this generation include all wide-bodied jet types, such as:

Airbus A300

Boeing 747

Douglas DC-10

Lockheed L.1011 Tri-Star

The first of which entered service in 1969 (Table 4.4).

4.1.4 Introduction of New Technology Generation

In the late seventies and early eighties a substantial number of the remaining first generation jets and a proportion of the older second generation models were likely to be retired from service as being increasingly uneconomic and uncompetitive, and because they were unable to comply with the environmental considerations such as noise

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* Excluding USSR and China.

TABLE 4.4

WIDE-BODIED JET AIRLINER GENERATION

Aircraft Types and Value

Aircraft Type	No.of Engines	Max.Weight for Take-off (lbs)	Seats	Built	Price US$ * Min.	Max.
Airbus A300B2-100	2	313055	225-351	1974-	29,000,000	53,000,000
-200	2	313055	225-351	1976-	29,000,000	53,000,000
-300	2	313055	225-351	1974-	29,000,000	53,000,000
A300B4-100	2	347230	225-351	1975-	31,000,000	53,000,000
-200	2	363760	225-351	1979-	31,000,000	53,000,000
A300C4	2	347230	Pass.orF	1979-	31,000,000	53,000,000
Boeing 747-100	4	750000	495	1969-76	22,000,000	35,000,000
-100B	4	750000	505	1978-	26,000,000	53,000,000
-100Combi	4	750000	505	1974-	27,000,000	32,000,000
-200B	4	833000	521	1971-	24,000,000	60,000,000
-200Combi	4	833000	521	1975-		35,000,000
-200C	4	833000	521	1973-	32,000,000	40,000,000
-200F	4	833000	F	1971-		60,000,000
-SP	4	702000	445	1976-	28,000,000	81,000,000
-SR	4	750000	521	1973-		50,000,000
-300	4	833000		1980-		90,000,000
Douglas DC-10-10	3	455000	385	1971-	13,000,000	60,000,000
-15	3	455000	385	1979-	18,000,000	60,000,000
-30	3	572000	385	1972-	18,000,000	60,000,000
-30CF	3	572000	F	1973-	22,500,000	60,000,000
-30ER	3	580000	385	1972-	24,000,000	60,000,000
-40	3	572000	385	1972-	15,000,000	60,000,000
Lockheed						
L.1011-1 Tristar	3	426000	413	1972-	17,000,000	50,000,000
-100 Tristar	3	466000	413	1975-	19,000,000	50,500,000
-200 Tristar	3	477000	413	1977-	19,000,000	50,500,000
-500 Tristar	3	496000	413	1979-	30,000,000	50,000,000

* Llovds Aviation Department, 1983

restrictions which would progressively come into effect in North America and some parts of Western Europe (IUAI, 1984).

The New Technology Generation is intended to provide its operators with a new standard of fuel efficiency, a vital area in the economics of the immediate future of airliner operations.

The aircraft in this generation include the following types (Table 4.5):

Airbus A310

Boeing 757

Boeing 767

These new airliners were expected to demonstrate seat-mile costs some 32% below that of current wide-bodied jets. The first six months of service confirmed the accuracy of this estimate, with one airline achieving figures of around 35% (Mondey, 1984).

4.1.5 Others

It should be noted that under the definitions of the four generations five aircraft do not fall into any category. These are:

BAC/Aerospatiale Concorde

BAe 146

Dassault Mercure

Fokker F.28

VFW 614

TABLE 4.5

NEW TECHNOLOGY JET AIRLINERS GENERATION

A/C TYPE	NO. OF ENGINES	MAX. T.O. WEIGHT (LBS)	SEATS	PRICE US$*		FIRST FLIGHT	FIRST AIRLINE SERVICE
				MIN.	MAX.		
Airbus A310-200	2	291,010	199-286	N/A	45,000,000	3rd April, 1982	29th March, 1983
Boeing 757-200	2	240,000	196-226	35,000,000	39,000,000	19th Feb., 1982	1st Jan., 1983
Boeing 767-200	2	310,000	230-292	43,000,000	48,000,000	26th Sept., 1981	8th Sept., 1982

* Lloyd's Aviation Department, 1983.

4.2 Jet Airliner Fleet

Figures 4.1 and 4.2 show the development of jet airliner fleet worldwide* through the cumulative frequency of aircraft-years and flying hours from 1958 to 1983. Figure 4.3 shows the development of the number of aircraft in service and cumulative deliveries for the same period.

Table 4.6 shows the numbers of western built jet airliners (all generations) in service as at 31st December 1983 and the estimated market value in the same time.

The total estimated market value of the international jet airliner fleet is 77,643.12 million dollar value. The most important category is the wide-bodied jet airliners which produce 20.15% of the number of total fleet worldwide but represent 53.39% of the estimated market value. The second important category is the second generation jet airliners which produce 58.49% of the total fleet but represent 36.31% of the dollar estimated market value. When second generation and wide-bodied generation are combined, we find that 78.64% of the number of total international fleet produce 89.70% of the value of fleet.

Tables 4.7, 4.8 and 4.9 give the share rate of each generation in the world fleet in respect of numbers of aircraft in service, aircraft-years and flying-hours for the period from 1958-1983.**

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* Western built jet airliners only

** Appendices 3, 4 and 5 give a detailed data for each aircraft (all generations).

FIGURE (4.1)

JET AIRLINERS (ALL TYPES)

CUMULATIVE AIRCRAFT-YEARS 1958-1983

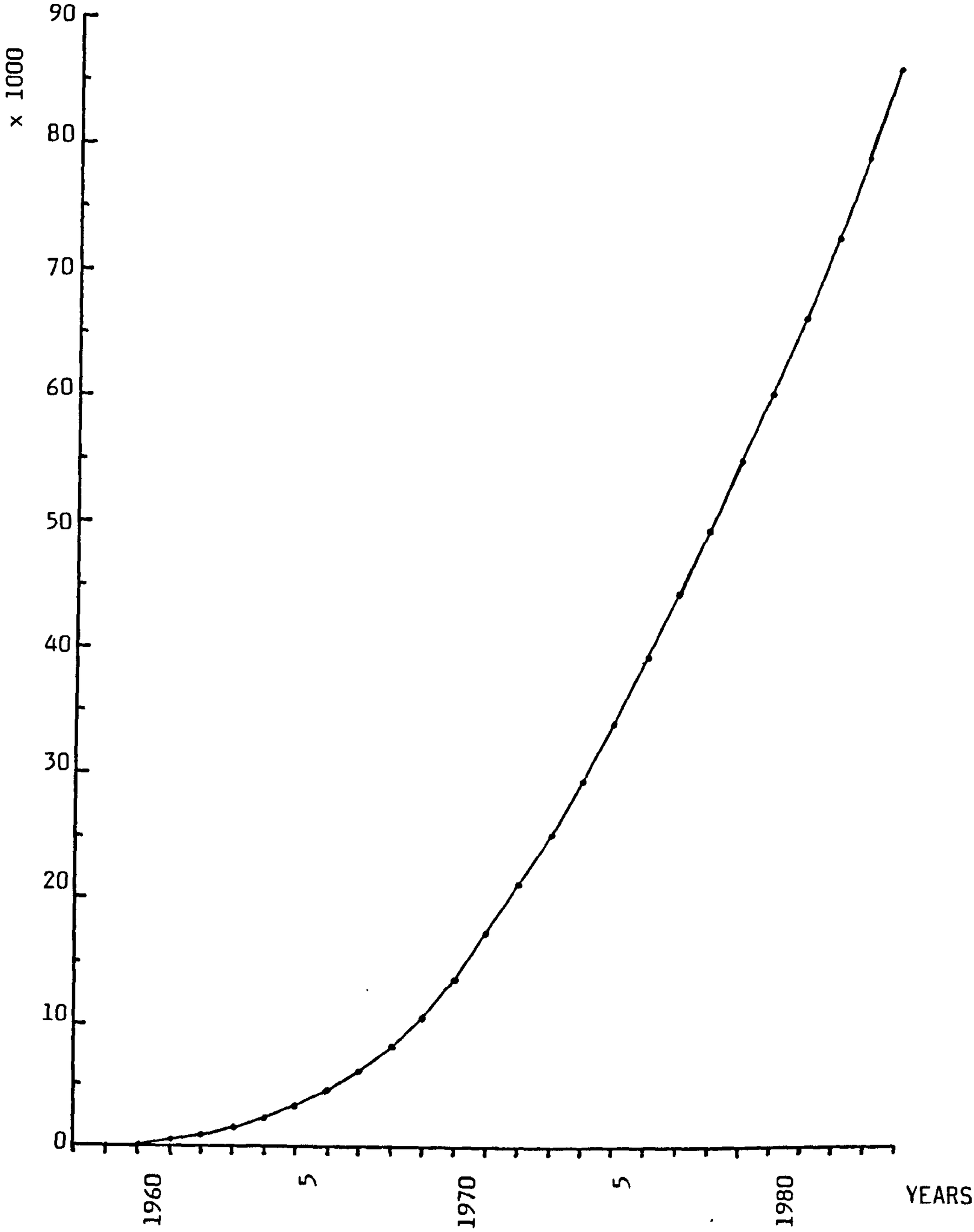


FIGURE (4.2)

JET AIRLINERS (ALL TYPES)

CUMULATIVE FLYING HOURS 1958-1983

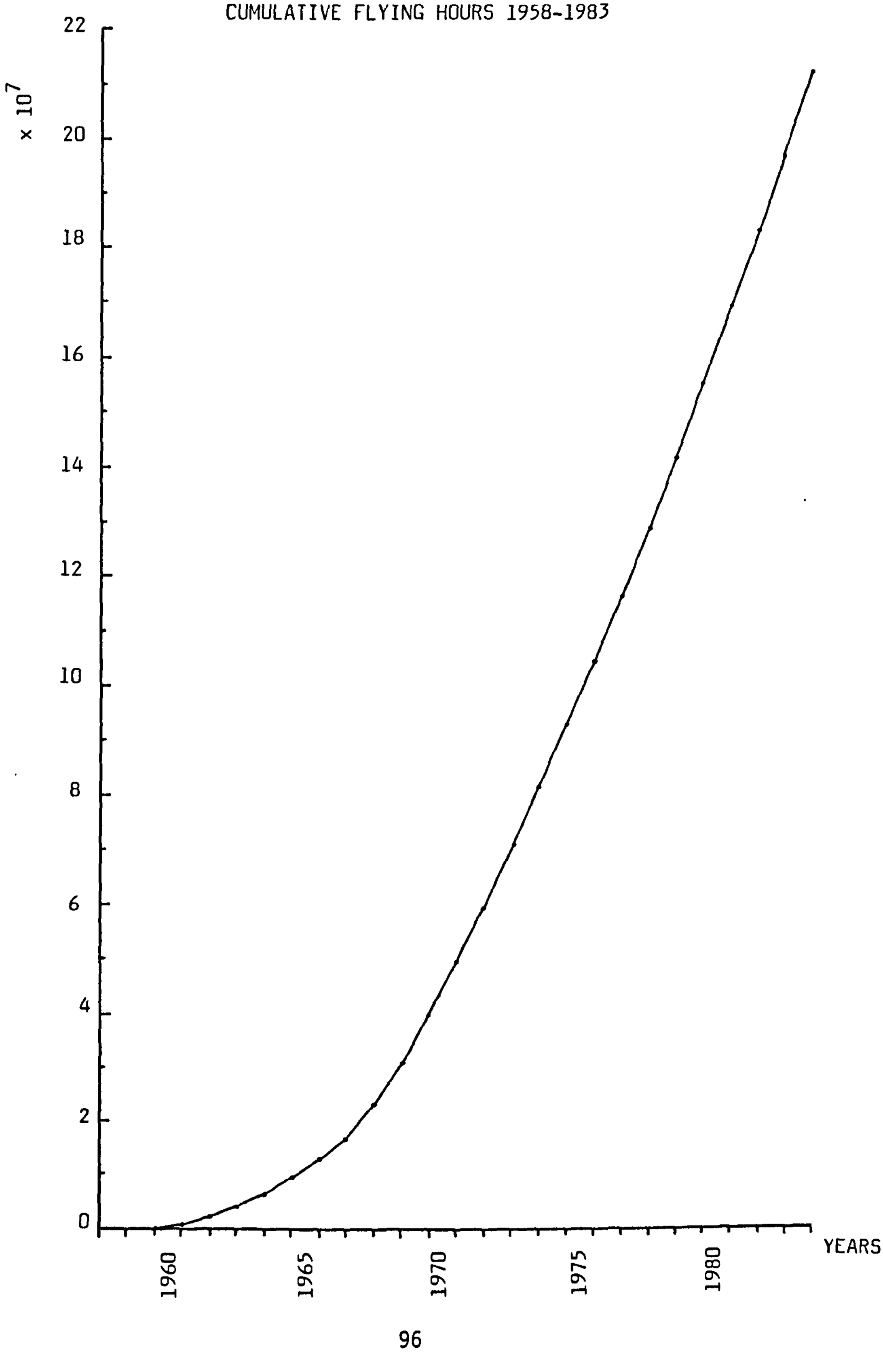


FIGURE (4.3)

JET AIRLINERS (ALL TYPES)

AIRCRAFT IN SERVICE AND CUMULATIVE DELIVERIES

1958-1983

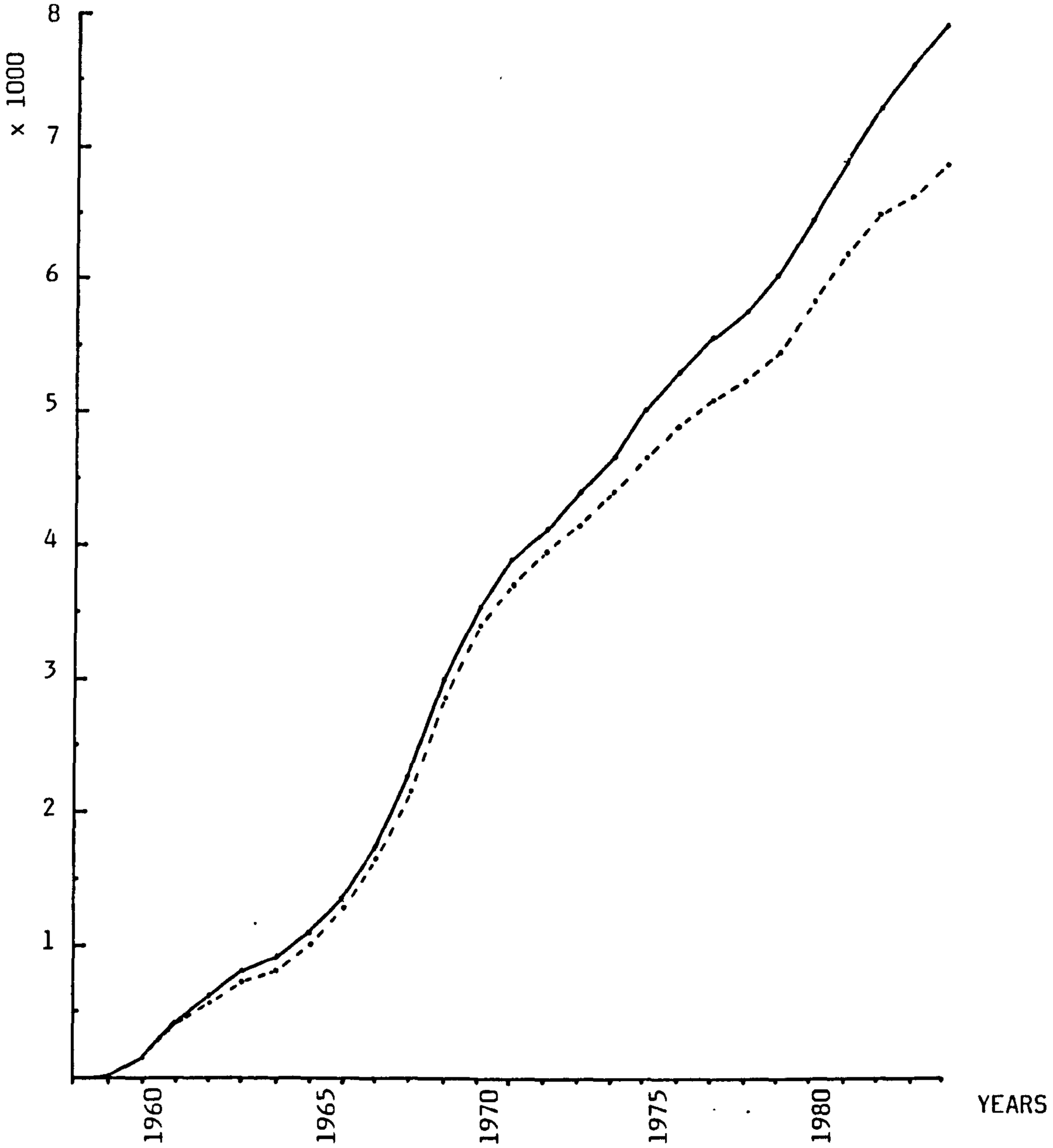


TABLE 4.6

JET AIRLINER FLEET AS AT 31/12/83

CLASS	NUMBERS IN SERVICE	% (1)	EST. MARKET VALUE (IN MILLIONS US$)	% (2)
First Generation	1,144	16.70	2,373.67	3.06
Second Generation	4,008	58.49	28,192.84	36.31
Wide-bodied Generation	1,381	20.15	41,455.13	53.39
New Technology Generation	119	1.74	4,815.53	6.20
Others (3)	200	2.92	805.95	1.04
TOTAL	6,852	100.00	77,643.12	100.00

NOTES:

(1) Per cent of total fleet.

(2) Per cent of total estimated market value.

(3) Other jet airliners contain:

BAC/Aer. Concorde, BAe 146, Dassalt Mercure, Fokker F.28 and VFW 614.

TABLE 4.7.

JET AIRLINERS IN SERVICE* 1958-1983

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1st Generation:													
No.in Service	13	142	394	593	747	829	911	1014	1139	1306	1510	1651	1689
% of total	100%	100%	100%	100%	100%	99.2%	87.8%	77.5%	67.3%	59.6%	52.2%	48.1%	45.2%
2nd Generation:													
No.in Service						7	126	294	553	804	1383	1766	1926
% of total						0.8%	12.2%	22.5%	32.7%	40.4%	47.8%	51.5%	51.6%
3rd Generation:													
No.in Service												4	95
% of total												0.1%	2.6%
N.T.Generation:													
No.in Service													
% of total													
Others:													
No.in Service												11	24
% of total												0.3%	0.6%
TOTAL (100%)	13	142	394	593	747	836	1037	1308	1692	2190	2893	3432	3734

* Western built only

/continued

TABLE 4.7 (Continued)

JET AIRLINERS IN SERVICE* 1958-1983

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
1st Generation:													
No.in Service	1700	1689	1665	1646	1632	1568	1522	1470	1445	1385	1314	1221	1144
% of total	42.85%	40.58%	37.81%	35.17%	33.10%	30.70%	28.96%	26.95%	24.84%	22.40%	20.24%	18.37%	16.70%
2nd Generation:													
No.in Service	2052	2149	2276	2449	2621	2753	2875	3041	3289	3526	3764	3891	4008
% of total	51.72%	51.62%	51.68%	52.33%	53.15%	53.91%	54.70%	55.80%	56.53%	57.04%	57.96%	58.54%	58.49%
W.B.Generation:													
No.in Service	177	275	397	508	591	669	726	796	933	1110	1247	1335	1381
% of total	4.46%	6.61%	9.01%	10.85%	11.99%	13.10%	13.81%	14.59%	16.04%	17.96%	19.20%	20.08%	20.15%
N.T.Generation:													
No.in Service												22	119
% of total												0.33%	1.74%
Others:													
No.in Service	38	49	66	77	87	117	133	115	151	161	169	178	200
% of total	0.90%	1.18%	1.50%	1.67%	1.76%	2.29%	2.53%	2.60%	2.59%	2.60%	2.60%	2.68%	2.92%
TOTAL (100%)	3967	4162	4404	4680	4931	5107	5256	5455	5818	6182	6494	6647	6852

* Western built only

TABLE 4.8.

JET AIRLINERS AIRCRAFT-YEARS* 1958-1983

'Hundreds

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1st Generation:													
Aircraft Years	0.022	0.641	2.713	5.049	6.907	7.973	8.775	9.649	10.869	12.161	14.254	15.916	16.861
% of total	100%	100%	100%	100%	100%	99.89%	93.27%	82.40%	71.99%	63.43%	55.75%	49.71%	46.64%
2nd Generation:													
Aircraft Years						0.009	0.633	2.061	4.229	7.011	11.314	16.040	18.627
% of total						0.11%	6.72%	17.60%	28.01%	36.57%	44.25%	50.10%	51.53%
W.B. Generation:													
Aircraft Years												0.001	0.133
% of total												-	1.35%
N.T.Generation:													
Aircraft Years													
% of total													
Others:													
Aircraft Years												0.002	0.172
% of total												0.10%	0.48%
TOTAL (100%)	0.022	0.641	2.713	5.049	6.907	7.982	9.408	11.710	15.098	19.172	25.568	32.019	36.119

* Western built only

'continued

TABLE 4.8 (Continued)

JET AIRLINERS AIRCRAFT-YEARS 1958-1983

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
1st Generation:													
Aircraft Years	17.038	17.016	16.831	16.630	16.426	16.098	15.554	14.969	14.651	14.291	13.507	12.732	11.792
% of total	44.03%	41.71%	39.23%	36.49%	34.01%	32.03%	29.97%	27.98%	25.96%	23.73%	21.30%	19.34%	17.44%
2nd Generation:													
Aircraft Years	20.007	21.060	22.184	23.657	25.435	26.822	28.128	29.548	31.648	34.141	36.450	38.370	39.604
% of total	51.71%	51.63%	51.53%	51.91%	52.67%	53.38%	54.19%	55.23%	56.08%	56.68%	57.43%	58.29%	58.57%
W.B. Generation:													
Aircraft Years	1.348	2.258	3.385	4.572	5.582	6.313	6.967	7.580	8.632	10.230	11.803	12.968	13.581
% of total	3.48%	5.54%	7.86%	10.03%	11.56%	12.56%	13.42%	14.17%	15.30%	16.99%	18.62%	19.70%	20.09%
N.T. Generation:													
Aircraft Years												0.026	0.756
% of total												0.04%	1.12%
Others*													
Aircraft Years	0.301	0.458	0.595	0.718	0.850	1.020	1.256	1.495	1.501	1.568	1.640	1.727	1.681
% of total	0.78%	1.12%	1.38%	1.57%	1.70%	2.03%	2.42%	2.82%	2.66%	2.60%	2.59%	2.63%	2.78%
TOTAL (100%)	38.694	40.792	43.055	45.577	48.293	50.253	51.901	53.592	56.425	60.230	63.400	65.823	67.617

* Western built only.

