# ICAO CIRCULAR

CIRCULAR 272-AN/161

1998

# ACCIDENT/INCIDENT REPORTING (ADREP)

## ANNUAL STATISTICS — 1997

*Approved by the Secretary General and published under his authority*

INTERNATIONAL CIVIL AVIATION ORGANIZATION
MONTREAL • CANADA

*Published in separate English, French, Russian and Spanish editions by the International Civil Aviation Organization. All correspondence, except orders and subscriptions, should be addressed to the Secretary General.*

Orders for this publication should be sent to one of the following addresses, together with the appropriate remittance (by bank draft, cheque or money order) in U.S. dollars or the currency of the country in which the order is placed.

Document Sales Unit
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada H3C 5H7

Telephone: (514) 954-8022
Telex: 05-24513
Facsimile: (514) 954-6769
Sitatex: YULCAYA
Internet: sales_unit@icao.int

Credit card orders (American Express, MasterCard and Visa) are accepted at the above address.

*Egypt.* ICAO Representative, Middle East Office, Egyptian Civil Aviation Complex, Cairo Airport Road, Heliopolis, Cairo 11776
Telephone: (20 2) 267-4840; Facsimile: (20 2) 267-4843; Sitatex: CAICAYA

*France.* Représentant de l'OACI, Bureau Europe et Atlantique Nord, 3 *bis,* villa Émile-Bergerat, 92522 Neuilly-sur-Seine (Cedex)
Téléphone: (33 1) 46 41 85 85; Télécopieur: (33 1) 46 41 85 00; Sitatex: PAREUYA

*India.* Oxford Book and Stationery Co., Scindia House, New Delhi 110001
*or* 17 Park Street, Calcutta 700016
Telephone: (91 11) 331-5896; Facsimile: (91 11) 332-2639

*Japan.* Japan Civil Aviation Promotion Foundation, 15-12, 1-chome, Toranomon, Minato-Ku, Tokyo
Telephone: (81 3) 3503-2686; Facsimile: (81 3) 3503-2689

*Kenya.* ICAO Representative, Eastern and Southern African Office, United Nations Accommodation, P.O. Box 46294, Nairobi
Telephone: (254-2) 622-395; Facsimile: (254 2) 226-706; Sitatex: NBOCAYA

*Mexico.* Representante de la OACI, Oficina Norteamérica, Centroamérica y Caribe, Masaryk No. 29-3er. piso, Col. Chapultepec Morales, México, D.F., 11570
Teléfono: (52 5) 250-3211; Facsímile: (52 5) 203-2757; Sitatex: MEXCAYA

*Peru.* Representante de la OACI, Oficina Sudamérica, Apartado 4127, Lima 100
Teléfono: (51 14) 302260; Facsímile: (51 14) 640393; Sitatex: LIMCAYA

*Senegal.* Représentant de l'OACI, Bureau Afrique occidentale et centrale, Boîte postale 2356, Dakar
Téléphone: (221) 8-23-47-86; Télécopieur: (221) 8-23-69-26; Sitatex: DKRCAYA

*South Africa.* Avex Air Training (Pty) Ltd., Private Bag X102, Halfway House, 1685, Republic of South Africa
Telephone: (27-11) 315-0003/4; Facsimile: (27-11) 805-3649; Internet: avex@iafrica.com

*Spain.* A.E.N.A. — Aeropuertos Españoles y Navegación Aérea, Calle Juan Ignacio Luca de Tena, 14, Planta Tercera, Despacho 3. 11, 28027 Madrid
Teléfono: (34 1) 321-3148; Facsímile: (34 1) 321-3157; Internet: sscc.jcsoria@aena.es

*Thailand.* ICAO Representative, Asia and Pacific Office, P.O. Box 11, Samyaek Ladprao, Bangkok 10901
Telephone: (66 2) 537-8189; Facsimile: (66 2) 537-8199; Sitatex: BKKCAYA

*United Kingdom.* Wetward Digital Limited, 37 Windsor Street, Cheltenham, Glos., GL52 2DG
Telephone: (44 1242) 235-151; Facsimile: (44 1242) 584-139

2/98

# TABLE OF CONTENTS

# INTRODUCTION

## GENERAL

1. The information in this publication is based on accident and incident reports provided to ICAO by Contracting States in accordance with the reporting requirements in Chapter 6 of Annex 13, *Aircraft Accident and Incident Investigation.*

2. This edition of the ICAO Accident/Incident Reporting (ADREP) annual statistics contains detailed information for the year 1997, preliminary data for the year 1998, and ten year trends from 1989 to 1998. ADREP data reports are sent to ICAO upon completion of an accident or incident investigation, and therefore data can be published only with some delay.

## PURPOSE

3. The purpose of ADREP statistics is to provide data that may be useful for general safety studies and accident prevention programmes. For more specific needs, States are invited to make full use of ADREP information by making specific ADREP requests to facilitate safety studies, accident prevention programmes and accident investigations.

## LIMITATIONS

4. The reader should be aware of the following:

a) the *Accident/Incident Reporting Manual (ADREP Manual)* (Doc 9156) contains lists of codes to be used by States in the preparation of ADREP reports. Due to the sensitive subject matter, it is possible for the compiler to show unintentional bias in the choice of codes used to describe the occurrence and, in particular, those organizations or persons involved;

b) some occurrences are reported to ICAO through electronic means. Most of this data is converted to ICAO's format before it is entered into the ADREP database. Since some of the data reported is not compatible with the ADREP coding system, precision is not attainable in all cases; and

c) coding of accidents and incidents have been redefined over time, in particular those pertaining to incidents. Older data has not been recoded to reflect the new coding and format.

## LAYOUT

5. This circular contains five parts:

- Part I provides general information regarding the scope of the information contained in the ADREP system.
- Part II presents information on accident types which have been the focus of accident prevention programmes in the last 10 years.
- Part III contains detailed information for the year 1996.
- Part IV provides general accident trend information including preliminary data for 1998.
- Part V provides a list of accidents involving passenger fatalities in scheduled and non-scheduled operations in 1997.

# Part I

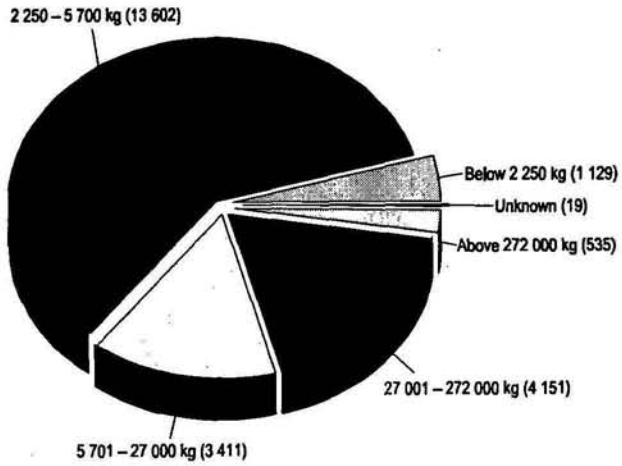
# GENERAL INFORMATION REGARDING THE ADREP DATA

1. As of 31 May 1998, the ICAO ADREP system contained data from some 22 908 reports: 3 592 preliminary reports, 16 330 data reports, and unofficial data on 2 686 occurrences, which were within the reporting requirements of Annex 13, Chapter 6. Of a total of 22 908 reports, 84.5% were accident reports and 15.5% were incident reports.

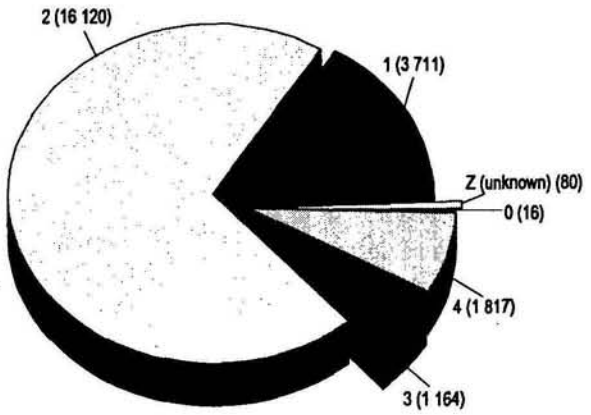
2. General aviation accounted for 53.2% of the reports, and airline operations for 46.8%. In terms of the types of aircraft, 93% were for fixed-wing aircraft, and 7% for helicopters.

3. The percentages of reports in relation to the mass category of the aircraft involved and their number of engines are shown below:

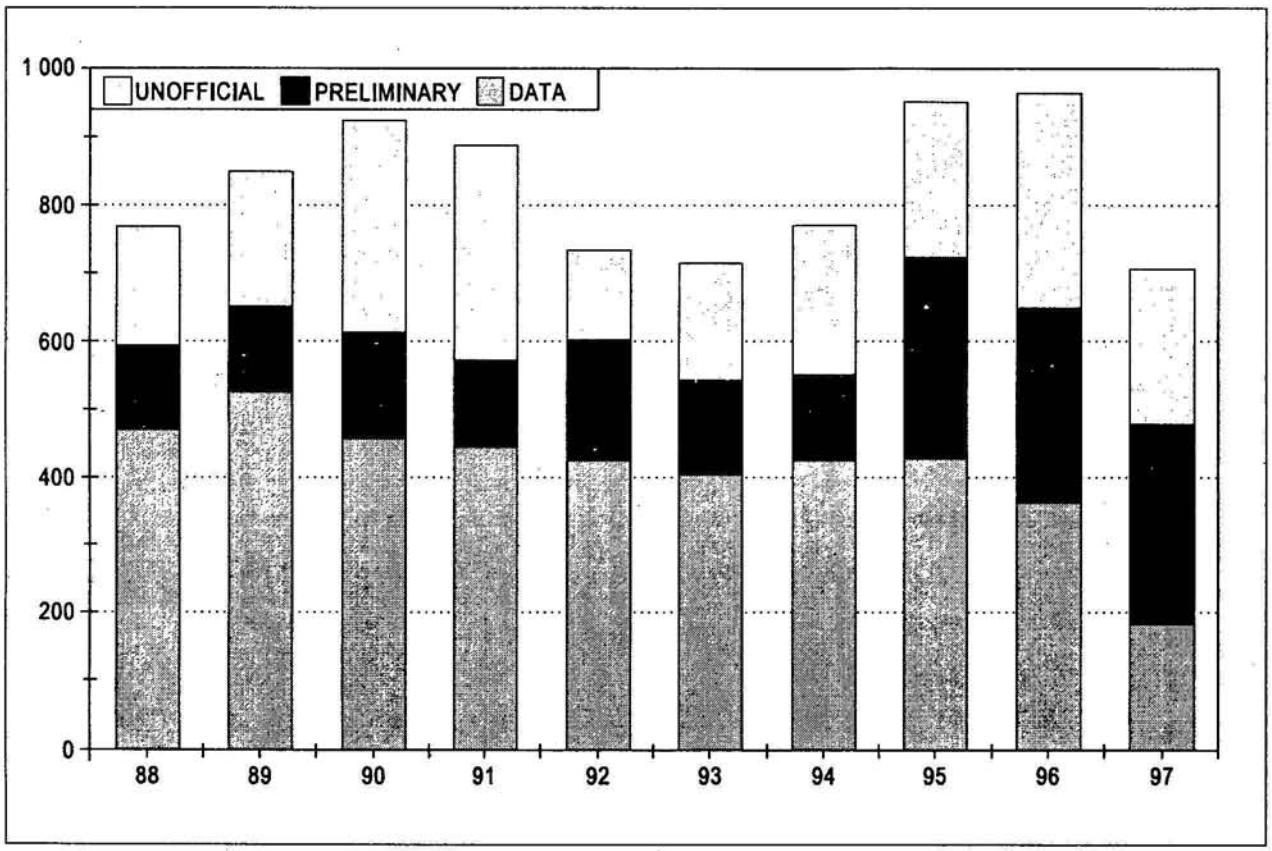
**Mass category**




**Number of engines**



4. The information in Part II presents data from the last 10 years based on 8 416 reports and Part III, for the year 1996 is based on 685 reports. The table below shows the distribution of these reports into accident/incident data reports, preliminary reports and unofficial reports, for the last 10 years.