TABLE 4.9

JET AIRLINERS FLYING HOURS* 1958-1983

(Millions)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1st Generation:													
Flying hours	0.005	0.174	0.679	1.506	1.866	2.300	2.636	3.019	3.316	3.980	4.663	5.004	4.978
% of total	100%	100%	100%	100%	100%	99.74%	94.65%	85.24%	75.54%	67.65%	61.21%	54.93%	50.92%
2nd Generation:													
Flying hours						0.006	0.149	0.523	1.071	1.903	2.955	4.083	4.622
% of total						0.26%	5.35%	14.76%	24.40%	32.35%	38.79%	44.87%	47.28%
W.B. Generation:													
Flying hours												0.002	0.110
% of total												0.02%	1.13%
N.T.Generation:													
Flying hours													
% of total													
Others:													
Flying hours												0.012	0.035
% of total												0.12%	0.36%
TOTAL 100%	0.005	0.174	0.679	1.506	1.866	2.306	2.785	3.542	4.387	5.883	7.618	9.101	9.745

* Western built only

continued

TABLE 4.9 (Continued)

JET AIRLINERS FLYING HOURS 1958-1983

(Millions)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
1st Generation:													
Flying hours	4.722	4.766	4.426	3.922	3.586	3.102	3.238	3.157	2.954	2.310	1.656	1.332	1.015
% of total	47.29%	44.30%	39.74%	35.50%	32.03%	28.74%	26.16%	23.99%	21.37%	16.48%	12.04%	9.59%	6.79%
2nd Generation:													
Flying hours	4.853	5.171	5.518	5.654	6.856	6.350	6.682	7.337	7.827	8.159	8.221	8.416	8.617
% of total	47.89%	48.10%	49.54%	51.17%	52.30%	53.65%	53.90%	55.81%	56.61%	58.19%	59.78%	60.59%	57.65%
W.B. Generation:													
Flying Hours	0.427	0.727	1.081	1.350	1.601	1.916	2.270	2.638	2.806	3.306	3.612	3.858	4.039
% of total	4.21%	6.85%	9.71%	12.22%	14.30%	16.19%	18.34%	19.29%	20.30%	23.58%	26.23%	27.78%	27.02%
N.T. Generation:													
Flying hours												0.011	0.994
% of total												0.08%	6.65%
Others:													
Flying hours	0.062	0.081	0.113	0.123	0.153	0.168	0.187	0.225	0.238	0.246	0.265	0.273	0.283
% of total	0.62%	0.75%	1.01%	1.11%	1.37%	1.42%	1.51%	1.71%	1.72%	1.75%	1.92%	1.96%	1.89%
TOTAL *100%	10.125	10.753	11.138	11.049	11.196	11.836	12.377	13.157	13.157	14.021	13.757	13.890	14.948

* Western built only.

4.3 Nature of Aircraft Accidents and their Causes

4.3.1 Introduction

Very large sums are invested in modern aircraft, their equipment and their operations. The largest modern jet airliner could cost up to US$ 90,000,000 each,* and may carry over 500 passengers whose collective worth if compensation for death or injury has to be assessed, may run to a further US$ 100,000,000, in addition to any compensation or indemnity to a third party.

As for the time of accident (phase of flight) figure 4.4 shows that 75% of all accidents occur during the take-off, approach and landing phase, this comprises only 6% of total flight time.

---

* See Table 4.4.

Appendix One shows airlines major catastrophic total losses 1977-1984, from which it appears that the liability reserves for accidents of American Airlines DC-10 on 25th May, 1979 reached US$ 190,000,000 in addition to US$ 37,000,000 for aircraft hull.

FIGURE (4.4)

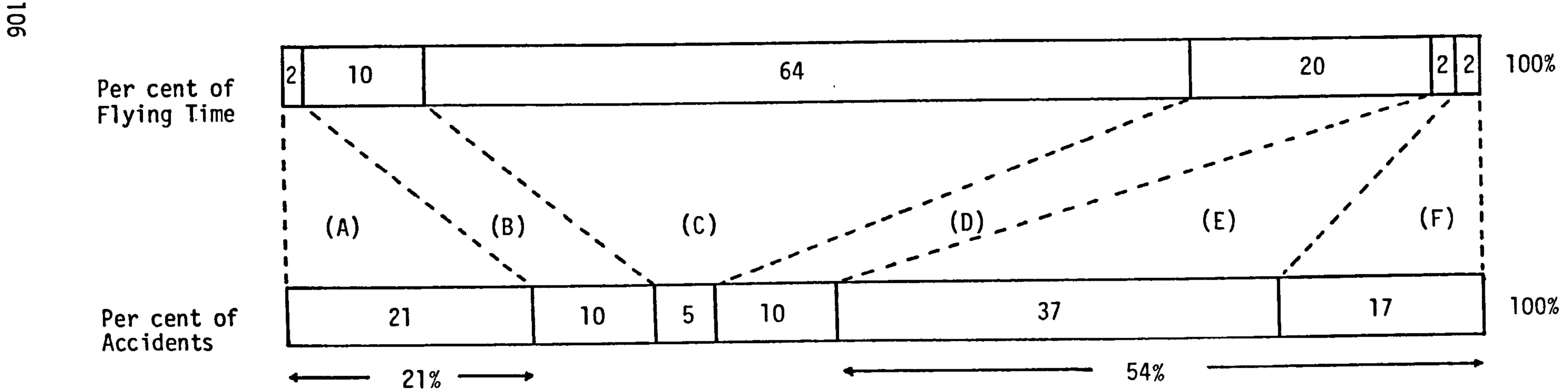
ANALYSIS OF 217 WORLDWIDE JET "TOTAL LOSS" ACCIDENT, 62 TO 76

(EXCLUDES TEST, TRAINING AND GROUND ACCIDENTS)

TYPICAL FLIGHT PROFILE

(BASED ON 3,000 HOURS PER YEAR AND 5 SECTORS PER DAY)

(A) TAKE-OFF (B) CLIMB (C) CRUISE (D) DESCENT (E) APPROACH (F) LANDING



SOURCE: Bellon, 1978.

4.3.2 Some Causes of Aircraft Accidents

Causes of accidents in the field of aviation can generally be divided into the following categories (Lloyd, E. and Tye, W. 1982):

I Failure of flight system or part of a system

(a) Single active failures.

(b) Passive and undetected 'dormant' failures.

(c) Combinations of independent failures.

(d) Common-mode failures.

(e) Cascade failures

(f) Failure produced by the environment.

II Influences and effects of the factors affecting performance of aircraft

(a) The effects of environmental conditions

(b) Runway surfaces conditions.

(c) The effects of ground equipment on navigation system and automatic landing.

III Errors

(a) Design errors

- The failure to take account of all likely environmental conditions (e.g. temperature effects, vibration, icing).

- The poor segregation of critical systems so that cascade or other multiple failures can occur.

- Inadequate protection of flammable substances from sources of ignition.

- The location of essential equipment near sources of contamination (e.g. electrical equipment, below toilets and galleys).

(b) Manufacturing errors

These are basically caused by:

- Inadequate control of quality.

- Insufficient information on drawings.

- Contamination.

- Damage

(c) Maintenance errors.

IV Pilot and Crew Mismanagement

V Personnel and Passenger Behaviour

The behaviour of passengers, ground handlers, and cabin crew.

4.4 Analysis of Aircraft Losses

4.4.1 Risk Measurement

Diacon and Carter (1984) defined the aim of risk measurement as to calculate the impact of possible losses on the firm. Once the possible loss-making situation has been identified, it is then necessary to examine (Diacon, S.R. and Carter, R.L., 1984):

(a) The number of possible losses each year (the frequency of loss).

(b) The possible size of each of these losses.

(c) The value of assets at risk (the maximum possible loss).

The risk manager needs to know the average amount of losses of a particular type that he can expect in a year. First he needs to know the average, expected or mean frequency of loss, and the probability distribution of loss frequencies.

The next concern is to estimate the probability distribution of loss size. This combined with expected frequency will measure the chance or probability associated with each and every loss value from a given loss-making situation. Finally, the valuation of loss-bearing assets has to be made.

McGuinness (1970) defined the probable maximum loss for a specified financial interest as that proportion of the total value of the interest which will equal or exceed in a stated proportion of all cases, the amount of any financial loss to that interest, from a specified event or group of events.

Therefore, the PML depends upon (Wilkinson, M., 1982):

(1) estimates of the likelihood that losses of various sizes will occur;

(2) the amount of losses and associated probabilities that the insured is willing to accept;

(3) the amount of losses and associated probabilities that the underwriter is not willing to accept.

Thus, the insured and the underwriter can have different estimates of the PML for the same loss exposure.

4.4.2 Accidents Rates

4.4.2.1 Measures of Aircraft Damage

Aviation accidents are broadly divided into two main classes, the first due to normal circumstances and the second due to abnormal circumstances.

The 'normal circumstances' accidents may generally be divided into operational and non-operational, each of these classes could be fatal or non-fatal.

Though of less significance than major fatal accidents, those which results in destruction or substantial damage are important.

One of the most vital statistics in the airline business is load factor. From the standpoint of aviation underwriters, the increase of load factors has meant an increase in the number of passengers exposed to risk in the airline industry as a whole and in individual airlines particularly; where the expected passengers liability for particular airliner = seating capacity x load factor
x average amount of claim.

4.4.2.2 Jet airliners' accident rate

The safety performance in respect of western built jet airliners in terms of the accidents rates achieved, represent the facts available in practice and the extension of past trends provides a general view of the future expectation.

Figures (4.5) to (4.9) show the number of total losses for the airliners and the fatalities involved during the period of 1958 to 1983.

FIGURE (4.5)

JET AIRLINERS (ALL TYPES)

TOTAL LOSSES

1958-1983

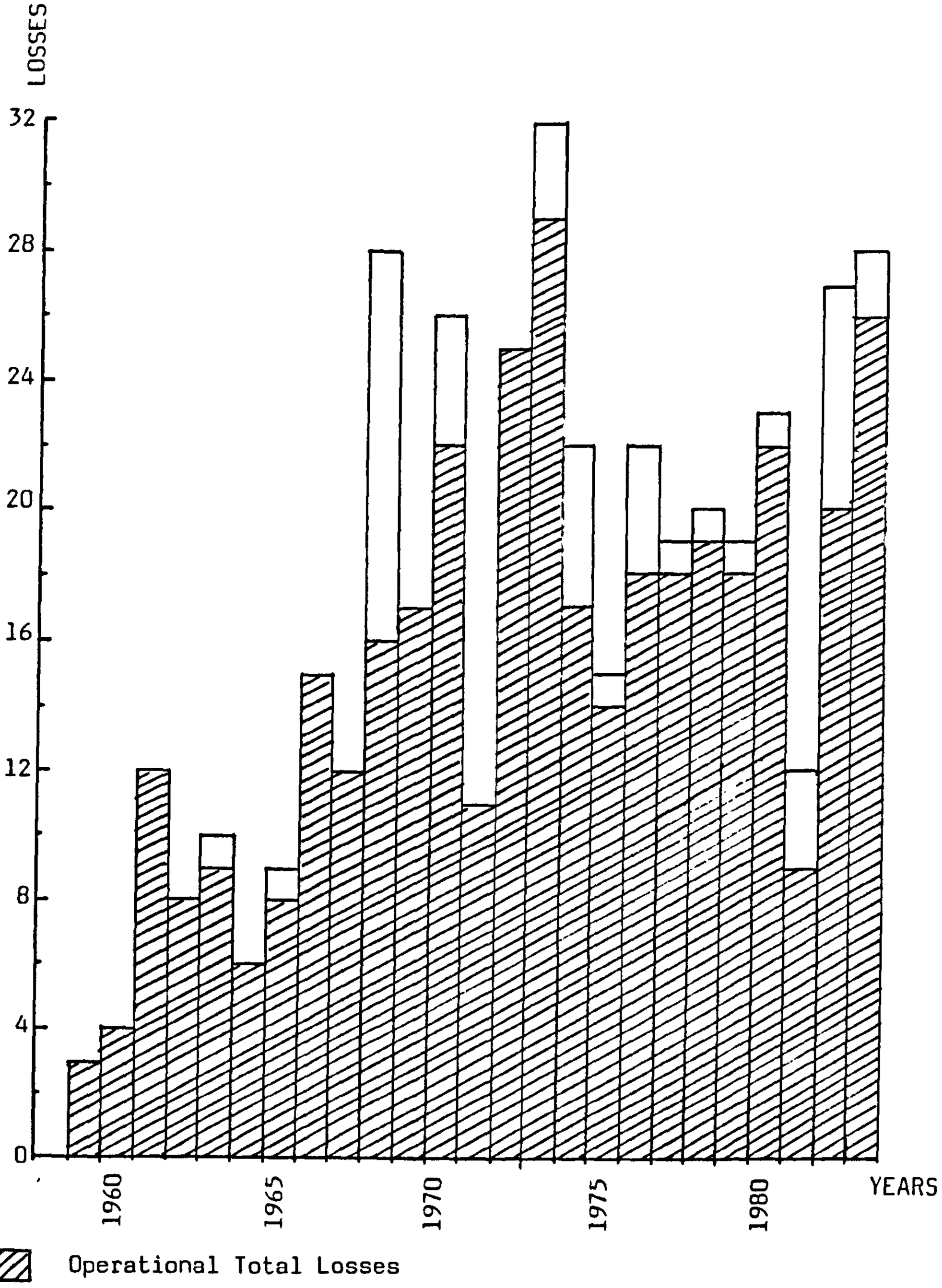


FIGURE (4.6)

JET AIRLINERS (ALL TYPES)

CUMULATIVE TOTAL LOSSES (ALL CAUSES)

1958-1983

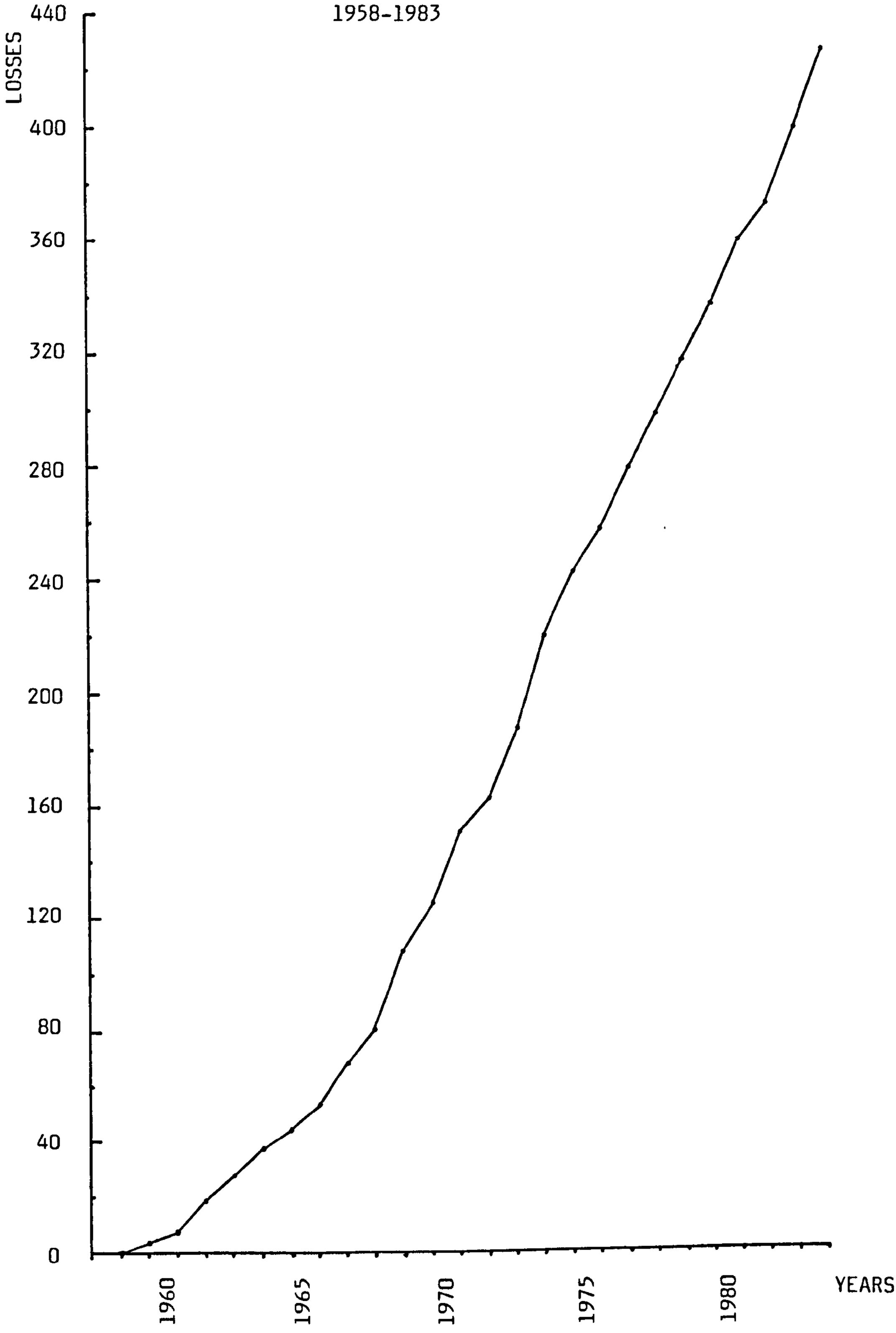
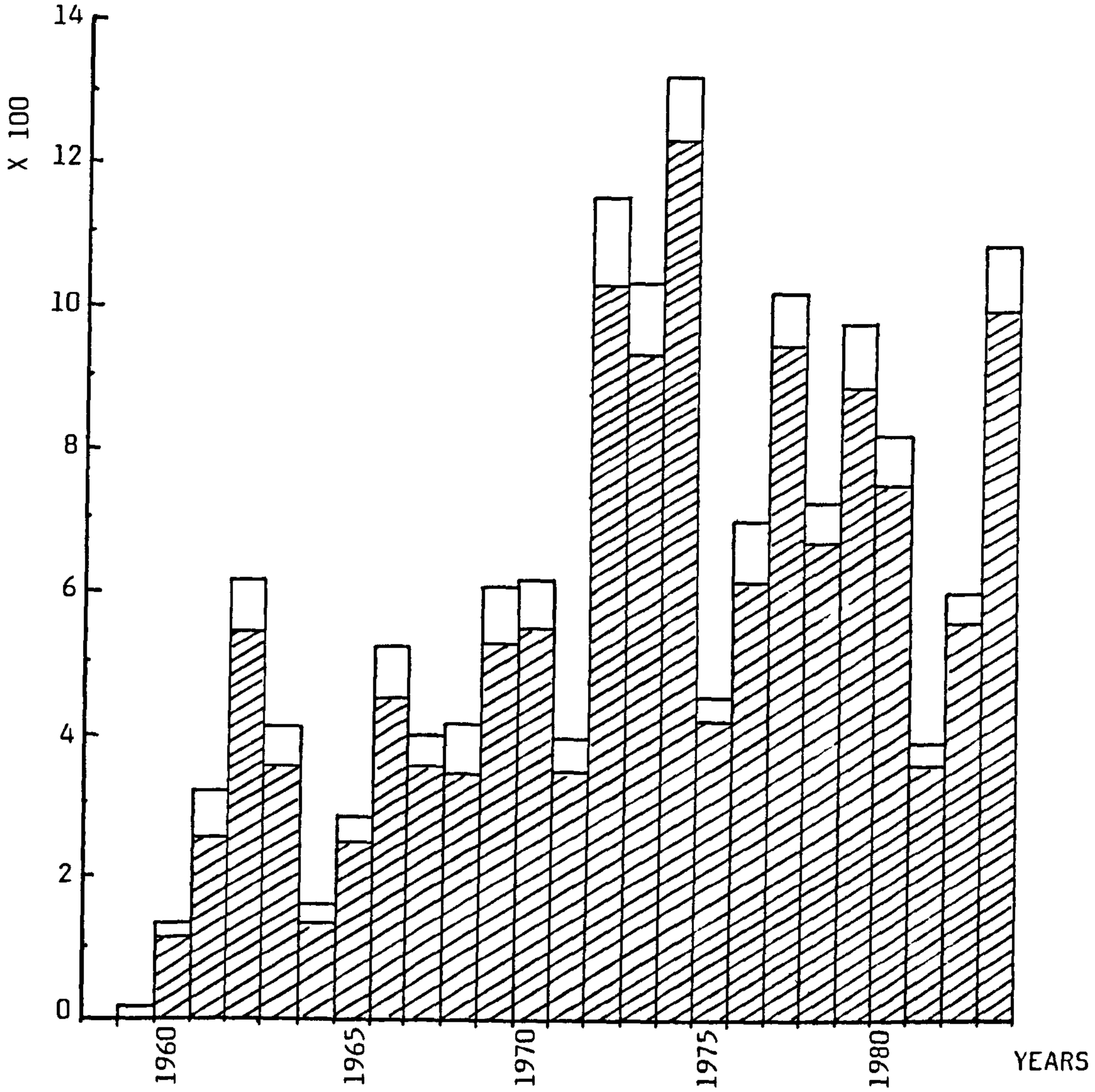


FIGURE (4.7)

JET AIRLINERS (ALL TYPES)

FATALITIES (PASSENGERS AND CREW)

1958-1983



Passengers Fatalities

Crew Fatalities

FIGURE (4.8)

JET AIRLINES (ALL TYPES)