*Note.— The reporting to ICAO of an accident is usually done twice, first with a short report called a "Preliminary Report" and, when the investigation is completed, with a complete report called an "Accident Data Report". A Preliminary Report is not required for incidents (only for accidents) nor is it required if the Accident Data Report can be submitted within 30 days of the date of the accident.*

# Part II
# ACCIDENT TYPES

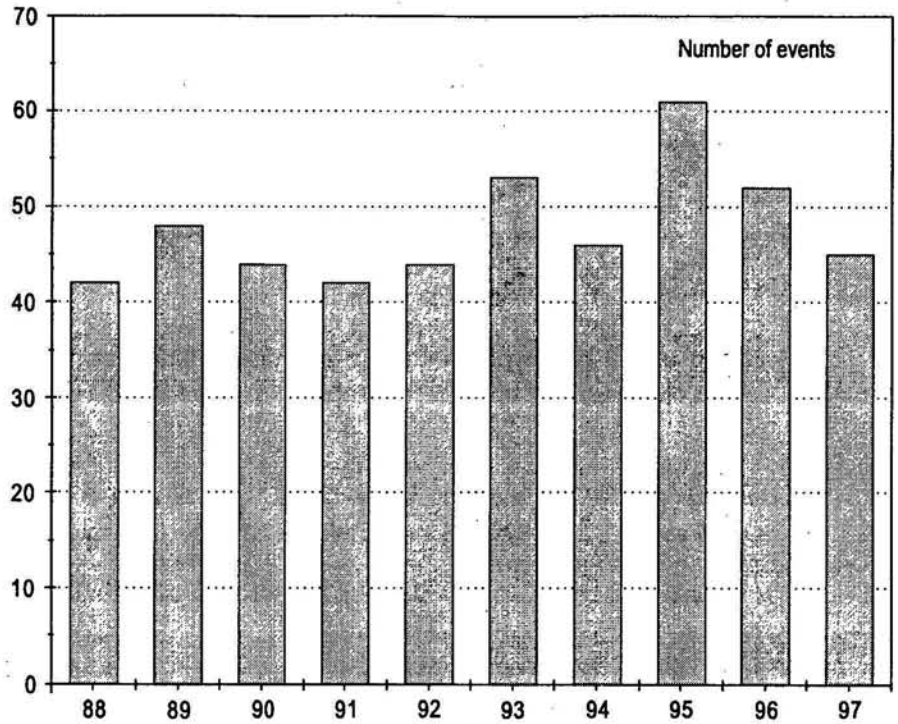
The following tables present accident types in airline operations, which have been of special interest and subject to specific accident prevention programmes in the last 10 years. It should be noted that a given accident may fall into more than one of the following accident types.

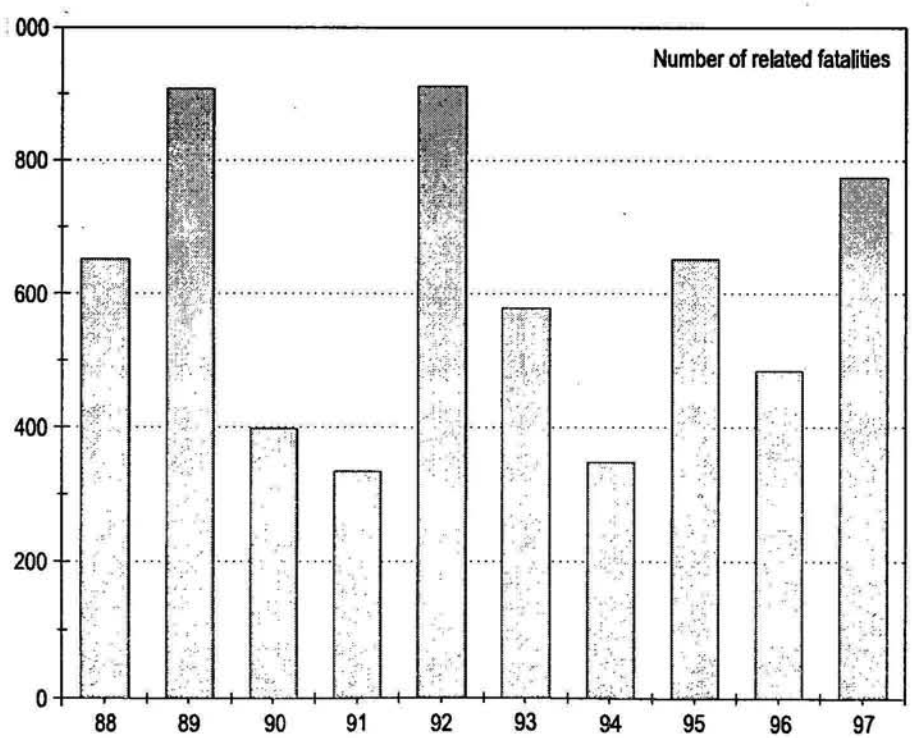
*Note on the statistical tables.— The tables were developed with data from the ADREP reporting system. In the ADREP report, each accident/incident may be described by up to five events. For each event type, there is a corresponding phase of operation and up to ten descriptive factors consisting of one subject and up to three modifiers as well as up to three related explanatory factors consisting of one organization/person, a subject and a modifier.*

**Controlled Flight into Terrain (CFIT)**

CFIT is defined as an accident in which aircraft, under the control of the crew, is flown into terrain (or water) with no prior awareness on the part of the crew of the impending accident. The prevention of these types of accidents has recently been the subject of an industry task force.

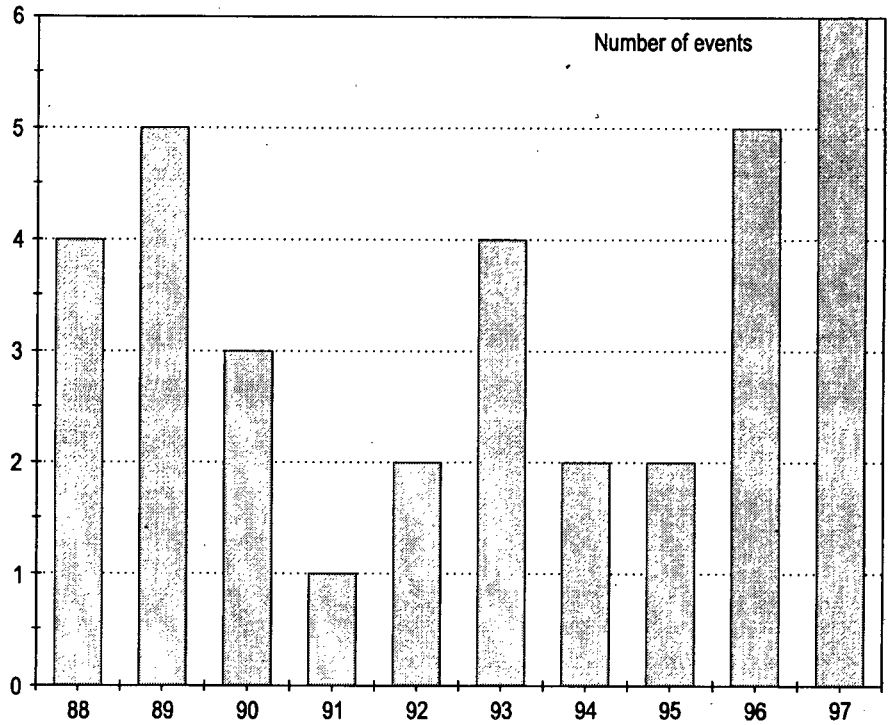
The tables present information on accidents which were classified as "CFIT" accidents.

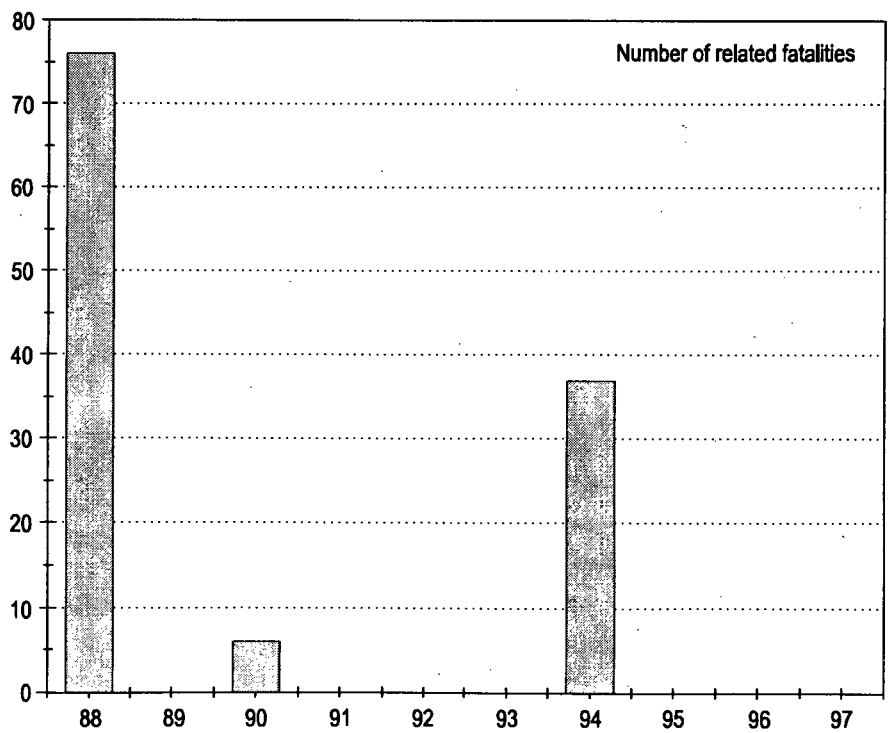


## Windshear

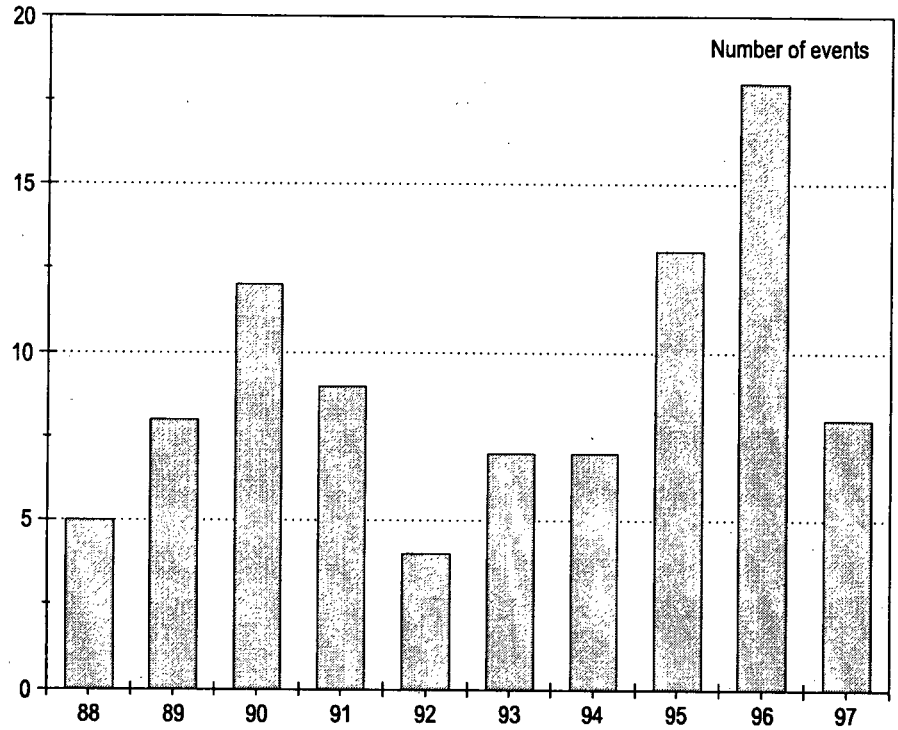
The tables present information on occurrences where windshear was quoted as a type of event or where a factor "windshear" was entered in the report.