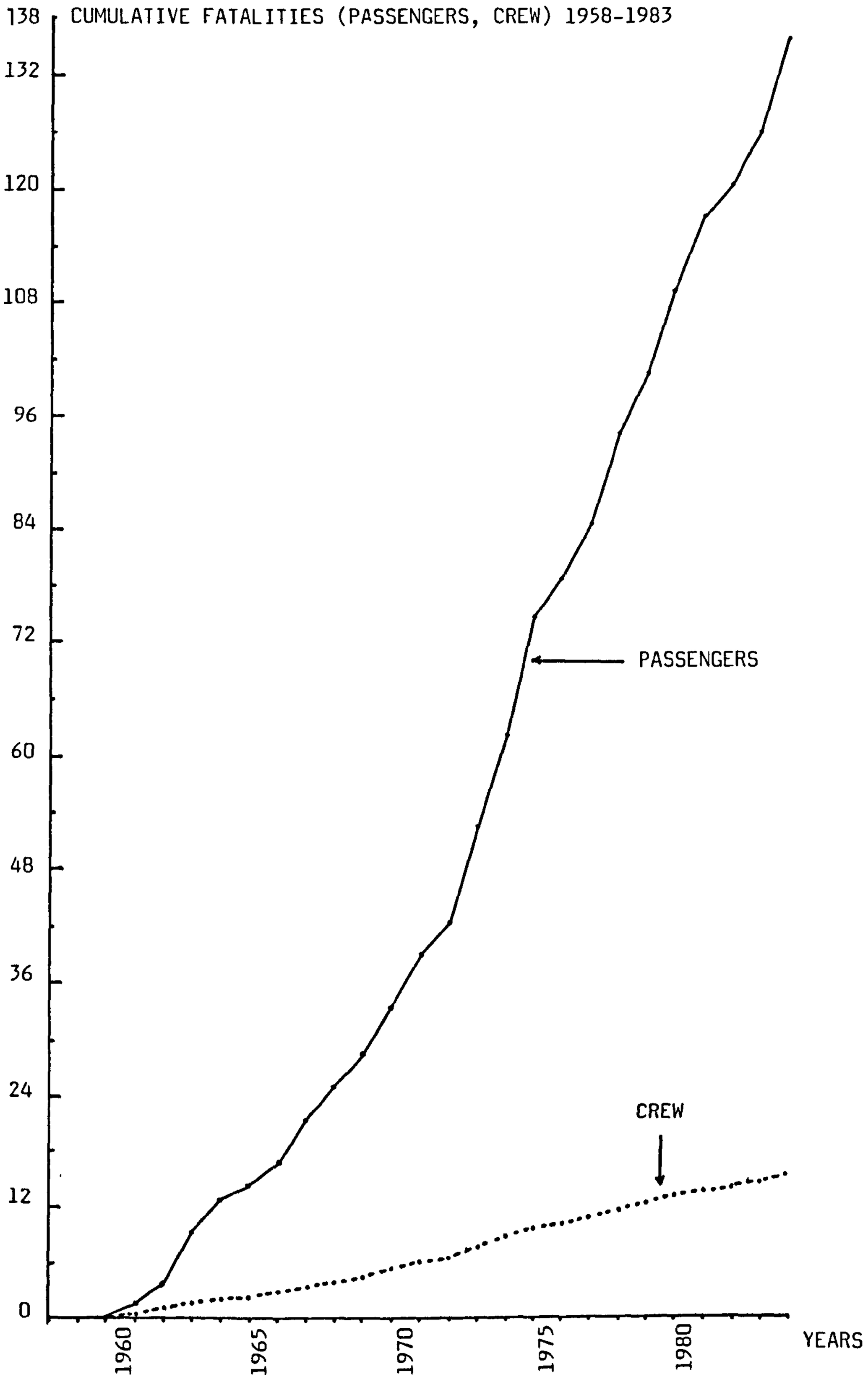


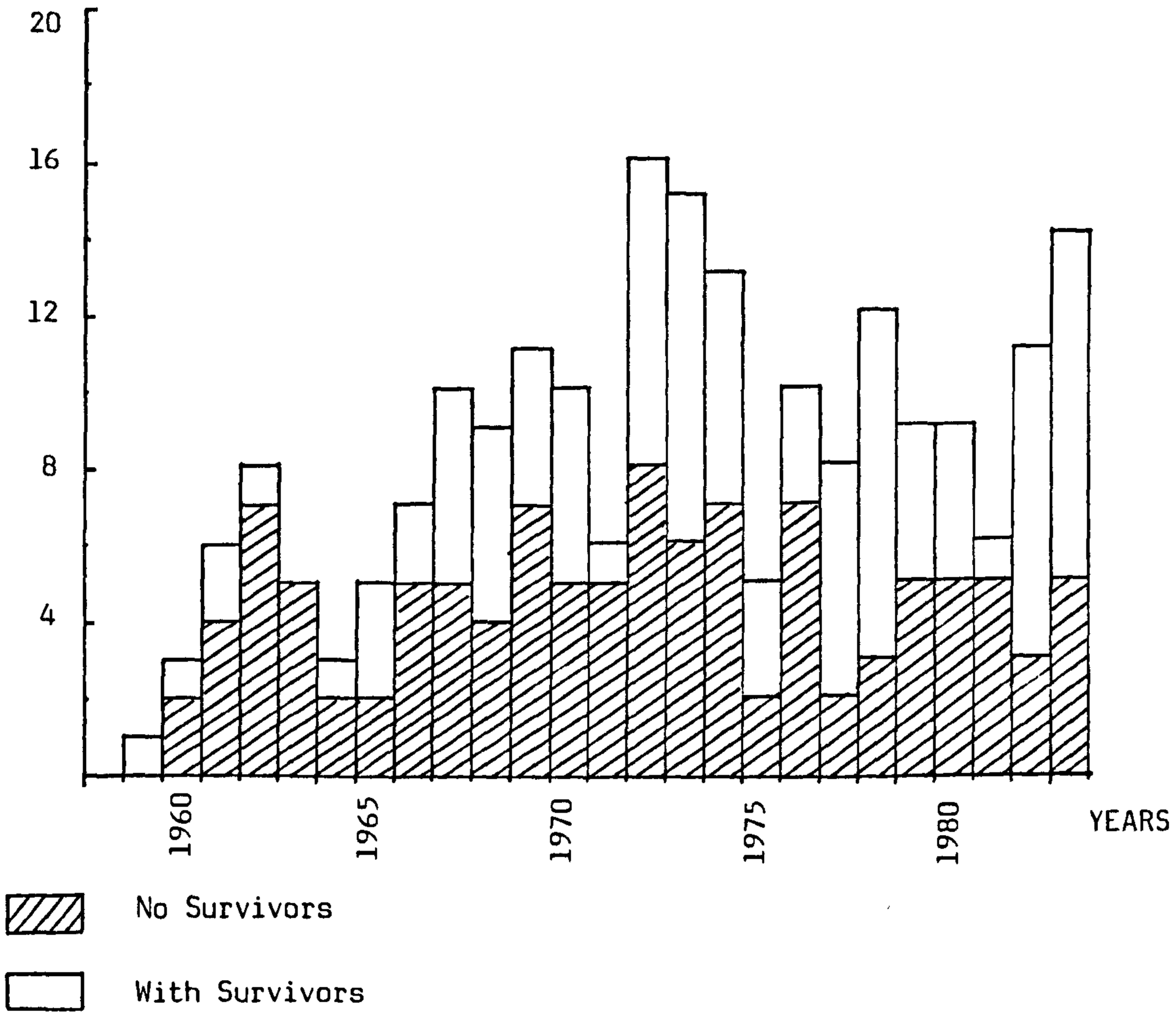
FIGURE (4.9)

JET AIRLINERS (ALL TYPES)

FATAL ACCIDENTS

INVOLVING PASSENGERS

1958-1983



Figures (4.10), (4.11) and (4.12) show the annual accident rate during the same period. Three and five years moving average are tested; the five year average provides the best fit.

The improved safety performance of each type of aircraft during its life contributes to the improved record for the international fleet as a whole and as each new generation of design appears it benefits from the previous generation.

For a particular class of event i (such as jet airliner accidents) a number of such accidents or events N_i will occur in a given period of years, t_i. The mean number of accidents per year $\bar{N}_i$ may calculate as follows:

$$\bar{N}_i = \frac{N_i}{t_i} \qquad (4.1)$$

For each event, j of class i, there will be a number of consequence measures for consequences of differing nature.

Let T_{ij} represent the total number of fatalities and injuries for accident ij.

F_{ij} = Number of fatalities

I_{ij} = Number of injuries

D_{ij} = Cost of event

FIGURE (4.10)

NORMAL FATAL T/Ls PER 10^6 FLYING HOURS

1958-1983

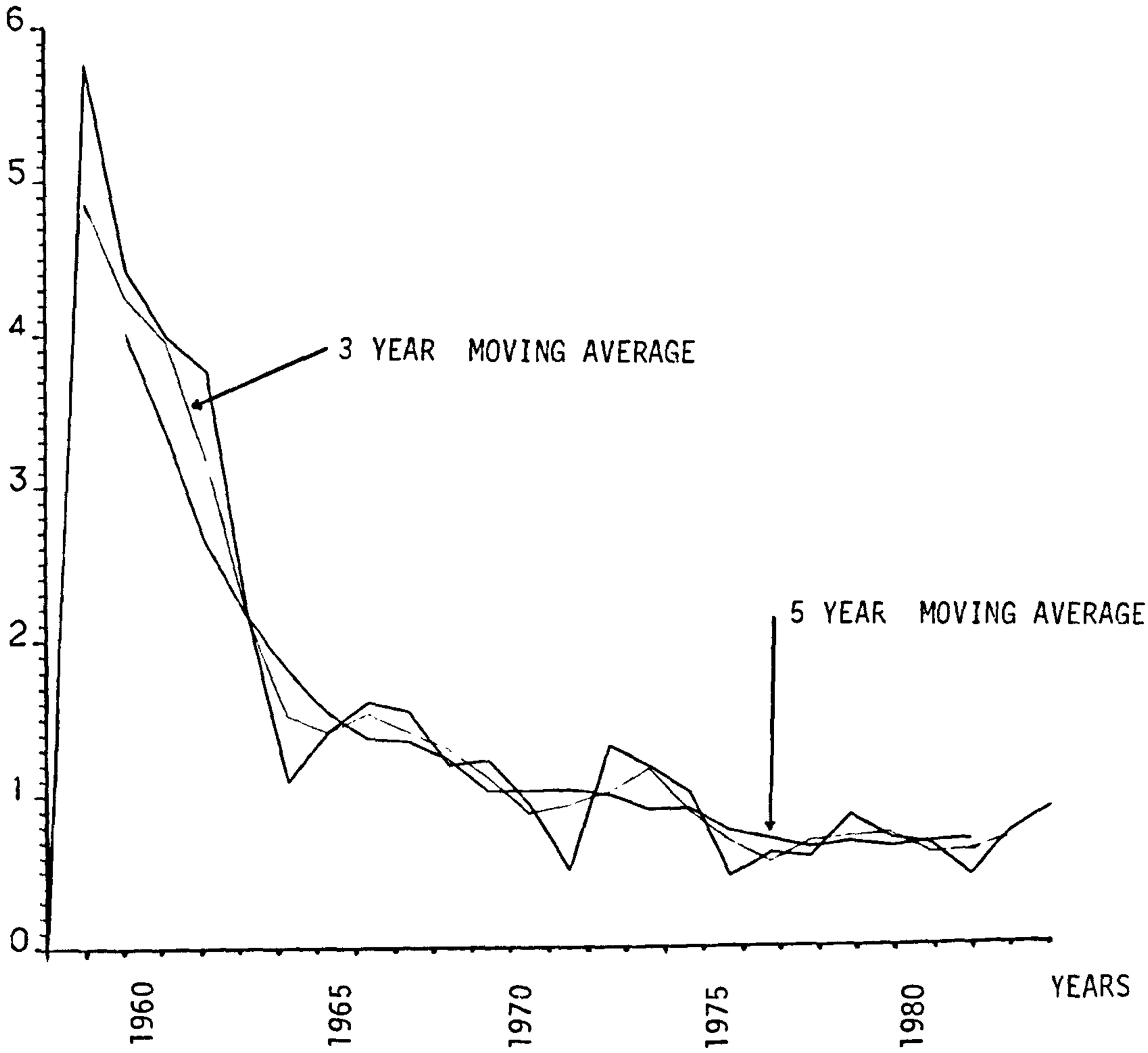


FIGURE (4.11)

NORMAL OPERATIONAL T/Ls PER 10^6 FLYING HOURS

1958-1983

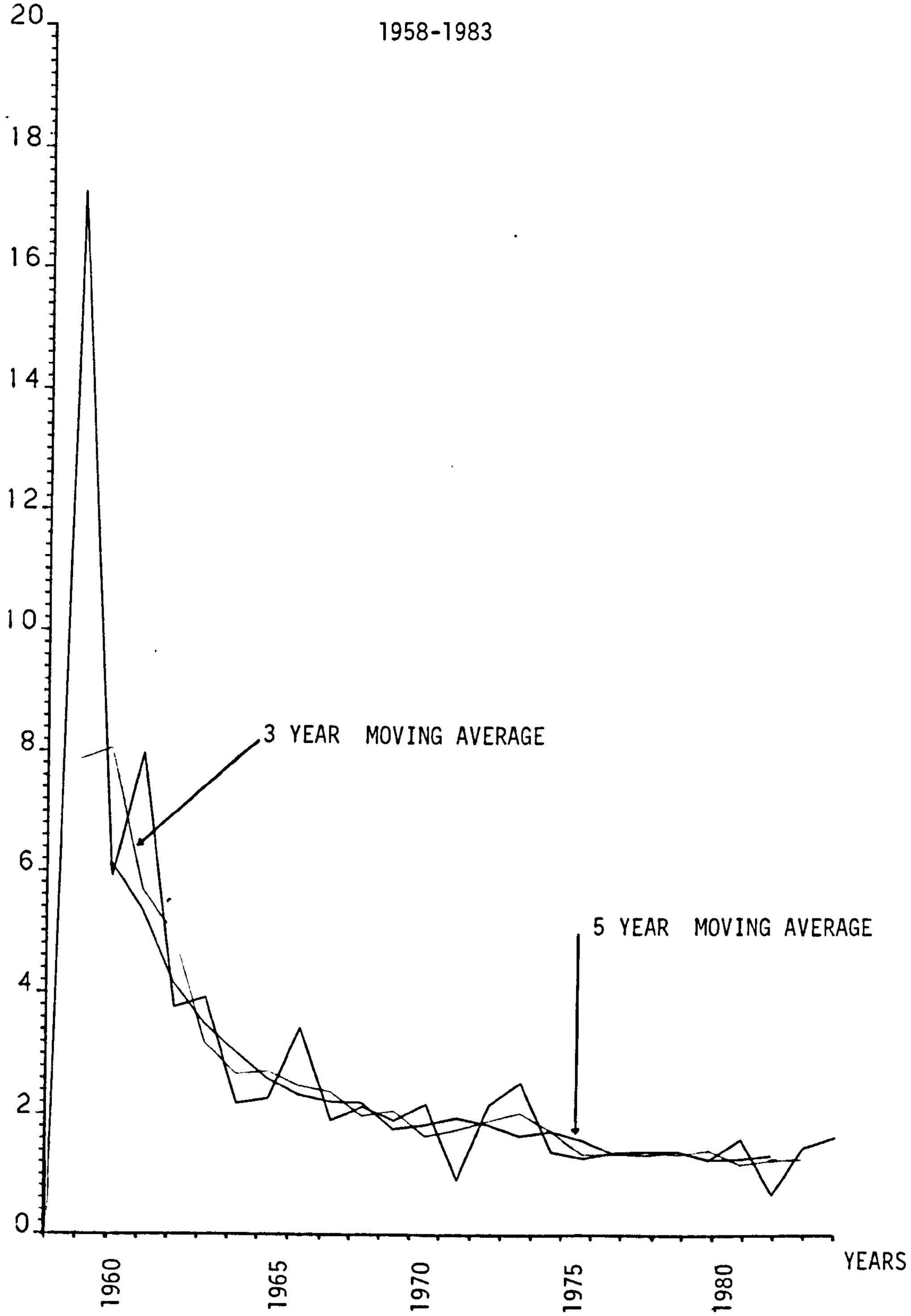
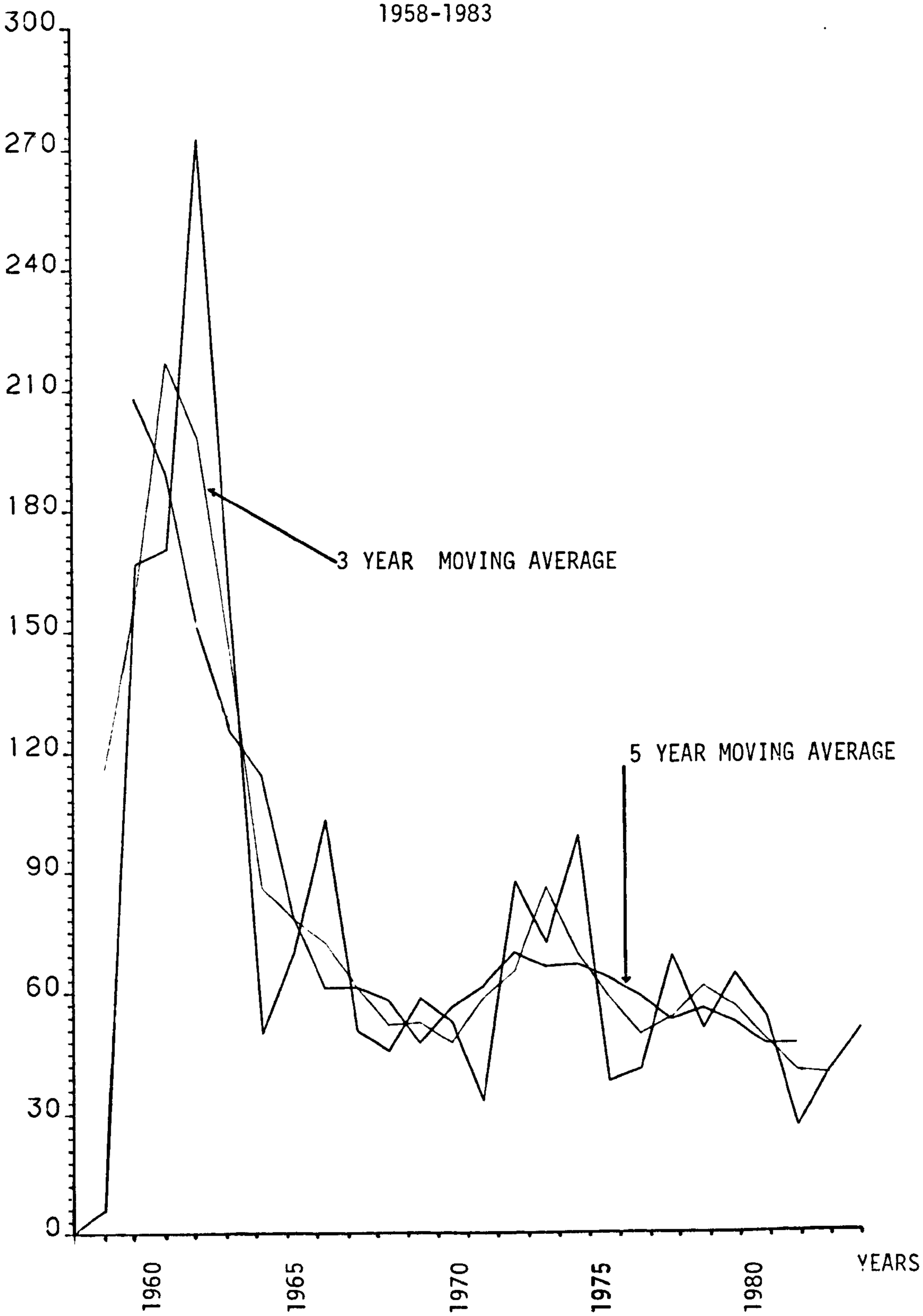


FIGURE (4.12)

PASSENGERS FATALITIES PER 10^6 FLYING HOURS

1958-1983



Where:

$$T_{ij} = F_{ij} + I_{ij} \tag{4.2}$$

The mean number of fatalities, injuries or costs may derive for each factor as follows:

$$\bar{F}_i = \frac{1}{N_i} \sum_j F_{ij} \tag{4.3}$$

$$\bar{I}_i = \frac{1}{N_i} \sum_j I_{ij} \tag{4.4}$$

$$\bar{D}_i = \frac{1}{N_i} \sum_j D_{ij} \tag{4.5}$$

If the frequency of events is high enough to provide some measures of statistical convergence, rates of fatalities, injuries and costs can be calculated for individual airlines and for the whole fleet internationally.

Then the mean number of fatalities, injuries and costs per year for each class of accident or event, N_i is as follows:

$$\bar{N}_i \times \bar{F}_i \tag{4.6}$$

$$\bar{N}_i \times \bar{I}_i \tag{4.7}$$

$$\bar{N}_i \times \bar{D}_i \tag{4.8}$$

The risk for an individual is:

$$\bar{F}_i = \frac{\bar{N}_i \times \bar{F}_i}{P_i} \qquad (4.9)$$

$$\bar{K}_i = \frac{\bar{N}_i \times \bar{I}_i}{P_i} \qquad (4.10)$$

Where:

$\bar{F}_i$ represents the mean probability of death to an individual at risk per year.

$\bar{K}_i$ represents the mean probability of injury to an individual at risk per year.

P_i = the total population at risk.

CHAPTER FIVE

AVIATION RISK MANAGEMENT

5.1 Introduction to Risk Management

Risk management is a scientific approach to the problem of dealing with the pure risks faced by individuals and businesses, and may be defined as the minimisation of the adverse effects of risk at minimum cost through its identification, measurement, and control (Williams, C.A. and Heins, R., 1971).

Risk management is essential in the operation of commercial airlines according to the nature of the risk faced by these airlines in addition to the variation of factors affecting the airlines and insurance industries.*

These factors create great difficulties in the evaluation and assessment of risks and its potential; and the magnitude of these difficulties is also increasing.

For the well-being of the aviation industry and in the interests of human and financial survival and of all parties concerned with airlines operation of flight these risks must be controlled and accidents must be prevented. However, airline accidents still occur because of the involvement of the following factors:

(a) Human errors or failures.

---

* See Chapters One and Two.

(b) Machine failures (aircraft and equipment involved in its operation).

(c) Adverse weather conditions.

(d) Acts of violence.

5.1.1 Risk Management Process

Although there are significant differences between the many writers and researchers* regarding the techniques that should be used, almost all agree on the fundamental procedures that must be followed. In their chronological order, these procedures include:

(1) Identification of the pure risk events that may impose financial losses.

(2) Evaluation of the risks in terms of financial, moral and social effects that would be involved if such events should occur.

---

* Such as:
Willett, A., 1951; Mehr, R.I. and Hedges, B.A., 1963; Horrigan, W., 1969; Greene, M.R., 1973; Damary, R., 1976; Vaughan, E. and Elliot, C., 1976; Muckleston, R.A., 1977; Crockford, N., 1980; Dorfman, M.S., 1982; Olson, G. and Simkiss, J., 1982; Carter, R.L. 1974 .

(3) Risk measurement and analysis in terms of probability, frequency and severity.

(4) Selection of the risk treatment method.

(5) Periodic re-evaluation, monitoring and accountability.

5.1.2 Risk Management Tools

Risk management tools refer to the methods used to reduce risks or their severity and minimize the probable or possible losses, which can be utilized, singly or combined, whether by the individuals, projects or societies. These methods vary according to type of risk. These methods may be classed as follows:

I Risk avoidance.

II Risk retention/self-insurance.

III Risk control and loss prevention.

IV Insurance as a means of transferring risk.

V Combination/pooling.

In the following section, suitable methods of dealing with aviation risks will be described.

5.2 Aviation Risk Management

5.2.1 Insurance

Pfeffer (1956) suggests that the essence of insurance is a mechanism designed to reduce the degree of uncertainty of the insured by means of a transfer of particular risks.

From the point of view of the insured the significant aspect of this mechanism is that it eliminates the chance of a large loss and the associated uncertainties by virtue of predetermined payment (Harrigan, W., 1969).

The term "Aviation Insurance" could be applied to all the major insurance coverage available against aviation perils. The major cover available is "Hull and liability" which specifically covers risks resulting from the operation of aircraft by commercial airlines. The other aviation covers such as airport liability, Hangarkeeper's liability and aviation products liability insurance are closely related to a similar type of non-aviation covers adapted for the purpose of covering some other collateral aviation exposure.

5.2.1.1 Characteristics of Aviation Underwriting

The nature of an aircraft in flight means that an accident may produce considerable damage to physical property and injury or death of persons both within the aircraft and on the ground leading to catastrophe. This problem has grown over the years with increased load, size, value and speed of the aircraft and the number of lives exposed.

The limited spread of aviation risks in commercial aircraft has derived from the introduction of wide-bodied jet airliners which entered the field in 1968 while old small planes (piston and turbo-prop. engined) became obsolete and left the field of operations. So while the number of flights and the number of passengers were increasing, the number of aircraft and the policies covering them were not increasing proportionately. Therefore, by the early seventies, the aviation insurer's exposure to loss from one major catastrophe could result in much higher cost and his ability to spread his loss over a large number of policies and their revenue was dwindling (Pielemeier, G.L., 1976).

Therefore, aviation risks and their corresponding characteristics, which are discussed earlier in chapter two and the regulations affecting the limits of the airliner's operators liabilities, which are discussed in chapter three present significant problems in the insurance market in respect of aviation underwriting. The underwriters and others associated in analysing these risks must be experts of exceptional ability and experience in dealing with such risks.

5.2.1.2 Effective Factors in Rating Aviation Risks

There are many factors to be considered in the selection and rating of aviation risks. The principal areas of these factors are:

(1) The insured experience, safety record and circumstances of any previous losses.