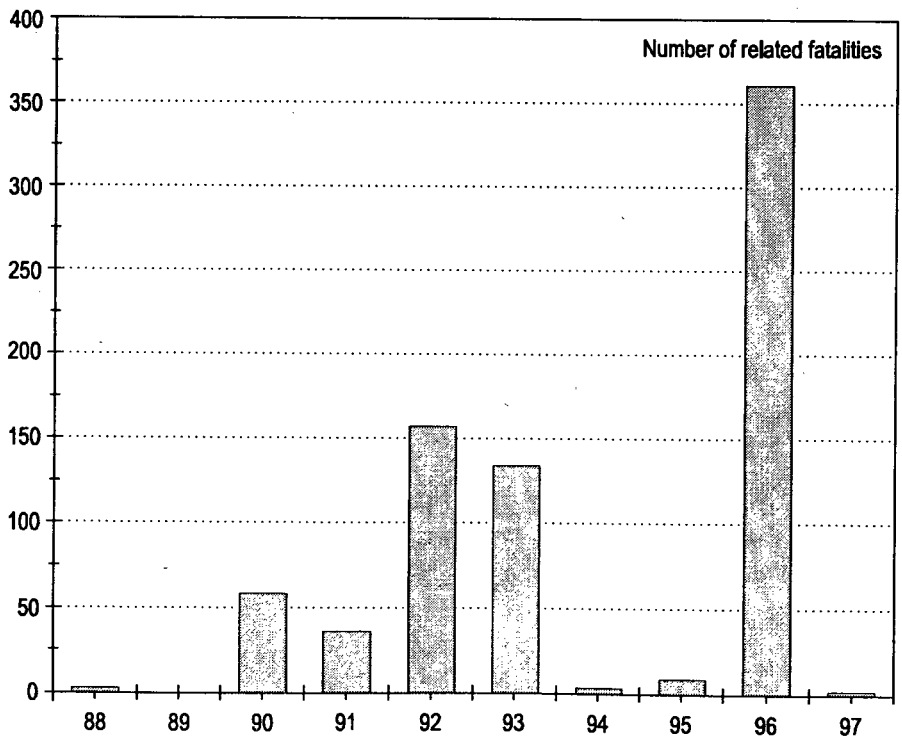


## Aircraft collisions

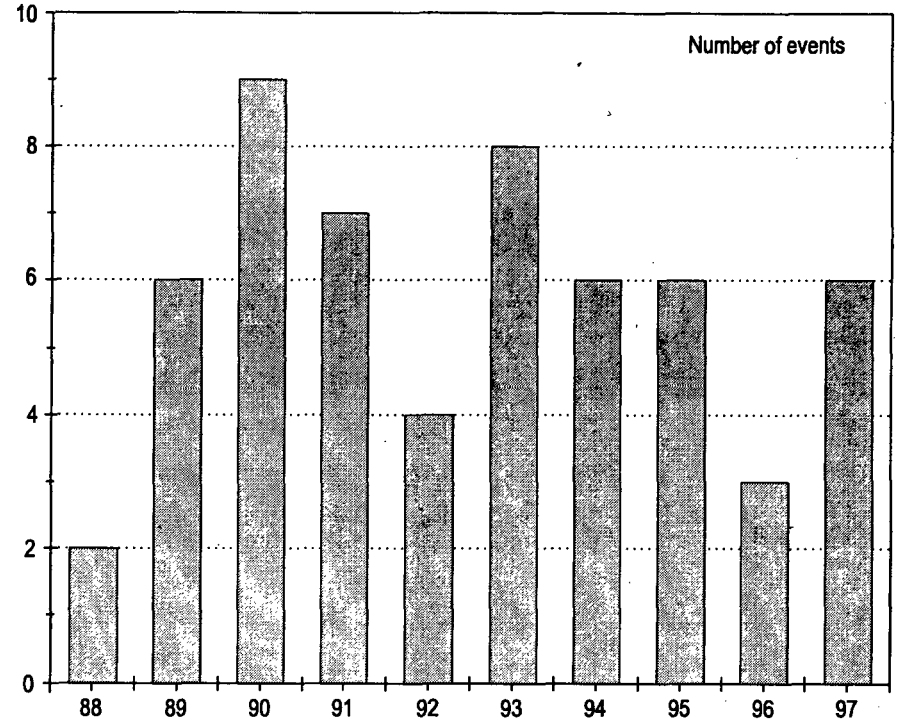
The tables present information on collisions between two aircraft (collisions between an aircraft and other objects are not included).

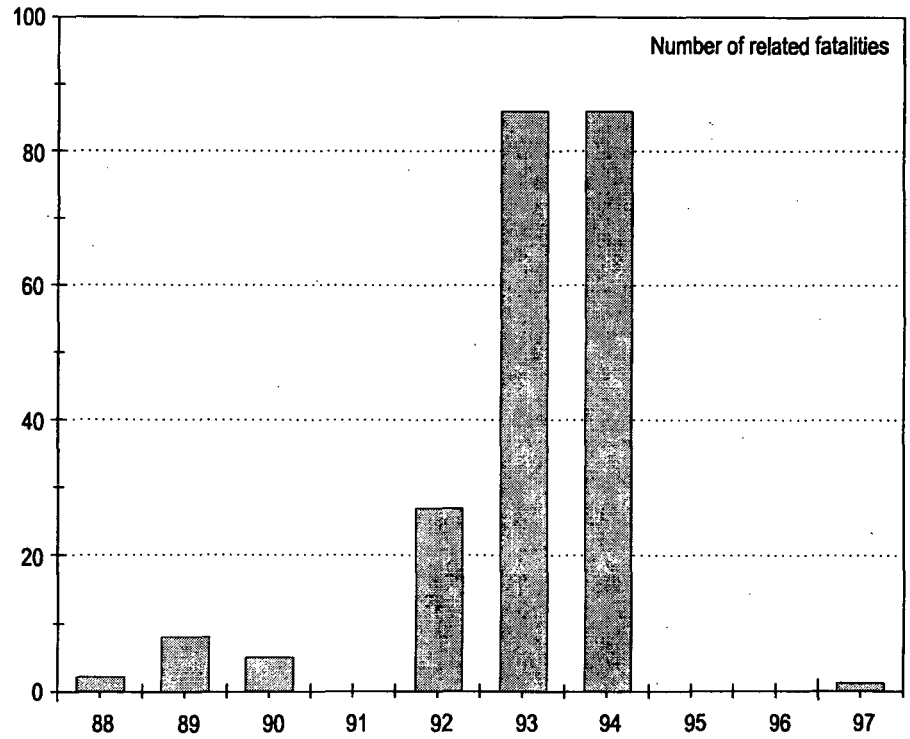


## Icing

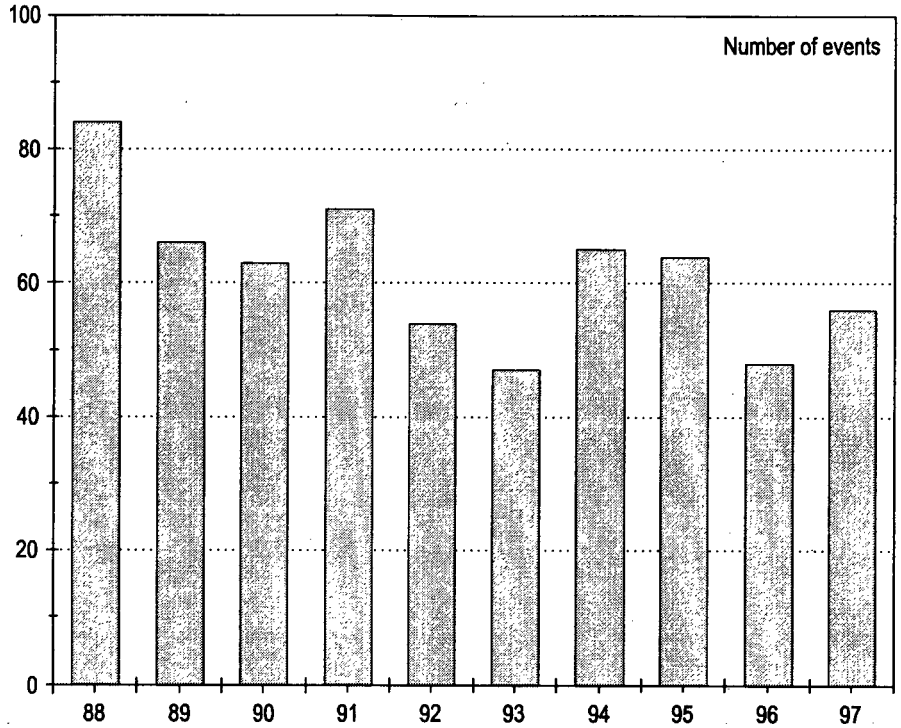
The tables present information on occurrences in which either an event "aircraft encountered icing" was coded, or "icing" was coded as a factor.

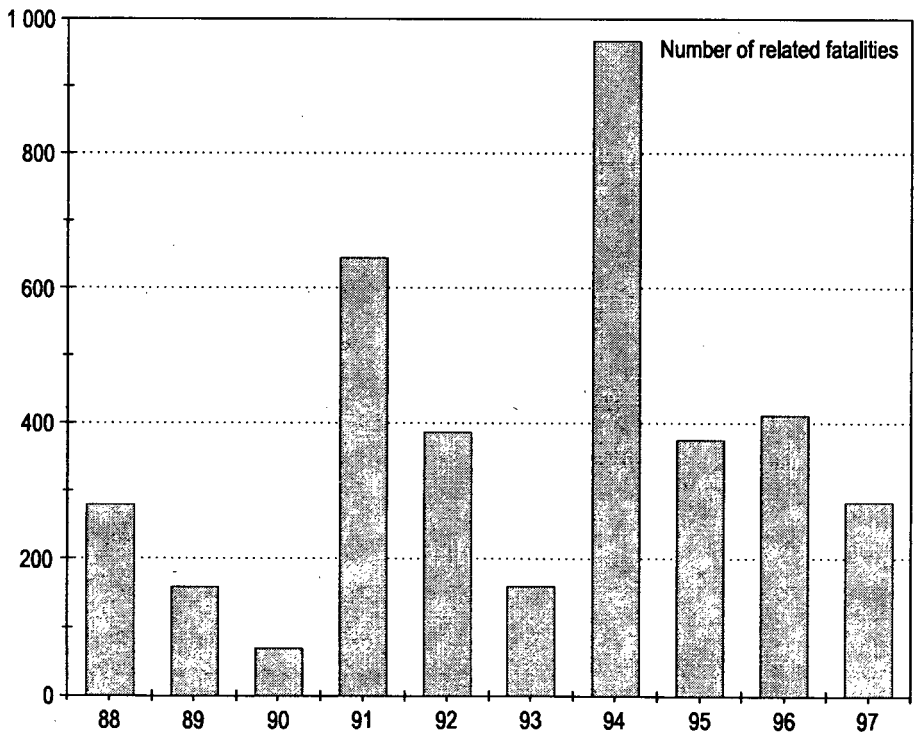


### Loss of control

The tables present information on accidents in which at least one event was coded as "loss of control".



# Part III
# INFORMATION FOR THE YEAR 1996

*Note.— Tables III-1 and III-2 provide data for 1997. The charts that follow provide data up to 1996 only.*

## Table III-1. Accidents and incidents by type of operation and aircraft mass

### 1997

| Type of operation and aircraft mass | Number of reports | | | Number of occurrences | | | Number of fatalities | | | | Number of aircraft destroyed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PR | DR | Unofficial | Fatal | Non-fatal | Total | Crew | Pax | Other | Total | |
| I. Accidents to aeroplanes | | | | | | | | | | | |
| Scheduled airline operations | | | | | | | | | | | |
| Aeroplanes: over 27 000 kg | 16 | 16 | 27 | 14 | 45 | 59 | 68 | 752 | 1 | 821 | 17 |
| Aeroplanes: 2 250 to 27 000 kg | 18 | 6 | 24 | 19 | 29 | 48 | 33 | 168 | 1 | 202 | 25 |
| Non-scheduled airline operations | | | | | | | | | | | |
| Aeroplanes: over 27 000 kg | 6 | 2 | 6 | 4 | 10 | 14 | 15 | 110 | 0 | 125 | 5 |
| Aeroplanes: 2 250 to 27 000 kg | 34 | 19 | 19 | 19 | 53 | 72 | 32 | 128 | 0 | 160 | 23 |
| Other airline operations | | | | | | | | | | | |
| Aeroplanes: over 27 000 kg | 0 | 0 | 3 | 1 | 2 | 3 | 2 | 0 | 0 | 2 | 2 |
| Aeroplanes: 2 250 to 27 000 kg | 3 | 3 | 9 | 9 | 6 | 15 | 20 | 5 | 0 | 25 | 12 |
| General aviation | | | | | | | | | | | |
| Aeroplanes: over 5 700 kg | 3 | 7 | 11 | 8 | 13 | 21 | 38 | 33 | 63 | 134 | 11 |
| Aeroplanes: 2 250 to 5 700 kg | 30 | 67 | 24 | 27 | 94 | 121 | 34 | 24 | 0 | 58 | 43 |
| II. Accidents to helicopters | | | | | | | | | | | |
| Airline operations | 2 | 1 | 4 | 6 | 1 | 7 | 6 | 42 | 0 | 48 | 4 |
| General aviation | 15 | 10 | 10 | 21 | 14 | 35 | 20 | 49 | 0 | 69 | 22 |
| III. Incidents | | | | | | | | | | | |
| Aeroplanes | | | | | | | | | | | |
| Airline operations | 133 | 37 | 70 | 0 | 240 | 240 | 0 | 0 | 0 | 0 | 0 |
| General aviation | 12 | 1 | 9 | 0 | 22 | 22 | 0 | 0 | 0 | 0 | 0 |
| Helicopters | | | | | | | | | | | |
| Airline operations | 3 | 1 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 0 |
| General aviation | 9 | 2 | 1 | 0 | 12 | 12 | 0 | 0 | 0 | 0 | 0 |

## Table III-2. Accidents and incidents by type of operation and type of powerplant

### 1997

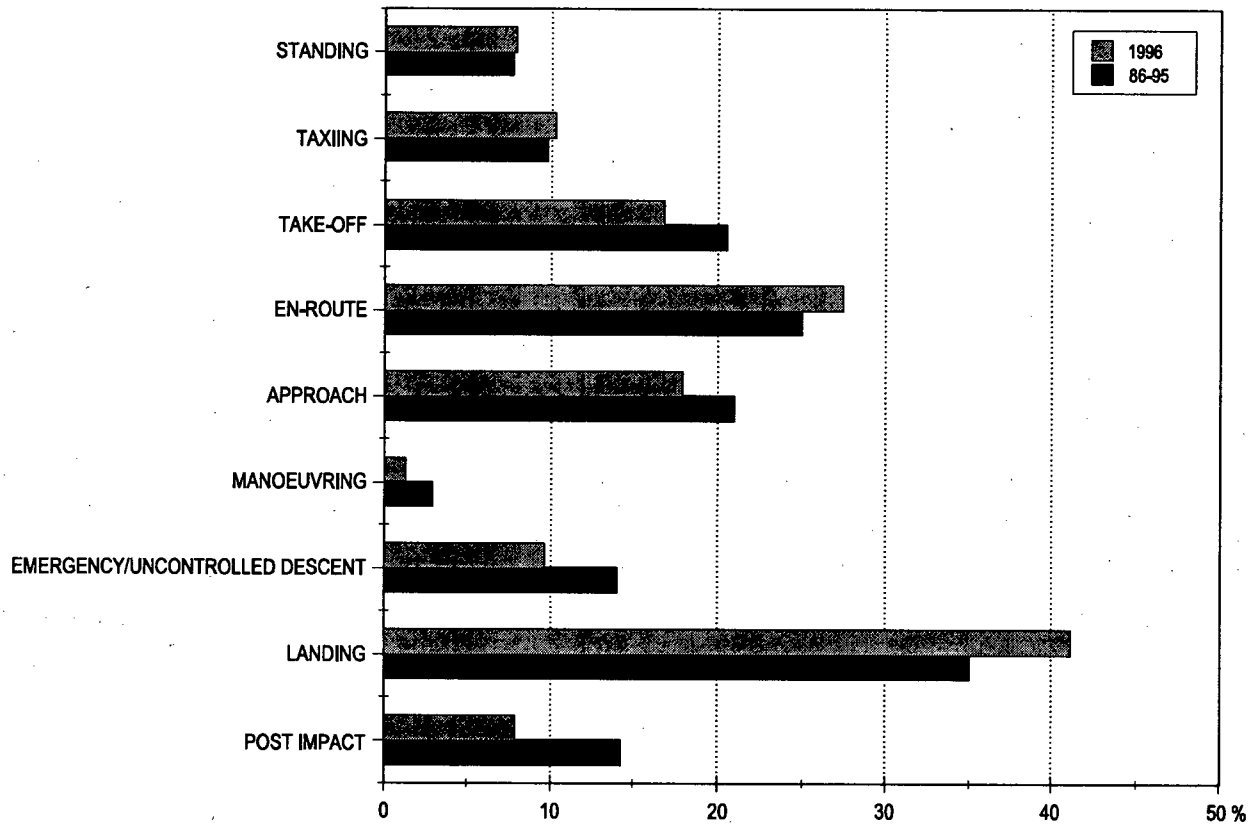
| Type of operation and type of powerplant | Number of reports | | | Number of occurrences | | | Number of fatalities | | | | Number of aircraft destroyed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PR | DR | Unofficial | Fatal | Non-fatal | Total | Crew | Pax | Other | Total | |
| I. Fixed wing aircraft | | | | | | | | | | | |
| Scheduled airline operations | | | | | | | | | | | |
| Turbofan/turbojet | 90 | 40 | 65 | 15 | 180 | 195 | 69 | 753 | 1 | 823 | 19 |
| Turboprop | 44 | 14 | 33 | 14 | 77 | 91 | 29 | 142 | 1 | 172 | 19 |
| Piston | 1 | 0 | 4 | 4 | 1 | 5 | 3 | 25 | 0 | 28 | 4 |
| Non-scheduled airline operations | | | | | | | | | | | |
| Turbofan/turbojet | 17 | 5 | 11 | 5 | 28 | 33 | 15 | 79 | 0 | 94 | 5 |
| Turboprop | 21 | 6 | 18 | 12 | 33 | 45 | 26 | 149 | 0 | 175 | 16 |
| Piston | 34 | 14 | 6 | 6 | 48 | 54 | 6 | 10 | 0 | 16 | 7 |
| Other airline operations | | | | | | | | | | | |
| Turbofan/turbojet | 0 | 1 | 9 | 3 | 7 | 10 | 10 | 1 | 0 | 11 | 5 |
| Turboprop | 1 | 1 | 5 | 3 | 4 | 7 | 7 | 1 | 0 | 8 | 5 |
| Piston | 2 | 2 | 3 | 4 | 3 | 7 | 5 | 3 | 0 | 8 | 4 |
| General aviation | | | | | | | | | | | |
| Turbofan/turbojet | 8 | 6 | 15 | 6 | 23 | 29 | 24 | 16 | 63 | 103 | 9 |
| Turboprop | 14 | 23 | 12 | 12 | 37 | 49 | 27 | 23 | 0 | 50 | 16 |
| Piston | 23 | 46 | 17 | 17 | 69 | 86 | 21 | 18 | 0 | 39 | 29 |
| II. Helicopters | | | | | | | | | | | |
| Airline operations | | | | | | | | | | | |
| Turboshaft | 5 | 2 | 4 | 6 | 5 | 11 | 6 | 42 | 0 | 48 | 4 |
| General aviation | | | | | | | | | | | |
| Turboshaft | 19 | 11 | 11 | 20 | 21 | 41 | 19 | 48 | 0 | 67 | 19 |
| Piston | 5 | 1 | 0 | 1 | 5 | 6 | 1 | 1 | 0 | 2 | 3 |