(2) Period of insurance.

(3) Aircraft type(s): this is the most important factor the aviation underwriter considers. The specific aircraft determines the insured maximum value which will be placed upon it and the crew and passengers accommodation capacity. This data establishes the loss potential of the insured risk upon the physical damage to the aircraft hull, passengers and third party legal liabilities.

Some factors involving aircraft type:

(a) Construction and structural factors, such as:

- airframe and flight control and structural integrity;
- power plant group;
- all flight systems group.

(b) Aircraft-years (age) and flying hours.

(c) Maximum take-off weight.

(d) Configuration of engines, wings and landing gear.

(4) Risks covered, such as:

flight risks, ground risks, taxying risks, and all other risks.* Normally, commercial airlines covered by "All Risks" policies.

(5) Purposes of use:

aircraft risks are customarily divided into five classifications according to use, these are:*

- private pleasure;

- business;

- commercial;

- rental for private pleasure and business only;

- special uses.

(6) The abilities and rating of the pilot:

Part IV of Air Navigation Order 1974 (U.K.) deals with crews and their licences. An aircraft may not fly without a duly licenced crew of the number required by the law of the country of registration, where the aircraft is used for public transport.

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* For definition of these terms see Lloyd's Aircraft Policy (AVN 1A) Appendix Six (a).

The most important types of licence for airliners are:

- Commercial pilot's licence.

- Senior commercial pilot's licence.

- Airline transport pilot's licence

Lloyd's Aircraft Policy (AVN 1A) stipulates that the policy does not apply whilst the aircraft is being piloted by any person other than as stated in the schedule, except that the aircraft may be operated on the ground by any person competent for the purpose.

(7) Geographical limits:

The territories natural features, prevalent weather conditions and other elements of geography of airports used and the area of most concentrated flying also have a decided effect in the risk evaluation process. Most scheduled airlines have world-wide geographical coverage.

(8) Limits of insurance required:

in respect of accidental damage to aircraft (maximum hull value for any one aircraft in the schedule), third party legal liability and legal liability to passengers (maximum single limit for any one accident/ aircraft in respect of third party, passenger,

baggage, freight, mail and comprehensive general legal liability).

5.2.1.3 Clauses and Endorsements affect on Aviation Insurance Market Internationally

These help the underwriters to eliminate or, at least, minimize the effects of moral hazards, uninsurable risks and the catastrophic risks.

The conditions and exclusions which appear in aviation insurance policies are divided into two parts:

(a) Conditions and exclusions applicable to each section in the policy in respect of aircraft hull, legal liability to third party and legal liability to passengers.

(b) Conditions and exclusions applicable to all sections in the policy.

In many cases it is possible to effect separate insurance cover, or for these to be written back into the policy in respect of a risk or risks normally excluded from the policy subject to an additional premium.*

These clauses and endorsements incorporate or exclude certain provisions to the standard policy form approved by Lloyd's Aviation Underwriters' Association to be used by the international aviation market.

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* E.g. in the case of war risks, noise.

The most important clauses and endorsements applied in aviation insurance are:*

- Aircraft Wreck and Salvage Clause (AVN 3).

- Component Parts Clause (AVN 4).

- Deferred Premium Clause (AVN 5A).

- Full Premium if lost Clause (AVN 8).

- Full Premium in the event of a Claim Exceeding the Premium Paid Clause (AVN 9).

- Legal Liability to Passengers (Baggage) Clause (AVN 10).

- Transportation Costs Clause (AVN 11).

- War Risk on Aircraft Hulls Clause (AVN 12).

- Limitation of Liability Clause, "Joint Assureds" (AVN 14).

- Limitation of Liability Endorsement. "Additional Assureds" (AVN 15).

- Additions and Deletions Clause, "Hull" (AVN 17A).

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* See Appendix Six (b) for text of these Clauses.

- Additions and Deletions Clause, "Liability Only" (AVN 18A).

- Early Warning Lines Exclusion Clause (North America) "Dew Line", (AVN 19).

- Claims Co-operation Clause (AVN 21).

- Deficit Clause, "Three Years" (AVN 22).

- Unlicenced Landing Ground Suitability Clause (AVN 23).

- Burning Costs Clause (AVN 24).

- Claim Control Clause (AVN 25).

- Aircraft Laying-up Returns Clause (AVN 26).

- Additional Insurance Clause (AVN 27).

- Breach of Warranty Endorsement (AVN 28).

- Manufacturer as Additional Assured Clause (AVN 29).

- Prior Advice Clause (AVN 31).

- Passenger Voluntary Settlement Endorsement (AVN 34).

- Spreader Clauses "A" and "B" (AVN 35 and 36).

- Aviation Radioactive Contamination Exclusion Clause "general" (AVN 38).

- Aviation Radioactive Contamination Exclusion Clause "Engines" (AVN 39).

- Mutual Cancellation Clause "Warsaw Convention" (AVN 40).

- Reinsurance Underwriting and Claims Control Clause (AVN 41).

- Documents of Carriage Clause (AVN 42).

- Mutual Revision Clause "Aviation Liability" (AVN 44).

- Passenger Liability (Mutual Revision and Special Contracts) Clause (AVN 44A).

- Noise and Pollution and Other Perils Exclusion Clause (AVN 46B).

- War, Hi-jacking and other Perils Exclusion Clause "Aviation" (AVN 48B).

- Hi-jacking Endorsement (AVN 50).

- Extended Coverage Endorsement "A/C Hulls" (AVN 51).

- Extended Coverage Endorsement "A/C Liability" (AVN 52).

- Additional Insured Endorsement "Liabilities" (AVN 53).

- Non-owned Aircraft Endorsement (AVN 54).

- Aircraft All Risks Extension Clause (AVN 55).

5.2.1.4 Deductibles

The reason for applying deductibles in aviation insurance is to avoid high assessment costs in connection with minor claims. Additionally, an insured has an interest in his policy as a means of making him safety conscious.

The deductibles may be a fixed sum of money or a percentage of the insured value, and may vary on different sections of the policy and for different types of risk and for different types of aircraft (if any). This term applies only for partial loss, and does not apply in the event of total loss, constructive total loss, and for arranged total loss.

From November, 1980 onwards, all risks falling due for renewal in London Aviation Insurance Market, have been subject to the application of a standardized level of deductibles on the Hull All Risks side (Bowring & Co., 1980).

These deductible levels are as follows:

(a) Aircraft Hull

AIRCRAFT TYPE	RISK	DEDUCTIBLE
Wide-bodies	Ingestion	1% of A/C value, subject to a min. of US$ 600,000 each engine, max. 2 deductibles
Wide-bodies	Flight and Taxying	1% of A/C value, subject to a min. of US$ 500,000.
Wide-bodies	Ground	US$ 20,000 min.
Other Aircraft	Ingestion	1% of A/C value, subject to a min. of US$ 250,000 each engine, max. 2 deductibles.
Other Aircraft	Flight and Taxying	1% of A/C value, subject to a min. of: $150,000 i.r.o. 4 eng. jets $100,000 i.r.o. 3 eng. jets $ 75,000 i.r.o. 2 eng. jets
Other Aircraft	Ground	$10,000 min.

(b) Passenger Baggage

U.S.A. Domestic - in accordance with tariff that is currently US$ 750 for each and every claim to increase in early 1981 to US$1000 each and every claim.

Elsewhere a minimum US$ 500 each and every claim.

(c) Cargo

U.S.A. Domestic - in accordance with tariff.

Elsewhere - minimum US$1000 each and every Consignment note.

5.2.1.5 Hull Deductible Insurance

The demand for "deductible" insurance arose in 1981 when all risks insurers felt obliged substantially to increase the excess applicable under jet airliner policies because of increasing frequency and cost of claims for repairable damage, especially that arising out of ingestion damage to turbine engines. The market is limited to a few London and other companies, and a few Lloyd's underwriters. The policy is synchronous with that of the principal all risks policy, and is to pay only amounts which would have been payable under the all risks policy but for the operation of the excess thereunder. Cover is always subject to an aggregate limit of claims payable during the policy period. The premium is usually a substantial lump sum, payable in full at inception of the policy (Carter, R.L. 1974).

5.2.2 Loss Prevention and Risk Control

The enormity of potential losses for some airliner accidents, causes the airline itself to make substantial efforts to prevent such losses and control the causative risk.

The adverse factors combining to escalate the potential losses and concern are:

(a) constantly increasing world traffic;

(b) ever larger and more expensive aircraft;

(c) more passengers per aircraft;

(d) more compensation per passenger;

(e) third parties indemnities.

Therefore the role of risk control and loss prevention in the risk management process may be expected to increase significantly when dealing with aviation risks. Basically, it would concentrate on two areas associated with:

1. Physical factors

2. Human factors

where the aims of this strategy are lowering the chance of loss or making the occurrence of loss less frequent, eliminating the risk and minimizing the impact of loss.

Loss prevention and safety of civil transportation with modern jet airliner's assembly of complex systems can be achieved through the following procedures:

- The regulations governing aircraft registration.

- Airworthiness regulations and inspection of aircraft (performance and safety).

- Airlines security.

- Airports operation and airside security.

- Periodic training programmes.

In order to achieve and maintain the levels of safety needed for aircraft, a safety assessment plan is important and is likely to include some or all of the following aspects (Lloyd, E. and Tye, W. 1982).

(a) preliminary hazard analysis;

(b) definition of airworthiness objectives;

(c) zonal analysis;

(d) studies of particular cascade and common-mode failures (e.g. engine burst studies);

(e) failure modes and effects analysis (fault/failure analysis);

(f) performance analysis;

(g) reports on testing, bench, simulator and flight tests to confirm assumptions made in analysis;

(h) reliability studies based on testing, manufacturers' data or reference to previous experience.

It may often be found most convenient to make separate reports on many of the above aspects of the investigation.

However, it is important that the whole should be fully cross-referenced for ease of use and to ensure that no gaps are inadvertently left in the evidence.

5.2.3 Retention and self-insurance

Vaughan, E. (1978) and Goshay, R. (1964) argue that the criteria for self-insurance are:

(a) The organisation should be big enough to permit the combination of a sufficiently large number of exposure units so as to make losses predictable. The programme must be based on the operation of the law of large numbers.

(b) The plan must be financially dependable. In most cases, this will require the accumulation of funds to meet losses that occur, with a sufficient accumulation to safeguard against unexpected deviations from predicted losses.

(c) The individual units exposed to loss must be distributed geographically in such a manner as to prevent a catastrophe. A loss affecting enough units to result in severe financial loss should be impossible.

The kind of variation that is possible and the severity of the losses would argue against total self-insurance for airlines because one of the conditions of self-insurance is enough units to predict loss on a

reasonable basis. The average airline certainly lacks this requirement and even the total international civil jet fleet* has not been a broad enough base to provide accurate predictions.

In this case, the airlines are unable to sustain the maximum potential losses (totally self-insurance) for the following reasons:

(1) nature and characteristics of aviation risks;

(2) possibility of catastrophic losses;

(3) extreme variation in losses.

Therefore, retention can be used to a limited degree in the form of the amount or percentage of deductibles which was discussed earlier in this Chapter.

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* Total international civil jet fleet as at December, 1983 is 6852 units.

CHAPTER SIX

CONCLUSIONS

6.1 Summary of Conclusions

Air accidents are remarkably infrequent but tend, when they come, to be disasters, especially in the age of jumbo-jets. It is, therefore, the rare disaster that the air companies (large enough to meet, themselves, the cost of their small losses) are most concerned to cover (Benjamin, B., 1979). Therefore, in the area of aviation risk management there are two main problems. Firstly, the constant changes both technologically and economically. Secondly, the potential catastrophic loss. It has been shown that aviation risks have a unique set of characteristics.

Identification, analysis and measurement are important components of the decision process when dealing with aviation risks in order to control them and their impact by means of loss prevention, by improving safety and security procedures, and by means of spreading their loss through appropriate insurance covers.

The increasing number of high-valued jet airliners in service, the increasing limits of liabilities and the reversal of jet airliners safety records, all provide new and threatening problems for the future of the airlines insurance industry.

Examining and investigating the accident rates for jet airliners (all generations), the annual total loss rates show large fluctuation from one year to another in respect of fatal and operational total

losses per flying hours as well as the passenger fatalities. This is because of the small numbers involved leading to large sampling errors. The trend as shown by the five years moving average is much more useful and indicates that the measure of aircraft T/Ls per 10^6 flying hours fell fairly steadily.

The extremely large potential losses in the airlines insurance business, and the large maximum limits for any one aircraft or any one accident in respect of both hull and passenger liability are associated with high deductibles for each aircraft in schedule of the policy and every loss. These emphasise the importance of co-operation of all parties involved in the field, particularly the official organisations (such as IATA, ICAO and IUAI) as groups, airlines as individuals and aviation insurance market to provide a full protection in the form of the best possible terms and conditions.

Because air transport has grown so rapidly, as shown in this study, the ratification of the effective international conventions and agreements would provide an unbreakable limit for the airlines in respect of passenger and third party legal liabilities and a maximum safety and security level for the security of the airliners as well as the passengers.

6.2 Suggestion for further Research

The prediction based on parametric statistics in the aviation field lacks sufficient data for the purpose of research. The underwriters, brokers and companies (both insurance and airlines) have such data on losses, claims and premiums.

However, when the researcher asked some of them for such data they refused to grant it. Therefore, further research should be based on the co-operation of airlines as well as aviation underwriters.

Determining the airlines insurance underwriting and calculation of premiums based on scientific bases as well as adequate experience requires quantitative data of all the economic, financial, technical and political factors discussed in this study.

APPENDIX ONE

Airline Major Catastrophic Total Losses

1977-1984

DATE OF LOSS	AIRLINE	AIRCRAFT TYPE	FATALITIES		HULL VALUE (MILLION US$)	LIABILITY RESERVES (MILLION US$)	
			PASS	CREW			
27. 3.77	KLM	B747-206B	234	14	40	144.5	(1)
27. 3.77	Pan-Am	B747-121	321	9	23	144.5	(1)
1. 1.78	Air India	B747-237B	190	23	40	3	
1. 3.78	Continental	DC-10-10	2	NIL	33	3	
25. 9.78	Pacific	B727-200	128	7	7.5	20	(2)
25. 5.79	American	DC-10-10	258	13	37	190	(3)
31.10.79	Western	DC-10-10	63	9	37	20	
28.11.79	Air New Zealand	DC-10-30	237	20	43	20	
19. 8.80	Saudia A/L	L1011-200	289	14	35	30	
18.11.80	Korean A/L	B747-2B5B	9	6	50	3.5	(4)
2. 2.81	Pakistan A/L	DC-10-30	NIL	NIL	35		
13. 1.82	Air Florida	B737-200	70	4	12	65	(5)
23. 1.82	World A/W	DC-10	3	NIL	48.5	3.5	
17. 3.82	Air France	A300-B4	NIL	NIL	FF 200 M		(6)
8. 6.82	VASP	B727-212	126	9	14	NOT KNOWN	
9. 7.82	Pan Am	B727-235	138	7	6	80	(7)
14. 9.82	Spantax	DC-10-30CF	48	3	20	40	
17. 9.82	Japan A/L	DC-8	NIL	NIL	7.3	13.3	

APPENDIX ONE (CONTINUED)

Airline Major Catastrophic Total Losses

1977-1984

DATE OF LOSS	AIRLINE	AIRCRAFT TYPE	FATALITIES		HULL VALUE (MILLION US$)	LIABILITY RESERVES (MILLION US$)
			PASS	CREW		
2. 6.83	Air Canada	DC-9-32	23	NIL	6.4	10
1. 9.83	Korean A/L	B747	240	29	35	40
23. 9.83	Gulf Air	B737-200	106	5	17	7
18.10.83	Lufthansa	B747-200F	NIL	NIL	38	3
8.11.83	TAAG	B737-200	121	5	15	1
27.11.83	Avianca	B747	163	20	52	20
7.12.83	Iberia Avianca	B727 DC9	72 42	NIL NIL	7.65 8.9	) 20
18.12.83	Malaysian	A300-B2	NIL	NIL	30	5
19.12.83	Japan A/L	B747-200	NIL	NIL	10	
24.12.83	Korean A/L	DC-10-304	NIL	3	33	0.5
22. 3.84	Pacific	B737	NIL	NIL	13	
12. 7.84	Lufthansa	B737 (5) B727 (5)			) Dmks 35 m	(8)
	LTU	B757 (1)			Dmks 20 m	
	Hapag Lloyd	A300 (1) B727 (2)			) Dmks 30 m	
	General Av	150 light A/C			Dmks 100 m	

APPENDIX ONE (CONTINUED)

Airline Major Catastrophic Total Losses

1977-1984

REMARKS

(1) Liability Reserves split as follows:

KLM	45%	=	US$ 65,025,000
Pan Am	35%	=	US$ 50,575,000
Spanish Airports	20%	=	US$ 28,900,000
			US$144,500,000
Boeing Contribution			US$ 2,500,000

(2) Collided in mid-air with Cessna 172. Hit 15 houses, 13 on ground killed, 2 in Cessna.

(3) 2 killed on ground.

(4) 1 killed on ground.

(5) 4 third party killed.

(6) 2 passengers injured.

(7) 8 people killed on ground.

(8) Munich Airport. The airport and surrounding area were hit by a severe hailstorm. Hailstones the size of grapefruits.

SOURCE:

(1) Lloyd's Aviation Department.

(2) Sovereign Marine and General Insurance Company.

(3) La Reunion Aerienne.

APPENDIX TWO (A)

IATA CONDITIONS OF CONTRACT

(A) RESOLUTION 724

Passenger Ticket - Conditions of Contract

(1) As used in this contract "ticket" means this passenger ticket and baggage check, of which these conditions and the notice form part, "carriage" is equivalent to "transportation", "carrier" means all air carriers that carry or undertake to carry the passenger or his baggage hereunder or perform any other service incidental to such air carriage. "Warsaw Convention" means the Convention for the unification of certain Rules relating to International carriage by air signed at Warsaw, 12th October, 1929 or that Convention as amended at the Hague, 28th September 1955, whichever may be applicable.

(2) Carriage hereunder is subject to the rules and limitations relating to liability established by Warsaw Convention unless such carriage is not "international carriage" as defined by that Convention.

(3) To extend not in conflict with the foregoing carriage and other services performed by each carrier are subject to:

(i) provisions contained in this ticket;

(ii) applicable tariffs;

(iii) carrier's condition of carriage and related regulations which are made part hereof (and are available on application at the offices of the carrier), except in transportation between a place in the United States or Canada and any place outside thereof to which tariffs in force in those countries apply.

(4) Carrier's name may be abbreviated in the ticket, the full name and its abbreviation being set forth in carrier's tariffs, conditions of carriage, regulation or timetables; carrier's address shall be the airport of departure shown opposite the first abbreviation of carrier's name in the ticket; the agreed stopping places are those places set forth in the ticket or as shown in carrier's timetables as scheduled stopping places on the passenger's route; carriage to be performed hereunder by several successive carriers is regarded as a single operation.

(5) An air carrier issuing a ticket for carriage over the lines of another air carrier does so only as its agent.

(6) Any exclusion or limitation of liability of carrier shall apply to and be for the benefit of agents, servants, and representatives of carrier and any person whose aircraft is used by carrier for carriage and its agents, servants and representatives.

(7) Checked baggage will be delivered to bearer of the baggage check. In case of damage to baggage moving in international transportation, complaint must be made in writing to the carrier forthwith after discovery of damage and, at the latest, within seven days from receipt; in case of delay, complaint must be made within 21 days from date the baggage was delivered. See tariffs or conditions of carriage regarding non-international transportation.

(8) This ticket is good for carriage for one year from the date of issue, except as otherwise provided in this ticket, in carrier's tariffs, conditions of carriage, or related regulations. The fare for carriage hereunder is subject to change prior to commencement of carriage. Carrier may refuse transportation if the applicable fare has not been paid.

(9) Carrier undertakes to use its best efforts to carry the passenger and baggage with reasonable dispatch. Times shown in timetables or elsewhere are not guaranteed and form no part of this contract. Carrier may, without notice, substitute alternate carriers or aircraft, and may alter or omit stopping places shown on the ticket in case of necessity. Schedules are subject to change without notice. Carrier assumes no responsibility for making connections.

(10) Passenger shall comply with Government travel requirements, present exit, entry and other documents and arrive at airport by time fixed by carrier or, if no time is fixed, early enough to complete departure procedures.

(11) No agent, servant or representative of carrier has authority to alter, modify or waive any provision of this contract.

APPENDIX TWO (B)

IATA CONDITIONS OF CONTRACT

(B) RESOLUTION 600b

Air Waybill - Conditions of Contract (Version I)

(1) As used in this contract, "Convention" means the Convention for the unification of certain rules relating to International carriage by air, signed at Warsaw, 12th October, 1929 or that Convention as amended by the Hague Protocol, 1955 whichever may be applicable to carriage hereunder; "air waybill" is equivalent to "air consignment note"; "shipper" is equivalent to "consignor"; "carriage" is equivalent to "transportation" and "Carrier" includes the air carrier issuing this air waybill and all carriers that carry the goods hereunder or perform any other services related to such air carriage. For the purposes of the exemption from and limitation of liability provisions set forth or referred to herein. "Carrier" includes agents, servants, or representatives of any such air carrier. Carriage to be performed hereunder by several successive carriers is regarded as a single operation.

(2) (a) Carriage hereunder is subject to the Rules relating to liability established by the Convention, unless such carriage is not "international carriage" as defined by the Convention. (See Carrier's tariffs and conditions of carriage for each definition.)

(b) To the extent not in conflict with the foregoing, carriage hereunder and other services performed by each carrier are subject to:

(i) applicable laws (including national laws implementing the Convention), government regulations, orders, and requirements;

(ii) provisions herein set forth; and,

(iii) applicable tariffs, rules, conditions of carriage regulations and timetables (but not the times of departure and arrival herein) of such carrier, which are made part hereof and which may be inspected at any of its offices and at airports from which it operates regular services.

(c) For the purpose of the Convention, the agreed stopping places (which may be altered by the Carrier in case of necessity) are those places, except the place of departure and the place of destination, set forth on the face hereof or shown in the Carrier's timetables as scheduled stopping places for the route.

(d) In the case of carriage subject to the Convention, the shipper acknowledges that he has been given an opportunity to make a special declaration of the value of goods at delivery and that the sum entered on the face of the air waybill as "Shipper's/Consignor's Declared Value-For-Carriage" if in excess of 250 French gold francs (consisting of

65½ milligrams of gold with a fineness of 900 thousandths) or their equivalent per kilogramme, constitutes such special declaration of value.

(3) Insofar as any provision contained or referred to in this air waybill may be contrary to mandatory law, government regulations, orders, or requirements such provision shall remain applicable to the extent that it is not overridden thereby. The invalidity of any provision shall not affect any other part thereof.

(4) Except as the Convention or other applicable law may otherwise require:

(a) Carrier is not liable to the shipper or any other person for any damage, delay or loss of whatsoever nature (hereinafter collectively referred to as "damage") arising out of or in connection with the carriage of the goods, unless such damage is proved to have been caused by the negligence or wilful fault of the Carrier and there has been no contributory negligence of the shipper, consignee of other claimant;

(b) Carrier is not liable for any damage directly or indirectly arising out of compliance with laws, government regulations, orders or requirements or from any cause beyond the Carrier's control;

(c) The changes for carriage have been based upon the value declared by shipper, it is agreed that any liability shall in no event exceed the shipper's declared value for carriage stated on the face hereof, and in the absence of such declaration by shippers liability of carrier shall not exceed 250 such French gold francs or their equivalent per kilogramme of goods destroyed, lost, damaged or delayed;
all claims shall be subject to proof of value;

(d) A carrier issuing an air waybill for carriage exclusively over the lines of others does so only as a sales agent.