# FIXED WING AIRCRAFT

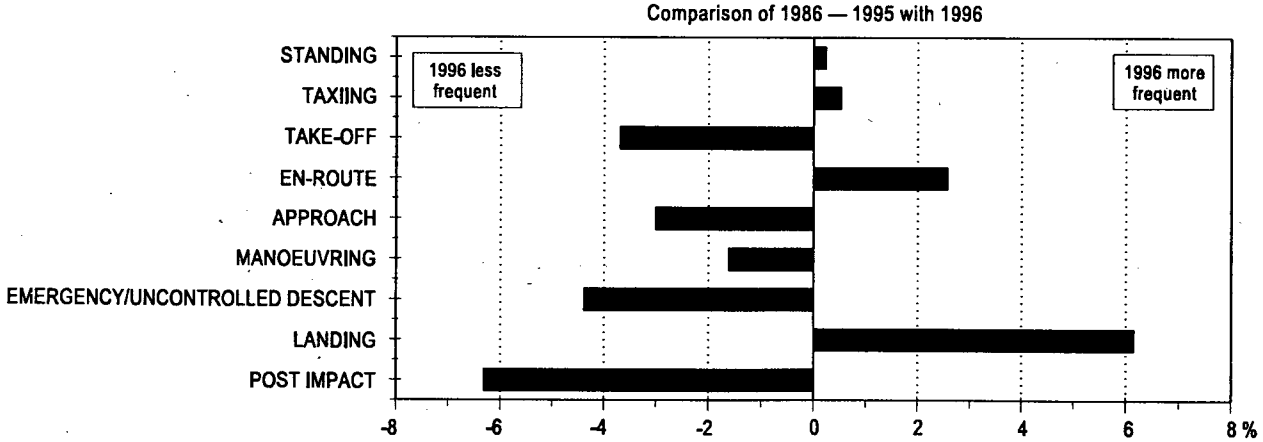
## Airline Operations

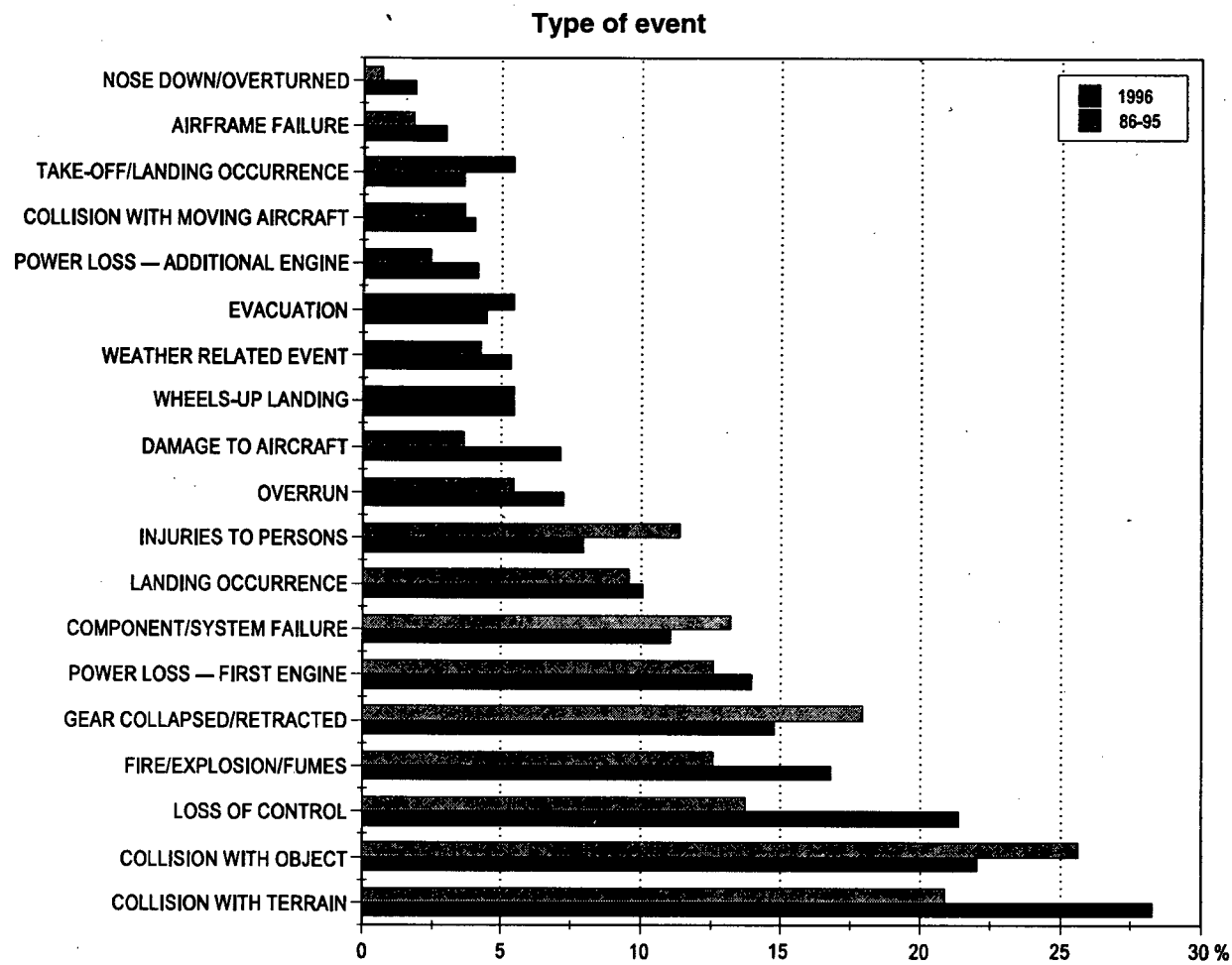
## Accidents

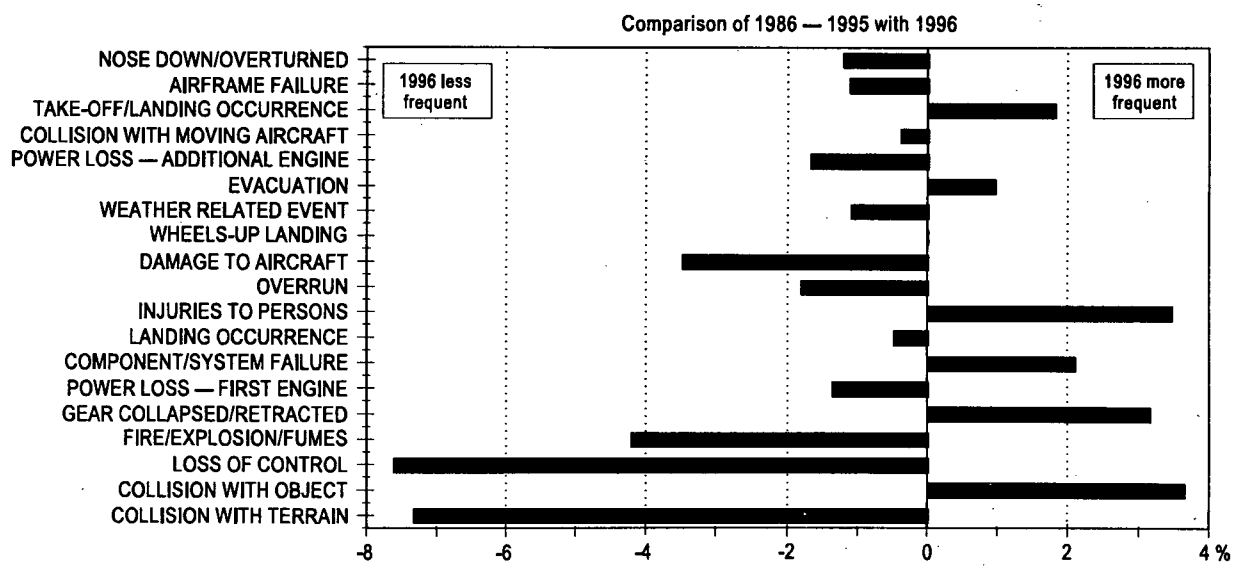
### Phase of operation



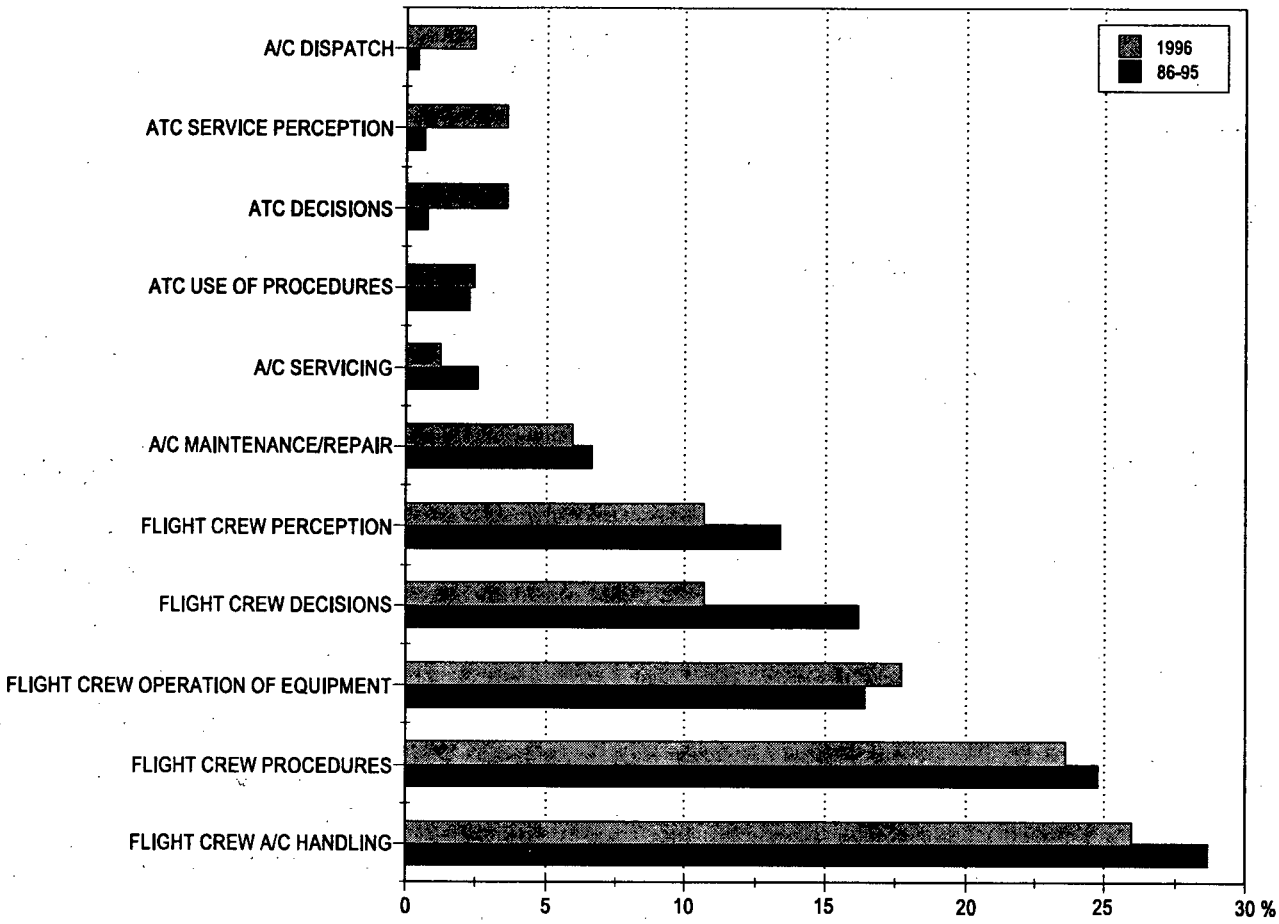

Comparison of 1986 — 1995 with 1996



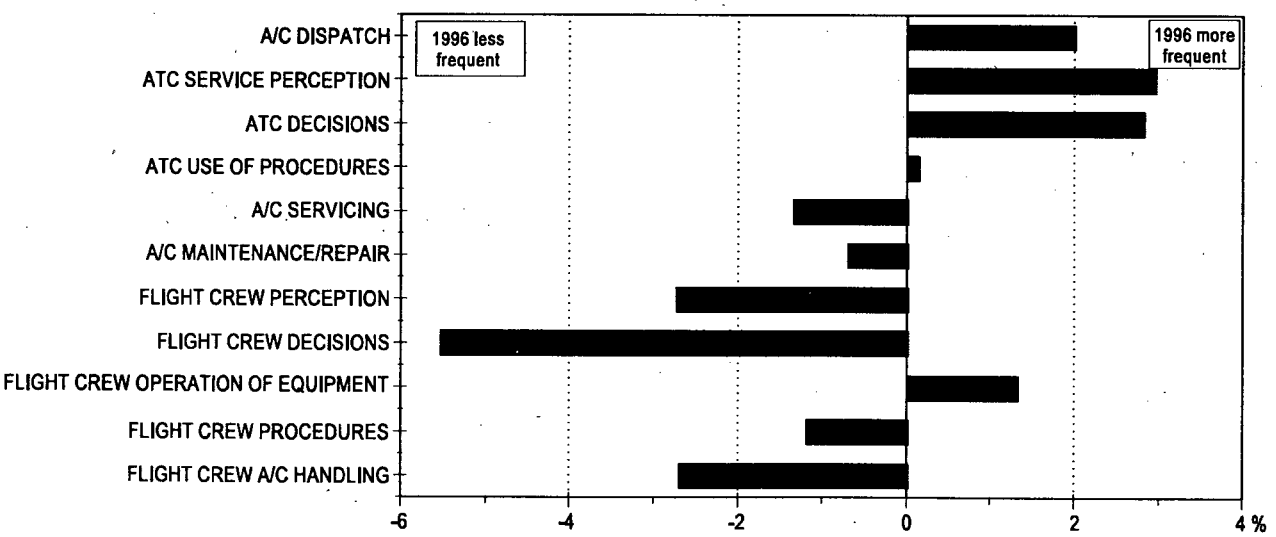

Type of event
NOSE DOWN/OVERTURNED
AIRFRAME FAILURE
TAKE-OFF/LANDING OCCURRENCE
COLLISION WITH MOVING AIRCRAFT
POWER LOSS — ADDITIONAL ENGINE
EVACUATION
WEATHER RELATED EVENT
WHEELS-UP LANDING
DAMAGE TO AIRCRAFT
OVERRUN
INJURIES TO PERSONS
LANDING OCCURRENCE
COMPONENT/SYSTEM FAILURE
POWER LOSS — FIRST ENGINE
GEAR COLLAPSED/RETRACTED
FIRE/EXPLOSION/FUMES
LOSS OF CONTROL
COLLISION WITH OBJECT
COLLISION WITH TERRAIN
1996
86-95
0
5
10
15
20
25
30 %


Comparison of 1986 — 1995 with 1996
1996 less frequent
1996 more frequent
NOSE DOWN/OVERTURNED
AIRFRAME FAILURE
TAKE-OFF/LANDING OCCURRENCE
COLLISION WITH MOVING AIRCRAFT
POWER LOSS — ADDITIONAL ENGINE
EVACUATION
WEATHER RELATED EVENT
WHEELS-UP LANDING
DAMAGE TO AIRCRAFT
OVERRUN
INJURIES TO PERSONS
LANDING OCCURRENCE
COMPONENT/SYSTEM FAILURE
POWER LOSS — FIRST ENGINE
GEAR COLLAPSED/RETRACTED
FIRE/EXPLOSION/FUMES
LOSS OF CONTROL
COLLISION WITH OBJECT
COLLISION WITH TERRAIN
-8
-6
-4
-2
0
2
4 %

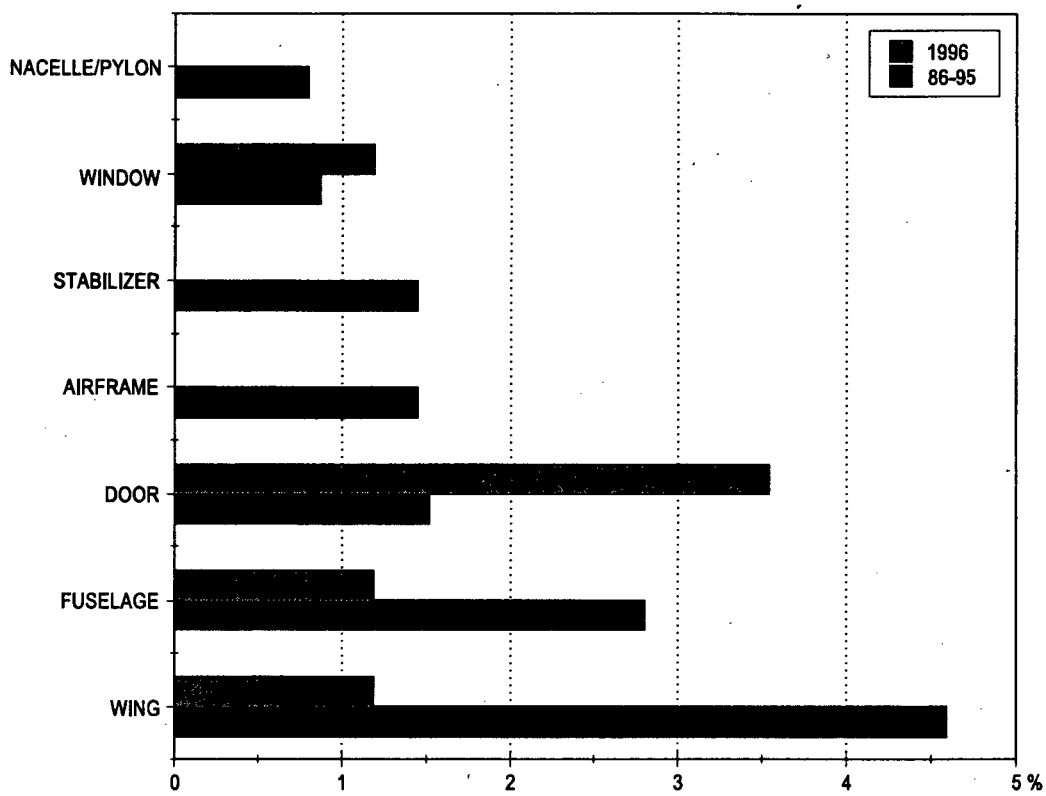
**Personnel factors**



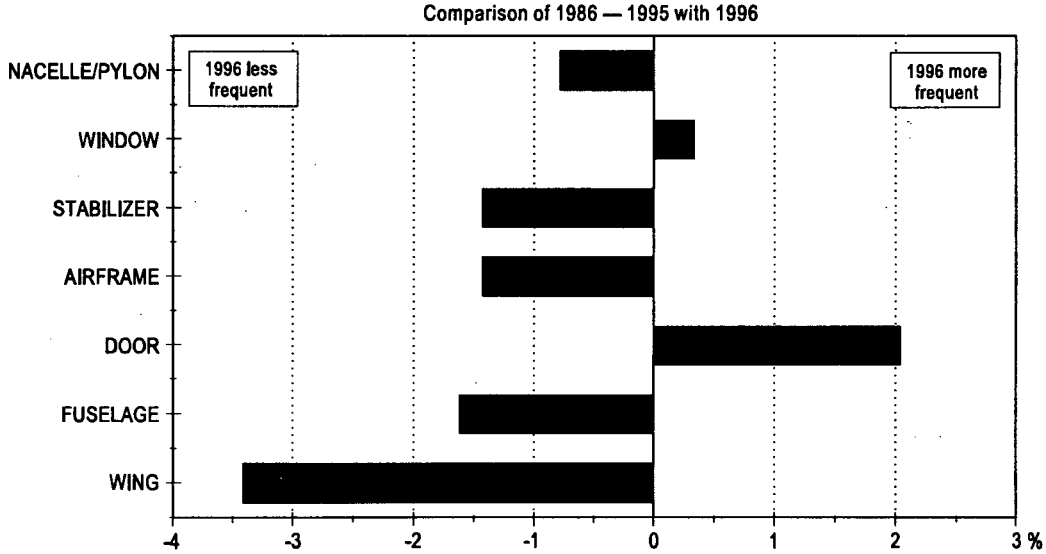

Comparison of 1986 — 1995 with 1996



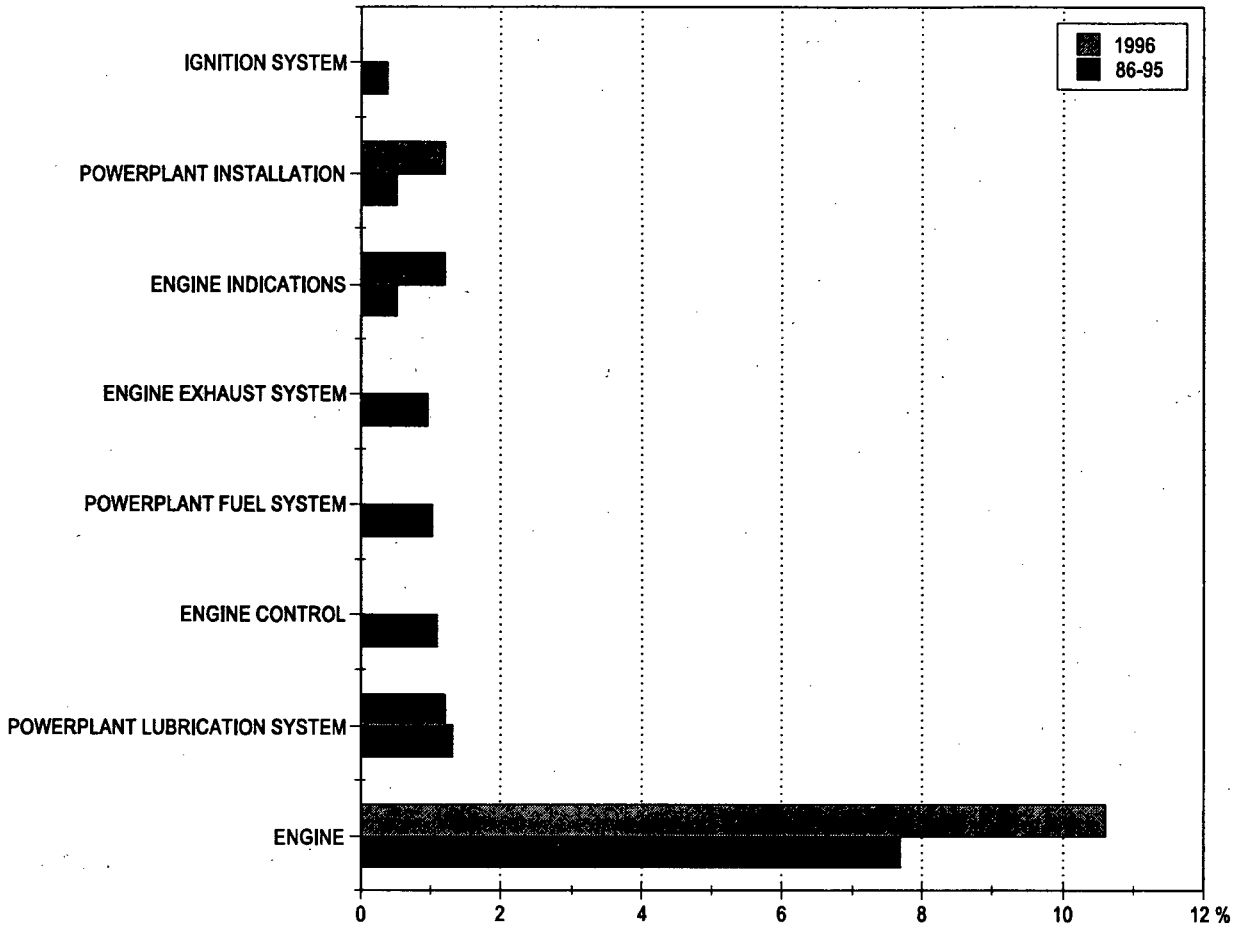
**Airframe factors**



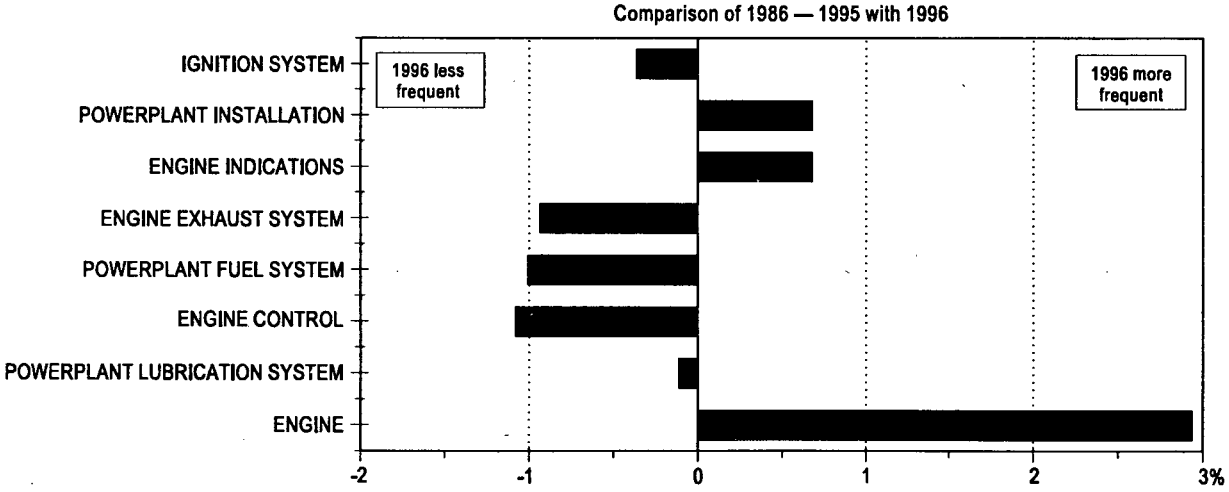

Comparison of 1986 — 1995 with 1996

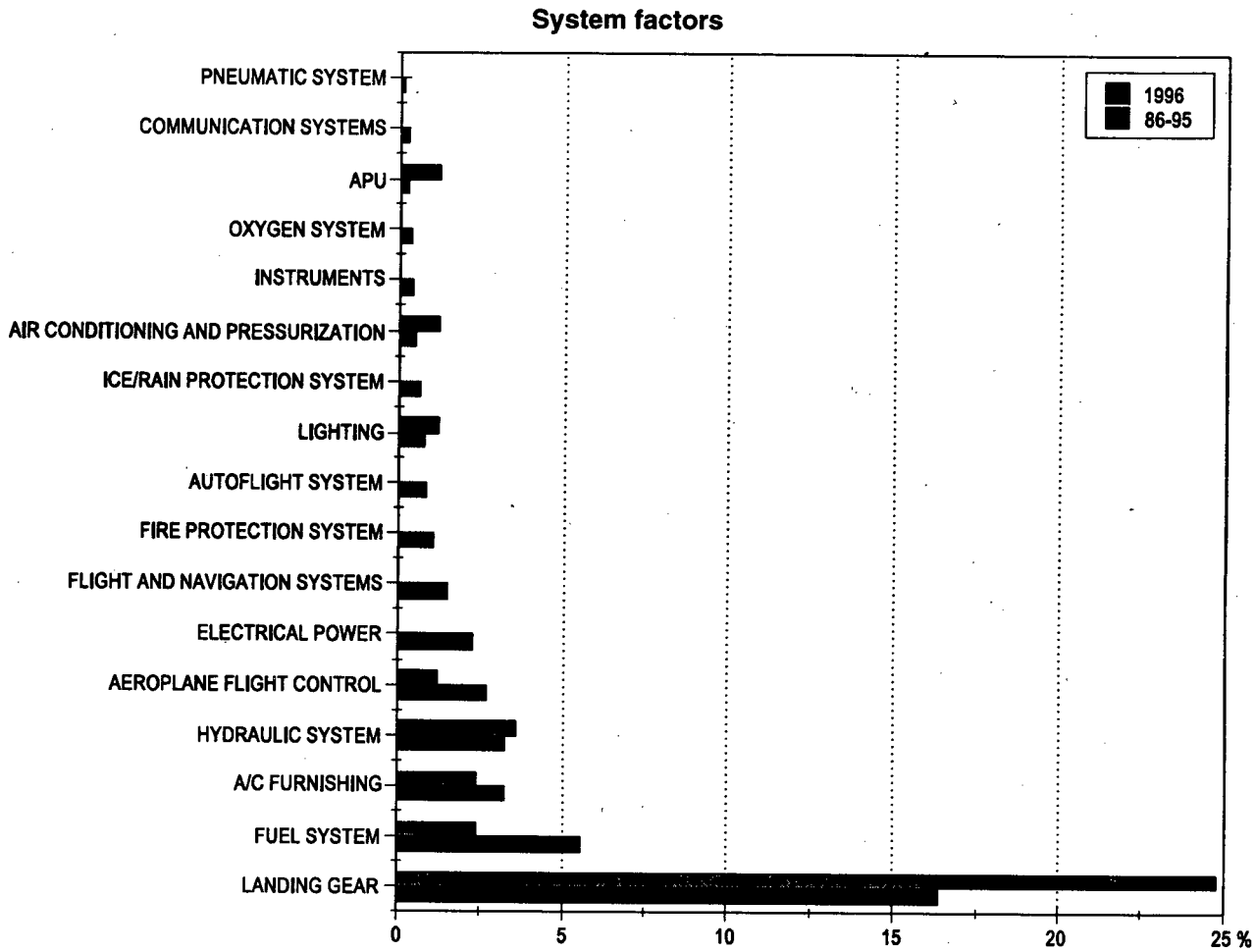


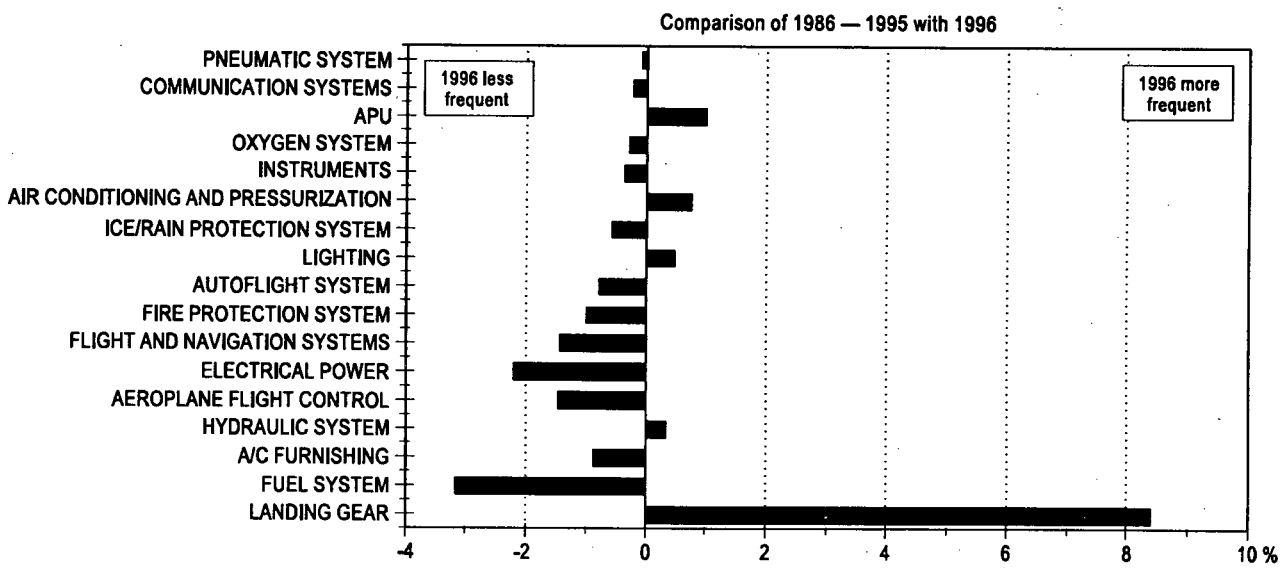
**Powerplant factors**



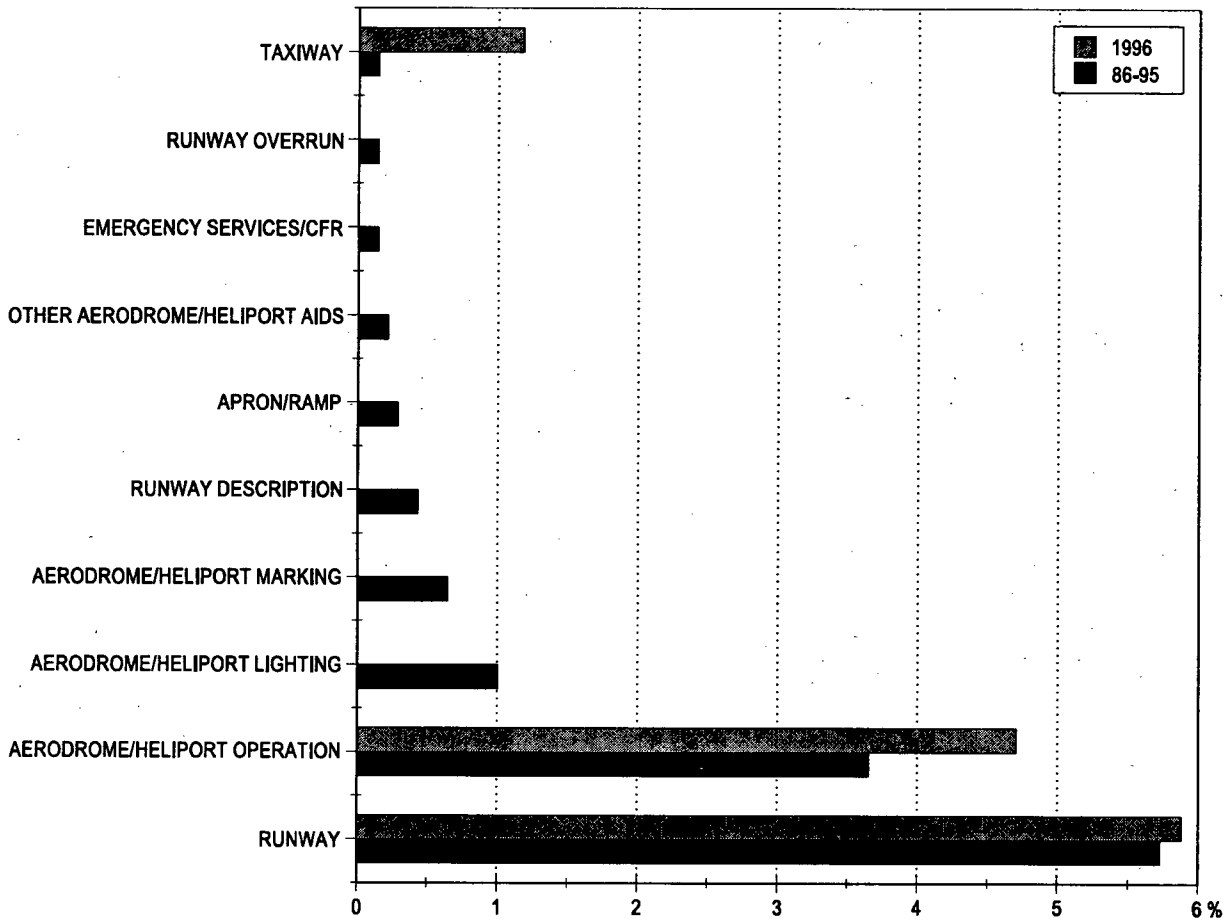

Comparison of 1986 — 1995 with 1996



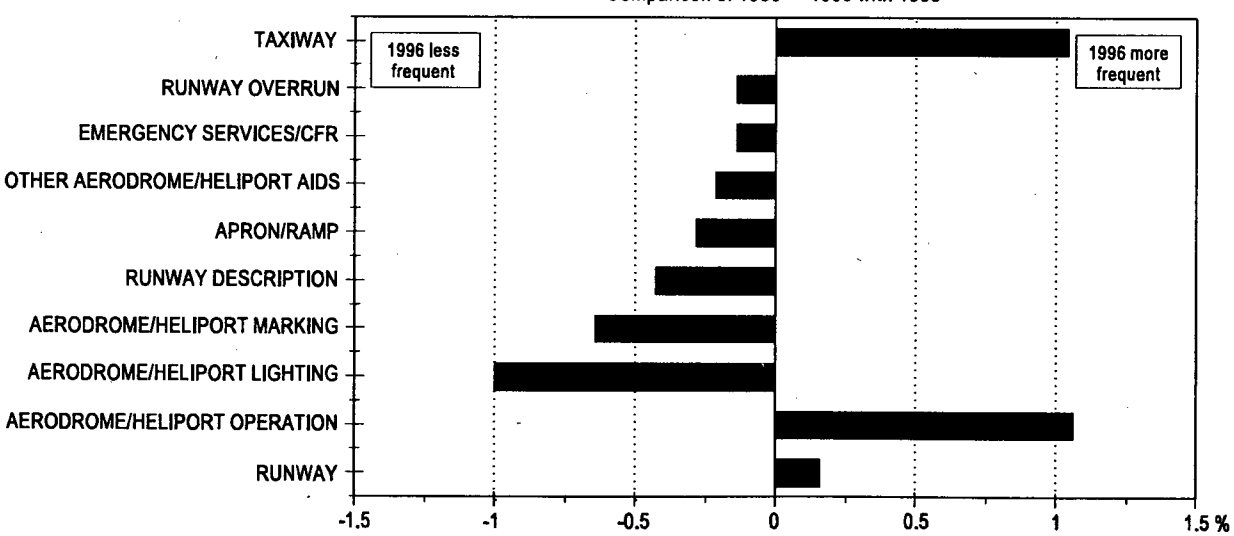

System factors
PNEUMATIC SYSTEM
COMMUNICATION SYSTEMS
APU
OXYGEN SYSTEM
INSTRUMENTS
AIR CONDITIONING AND PRESSURIZATION
ICE/RAIN PROTECTION SYSTEM
LIGHTING
AUTOFLIGHT SYSTEM
FIRE PROTECTION SYSTEM
FLIGHT AND NAVIGATION SYSTEMS
ELECTRICAL POWER
AEROPLANE FLIGHT CONTROL
HYDRAULIC SYSTEM
A/C FURNISHING
FUEL SYSTEM
LANDING GEAR
1996
86-95
0
5
10
15
20
25 %


Comparison of 1986 — 1995 with 1996
PNEUMATIC SYSTEM
COMMUNICATION SYSTEMS
APU
OXYGEN SYSTEM
INSTRUMENTS
AIR CONDITIONING AND PRESSURIZATION
ICE/RAIN PROTECTION SYSTEM
LIGHTING
AUTOFLIGHT SYSTEM
FIRE PROTECTION SYSTEM
FLIGHT AND NAVIGATION SYSTEMS
ELECTRICAL POWER
AEROPLANE FLIGHT CONTROL
HYDRAULIC SYSTEM
A/C FURNISHING
FUEL SYSTEM
LANDING GEAR
1996 less frequent
1996 more frequent
-4
-2
0
2
4
6
8
10 %