(5) It is agreed that no time is fixed for the completion of carriage hereunder and that the Carrier may, without notice, substitute alternate carriers or aircraft. Carrier assumes no obligation to carry the goods by any specified aircraft or over any particular route or routes or to make connection at any point according to any particular schedule, and the Carrier is hereby authorised to select, or deviate from the route or routes of shipment, notwithstanding that the same may be stated on the face hereof. The shipper guarantees payment of all charges and advances.

(6) The goods, or packages said to contain the goods, described on the face hereof, are accepted for carriage from their receipt

at Carrier's terminal or airport office at the place of departure to the airport at the place of destination.
If so specifically agreed, the goods, or packages said to contain the goods, described on the face hereof, are also accepted for forwarding to the airport of departure and for reforwarding beyond the airport of destination. If such forwarding or reforwarding is by carriage operated by the Carrier, such carriage shall be upon the same terms as to liability as set forth in paragraphs 2 and 4 hereof.
In any other event, the issuing carrier and last carrier, respectively in forwarding or reforwarding the goods, shall do so only as agents of the shipper, owner, or consignee, as the case may be, and shall not be liable for any damage arising out of such additional carriage, unless proved to have been caused by its own negligence or wilful fault.
The shipper, owner and consignee hereby authorise such carriers to do all things deemed advisable to effect such forwarding or reforwarding, including, but without limitation, selection of the means of forwarding or reforwarding and the routes thereof (unless these have been herein specified by the shipper), execution and acceptance of documents of carriage (which may include provisions exempting or limiting liability) and consigning of goods with no declaration of value, notwithstanding any declaration of value in this air waybill.

(7) Carrier is authorised (but shall be under no obligation) to advance any duties, taxes or charges and to make any disbursements with respect to the goods, and the shipper, owner and consignee shall be jointly and severally liable for the reimbursement thereof.
No Carrier shall be under obligation to incur any expense or to make any advance in connection with the forwarding or reforwarding of the goods except against repayment by the shipper.

If it is necessary to make customs entry of the goods at any place, the goods shall be deemed to be consigned at such place to the person named on the face hereof as customs consignee, or if no such person be named, to the carrier carrying the goods to such place or to such customs consignee, if any, as such carrier may designate.

(8) At the request of the shipper, and if the appropriate premium is paid and the fact recorded on the face hereof, the goods covered by the air waybill are insured on behalf of the shipper under an open policy for the amount requested by the shipper as set out on the face hereof (recovery being limited to the actual loss or damage from any external cause whatsoever, except those arising directly or indirectly from war risks, strikes, riots, hostilities, legal seizure or delay or inherent vice and subject to the terms and conditions of such open policy which is available for inspection by the shipper. Claims under such policy must be reported immediately to an office of the Carrier.

(9) Except as otherwise specifically provided in this contract, delivery of the goods will be made only to the consignee named on the face hereof, unless such consignee is one of the Carriers participating in the carriage, in which event delivery shall be made to the person indicated on the face hereof as the person to be notified. Notice of arrival of the goods will, in the absence of other instructions, be sent to the consignee, or the person to be notified, by ordinary methods; Carrier is not liable for non-receipt or delay in receipt of such notice.

(10) (a) No action shall be maintained in the case of damage to goods unless a written notice, sufficiently describing the goods concerned, the approximate date of the damage, and the details of the claim, is presented to the office of the Carrier within seven days from the date of receipt thereof, in the case of delay, unless presented within 14 days from the date the goods are placed at the disposal of the person entitled to delivery, and in the case of loss (including non-delivery) unless presented within 120 days from the date of issue of the air waybill.

(b) Any rights to damages against the Carrier shall be extinguished unless an action is brought within two years after the occurrence of the events giving rise to the claim.

(11) The shipper shall comply with all applicable laws, customs and other government regulations of any country to, from, through or over which the goods may be carried, including those relating to the package, carriage or delivery of the goods, and shall furnish such information and attach such documents to this air waybill as may be necessary to comply with such laws and regulations. Carrier is not liable to the shipper or any other person for loss or expense due to shipper's failure to comply with this provision.

(12) No agent, servant or representative of the Carrier has authority to alter, modify or waive any provision of this contract.

APPENDIX THREE

JET AIRLINERS IN SERVICE
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Aircraft in Service								
	1958	1959	1960	1961	1962	1963	1964	1965	1966
1st Generation:									
- Aero.Caravelle	-	18	56	93	128	146	168	185	201
- Boeing 707/720	8	80	171	247	309	341	376	435	517
- Convair 880/990	-	-	14	50	81	95	100	98	97
- Douglas DC-8	-	21	111	149	169	188	207	236	264
- H.S.Comet	5	23	42	54	60	59	60	60	60
Sub-total	13	142	394	593	747	829	911	1014	1139
2nd Generation:									
- BAC One-Eleven						-	-	34	79
- BAC VC-10/Super VC-10						-	13	24	27
- Boeing 727						6	101	209	343
- Boeing 737						-	-	-	-
- Douglas DC-9						-	-	5	73
- H.S.Trident						1	12	22	31
Sub-total						7	126	294	553
W.B.Generation:									
- Airbus A.300									
- Boeing 747									
- Douglas DC-10									
- Lockheed L.1011 Tristar									
Sub-total									
N.T. Generation:									
- Airbus A.310									
- Boeing 757									
- Boeing 767									
Sub-total									
Others:									
- BAC/Aero Concorde									
- BAe 146									
- Dassault Mercure									
- Fokker F.28									
- VFW 614									
Sub-total									
TOTAL (All types)	13	142	394	593	747	836	1037	1308	1692

/continued

JET AIRLINERS IN SERVICE
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Aircraft in Service								
	1967	1968	1969	1970	1971	1972	1973	1974	1975
1st Generation:									
-Aero Caravelle	219	231	238	246	215	246	232	216	210
-Boeing 707/720	632	731	785	797	797	797	799	807	804
-Convair 880/990	95	92	91	88	88	85	83	83	79
-Douglas DC-8	302	401	483	509	522	520	515	511	509
-H.S.Comet	58	55	54	49	48	41	36	29	30
Sub-total	1306	1510	1651	1689	1700	1689	1665	1646	1632
2nd Generation:									
-BAC One-Eleven	98	121	158	179	189	196	197	198	197
-BAC VC-10/Super VC-10	31	36	37	37	37	35	34	33	33
-Boeing 727	496	656	764	817	848	889	979	1067	1152
-Boeing 737	2	109	223	259	288	311	326	367	417
-Douglas DC-9	225	419	534	582	626	644	659	702	736
-H.S.Trident	32	42	50	52	64	74	81	82	86
Sub-total	884	1383	1766	1926	2052	2149	2276	2449	2621
W.B.Generation:									
-Airbus A.300	-	-	-	-	-	5	14		
-Boeing 747	4	95	164	194	221	241	248		
-Douglas DC-10	-	-	13	65	121	167	209		
-Lockheed L.1011 Tristar	-	-	-	16	55	95	120		
Sub-total	4	95	177	275	397	508	591		
N.T.Generation:									
-Airbus									
-Boeing 757									
-Boeing 767									
Sub-total									
Others:									
-BAC/Aero Concorde	-	-	-	-	-	-	1		
-BAe 146	-	-	-	-	-	-	-		
-Dassault Mercure	-	-	-	-	-	6	10		
-Fokker F.28	11	24	38	49	66	71	75		
-VFW 614	-	-	-	-	-	-	1		
Sub-total	11	24	38	49	66	77	87		
TOTAL (All Types)	2190	2893	3432	3734	3967	4162	4404	4680	4931

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JET AIRLINERS IN SERVICES
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Aircraft in Service							
	1976	1977	1978	1979	1980	1981	1982	1983
1st Generation:								
-Aero Caravelle	197	188	179	173	152	135	120	118
-Boeing 707/720	768	757	750	738	715	676	606	541
-Convair 880/990	76	75	65	65	61	60	60	58
-Douglas DC-8	501	482	462	460	450	440	432	424
-H.S.Comet	26	20	14	9	7	3	3	3
Sub-total	1568	1522	1470	1445	1385	1314	1221	1144
2nd Generation:								
-BAC One-Eleven	197	202	203	203	207	207	209	210
-BAC VC-10/SuperVC10	30	30	21	20	19	4	3	2
-Boeing 727	1208	1272	1388	1521	1647	1731	1743	1753
-Boeing 737	455	479	515	591	681	784	875	949
-Douglas DC-9	778	799	819	856	874	946	984	1025
-H.S.Trident	85	93	98	98	98	92	77	69
Sub-total	2753	2875	3044	3289	3526	3764	3891	4008
W.B.Generation:								
-Airbus A.300	27	43	59	83	121	158	203	221
-Boeing 747	279	295	324	391	466	519	545	565
-Douglas DC-10	227	241	258	290	331	350	353	355
-Lockheed L.1011 Tristar	136	147	155	169	192	220	234	240
Sub-total	669	726	796	933	1110	1247	1335	1381
N.T.Generation:								
-Airbus A.310							-	17
-Boeing 757							2	27
-Boeing 767							20	75
Sub-total							22	119
Others:								
-BAC/Aero Concorde	8	10	11	11	14	14	14	14
-BAe 146	-	-	-	-	-	-	-	8
-Dassault Mercure	10	10	10	10	10	10	10	10
-Fokker F.28	93	104	114	120	133	143	152	166
-VFW 614	6	9	10	10	4	2	2	2
Sub-total	117	133	145	151	161	169	178	200
TOTAL (All Types)	5107	5256	5455	5818	6182	6494	6647	6852

APPENDIX FOUR

JET AIRLINERS AIRCRAFT YEARS
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Aircraft Years (Age) (Hundreds)								
	1958	1959	1960	1961	1962	1963	1964	1965	1966
1st Generation:									
-Aero Caravelle	-	0.068	0.383	0.751	1.152	1.404	1.597	1.773	1.960
-Boeing 707/720	0.013	0.389	1.284	2.077	2.859	3.264	3.608	4.080	4.788
-Convair 880/990	-	-	0.052	0.347	0.712	0.909	0.976	1.000	0.980
-Douglas DC-8	-	0.048	0.654	1.368	1.610	1.786	1.986	2.196	2.541
-H.S.Comet	0.009	0.136	0.340	0.506	0.574	0.610	0.608	0.600	0.600
Sub-total	0.022	0.641	2.713	5.049	6.907	7.973	8.775	9.640	10.869
2nd Generation:									
-BAC One-Eleven						-	-	0.139	0.583
-BAC VC10/Super VC10						-	0.052	0.197	0.253
-Boeing 727						0.009	0.516	1.542	2.768
-Boeing 737						-	-	-	-
-Douglas DC-9						-	-	0.006	0.319
-H.S.Trident						0	0.065	0.177	0.276
Sub-total						0.009	0.633	2.061	4.229
W.B.Generation:									
-Airbus A.300									
-Boeing 747									
-Douglas DC-10									
-Lockheed L.1011 Tristar									
Sub-total									
N.T.Generation:									
-Airbus A.310									
-Boeing 757									
-Boeing 767									
Sub-total									
Others:									
-BAC/Aero Concorde									
-BAe 146									
-Dassault Mercure									
-Fokker F.28									
-VFW 614									
Sub-total									
TOTAL (All Types)	0.022	0.641	2.713	5.049	6.907	7.982	9.408	11.710	15.098

JET AIRLINERS AIRCRAFT YEARS
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Aircraft Years (Age) (Hundreds)								
	1967	1968	1969	1970	1971	1972	1973	1974	1975
1st Generation:									
-Aero Caravelle	2.113	2.290	2.349	2.448	2.478	2.465	2.456	2.275	2.152
-Boeing 707/720	5.703	6.907	7.653	7.940	8.017	7.989	8.012	8.064	8.083
-Convair 880/990	0.970	0.950	0.920	0.910	0.880	0.880	0.850	0.830	0.808
-Douglas DC-8	2.783	3.527	4.454	5.033	5.173	5.248	5.198	5.145	5.106
-H.S.Comet	0.592	0.580	0.540	0.530	0.490	0.434	0.375	0.316	0.277
Sub-total	12.161	14.254	15.916	16.861	17.038	17.016	16.891	16.630	16.426
2nd Generation:									
-BAC One-Eleven	0.888	1.064	1.414	1.723	1.857	1.932	1.970	1.979	1.980
-BAC VC10/Super VC10	0.293	0.346	0.373	0.378	0.370	0.370	0.341	0.340	0.330
-Boeing 727	4.183	5.835	7.166	7.907	8.404	8.697	9.348	10.272	11.122
-Boeing 737	0	0.417	1.728	2.456	2.738	2.982	3.180	3.422	3.913
-Douglas DC-9	1.328	3.279	4.883	5.651	6.053	6.375	6.561	6.820	7.182
-H.S.Trident	0.319	0.373	0.476	0.512	0.585	0.704	0.784	0.824	0.878
Sub-total	7.011	11.314	16.040	18.627	20.007	21.060	22.184	23.657	25.435
W.B.Generation:									
-Airbus A.300	-	-	-	-	-	0.018	0.088		
-Boeing 747	0.001	0.488	1.326	1.841	2.071	2.312	2.466		
-Douglas DC-10	-	-	0.022	0.358	0.987	1.490	1.918		
-Lockheed L.1011 Tristar	-	-	-	0.059	0.327	0.752	1.080		
Sub-total	0.001	0.488	1.348	2.258	3.385	4.572	5.582		
N.T.Generation:									
-Airbus A.310									
-Boeing 757									
-Boeing 767									
Sub-total									
Others:									
-BAC/Aero Concorde	-	-	-	-	-	-	0		
-BAe 146	-	-	-	-	-	-	-		
-Dassault Mercure	-	-	-	-	-	0.023	0.086		
-Fokker F.28	0.062	0.172	0.301	0.458	0.595	0.691	0.761		
-VFW 614	-	-	-	-	-	-	0.003		
Sub-total	0.062	0.172	0.301	0.458	0.575	0.718	0.850		
TOTAL (All Types)	19.172	25.568	32.019	36.148	38.694	40.792	43.055	45.577	48.293

JET AIRLINERS AIRCRAFT YEARS
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Aircraft Years (Age) (Hundreds)							
	1976	1977	1978	1979	1980	1981	1982	1983
1st Generation:								
-Aero Caravelle	2.028	1.935	1.845	1.769	1.679	1.439	1.305	1.200
-Boeing 707/720	7.935	7.664	7.540	7.483	7.324	6.999	6.427	5.692
-Convair 880/990	0.787	0.760	0.700	0.650	0.645	0.610	0.600	0.593
-Douglas DC-8	5.053	4.954	4.702	4.620	4.558	4.411	4.370	4.277
-H.S.Comet	0.295	0.241	0.182	0.129	0.085	0.048	0.030	0.030
Sub-total	16.098	15.554	14.969	14.651	14.291	13.507	12.732	11.792
2nd Generation:								
-BAC One-Eleven	1.968	2.002	2.038	2.030	2.048	2.072	2.078	2.095
-BAC VC10/Super VC10	0.321	0.300	0.277	0.208	0.193	0.085	0.037	0.030
-Boeing 727	11.738	12.398	13.238	14.551	15.872	16.961	17.391	17.505
-Boeing 737	4.363	4.665	4.956	5.512	6.371	7.346	8.346	9.194
-Douglas DC-9	7.580	7.862	8.078	8.367	8.677	9.051	9.678	10.040
-H.S.Trident	0.852	0.897	0.961	0.980	0.980	0.945	0.840	0.740
Sub-total	26.822	28.124	29.548	31.648	34.141	36.450	38.370	39.604
W.B.Generation:								
-Airbus A.300	0.197	0.342	0.517	0.696	1.022	1.398	1.815	2.120
-Boeing 747	2.628	2.884	3.077	3.553	4.280	4.949	5.338	5.553
-Douglas DC-10	2.184	2.332	2.488	2.762	3.130	3.418	3.537	3.566
-Lockheed L.1011 Tristar	1.304	1.409	1.498	1.621	1.798	2.038	2.278	2.342
Sub-total	6.313	6.967	7.580	8.632	10.230	11.803	12.968	13.581
N.T.Generation:								
-Airbus A.310							-	0.083
-Boeing 757								0.155
-Boeing 767							0.026	0.518
Sub-total							0.026	0.756
Others:								
-BAC/Aero Concorde	0.053	0.092	0.103	0.110	0.126	0.140	0.140	0.140
-BAE 146	-	-	-	-	-	-	-	0.023
-Dassault Mercure	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
-Fokker F.28	0.825	0.989	1.107	1.194	1.259	1.378	1.467	1.601
-VFW 614	0.042	0.075	0.095	0.100	0.083	0.022	0.020	0.020
Sub-total	1.020	1.256	1.405	1.504	1.568	1.640	1.727	1.881
TOTAL (All Types)	50.253	51.901	53.502	56.435	60.230	63.400	65.823	67.617

APPENDIX FIVE

JET AIRLINERS FLYING HOURS
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Flying Hours (Millions)								
	1958	1959	1960	1961	1962	1963	1964	1965	1966
1st Generation:									
-Aero Caravelle	0.001	0.011	0.068	0.150	0.200	0.270	0.320	0.390	0.400
-Boeing 707/720	0.002	0.118	0.330	0.719	0.825	1.049	1.222	1.440	1.663
-Convair 880/990	-	-	0.009	0.087	0.167	0.219	0.249	0.263	0.273
-Douglas DC-8	-	0.007	0.176	0.409	0.518	0.603	0.678	0.773	0.877
-H.S.Comet	0.002	0.038	0.096	0.141	0.156	0.159	0.167	0.183	0.103
Sub-total	0.005	0.174	0.679	1.506	1.866	2.300	2.636	3.049	3.316
2nd Generation:									
-BAC One-Eleven						-	0.001	0.038	0.129
-BAC VC10/Super VC10						0.002	0.019	0.061	0.090
-Boeing 727						0.002	0.122	0.402	0.708
-Boeing 737						-	-	-	-
-Douglas DC-9						-	-	0.001	0.091
-H.S.Trident						0.002	0.007	0.026	0.053
Sub-total						0.006	0.149	0.528	1.071
W.B.Generation:									
-Airbus A.300									
-Boeing 747									
-Douglas DC 10									
-Lockheed L.1011 Tristar									
Sub-total									
N.T.Generation:									
-Airbus A.310									
-Boeing 757									
-Boeing 767									
Sub-total									
Others:									
-BAC/Aero Concorde									
-BAe 146									
-Dassault Mercure									
-Fokker F.28									
-VFW 614									
Sub-total									
TOTAL (All Types)	0.005	0.174	0.679	1.506	1.866	2.306	2.785	3.577	4.390

JET AIRLINERS FLYING HOURS
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Flying Hours (Millions)								
	1967	1968	1969	1970	1971	1972	1973	1974	1975
1st Generation:									
-Aero Caravelle	0.470	0.500	0.484	0.495	0.466	0.478	0.448	0.384	0.273
-Boeing 707/720	2.070	2.474	2.641	2.475	2.361	2.383	2.175	2.073	2.013
-Convair 880/990	0.269	0.250	0.229	0.218	0.188	0.167	0.154	0.055	0.028
-Douglas DC-8	1.052	1.299	1.581	1.714	1.697	1.684	1.607	1.381	1.248
-B.S.Comet	0.119	0.140	0.069	0.076	0.080	0.054	0.042	0.029	0.024
Sub total	3.980	4.663	5.004	4.978	4.792	4.766	4.426	3.922	3.586
2nd Generation:									
-BAC One-Eleven	0.205	0.236	0.320	0.364	0.375	0.376	0.389	0.376	0.366
-BAC VC10/Super VC10	0.105	0.124	0.141	0.151	0.149	0.128	0.131	0.109	0.089
-Boeing 727	1.189	1.634	1.974	2.013	2.163	2.286	2.468	2.574	2.713
-Boeing 737	0.002	0.080	0.351	0.518	0.571	0.663	0.733	0.793	0.871
-Douglas DC-9	0.340	0.800	1.193	1.461	1.469	1.593	1.619	1.663	1.704
-H.S.Trident	0.062	0.081	0.104	0.115	0.126	0.128	0.148	0.134	0.113
Sub-total	1.903	2.955	4.083	4.622	4.853	5.174	5.518	5.654	5.856
W.B.Generation:									
-Airbus A.300			-	-	-	-	-	0.002	0.019
-Boeing 747			0.002	0.140	0.421	0.619	0.707	0.743	0.742
-Douglas DC-10			-	-	0.006	0.103	0.298	0.439	0.599
-Lockheed L.1011 Tristar			-	-	-	0.015	0.076	0.166	0.241
Sub-total	0.002	0140	0.427	0.737	1.081	1.350	1.601		
N.T.Generation:									
-Airbus A.310									
-Boeing 757									
-Boeing 767									-
Sub-total									
Others:									
-BAC/Aero Concorde			-	-	-	-	-	0.001	0.002
-BAe 146			-	-	-	-	-	-	-
-Dassault Mercure			-	-	-	-	-	0.003	0.013
-Fokker F.28			0.012	0.035	0.063	0.081	0.113	0.119	0.136
-VFW 614			-	-	-	-	-		0.002
Sub-total			0.012	0.035	0.063	0.081	0.113	0.123	0.153
TOTAL (All Types)	5.883	7.618	9.101	9.775	10.135	10.758	11.139	11.049	11.196

JET AIRLINERS FLYING HOURS
(ALL TYPES)

(IATA and NON-IATA OPERATORS 1958-1983)

Aircraft Type	Flying Hours (Millions)							
	1976	1977	1978	1979	1980	1981	1982	1983
1st Generation:								
-Aero Caravelle	0.261	0.219	0.236	0.235	0.173	0.117	0.096	0.083
-Boeing 707/720	1.918	1.803	1.724	1.637	1.298	0.890	0.672	0.415
-Convair 880/990	0.024	0.026	0.026	0.023	0.015	0.012	0.007	0.005
-Douglas DC-8	1.178	1.168	1.154	1.050	0.821	0.637	0.557	0.512
-H.S.Comet	0.021	0.022	0.017	0.009	0.003	0	0	0
Sub total	3.402	3.238	3.157	2.954	2.310	1.656	1.332	1.015
2nd Generation:								
-BAC One-Eleven	0.367	0.367	0.373	0.374	0.338	0.286	0.304	0.296
-BAC VC10/Super VC10	0.086	0.072	0.055	0.050	0.019	0.002	0	0
-Boeing 727	2.945	3.200	3.517	3.904	4.098	4.031	3.877	3.712
-Boeing 737	1.040	1.061	1.188	1.340	1.525	1.744	1.969	2.230
-Douglas DC-9	1.808	1.883	1.994	2.043	2.072	2.068	2.181	2.320
-H.S.Trident	0.104	0.099	0.110	0.116	0.107	0.093	0.085	0.059
Sub-total	6.350	6.682	7.237	7.827	8.159	8.224	8.416	8.617
W.B.Generation:								
-Airbus A.300	0.032	0.066	0.113	0.155	0.234	0.320	0.390	0.438
-Boeing 747	0.873	1.055	1.168	1.321	1.504	1.647	1.792	1.911
-Douglas DC-10	0.705	0.791	0.859	0.859	1.039	1.071	1.042	1.044
-Lockheed L.1011 Tristar	0.306	0.355	0.398	0.471	0.529	0..574	0.634	0.616
Sub total	1.916	2.270	2.538	2.806	3.306	3.612	3.858	4.039
N.T.Generation:								
-Airbus A.310								0.011
-Boeing 757							0.002	0.030
-Boeing 767							0.009	0.950
Sub-total							0.011	0.991
Others:								
-BAC/Aero Concorde	0.001	0.006	0.012	0.014	0.014	0.011	0.011	0.011
-BAe 146	-	-	-	-	-	-	0.002	0.006
-Dassault Mercure	0.018	0.018	0.019	0.019	0.021	0.021	0.021	0.021
-Fokker F.28	0.141	0.158	0.189	0.201	0.209	0.233	0.239	0.245
-VFW 614	0.005	0.005	0.005	0.004	0.002	0	0	0
Sub-total	0.168	0.187	0.225	0.238	0.246	0.265	0.273	0.283
TOTAL (All Types)	11.836	12.377	13.157	13.825	14.021	13.757	13.890	14.948

APPENDIX SIX

TEXT OF POLICY AND CLAUSES

(A) LLOYD'S AIRCRAFT POLICY (AVN 1A)

Lloyd's Aircraft Policy

Whereas the Insured named in the attached Schedule has paid the premium specified in the Schedule to the Underwriting Members of Lloyd's who have hereunto subscribed their Names (hereinafter called "the Underwriters"),

Now We the Underwriters hereby agree to insure against loss, damage or liability arising from an Accident occurring during the Period of Insurance to the extent and in the manner hereinafter provided.

Now know Ye that We the Underwriters, Members of the Syndicates whose definitive numbers in the after-mentioned List of Underwriting Members of Lloyd's are set out in the attached Table, hereby bind ourselves each for his own part and not one for another, our Heirs, Executors and Administrators and in respect of his due proportion only, to pay or make good to the Insured or to the Insured's Executors or Administrators or to indemnify him or them against all such loss, damage or liability as herein provided, after such loss, damage or liability is proved and the due proportion for which each of Us, the Underwriters, is liable shall be ascertained by reference to his share, as shown in the said List, of the Amount, Percentage or Proportion of the total sum insured hereunder which is in the Table set opposite the definitive number of the Syndicate of which such Underwriter is a Member AND FURTHER THAT the List of Underwriting Members of Lloyd's referred to above shows their respective Syndicates and Shares therein, is deemed to be incorporated in and to form part of this Policy, bears the number specified in the attached Table and is available for inspection at Lloyd's Policy Signing Office by the Insured or his or their representatives and a true copy of the material parts of the said List certified by the General Manager of Lloyd's Policy Signing Office will be furnished to the Insured on application.

In Witness whereof the General Manager of Lloyd's Policy Signing Office has subscribed his Name on behalf of each of Us.

LLOYD'S POLICY SIGNING OFFICE
General Manager

FOR EMBOSSMENT BY • LLOYD'S POLICY SIGNING OFFICE •

AVN. 1A 14.11.73
Form approved by Lloyd's Aviation Underwriters' Association.

SECTION I LOSS OF OR DAMAGE TO AIRCRAFT

Coverage

1. (*a*) The Underwriters will at their option pay for, replace or repair, accidental loss of or damage to the Aircraft described in the Schedule arising from the risks covered, including disappearance if the aircraft is unreported for sixty days after the commencement of flight, but not exceeding the amount insured as shown therein and subject to the amounts to be deducted shown below.

(*b*) If the Aircraft is insured hereby for the risks of Flight, the Underwriters will, in addition, pay reasonable emergency expenses necessarily incurred by the Insured for the immediate safety of the Aircraft consequent upon damage or forced landing, *up to 10 per cent. of the amount specified in Part 2(5) of the Schedule.*

Exclusions applicable to this Section only

2. The Underwriters shall not be liable for

Wear and tear, breakdown

(*a*) wear and tear, deterioration, breakdown, defect or failure howsoever caused in any Unit (hereinafter defined) of the Aircraft and the consequences thereof within such Unit.

(*b*) damage to any Unit by anything which has a progressive or cumulative effect but damage attributable to a single recorded incident is covered under paragraph 1 (*a*) above.

HOWEVER accidental loss of or damage to the Aircraft consequent upon 2 (*a*) or (*b*) above is covered under paragraph 1 (*a*) hereof.

Conditions applicable to this Section only

3. (*i*) *If the Aircraft is damaged*

Dismantling Transport and Repairs

(*a*) no dismantling or repairs shall be commenced without the consent of the Underwriters except whatever is necessary in the interests of safety, or to prevent further damage, or to comply with orders issued by the appropriate authority.

Payment or Replacement

(*b*) The Underwriters will pay only for repairs and transport of labour and materials by the most economical method unless the Underwriters agree otherwise with the Insured.

(ii) If the Underwriters exercise their option to pay for or replace the Aircraft

(*a*) The Underwriters may take the Aircraft (together with all documents of record, registration and title thereto) as salvage

(*b*) the cover afforded by this Section is terminated in respect of the Aircraft even if the Aircraft is retained by the Insured for valuable consideration or otherwise

(*c*) the replacement aircraft shall be of the same make and type and in reasonably like condition unless otherwise agreed with the Insured.

Amounts to be deducted from claim

(iii) Except where the Underwriters exercise their option to pay for or replace the aircraft, there shall be deducted from the claim under paragraph 1 (*a*) of this Section:—

(*a*) the amount specified in Part 6 (B) of the Schedule and

(*b*) such proportion of the Overhaul Cost (hereinafter defined) of any Unit repaired or replaced as the used time bears to the Overhaul Life (hereinafter defined) of the Unit

No Abandonment

(iv) Unless the Underwriters elect to take the Aircraft as salvage the Aircraft shall at all times remain the property of the Insured who shall have no right of abandonment to the Underwriters.

Other Insurance

(v) No claim shall be payable under this Section if other Insurance which is payable in consequence of loss or damage covered under this Section has been or shall be effected by or on behalf of the Insured without the knowledge or consent of the Underwriters.

See also Section IV

SECTION II LEGAL LIABILITY TO THIRD PARTIES (OTHER THAN PASSENGERS)

Coverage

1. The Underwriters will indemnify the Insured for all sums which the Insured shall become legally liable to pay, and shall pay, as compensatory damages (including costs awarded against the Insured) in respect of accidental bodily injury (fatal or otherwise)

Headings and marginal captions are inserted for the purpose of convenient reference only and are not to be deemed part of this insurance.

and accidental damage to property caused by the Aircraft or by any person or object falling therefrom.

Exclusions applicable to this Section only

Employees and others

2. The Underwriters shall not be liable for claims arising from

(i) injury (fatal or otherwise) or loss sustained by any director or employee of the Insured or partner in the Insured's business whilst acting in the course of his employment with or duties for the Insured.

Operational Crew

(ii) injury (fatal or otherwise) or loss sustained by any member of the flight, cabin or other crew whilst engaged in the operation of the Aircraft.

Passengers

(iii) injury (fatal or otherwise) or loss sustained by any passenger whilst entering, on board, or alighting from the Aircraft.

Property

(iv) loss of or damage to any property belonging to or in the care, custody or control of the Insured.

Noise and Pollution and Other Perils

3. The Underwriters shall not be liable for claims directly or indirectly occasioned by happening through or in consequence of:—

(*a*) noise (whether audible to the human ear or not), vibration, sonic boom and any phenomena associated therewith,

(*b*) pollution and contamination of any kind whatsoever,

(*c*) electrical and electromagnetic interference,

(*d*) interference with the use of property;

unless caused by or resulting in a crash fire explosion or collision or a recorded in-flight emergency causing abnormal aircraft operation.

Nothing in this paragraph shall override exclusion 9 of Section IV (A).

Limits of indemnity applicable to this Section

4. The liability of the Underwriters under this Section shall not exceed the amounts stated in Part 6 II (C) of the Schedule, less any amounts under Part 6 II (B). The Underwriters will defray in addition any legal costs and expenses incurred with their written consent in defending any action which may be brought against the Insured in respect of any claim for compensatory damages covered by this Section, but should the amount paid or awarded in settlement of such claim exceed the limit of indemnity then the liability of the Underwriters in respect of such legal costs and expenses shall be limited to such proportion of the said legal costs and expenses as the limit of indemnity bears to the amount paid for compensatory damages.

See also Section IV

SECTION III LEGAL LIABILITY TO PASSENGERS

Coverage

1. The Underwriters will indemnify the Insured in respect of all sums which the Insured shall become legally liable to pay, and shall pay, as compensatory damages (including costs awarded against the Insured) in respect of

(*a*) accidental bodily injury (fatal or otherwise) to passengers whilst entering, on board, or alighting from the Aircraft and

(*b*) loss of or damage to baggage and personal articles of passengers arising out of an accident to the Aircraft.

Provided Always that

Documentary Precautions

(i) before a passenger boards the Aircraft the Insured shall take such measures as are necessary to exclude or limit liability for claims under (*a*) and (*b*) above to the extent permitted by law

(ii) If the measures referred to in proviso (i) above include the issue of a Passenger Ticket/Baggage Check, the same shall be delivered correctly completed to the passenger a reasonable time before the passenger boards the aircraft.

Effect of Non-Compliance

In the event of failure to comply with proviso (i) or (ii) the limit of indemnity by the Underwriters under this section shall not exceed the amount of the legal liability, if any, that would have existed had the proviso been complied with.

Exclusions applicable to this Section only

Employees and others

2. The Underwriters shall not be liable for injury or loss sustained by any

(i) director or employee of the Insured or partner in the Insured's business whilst acting in the course of his employment with or duties for the Insured.

Operational Crew

(ii) member of the flight, cabin, or other crew whilst engaged in the operation of the Aircraft.

Limits of indemnity applicable to this Section

3. The liability of the Underwriters under this Section shall not exceed the amount stated in Part 6 III (C) of the Schedule, less any amounts under Part 6 III (B). The Underwriters will defray in addition any legal costs and expenses incurred with their written consent in defending any action which may be brought against the Insured in respect of any claim for compensatory damages covered by this Section, but should the amount paid or awarded in settlement of such claim exceed the limit of indemnity then the liability of the Underwriters in respect of such legal costs and expenses shall be limited to such proportion of the said legal costs and expenses as the limit of indemnity bears to the amount paid for compensatory damages.

See also Section IV

SECTION IV (A) GENERAL EXCLUSIONS APPLICABLE TO ALL SECTIONS

This policy does not apply:—

Illegal Uses

1. Whilst the Aircraft is being used for any illegal purpose or for any purpose other than those stated in the Schedule and as defined in the Definitions.

Geographical Limits

2. Whilst the Aircraft is outside the geographical limits stated in the Schedule unless due to force majeure.

Pilots

3. Whilst the Aircraft is being piloted by any person other than as stated in the Schedule except that the Aircraft may be operated on the ground by any person competent for that purpose.

Transportation by other Conveyance

4. Whilst the Aircraft is being transported by any means of conveyance except as the result of an accident giving rise to a claim under Section I of this Policy.

Landing and Take-off Areas

5. Whilst the Aircraft is landing on or taking off or attempting to do so from a place which does not comply with the recommendations laid down by the manufacturer of the Aircraft except as a result of force majeure.

Contractual Liability

6. To liability assumed or rights waived by the Insured under any agreement (other than passenger ticket/baggage check issued under Section III hereof) except to the extent that such liability would have attached to the Insured in the absence of such agreement.

Number of Passengers

7. Whilst the total number of passengers being carried in the Aircraft exceeds the declared maximum number of passengers stated in the Schedule.

Non-Contribution

8. To claims which are payable under any other policy or policies except in respect of any excess beyond the amount which would have been payable under such other policy or policies had this insurance not been effected.

Radioactivity

9. To loss, damage or liability directly or indirectly caused by or contributed to by or arising from ionising radiations or contamination by radioactivity.

War, Hijacking and Other Perils

10. To claims caused by

(*a*) War, invasion, acts of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection, martial law, military or usurped power or attempts at usurpation of power.

(*b*) Any hostile detonation of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.

(*c*) Strikes, riots, civil commotions or labour disturbances.

(*d*) Any act of one or more persons, whether or not agents of a sovereign Power, for political or terrorist purposes and whether the loss or damage resulting therefrom is accidental or intentional.

(*e*) Any malicious act or act of sabotage.

(*f*) Confiscation, nationalisation, seizure, restraint, detention, appropriation, requisition for title or use by or under the order of any Government (whether civil military or de facto) or public or local authority.

(g) Hijacking or any unlawful seizure or wrongful exercise of control of the Aircraft or crew in flight (including any attempt at such seizure or control) made by any person or persons on board the aircraft acting without the consent of the Insured.

Furthermore this policy does not cover claims arising whilst the Aircraft is outside the control of the Insured by reason of any of the above perils.

The Aircraft shall be deemed to have been restored to the control of the Insured on the safe return of the Aircraft to the Insured at an airfield not excluded by the geographical limits of this Policy, and entirely suitable for the operation of the Aircraft (such safe return shall require that the Aircraft be parked with engines shut down and under no duress).

(B) GENERAL CONDITIONS APPLICABLE TO ALL SECTIONS

1. The due observance and fulfilment of the terms conditions and endorsements of this policy shall be a condition precedent to any liability of the Underwriters to make any payment under this policy.

Due Diligence

2. The Insured shall at all times use due diligence and do and concur in doing everything reasonably practicable to avoid or diminish any loss hereon.

Compliance with Air Navigation Orders, etc.

3. The Insured shall comply with all air navigation and airworthiness orders and requirements issued by any competent authority affecting the safe operation of the Aircraft and shall ensure that

(a) the aircraft is airworthy at the commencement of each flight

(b) all Log Books and other records in connection with the Aircraft which are required by any official regulations in force from time to time shall be kept up to date and shall be produced to the Underwriters or their Agents on request

(c) the employees and agents of the Insured comply with such orders and requirements.

Claims Procedure

4. Immediate notice of any event likely to give rise to a claim under this Policy shall be given as stated in Part 8 of the Schedule. In all cases the Insured shall

(a) furnish full particulars in writing of such event and forward immediately notice of any claim (by a Third Party or Passenger) with any letters or documents relating thereto

(b) give notice of any impending prosecution

(c) render such further information and assistance as the Underwriters may reasonably require

(d) not act in any way to the detriment or prejudice of the interest of the Underwriters.

The Insured shall not make any admission of liability or payment or offer or promise of payment without the written consent of the Underwriters.

5. The Underwriters shall be entitled (if they so elect) at any time and for so long as they desire to take absolute control of all negotiations and proceedings and in the name of the Insured to settle, defend or pursue any claim.

Subrogation

6. Upon an indemnity being given or a payment being made by the Underwriters under this Policy, they shall be subrogated to the rights and remedies of the Insured who shall co-operate with and do all things necessary to assist the Underwriters to exercise such rights and remedies.

Variation in Risk

7. Should there be any change in the circumstances or nature of the risks which are the basis of this contract the Insured shall give immediate notice thereof to the Underwriters and no claim arising subsequent to such change shall be recoverable hereunder unless such change has been accepted by the Underwriters.

Cancellation

8. This Policy may be cancelled by either the Underwriters or the Insured giving 10 days notice in writing of such cancellation. If cancelled by the Underwriters, they will return a pro rata portion of the premium in respect of the unexpired period of the Policy. If cancelled by the Insured a return of premium shall be at the discretion of the Underwriters. There will be no return of premium in respect of any Aircraft on which a loss is paid or is payable under this Policy.

Assignment

9. This Policy shall not be assigned in whole or in part except with the consent of the Underwriters verified by endorsement hereon.

Not Marine Insurance

10. This Policy is not and the parties hereto expressly agree that it shall not be construed as a Policy of marine insurance.

Arbitration

11. This Policy shall be construed in accordance with English Law and any dispute or difference between the Insured and the Underwriters shall be submitted to arbitration in London in accordance with the Statutory provision for arbitration for the time being in force.

Two or More Aircraft

12. When two or more aircraft are insured hereunder the terms of this policy apply separately to each.

Limits of Indemnity

13. Notwithstanding the inclusion herein of more than one Insured, whether by endorsement or otherwise, the total liability of the Underwriters in respect of any or all Insureds shall not exceed the limit(s) of indemnity stated in this Policy.

False and Fraudulent Claims

14. If the Insured shall make any claim knowing the same to be false or fraudulent as regards amount or otherwise this Policy shall become void and all claims hereunder shall be forfeited.

(C) DEFINITIONS

(*a*) "ACCIDENT" means any one accident or series of accidents arising out of one event.

(*b*) "UNIT" means a part or an assembly of parts (including any sub-assemblies) of the Aircraft which has been assigned an Overhaul Life as a part or an assembly. Nevertheless, an engine complete with all parts normally attached when removed for the purpose of overhaul or replacement, shall together constitute a single Unit.

(*c*) "OVERHAUL LIFE" means the amount of use, or operational and/or calendar time which, according to the Airworthiness Authority, determines when overhaul or replacement of a Unit is required.

(*d*) "OVERHAUL COST" means the costs of labour and materials which are or would be incurred in overhaul or replacement (whichever is necessary) at the end of the Overhaul Life of the damaged or a similar Unit.

(*e*) "PRIVATE PLEASURE" means use for private and pleasure purposes but NOT use for any business or profession nor for hire or reward.

(*f*) "BUSINESS" means the uses stated in Private Pleasure and use for the purpose of the Insured's business or profession but NOT use for hire or reward.

(*g*) "COMMERCIAL" means the uses stated in Private Pleasure and Business and use for the carriage by the Insured of passengers, baggage accompanying passengers and cargo for hire or reward.

(*h*) "RENTAL" means rental, lease, charter or hire by the Insured to any person, company or organisation for Private Pleasure and Business uses only, where the operation of the Aircraft is not under the control of the Insured. Rental for any other purpose is NOT insured under this Policy unless specifically declared to Underwriters under SPECIAL RENTAL USES in the Schedule.

Definitions (*e*), (*f*), (*g*) and (*h*) constitute Standard Uses and do not include Instruction, Aerobatics, Hunting, Patrol, Fire-fighting, the intentional dropping, spraying or release of anything, any form of experimental or competitive flying, and any other use involving abnormal hazard, but when cover is provided details of such use(s) are stated in the Schedule under SPECIAL USES.

(*j*) "FLIGHT" means from the time the Aircraft moves forward in taking off or attempting to take off, whilst in the air, and until the aircraft completes its landing run.

(*k*) "TAXYING" means movement of the aircraft under its own power other than in flight as defined. Taxying shall not be deemed to cease merely by reason of a temporary halting of the aircraft.

(*l*) "MOORED" means, in the case of aircraft designed to land on water, whilst the aircraft is afloat and is not in flight or taxying as defined, and includes the risks of launching and hauling up.

(*m*) "GROUND" means while the aircraft is not in flight or taxying or moored as defined.

SCHEDULE

PART 1

Policy No.	**Proposal dated**

Name of Insured

Address

Period of Insurance

From **To** **both days inclusive**

PART 2

Particulars of Aircraft

(1) Make & Type (Insert "Land","Sea" or "Amphibian" as applicable)	(2) Year of Manu-facture	(3) Registration Marks	(4) Declared Max. No. of Passen-gers at any one time	(5) Amount Insured	(6) Risks covered (Insert "Flight", "Taxying", "Moored", "Ground" as applicable)

PART 3

Purposes of Use

Standard Uses (Insert "Private Pleasure", "Business", "Commercial", "Rental for Private Pleasure and Business only" as applicable)	*Special Uses*	*Special Rental Uses*

PART 4

Pilots

PART 5

Geographical Limits

AVN 1A

SCHEDULE—*continued*

PART 6 — **Limits and Deductibles**

(A) Policy Section & Risk	(B) Amounts to be deducted		(C) Limit of Indemnity from which must be deducted the amount in column (B)	
I Loss of or damage to aircraft listed in Part 2 above		each accident	See Part 2 Column (5)	
II Liability to Third Parties	Bodily Injury	NIL	Bodily Injury	each person each accident
	Property Damage	each accident	Property Damage	each accident
III Liability to Passengers their baggage and personal articles	Bodily Injury	NIL	Bodily Injury	each person each Aircraft
	Baggage and Personal Articles	each person	Baggage and Personal Articles	each person each Aircraft

PART 7 — **Premium**

Section I

Section II

Section III

TOTAL _____

PART 8 — **Immediate notice of any claim pursuant to General Condition 4 to be given to:**

Dated in London, the

(B) TEXT OF AVIATION CLAUSES AND ENDORSEMENTS

AIRCRAFT WRECK AND SALVAGE CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association.)

It is hereby understood and agreed that in consideration of ..... paid as an additional premium Section I of this Policy is extended to indemnify the Assured in respect of the Assured's liability for salvage services (as defined below) rendered to the insured Aircraft; but in the event of the Aircraft being under insured such indemnity shall be reduced in the proportion that the insured value of the Aircraft bears to its sound value at the time of the accident. Provided always that such salvage services shall have been rendered in respect of a risk covered by this Policy and that any amount payable under this Clause shall not increase the limit of Underwriters' liability beyond that stated in Section I.

In the event of the insured Aircraft rendering salvage services (as defined below) the Underwriters hereby agree to hold covered the risks insured by this Policy in respect of deviation beyond the geographical limits stated in the Schedule, provided immediate notice be given to the Underwriters and any additional premium required be paid.

In addition the Underwriters will indemnify the Assured in respect of all sums which the Assured may become legally liable to pay for the raising, removal, disposal or destruction of the wreck of the insured Aircraft from any harbour or tidal water under the jurisdiction of a harbour or conservancy authority; provided that Underwriters' liability for such indemnity shall not exceed 1% of the value stated in the Schedule against such Aircraft.

Notwithstanding anything contained herein to the contrary the Underwriters shall not be liable for sue and labour charges or for general average contributions, save in so far as they may be salvage services as defined in this Clause.

DEFINITION.

"Salvage services" shall be deemed to mean any services rendered by or in relation to the Insured Aircraft in, on or over the sea or any tidal water or on or over the shores of the sea or any tidal water, in all cases in which they would have been salvage services, whether maritime or under contract, had they been rendered by or in relation to a vessel.

12/6/51
Aviation 3

COMPONENT PARTS CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

Aircraft .....

Insured Value of Aircraft .....

Notwithstanding anything contained herein to the contrary it is understood and agreed that in the event of loss of or damage to any Component Part of the above aircraft Underwriters' liability shall not exceed the percentage of the total insured value relating to that Component Part as shown on the Schedule attached. Such percentage shall be deemed to include the cost of labour, material, replacement part, transportation and other incidental charges incurred in reinstating such loss or damage.

The amount recoverable for transportation charges on any lost or damaged Component Part or Parts shall not exceed 15 per cent. of the percentage of the total insured value set against such Component Part or Parts.

The Underwriters will in addition pay the cost of such dismantling, opening up, inspecting, making good, re-assembling and transportation of undamaged parts as may be necessary and the test flying of the aircraft up to 5 per cent. of any admitted claim hereunder but not exceeding 2 per cent. of the insured value of the aircraft. Provided always that Underwriters' aggregate liability shall in no event exceed the insured value of the aircraft.

Average Clause applying to item of Schedule "Other Aircraft Parts or Equipment."

In the event of loss or damage to the unspecified aircraft parts or equipment the Assured shall only be entitled to recover such proportion of the said loss as the sum insured in respect of unspecified aircraft parts or equipment bears to the total value of such parts or equipment.

Subject otherwise to the general terms, conditions and limitations of this Policy.

25/10/50
Aviation 4

DEFERRED PREMIUMS

It is hereby understood and agreed that the premium shall be paid in the following instalments:—

Nevertheless it is further understood and agreed that:—

Notwithstanding any provision as to notice of cancellation contained in this Policy, it is a condition that in the event of any instalment not being paid by its due date the cover afforded by this Policy shall be deemed to have ceased at midnight of such due date.

In the event of a claim hereunder which exceeds the instalments of premium paid on this Policy the instalments of premium then outstanding shall become payable forthwith.

9/10/74
AVN 5A

FULL PREMIUM IF LOST

(Approved by Lloyd's Aviation Underwriters' Association)

It is understood and agreed that in the event of a claim arising hereunder adjustable on the basis of a Total Loss the Full Annual Premium of , less the amount of premium already paid, shall become due and payable forthwith.

21/1/55
Aviation 8

FULL PREMIUM IN THE EVENT OF A CLAIM EXCEEDING PREMIUM PAID

(Approved by Lloyd's Aviation Underwriters' Association)

It is understood and agreed that in the event of a claim arising hereunder which exceeds the premium paid the balance of the Full Annual Premium of shall become due and payable forthwith.

21/1/55
Aviation 9

EXTENSION OF SECTION III OF LLOYD'S AIRCRAFT POLICY LEGAL LIABILITY TO PASSENGERS (BAGGAGE).

(Approved by Lloyd's Aviation Underwriters' Association.)

It is hereby understood and agreed that in consideration of ..... paid as an additional premium Section III of this Policy is extended to indemnify the Assured in respect of all sums which the Assured shall become legally liable to pay as compensation, including costs awarded, in respect of damage to or loss of personal baggage belonging to passengers whilst such personal baggage is being carried in or loaded into or unloaded from the Aircraft.

Provided always that such personal baggage carried in any Aircraft insured hereunder operating for hire or reward shall be carried subject to the terms of a ticket and/or baggage check which shall be issued by the Assured to the passenger before the commencement of the flight and that such ticket and/or baggage check shall have printed in a conspicuous manner a condition that the Assured will not be liable for any damage or loss howsoever caused in so far as such condition is not contrary to law or to any international agreement.

The liability of Underwriters shall not exceed £ in respect of any one passenger, £ in respect of any one accident or series of accidents arising out of one event, and further shall not exceed £ in respect of all claims hereunder during the currency of this Policy.

Subject otherwise to the general terms, conditions and limitations of this Policy.

8/2/50
Aviation 10

15% TRANSPORTATION COSTS CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding anything contained herein to the contrary it is hereby understood and agreed that in the event of the Aircraft sustaining damage covered under Section I of this Policy the liability of the Underwriters for transportation costs shall not exceed 15% of the admitted cost of repairing such damage. Provided always that any amount payable under this Clause shall not increase the limit of the Underwriters' liability beyond that stated in Section I.

For the purpose of this Clause:—

(a) "Transportation Costs" shall be deemed to mean the aggregate of the cost of (1) Removing the Aircraft to a repair site (2) Transporting such labour, replacement parts, material and equipment as may be required to make good damage covered by this policy (3) Returning the Aircraft from the repair site to the airport nearest to the place of accident or to its home airport, whichever may be the nearer to the repair site.

In all cases the liability of the Underwriters shall be limited to the cost of transportation by the least expensive means which in respect of the transportation of labour shall take into account wages and subsistence payable during transit.

(b) The "Admitted Cost" of repairing the damage shall be deemed to mean the aggregate of the cost of (1) Labour (2) Replacement parts and material (ex the nearest place where such parts and material are normally stocked) to make good the damage covered by this Policy, including the cost of any necessary opening up and dismantling required for inspection and repairs (3) Re-assembly.

Subject otherwise to the general terms, conditions and limitations of this Policy.

20/10/55
AVIATION 11.

WAR RISK ON AIRCRAFT HULLS.

Hull War Risks Termination Clause.

(Approved by Lloyd's Aviation Underwriters' Association)

In the event of the outbreak of war between any of the four Great Powers (France, Great Britain and/or any of the British Commonwealth of Nations, the Union of Soviet Socialist Republics and the United States of America) this insurance will ipso facto terminate 24 hours from Midnight G.M.T. of the day on which such outbreak of war occurs. Nevertheless, should the aircraft

(1) Be in the air when such outbreak of war occurs

or

(2) Being at an airport depart therefrom as a measure of safety in respect of an insured peril within 24 hours of such outbreak of war

this insurance will be continued until Midnight G.M.T. of the day on which the aircraft lands wherever such landing may be regardless of whether or not any accidental damage has been sustained by the aircraft.

Notwithstanding any provisions in this policy or in any endorsements thereto to the contrary this insurance will ipso facto terminate in the event the insured aircraft is requisitioned, either for title or use.

In the event of the termination of this insurance by reason of the outbreak of such a war or by the requisition of the insured aircraft but not otherwise, pro rata net return of premium shall be payable to the Assured. Such return premium shall be paid on demand or as soon thereafter as practicable to do so.

All other terms and conditions remain unchanged.

18/11/49
Aviation 12

LIMITATION OF LIABILITY CLAUSE
(JOINT ASSUREDS)

(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding the inclusion herein of more than one Assured, whether by endorsement or otherwise, the total liability of the Underwriters in respect of any or all Assureds shall not exceed the limit(s) of liability stated in this Policy.

10/4/58
Aviation 14

LIMITATION OF LIABILITY ENDORSEMENT
(ADDITIONAL ASSUREDS)
(Approved by Lloyd's Aviation Underwriters' Association)

It is hereby understood and agreed that this Insurance is extended to cover the undermentioned as additional Assured(s), but only in respect of the coverage provided under this Policy.

It is further understood and agreed that notwithstanding the inclusion herein of more than one Assured, the total liability of the Underwriters in respect of any or all Assureds shall not exceed the limit(s) of liability stated in this Policy.

Subject otherwise to all the terms, conditions, exclusions and limitations of the Policy.

In consideration of the foregoing the sum of.....is paid hereon as an additional premium.

Additional Assured(s)

10/4/56
Aviation 15

ADDITIONS AND DELETIONS
(Applicable to Hulls only)

1. The insurance afforded by this Policy is automatically extended to include at pro rata additional premium further Aircraft added during the currency of this Policy provided such Aircraft are owned or operated by the Assured and are of the same type and value as Aircraft already covered hereunder.
2. The inclusion of additional Aircraft of other types or different values shall be subject to special agreement and rating by Underwriters prior to attachment.
3. Aircraft which have been sold or disposed of shall be deleted from this Policy and the Assured shall be entitled to pro rata return of premium provided no claim has arisen and become payable under this Policy in respect of such Aircraft, and that this Policy is not cancelled by virtue of such deletion.

ALWAYS PROVIDED THAT:—

(i) Notwithstanding the foregoing provisions for additions and deletions the premium in respect of each separate period of Flight Risk Insurance on any Aircraft covered during the currency of this Policy shall in no case be less than fifteen days' pro rata premium.
(ii) In the event of a claim arising in respect of any Aircraft added hereto being settled on a total loss basis full twelve months' premium shall be paid hereunder in respect of such Aircraft.
(iii) Notice of the addition or deletion of any Aircraft under the provisions of Paragraphs 1 and 3 respectively shall be given to the Underwriters or their representatives in writing within ten days of attachment or deletion.

12/2/75
AVN 17A

ADDITIONS AND DELETIONS
(Applicable to Liabilities only)

1. The insurance afforded by this Policy is automatically extended to include at pro rata additional premium further Aircraft added during the currency of this Policy provided such Aircraft are owned or operated by the Assured and are of the same type as Aircraft already covered hereunder and of no greater seating capacity.
2. The inclusion of additional Aircraft of other types or greater seating capacity shall be subject to special agreement and rating by Underwriters prior to attachment.
3. Aircraft which have been sold or disposed of shall be deleted from this Policy and the Assured shall be entitled to pro rata return of premium.
4. Notwithstanding the foregoing provisions for additions and deletions the premium in respect of each separate period of Flight Risk Insurance on any Aircraft covered during the currency of this Policy shall in no case be less than fifteen days' pro rata premium.
5. Notice of the addition or deletion of any Aircraft under the provisions of Paragraphs 1 and 3 respectively shall be given to the Underwriters or their representatives in writing within ten days of attachment or deletion.

12/2/75
AVN. 18A

EARLY WARNING LINES—EXCLUSION CLAUSE
(NORTH AMERICA)
(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding anything contained herein to the contrary this Policy does not cover operations directly or indirectly connected with the Continental Radar Defence System.

7/5/57
Aviation 19

CLAIMS CO-OPERATION CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding anything herein contained to the contrary, it is a condition precedent to any liability under this policy that

(a) the Reassured shall upon knowledge of any loss or losses which may give rise to a claim under this policy advise the Underwriters thereof within seven days,

(b) the Reassured shall furnish the Underwriters with all information available respecting such loss or losses and shall co-operate with the Underwriters in the adjustment and settlement thereof.

6/5/58 .
Aviation 21

DEFICIT CLAUSE (THREE YEARS)

(Approved by Lloyd's Aviation Underwriters' Association)

It is agreed that in the event of this contract showing a loss on the result of any one year, the total amount of such loss shall be debited to the Profit Account for the ensuing year or years, but no Profit Commission shall be considered as earned on any ensuing year or years until the previous loss has been balanced and a credit balance again restored. It being further understood and agreed that any such loss referred to above shall not be carried forward for more than three consecutive years.

6/5/58
Aviation 22

UNLICENSED LANDING GROUND SUITABILITY CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

In consideration of an additional premium of it is hereby understood and agreed that notwithstanding anything contained herein to the contrary, the landing and taking off of the insured aircraft by day on Landing Grounds other than duly licensed airfields is covered under the policy subject however to each such landing ground having been previously surveyed from the ground by the Insured and by the pilot using the landing ground, and from the air by the same pilot immediately prior to landing, and subject to previous permission having been obtained from the owner and/or tenant of the land.

In the event of a claim being made under the policy in respect of an accident occurring during the use of any such landing ground the onus of proving its suitability as such and that it had been surveyed from the ground and from the air, as provided above, shall rest entirely on the Insured.

6/5/58
Aviation 23

BURNING COSTS CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

The Premium to be paid to Underwriters hereon shall be calculated at a provisional Rate of % per annum on the insured value of the Aircraft. As soon as practicable after the total claims (including claims expenses less salvages and/or refunds and/or recoveries) payable under this Policy are ascertained, the above mentioned Rate of % shall be adjusted so that the total gross Premium under this Policy is equal to % of the total claims (including claims expenses less salvages and/or refunds and/or recoveries) subject however to a minimum annual rate of % and a maximum annual Rate of %.

6/5/58
Aviation 24

CLAIMS CONTROL CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding anything herein contained to the contrary, it is a condition precedent to any liability under this policy that

(a) the Reassured shall, upon knowledge of any loss or losses which may give rise to a claim under this policy, advise the Underwriters thereof by cable within 72 hours;

(b) the Reassured shall furnish the Underwriters with all information available respecting such loss or losses, and the Underwriters shall have the right to appoint adjusters, assessors and/or surveyors and to control all negotiations, adjustments and settlements in connection with such loss or losses.

3/6/58
Aviation 25.

AIRCRAFT LAYING-UP RETURNS CLAUSE.

(Approved by Lloyd's Aviation Underwriters' Association.)

IN THE EVENT of the aircraft hereby insured being laid up, the Flight and Taxying cover under all sections of this insurance will be suspended during the period of lay-up and credit therefor will be adjusted on expiry of this insurance subject to the follpwing conditions:—

1. Notice must be given to the Underwriters by the Assured prior to the date of inception and also upon termination of lay-up.

2. No return of premium shall be made:—

(a) in respect of the period of the annual renewal of the Certificate of Airworthiness including any work necessitated thereby

(b) unless the period of lay-up is of at least 30 consecutive days, but should the period defined in (a) occur during lay-up then the Assured shall be entitled to add the lay-up days prior to and subsequent to the period defined in (a) in computing the period of 30 days or more for which a return may be made

(c) if a claim in respect of the aircraft concerned has been made on this insurance.

Subject always to the foregoing conditions the return shall be 75 per cent. of *pro rata* of the difference between the annual hull risk premium and the annual ground risk premium (as agreed by the Underwriters) for the actual period of lay-up as defined above.

In the event of the aircraft being laid up for a period of 30 consecutive days or more, a part only of which attaches to this insurance and part to the annual renewal insurance, then this insurance shall return premium for such proportion of the total period of lay-up as the number of days attaching hereto bears to such total period.

5/4/60

Aviation 26

ADDITIONAL INSURANCE CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

Warranted that no additional insurance on any interests on or in relation to any Aircraft described in the Schedule, save such as may be required to cover personal accident and legal liability, has been or shall be effected to operate during the currency of this Policy by or for account of the Assured, Owners, Managers, Mortgagees or Hirers except:—

1. Additional insurance on terms and conditions identical with those contained in this Policy.

2. Additional insurance on Total Loss Only or any conditions other than those stated in (1) above, whether Policy Proof of Interest, Full Interest Admitted, or otherwise, but only to cover in respect of any one Aircraft an amount not exceeding 10 per cent. of the Total Value of that Aircraft as stated in the Schedule of this Policy.

Aviation 27

BREACH OF WARRANTY ENDORSEMENT

(Approved by Lloyd's Aviation Underwriters' Association)

Attaching to and forming part of Policy No. on aircraft C.A.A. Identification Mark which is encumbered by a lien in the amount of $ payable in instalments of $ each, the last instalment being due The said lien is held by

(hereinafter called the Lienholder)

In consideration of an additional premium of $ IT IS UNDERSTOOD AND AGREED THAT:

1. The insurance afforded by the Policy shall not be invalidated as regards the interest of the Lienholder by any act or neglect of the Insured except that any change in title or ownership of the aircraft, conversion, embezzlement or secretion by the Insured in possession of the aircraft are not covered hereunder; PROVIDED HOWEVER THAT:

   A. If the Insured fails, on demand of the Underwriters to pay any premium due under this policy, the Lienholder shall pay such premium; and

   B. The Lienholder shall notify the Underwriters of any increase of hazard which comes to the Lienholder's attention and if not permitted by the policy, it shall be endorsed thereon, the Lienholder agreeing to pay any additional required premium if the Insured shall fail to do so on demand of the Underwriters.

It is, however, further understood and agreed by the parties concerned that the protection afforded to the Lienholder by the terms of this endorsement is limited to the perils covered under the policy and for which a specific premium charge has been made.

2. If the Insured fails to render proof of loss within the time granted in the policy conditions, the Lienholder shall do so within 60 days thereafter, in form and manner as provided by the policy and further shall be subject to the provisions of the policy relating to appraisal and time of payment and of bringing suit.

3. Whenever the Underwriters shall be liable to the Lienholder for any sum for loss or damage under this policy and shall claim that as to the Insured, no liability therefor existed, their liability under the terms of this endorsement shall not in any event exceed the amount of the lien set forth above, less the amount of all matured instalments and less unearned interest or carrying charges and unearned financed insurance premium, if any.

4. The Underwriters reserve the right to cancel this policy at any time as provided by its terms but in such case notification shall be given the Lienholder when not less than 10 days thereafter such cancellation shall be effective as to the interest of said Lienholder therein and the Underwriters shall have the right, on like notice, to cancel this endorsement.

5. Upon payment of any sum to the Lienholder as provided hereunder, the Underwriters shall to the extent of such payment be thereupon legally subrogated to all the rights of the Lienholder under all securities held as collateral to the debt and the Lienholder shall assign and transfer to the Underwriters all instruments of security pertaining to the aircraft; but no subrogation shall impair the right of the Lienholder to recover the full amount of his claim.

13/1/59
Aviation 28

MANUFACTURER AS ADDITIONAL ASSURED

(Approved by Lloyd's Aviation Underwriters' Association)

Agreed to include ....as an Additional Assured but only in so far as their interests arise as owners (in whole or in part) of the insured aircraft.

This agreement shall not operate to prejudice Underwriters rights of recourse against ..... as manufacturers, repairers, suppliers or servicing agents where such right of recourse would have existed had this endorsement not been effected under this Policy.

3/3/59
Aviation 29

PRIOR ADVICE CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association)

In the event that any alteration of this contract is held covered subject to 'prior advice' to Underwriters, it is hereby understood and agreed that 'prior advice' shall be deemed to have been given only if the Insured shall have notified the Underwriters or their representatives by cable or telegram date and time stamped by postal authorities before the effective time of such alteration. Proof of the despatch of such date and time stamped cable or telegram shall be the only evidence of 'prior advice' acceptable to the Underwriters and shall be a condition precedent to any liability arising from such alteration.

7/4/59
Aviation 31

PASSENGER VOLUNTARY SETTLEMENT ENDORSEMENT

(FOR ATTACHMENT TO LLOYD'S AIRCRAFT LIABILITY POLICY (U.S.A.))
(Approved by Lloyd's Aviation Underwriters' Association)

1. In consideration of an additional premium of $ it is agreed that the Underwriters will at the request of and regardless of legal liability of the Named Insured offer settlement on the basis of the benefits hereinafter set forth in respect of bodily injury accidentally sustained by any passenger provided that at the time of any accident causing such bodily injury Coverage "C" (Passenger Bodily Injury Liability) of the policy is effective in respect of such accident.

2. LIMITS OF SETTLEMENT

For death or for total loss of two limbs or total loss of sight of two eyes or total loss of one limb and total loss of sight of one eye the amount offered shall not exceed the amount expressed as the limit of settlement for "each passenger" in the schedule of this Endorsement; or

For total loss of one limb or total loss of sight of one eye the amount offered shall not exceed one half of the amount expressed as the limit of settlement for "each passenger" in the schedule of this Endorsement.

For permanent total disablement other than by loss of limbs or sight the amount offered shall not exceed the amount expressed as the limit of settlement for "each passenger" in the schedule of this Endorsement.

Subject to the limit for "each passenger" the total of the amounts which the Underwriters shall offer on account of death or other loss sustained by two or more passengers in any one accident shall not exceed the amount expressed as the limit of settlement for "each accident" in the schedule of this Endorsement.

3. DEFINITIONS

"LOSS OF A LIMB" means loss by physical separation of a hand at or above the wrist or of a foot at or above the ankle.

"TOTAL LOSS OF SIGHT" means loss of sight which is certified as being entire and irrecoverable by a licensed physician specialising in ophthalmology.

"PERMANENT TOTAL DISABLEMENT" means disablement which has for twelve months from the date of the accident necessarily and continuously disabled the passenger from attending to business or occupation of any and every kind or if he has no business or occupation confined him immediately and continuously to the house and prevented him from attending to any of his usual duties (if any) and at the expiry of that twelve months period being beyond hope of improvement.

4. ADDITIONAL EXCLUSIONS

This Endorsement does not cover death of or bodily injury to any passenger caused by

(a) his suicide or attempted suicide or intentional self-injury or own criminal or felonious act or by his own act whilst in a state of insanity or intoxication.

(b) disease or natural causes, or medical or surgical treatment (except where such treatment is rendered necessary by bodily injury caused by accident within the scope of this Endorsement).

5. ADDITIONAL CONDITIONS

(a) The Insured shall furnish, as soon as practicable after each request from the Underwriters, reasonably obtainable information pertaining to injuries sustained by passengers. In the event of death immediate notice must be sent to the Underwriters.

(b) In consideration of any settlement under the provisions of this Endorsement and as a condition precedent thereto, the injured passenger and any person having a cause of action for such injuries, or in the event of death the person or persons having a cause of action for the death, shall in the manner required by the Underwriters, execute a full legal release of all claims for damages against the Insured and/or the crew of the aircraft and/or any employee of the Insured and/or any person whom the Insured has agreed to indemnify or hold harmless except claims for which the Insured or any Company as his Insurer may be held liable under any Workmen's Compensation Law. If the injured passenger or any person claiming by, through or under him shall fail to accept in writing within thirty (30) days from the date of offering the voluntary settlement under the provisions of this Endorsement or to execute the necessary release then the Underwriters may withdraw the offered voluntary settlement, without notice, in which circumstances the Underwriters will no longer be bound by the undertakings expressed in the preceding paragraphs. If subsequent to an offer of voluntary settlement being made in respect of any passenger any claim suit or demand is made or prosecuted against the Insured for damages on account of such bodily injuries or death, such claim suit or demand shall be considered as refusal to accept such voluntary settlement and the obligations of the Underwriters as expressed in Coverage "C" (Passenger Bodily Injury Liability) of the policy to which this Endorsement is attached, shall be available as fully and completely as if this Endorsement had not been issued.

(c) It is agreed that as respects the provisions of this Endorsement Exclusion (8) of the Policy is deleted. The Underwriters shall not be liable under the terms of this Endorsement for any payment which may be used to satisfy that obligation for which the Insured or his Insurer may be held liable under a Workmen's Compensation Law neither shall this Endorsement apply to loss suffered by passengers carried for hire or reward or by pilots or other members of the crew of the aircraft.

(d) This Endorsement also covers (subject otherwise to its terms, conditions and exclusions) death from drowning or death or disablement from exposure as the direct result of misfortune to the aircraft in connection with a flight covered hereunder.

(e) It is agreed that if a passenger disappears and his body is not found within a reasonable period of time, or a maximum period of one year, and the Underwriters, having examined all available evidence, shall have no reason other than to presume his death in circumstances rendering them liable for the payment of the death benefit under this Endorsement they shall at the request of the Insured forthwith pay such benefit, but if the passenger is subsequently found to be living the Insured shall take all reasonable steps to recover on behalf of the Underwriters any sums so paid.

(f) Except as provided by Conditions (d) and (e) above accidental death shall not be presumed by reason of the disappearance of any passenger.

The Schedule

Description of Aircraft

F.A.A. Reg. No.	Make, Model and Type *	Declared Maximum number of Passengers to be carried at any one time.

* Landplane, Seaplane, Skiplane, Amphibian or Rotorcraft

Limits of Settlement

Each Passenger — Each Accident

It is understood and agreed that, except as specifically provided in the foregoing to the contrary, this Endorsement is subject to the terms, exclusions, conditions and limitations of the policy to which it is attached.

5/12/61

Aviation 34

SPREADER CLAUSE "A"

(FOR ATTACHMENT TO PASSENGER VOLUNTARY SETTLEMENT ENDORSEMENT)

(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding anything contained herein to the contrary, it is understood and agreed that if in any accident resulting in a claim under this insurance the number of passengers in the aircraft exceeds the number stated in either the Schedule forming part of the Passenger Voluntary Settlement Endorsement or the Declarations in the main policy, then provided there is no violation of the limitations imposed by the Civil Aeronautics Authority and/or the Airworthiness Certificate as to seating capacity or maximum allowable gross weight, this insurance shall nevertheless remain effective, but the Limit of Settlement to be offered under the said Endorsement for death or loss of two limbs or loss of sight of two eyes or loss of one limb and loss of sight of one eye or permanent total disablement in respect of any passenger shall be calculated by dividing the "each accident" limit stated in the said Endorsement by the total number of passengers in the aircraft. The Limit of Settlement to be offered for loss of one limb or loss of sight of one eye shall also be reduced pro rata.

It is further understood and agreed that except as specifically provided in the foregoing to the contrary, this Clause is subject to the terms, exclusions, conditions and limitations of the policy to which it is attached.

5/12/61
Aviation 35

SPREADER CLAUSE "B"

(FOR ATTACHMENT TO PASSENGER VOLUNTARY SETTLEMENT ENDORSEMENT)

(Approved by Lloyd's Aviation Underwriters' Association)

Notwithstanding anything contained herein to the contrary, it is understood and agreed that if in any accident resulting in a claim under this insurance the number of passengers in the aircraft exceeds the number stated in the Schedule forming part of the Passenger Voluntary Settlement Endorsement, then provided there is no violation of the limitations imposed by the Civil Aeronautics Authority and/or the Airworthiness Certificate as to seating capacity or maximum allowable gross weight, this insurance shall nevertheless remain effective, but the Limit of Settlement to be offered under the said Endorsement for death or loss of two limbs or loss of sight of two eyes or loss of one limb and loss of sight of one eye or permanent total disablement in respect of any passenger shall be calculated by dividing the "each accident" limit stated in the said Endorsement by the total number of passengers in the aircraft. The Limit of Settlement to be offered for loss of one limb or loss of sight of one eye shall also be reduced pro rata. Nevertheless this insurance shall be null and void in the event that the number of passengers carried in the aircraft at the time of the accident exceeds that declared in the Policy.

It is further understood and agreed that except as specifically provided in the foregoing to the contrary, this Clause is subject to the terms, exclusions, conditions and limitations of the policy to which it is attached.

5/12/61
Aviation 36

AVIATION RADIOACTIVE CONTAMINATION EXCLUSION CLAUSE (GENERAL)

(Approved by Lloyd's Aviation Underwriters' Association)

(1) This policy does not cover

(a) loss or destruction of or damage to any property whatsoever or any loss or expense whatsoever resulting or arising therefrom

(b) any legal liability of whatsoever nature.

directly or indirectly caused or contributed to by or arising from ionising radiations or contamination by radioactivity from any source whatsoever.

(2) Loss, destruction, damage, expense or legal liability which, but for the provisions of paragraph (1) of this Clause, would be covered by this policy, and is directly or indirectly caused or contributed to by or arises from ionising radiations or contamination by radioactivity from any radioactive materials in course of carriage as cargo under International Air Transport Association regulations, shall (subject to all the other provisions of this policy) be covered, provided that:

(a) it shall be a condition precedent to the liability of the Underwriters that the carriage of any radioactive materials shall in all respects comply with the current regulations issued by the International Air Transport Association relating to the carriage of restricted articles by air;

(b) the loss, destruction, damage, expense or legal liability shall have occurred or arisen during the period of this policy, and any claim by the Assured against the Underwriters or by any claimant against the Assured shall have been made within three years after the date of the occurrence giving rise to the claim;

(c) in the case of any claim by virtue of this paragraph (2) under the Hull section of this policy, the level of contamination shall have exceeded the maximum permissible level set out in the following scale:—

Emitter	Maximum permissible level of non-fixed radioactive surface contamination (Averaged over 300 cm²)
Alpha emitters in Group 1 of the IAEA list of radioisotopes (IAEA Health and Safety Series No. 6)	Not exceeding 10^{-5} microcuries per cm²
All other substances	Not exceeding 10^{-4} microcuries per cm²

(d) the cover afforded by this paragraph (2) may be cancelled at any time by the Underwriters giving seven days' notice of cancellation.

4/5/64
Aviation 38

AVIATION RADIOACTIVE CONTAMINATION EXCLUSION CLAUSE (ENGINES)

(Approved by Lloyd's Aviation Underwriters' Association.)

(1) This policy does not cover

(a) loss or destruction of or damage to any property whatsoever or any loss or expense whatsoever resulting or arising therefrom

(b) any legal liability of whatsoever nature

directly or indirectly caused or contributed to by or arising from ionising radiations or contamination by radioactivity from any source whatsoever.

(2) Loss, destruction, damage, expense or legal liability which, but for the provisions of paragraph (1) of this Clause, would be covered by this policy, shall (subject to all the other provisions of this policy) be covered, provided that:—

(a) the cover afforded by this paragraph (2) shall not extend to

(i) loss or destruction of or damage to any aircraft engine or any part thereof or any loss or expense whatsoever resulting or arising therefrom

(ii) any legal liability of whatsoever nature

directly or indirectly caused or contributed to by or arising from contamination of any aircraft engine or any part thereof by ionising radiations or radioactivity from any source whatsoever;

(b) it shall be a condition precedent to the liability of the Underwriters that the carriage of any radioactive materials shall in all respects comply with the current regulations issued by the International Air Transport Association relating to the carriage of restricted articles by air;

(c) the loss, destruction, damage, expense or legal liability shall have occurred or arisen during the period of this policy, and any claim by the Assured against the Underwriters or by any claimant against the Assured shall have been made within three years after the date of the occurrence giving rise to the claim;

(d) in the case of any claim by virtue of this paragraph (2) under the Hull section of this policy, the level of contamination shall have exceeded the maximum permissible level set out in the following scale:—

Emitter	Maximum permissible level of non-fixed radioactive surface contamination (Averaged over 300 cm^2)
Alpha emitters in Group 1 of the IAEA list of radioisotopes (IAEA Health and Safety Series No. 6)	Not exceeding 10^{-5} microcuries per cm^2
All other substances	Not exceeding 10^{-4} microcuries per cm^2

(e) the cover afforded by this paragraph (2) may be cancelled at any time by the Underwriters giving seven days' notice of cancellation.

4/5/64
Aviation 39

MUTUAL CANCELLATION CLAUSE (WARSAW CONVENTION)

(Approved by Lloyd's Aviation Underwriters' Association)

If at any time during the currency of this policy the Insured's legal liability may be affected by any one or any combination of the following events:

Any ratification or denunciation of, or accession or adherence to, the 1929 Warsaw Convention or the Hague Protocol thereto, or if the said Convention or Protocol ceases to apply in respect of any State or Territory where it was previously in force

THEN notwithstanding any other provisions of the policy relating to cancellation, the cover hereunder may be cancelled either by the Insured or by Underwriters by the giving of not less than 60 days' notice in writing

PROVIDED that in contemplation of any of the above events the parties hereto may at any time agree upon revised terms and conditions which shall, unless otherwise agreed, become operative immediately such events become effective.

Any Notice of Cancellation hereunder shall cease to have effect if any agreement on revised terms and conditions is reached as aforesaid.

25/6/62
Aviation 40

REINSURANCE UNDERWRITING & CLAIMS CONTROL CLAUSE

(Approved by Lloyd's Aviation Underwriters' Association.)

1. Being a Reinsurance of the ..... Company and, except as provided by paragraph 2 hereof, warranted the same gross rate, terms and conditions as the said Company as agreed at inception, and that the said Company retains during the currency of this Policy at least ..... on the identical subject matter and risk and in identically the same proportion on each separate part thereof, but in the event of the retained line being less than as above, Underwriters' lines to be proportionately reduced.

2. Subject to the foregoing, it is a condition precedent to any liability under this Reinsurance that:

(a) no amendment to the terms or conditions or additions to or deletions from the original policy shall be binding upon Underwriters hereon unless prior agreement has been obtained from the said Underwriters;
(b) the Reassured shall upon knowledge of any loss or losses which may give rise to a claim under this policy, advise the Underwriters by cable within 72 hours;
(c) the Reassured shall furnish the Underwriters with all information available respecting such loss or losses, and the Underwriters shall have the sole right to appoint adjusters, assessors, surveyors and/or lawyers and to control all negotiations, adjustments and settlements in connection with such loss or losses.

9/6/65
Aviation 41

DOCUMENTS OF CARRIAGE CLAUSE

1. It is a condition of this Policy that the Insured will take all reasonable steps to ensure that

(a) before a passenger boards the Aircraft, or when the Insured takes charge of registered/checked baggage and/or cargo, the appropriate Document of Carriage (correctly completed so as to identify the contract of carriage and to exclude or limit the Insured's legal liability) is delivered to the passenger or consignor/shipper as the case may be
(b) suitable evidence of compliance with the foregoing is preserved and made available to Underwriters upon request

2. In the event of failure by the Insured to comply with the foregoing condition, the amount of Underwriters' liability shall not exceed the sum for which the Insured would have been legally liable if the aforesaid failure had not occurred, subject always to the Policy limits.

3. As used herein:

"Document of Carriage" means a passenger ticket, baggage ticket/check or an air consignment note/air waybill (whichever is relevant to liability covered by this Policy) of which the form, the Conditions of Contract (including any applicable Tariff or Conditions of Carriage) and the usage thereof are either

(i) in accordance with current and relevant Resolutions adopted by members of the International Air Transport Association

or (ii) approved in writing by Underwriters in any other case.

10/11/65
Aviation 42

MUTUAL REVISION CLAUSE (AVIATION LIABILITY)

1. As used herein "Warsaw Convention" means the Convention for the Unification of Certain Rules relating to International Carriage by Air signed at Warsaw, October 12th 1929 or any amendment or supplement to that Convention whether by means of Protocol, additional, new or supplemental Convention or otherwise.

2. If at any time during the currency of this policy the Insured's legal liability may be affected by any one or any combination of the following events:

(a) Any ratification or denunciation of, or accession or adherence to, the Warsaw Convention or if the Warsaw Convention ceases to apply in respect of any State or Territory where it was previously in force.

(b) Any alteration of liability in conformity with any Government or other official requirement or commercial agreement or by means of a Special Contract or Tariff provision in accordance with the Warsaw Convention

THEN notwithstanding any other provisions of the policy, and in contemplation of any of the above events, either the Insured or the Underwriters shall have the right to request a revision of terms and conditions. Revised terms and conditions agreed by the parties hereto shall, unless otherwise agreed, become operative if and when the events (or event) relevant to the aforesaid revision become(s) effective.

3. If no agreement is reached on revised terms and conditions on the expiry of 60 days from the date of a written request for the aforesaid revision, then either party shall have the right to give 30 days notice of cancellation of the Policy.

17/3/66
Aviation 44

PASSENGER LIABILITY (MUTUAL REVISION & SPECIAL CONTRACTS) CLAUSE

1. As used herein "Warsaw Convention" means the Convention for the Unification of Certain Rules relating to International Carriage by Air signed at Warsaw, October 12th, 1929, or any amendment or supplement to that Convention whether by means of Protocol, additional, new or supplemental Convention or otherwise.

2. MUTUAL REVISION. If at any time during the currency of this policy the Insured's legal liability may be affected by any one or any combination of the following events:

(a) Any ratification or denunciation of, or accession or adherence to, the Warsaw Convention or if the Warsaw Convention ceases to apply in respect of any State or Territory where it was previously in force.

(b) Any alteration of liability by national legislation or in conformity with any Government or other official requirement

THEN notwithstanding any other provisions of the policy, and in contemplation of any of the above events, either the Insured or the Underwriters shall have the right to request a revision of terms and conditions. Revised terms and conditions agreed by the parties hereto shall, unless otherwise agreed, become operative if and when the events (or event) relevant to the aforesaid revision become(s) effective.

If no agreement is reached on revised terms and conditions on the expiry of 60 days from the date of a written request for the aforesaid revision, then either party shall have the right to give 30 days' notice of cancellation of the Policy.

3. SPECIAL CONTRACTS. Subject to the prior approval of Underwriters and in consideration of additional premium this policy may be extended to cover the Insured's legal liability in respect of Special Contracts. As used herein "Special Contract" means

(i) an agreement between the Insured and a passenger for a higher limit of liability in accordance with Article 22(1) of the Warsaw Convention, or

(ii) any other agreement between the Insured and a passenger whereby the Insured assumes increased legal liability in respect of the passenger's death or injury

Special Contracts which have been approved as aforesaid are identified by the documents annexed hereto being either Specimen Tickets, Tariff(s), Conditions of Contract or of Carriage, and Notices to Passengers, or alternatively Copies of Agreements between carriers requiring the parties thereto to enter into Special Contracts.

4. Nothing herein shall be deemed to alter the limits of Underwriters liability as specified in the Policy. Any condition of the Policy relating to contractual agreements is varied only as may be necessary to the extent herein provided.

12/4/67
Aviation 44A

NOISE AND POLLUTION AND OTHER PERILS EXCLUSION CLAUSE

1. This Policy does not cover claims directly or indirectly occasioned by, happening through or in consequence of:—

(a) noise (whether audible to the human ear or not), vibration, sonic boom and any phenomena associated therewith,

(b) pollution and contamination of any kind whatsoever,

(c) electrical and electromagnetic interference,

(d) interference with the use of property;

unless caused by or resulting in a crash fire explosion or collision or a recorded in-flight emergency causing abnormal aircraft operation.

2. With respect to any provision in the Policy concerning any duty of Underwriters to investigate or defend claims, such provision shall not apply and Underwriters shall not be required to defend

(a) claims excluded by Paragraph 1 or

(b) a claim or claims covered by the Policy when combined with any claims excluded by Paragraph 1 (referred to below as "Combined Claims").

3. In respect of any Combined Claims, Underwriters shall (subject to proof of loss and the limits of the Policy) reimburse the Insured for that portion of the following items which may be allocated to the claims covered by the Policy:

(i) damages awarded against the Insured and

(ii) defence fees and expenses incurred by the Insured.

4. Nothing herein shall override any radioactive contamination or other exclusion clause attached to or forming part of this Policy.

AVN. 46B
(12.1.72.)

WAR, HI-JACKING AND OTHER PERILS EXCLUSION CLAUSE (AVIATION)

This Policy does not cover claims caused by

(a) War, invasion, acts of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection, martial law, military or usurped power or attempts at usurpation of power.

(b) Any hostile detonation of any weapon of war employing atomic or nuclear fission and or fusion or other like reaction or radioactive force or matter.

(c) Strikes, riots, civil commotions or labour disturbances.

(d) Any act of one or more persons, whether or not agents of a sovereign Power, for political or terrorist purposes and whether the loss or damage resulting therefrom is accidental or intentional.

(e) Any malicious act or act of sabotage.

(f) Confiscation, nationalisation seizure, restraint, detention, appropriation, requisition for title or use by or under the order of any Government (whether civil military or de facto) or public or local authority.

(g) Hi-jacking or any unlawful seizure or wrongful exercise of control of the Aircraft or crew in flight (including any attempt at such seizure or control) made by any person or persons on board the Aircraft acting without the consent of the Insured.

Furthermore this Policy does not cover claims arising whilst the Aircraft is outside the control of the Insured by reason of any of the above perils. The Aircraft shall be deemed to have been restored to the control of the Insured on the safe return of the Aircraft to the Insured at an airfield not excluded by the geographical limits of this Policy, and entirely suitable for the operation of the Aircraft (such safe return shall require that the Aircraft be parked with engines shut down and under no duress).

26.8.71
AVN. 48 B

HI-JACKING ENDORSEMENT
For use with an Aircraft Hull Policy (War Risks)

IT IS AGREED THAT NOTWITHSTANDING General Exclusion (d) and in consideration of additional premium

Hi-jacking

1. (a) Section 1 is extended to include loss of or damage to the Aircraft arising out of Hi-jacking or any unlawful seizure or wrongful exercise of control of the Aircraft or crew in flight (including any attempt at such seizure or control) made by any person or persons on board the Aircraft acting without the consent of the Assured.

(b) This Policy is extended to cover any loss of or damage to the Aircraft occurring subsequent to the unlawful seizure or wrongful exercise of control which would have been recoverable under the Assured's "All Risks" Policy No..... but for the intervention of such seizure or wrongful exercise of control: subject to such deductibles as may appear in that Policy. If the Aircraft lands under duress of such unlawful seizure or wrongful exercise of control, the coverage provided by this Policy and Endorsement is hereby continued, until terminated according to Clause 2 below.

NOTWITHSTANDING this extension the maximum payable under this Policy shall be the sum specified in column 4, Section VI.

Limitation of period after Hi-jacking

2. All coverage under this Policy and Endorsement in respect of an Aircraft that lands under duress of such unlawful seizure or wrongful exercise of control, is terminated

(i) at midnight (local time) on the fifteenth day after the first such landing above, unless the prior agreement of Underwriters has been obtained to continue the cover at an additional premium to be agreed. In the event of the unlawful seizure or wrongful exercise of control occurring within fifteen days of the natural expiry of the Policy, coverage under this Endorsement will automatically extend to the end of the fifteen days without additional premium

(ii) when any notice of cancellation (but see 3 below) or automatic termination of this Policy becomes effective

(iii) on the safe return of the Aircraft to the Assured at an airfield not excluded by the geographical limits of this Policy and the All Risks Policy for the Aircraft concerned, and entirely suitable for the operation of the Aircraft (such safe return shall require that the Aircraft be parked with engines shut down and under no duress)

whichever first occurs.

3. In the event of an Aircraft insured hereunder being hi-jacked or unlawfully seized, Underwriters hereon agree to waive their rights under Section IV 1 (a) and (b) of this Policy in respect of such an Aircraft: such waiver shall also apply in the case of any notice given but not effective prior to the commencement of such seizure, and shall cease on the termination of the coverage as provided by Clause 2 above.

4. In the event of the safe return of the Aircraft (as defined in 2(iii) above) following termination of coverage under 2(i) or 2(iii), the Aircraft shall re-attach to this Policy and Endorsement at a premium to be agreed.

5. Excluding any claim for landing dues, refuelling costs or similar charges, or arising from non-payment thereof.

6. Excluding any claim for wear, tear, gradual deterioration, or any servicing to any part of the Aircraft made necessary by the passage of time.

7. The attachment of this Endorsement shall have the effect of overriding Section IV 3(b) of this Policy.

8. Subject otherwise to all terms, conditions and limits of this Policy.

AVN 50
(1.9.71)

EXTENDED COVERAGE ENDORSEMENT (AIRCRAFT HULLS)

Notwithstanding the contents of the War, Hi-jacking and Other Perils Exclusion Clause forming part of this Policy, IT IS HEREBY UNDERSTOOD AND AGREED that this Policy is extended to cover claims caused by the following risks:—

(i) Strikes, riots, civil commotions or labour disturbances;

(ii) Any malicious act or act of sabotage;

(iii) Hi-jacking or any unlawful seizure or wrongful exercise of control of the aircraft or crew in flight (including any attempt at such seizure or control) made by any person or persons on board the aircraft acting without the consent of the Insured

PROVIDED ALWAYS THAT

1. The above extension shall only apply to the extent that the loss or damage is not otherwise excluded by (a), (b), (d) and (f) of the War, Hi-jacking and Other Perils Exclusion Clause

2. the limits of Underwriters' liability in respect of any or all of the risks covered under this endorsement shall not exceed the sum of ..... (in the aggregate during the policy period)

3. the Insured has paid or has agreed to pay the additional premium of ..... required by the Underwriters in respect of this extension

4. the insurance provided by this endorsement may be cancelled by the Underwriters giving notice effective on the expiry of seven days from midnight G.M.T. on the day on which notice is issued.

(26.8.71.)
AVN 51

EXTENDED COVERAGE ENDORSEMENT (AIRCRAFT LIABILITIES)

*delete as appropriate

1. In consideration of an Additional Premium of .....

subject to *monthly/quarterly review, it is hereby understood and agreed that with effect from .....

paragraphs ..... of the War, Hi-jacking and Other Perils Exclusion Clause forming part of this Policy, are deleted.

2. Nevertheless, the coverage provided by this Endorsement shall TERMINATE AUTOMATICALLY

(a) upon the outbreak of war (whether there be a declaration of war or not) between any of the following States, namely, the United Kingdom, United States of America, France, the Union of Soviet Socialist Republics, the People's Republic of China
PROVIDED THAT if the Aircraft is in the air when such outbreak of war occurs, then the coverage provided by this Endorsement (subject to its terms and conditions and provided not otherwise cancelled, terminated or suspended) will be continued in respect of such Aircraft until the said Aircraft has completed its first landing thereafter.

(b) upon the hostile detonation of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter wheresoever or whensoever such detonation may occur and whether or not the insured Aircraft may be involved.

3. Notwithstanding, in the event the insured Aircraft is requisitioned for either title or use the coverage provided by this Endorsement will terminate in respect of such Aircraft.

4. The coverage provided by this Endorsement may be cancelled by either the Underwriters or the Insured giving notice effective on the expiry of seven days from Midnight G.M.T. on the day on which notice is issued.

(26.8.71.)
AVN 52

ADDITIONAL INSURED ENDORSEMENT (LIABILITIES)

It is hereby understood and agreed that .....

.....

are added as an Additional Insured but only insofar as their interests arise as owners (in whole or in part) of the insured aircraft and only with respect to the operation of the aircraft by the Named Insured.

This Endorsement does not provide coverage for the Additional Insured with respect to claims arising out of their legal liability as manufacturers, repairers, suppliers or servicing agents and shall not operate to prejudice Underwriters' rights of recourse against the Additional Insured as manufacturers, repairers, suppliers or servicing agents where such rights of recourse would have existed had this Endorsement not been effected under this Policy.

This Endorsement attaches to and forms part of Policy No. .....

and is effective from the ..... day of ..... 19.....

(13.10.71)
AVN. 53

NON-OWNED AIRCRAFT ENDORSEMENT

In consideration of an additional premium of ..... it is understood and agreed that in addition to the Aircraft declared hereunder, cover granted under this policy applies to Aircraft used by the Named Insured but not so declared, ALWAYS PROVIDED the Named Insured :

1. has no interest in the Aircraft as owner in whole or in part
2. exercises no part in the servicing or maintenance of the Aircraft
3. exercises no part in the appointment or provision of personnel for the operation of the Aircraft.

THIS ENDORSEMENT does not apply :

(a) to liability arising out of any product manufactured, sold, handled or distributed by the Named Insured

(b) to any Aircraft having a seating capacity, including crew, in excess of .....

(c) to liability for loss of or damage to the Aircraft or any consequential loss arising therefrom

(d) when the Aircraft is used by the Named Insured for hire and reward.

All other terms and conditions of the policy remain unchanged.

AVN 54.
(12.1.72)

AIRCRAFT ALL RISKS EXTENSION CLAUSE

(For use with Aircraft Hull Policy (War Risks))

This Policy is extended to cover any loss of or damage to the Aircraft insured hereunder

which would have been recoverable under the Assured's All Risks Policy No..... but for the intervention of a peril insured under paragraphs (a) (b) (c) or (d) of Section I of the Policy to which this Clause is attached.

NOTWITHSTANDING this extension the maximum payable under this Policy shall be the sum specified in column 4, Section VI.

Coverage under this extension shall terminate

(i) at midnight (local time) on the fifteenth day following the day on which this extension of coverage first became effective unless the prior agreement of Underwriters has been obtained to continue the cover;
should the natural expiry date of this policy occur during the above period, the extension shall nevertheless remain in force until the above mentioned fifteenth day

(ii) on cancellation or automatic termination of the Policy to which this Clause is attached

(iii) on the safe return of the Aircraft to the Assured at an airfield not excluded by the geographical limits of this Policy and the All Risks Policy for the Aircraft concerned, and entirely suitable for operation of the Aircraft (such safe return shall require that the Aircraft be parked with engines shut down and under no duress)

whichever first occurs.
Subject otherwise to all terms, conditions and limits of this Policy.

AVN. 55
(14.3.73.)

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