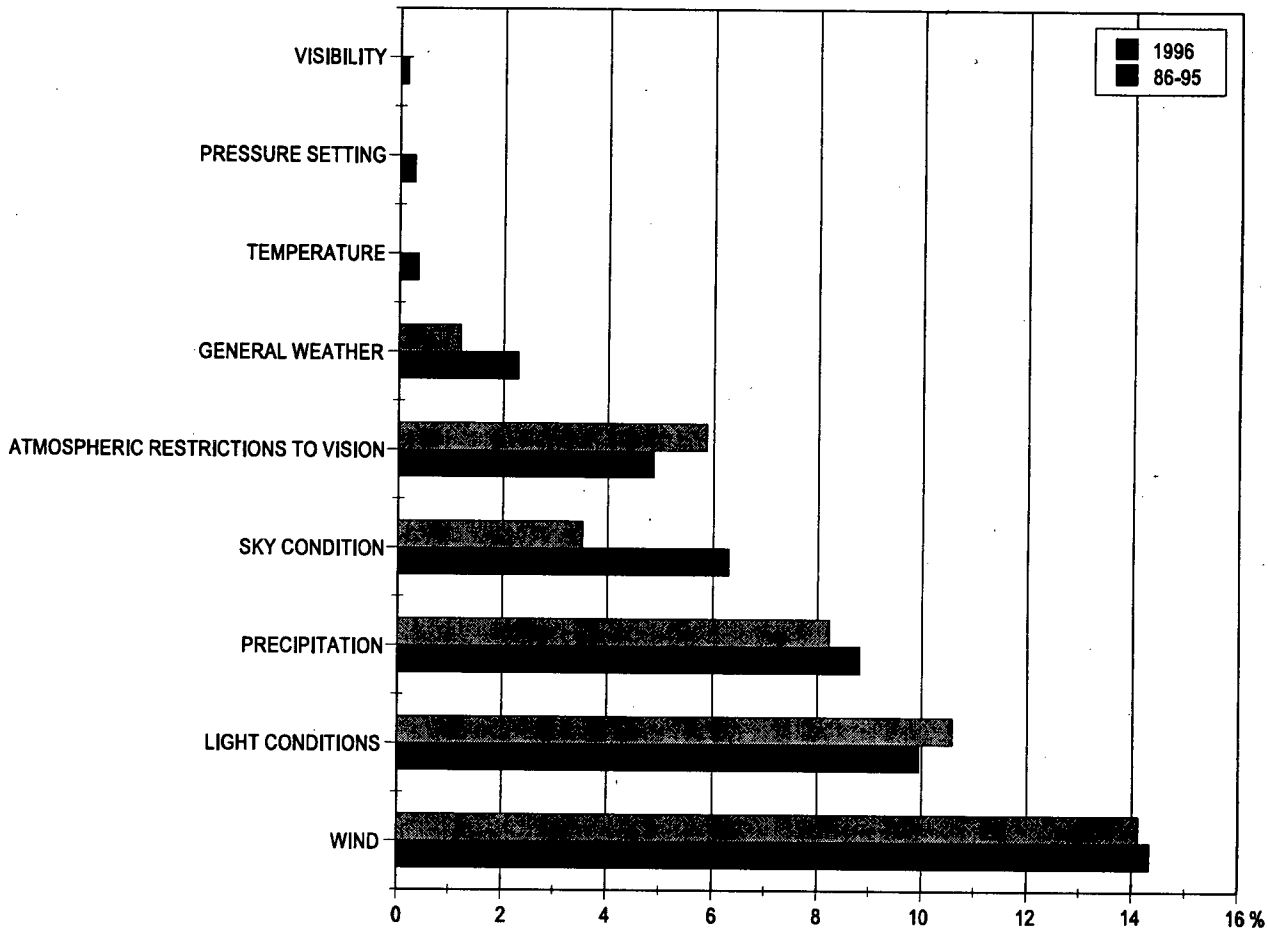
**Aerodrome factors**



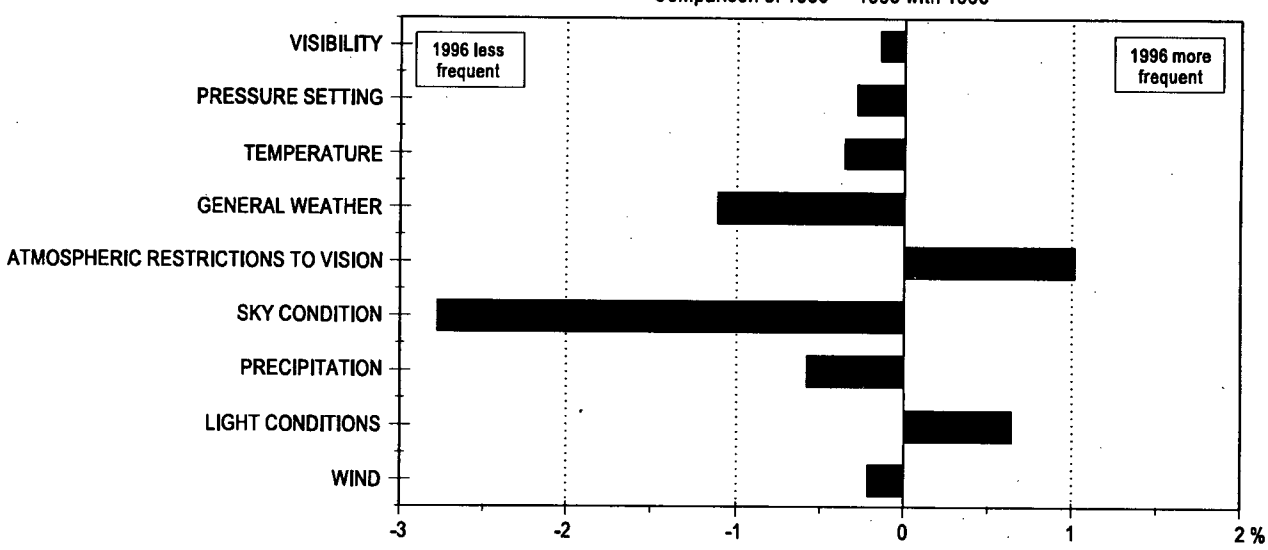

Comparison of 1986 — 1995 with 1996



## Weather factors




Comparison of 1986 — 1995 with 1996

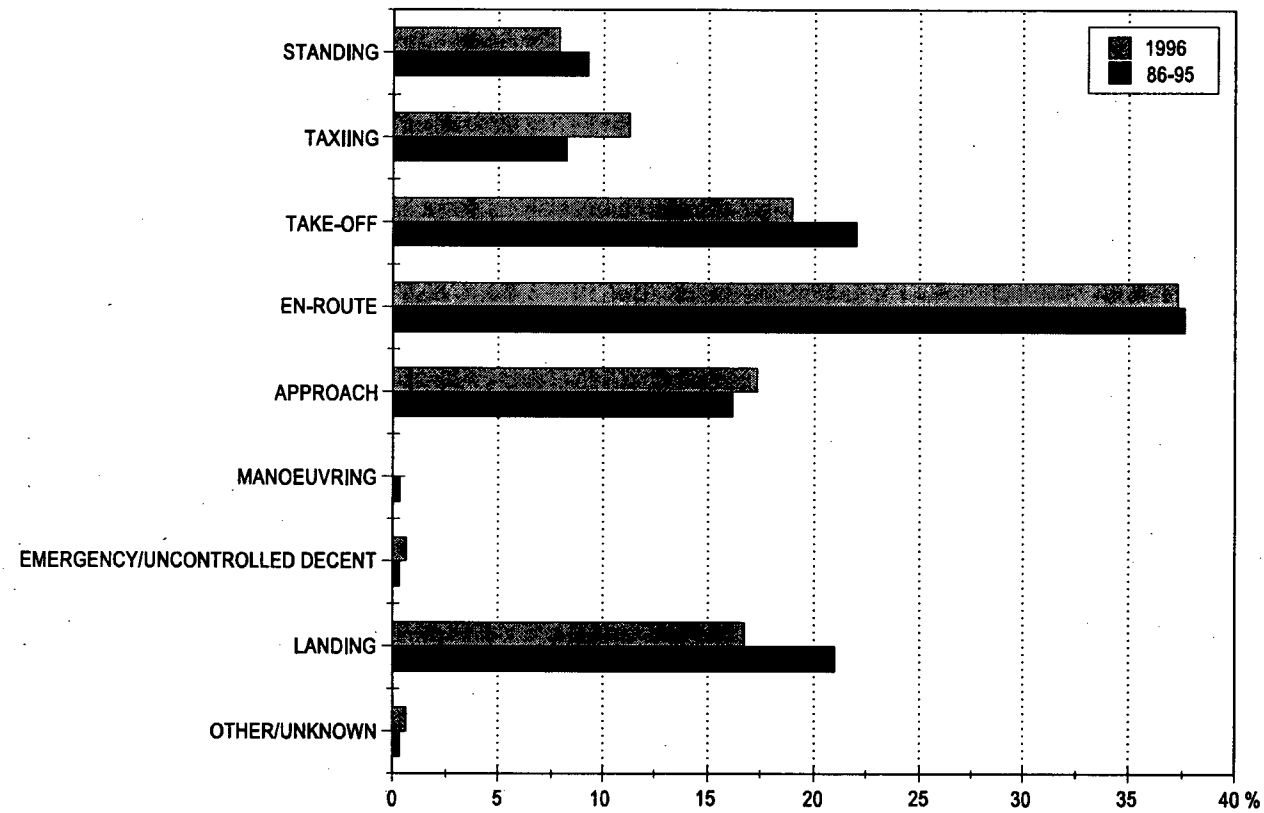


# FIXED WING AIRCRAFT

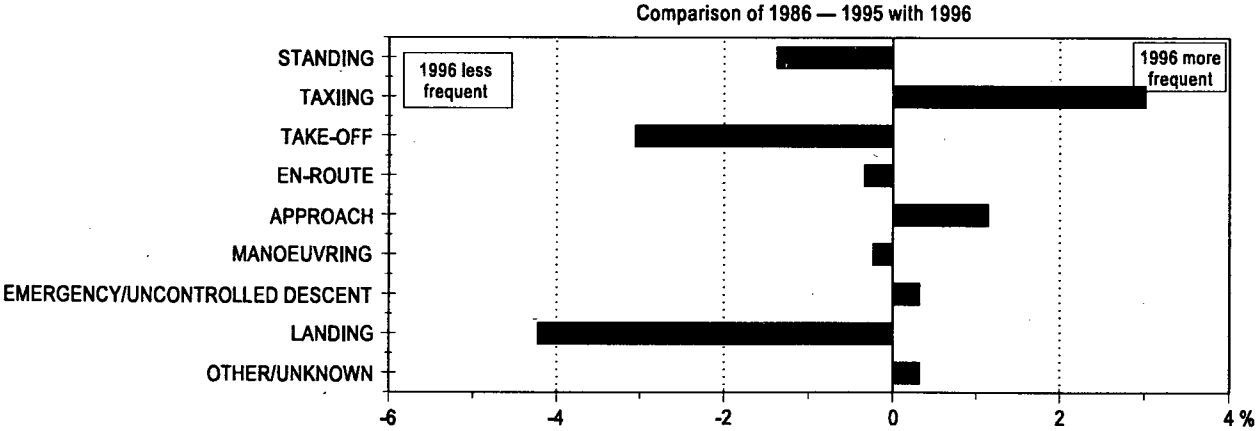
## Airline operations

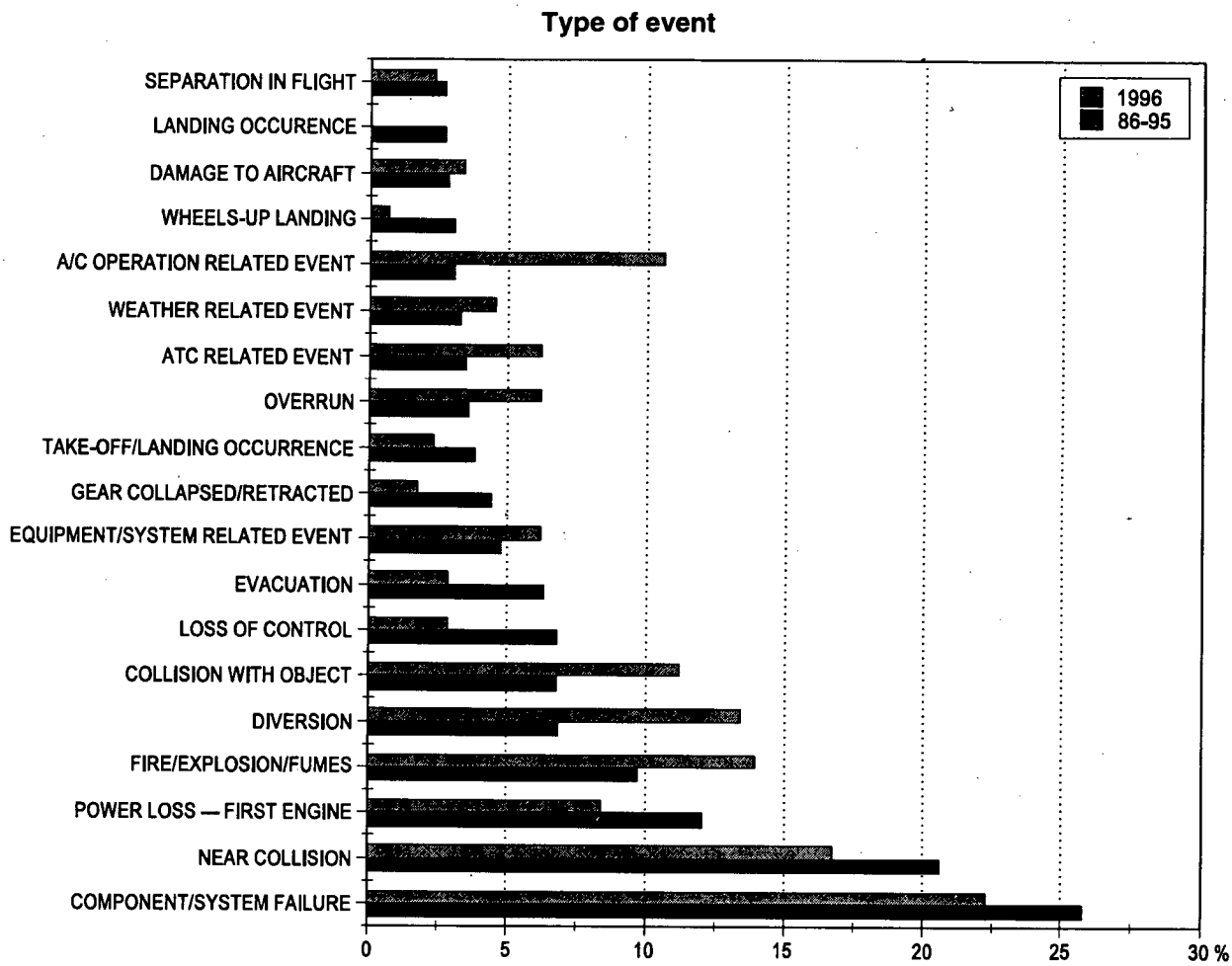
## Incidents

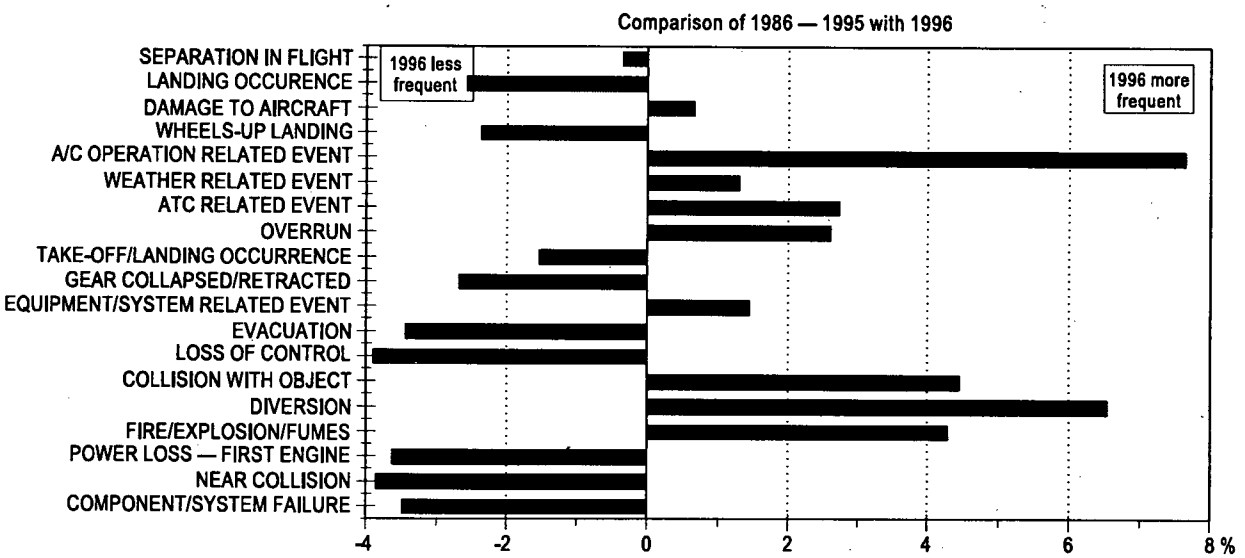
### Phase of operation



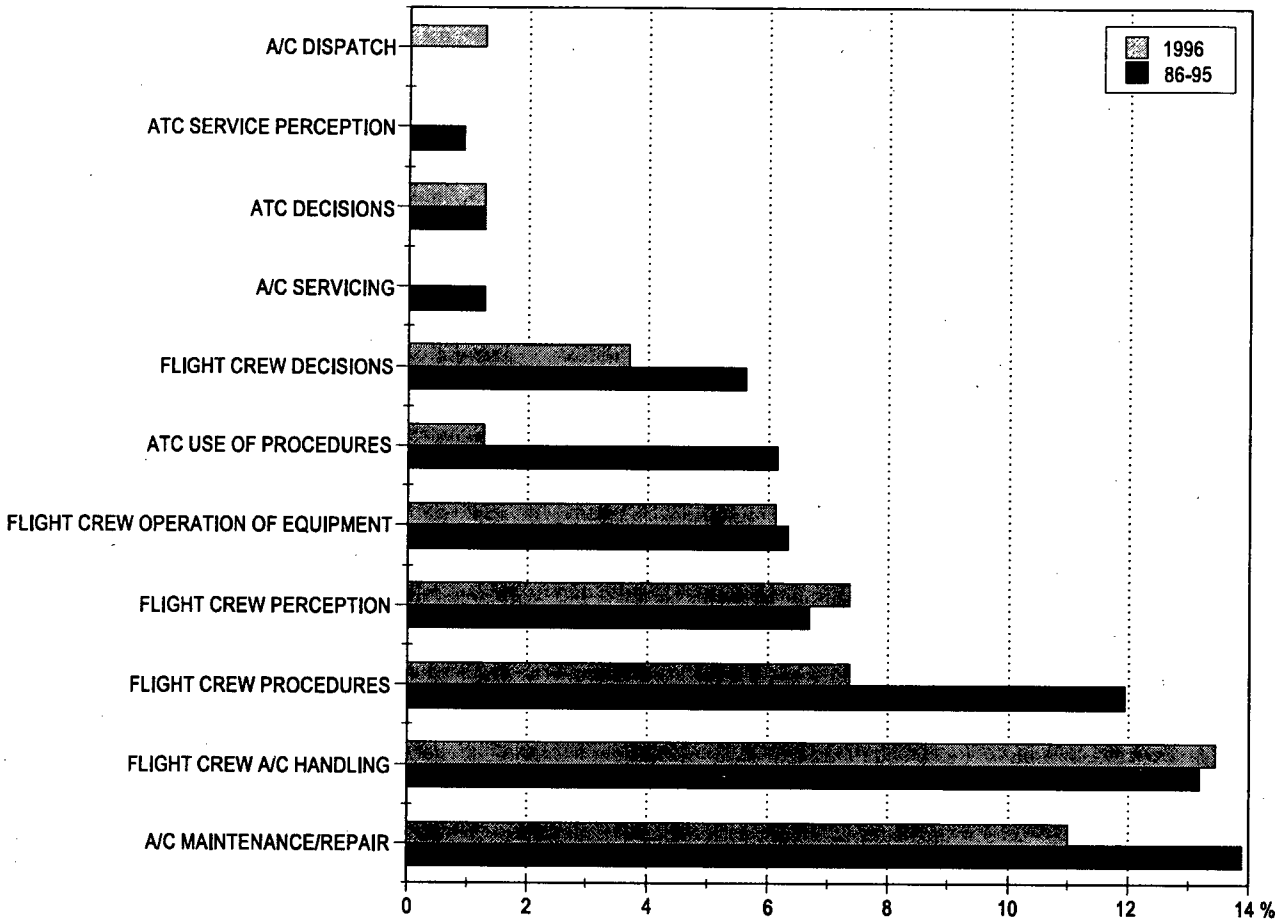

### Comparison of 1986 — 1995 with 1996



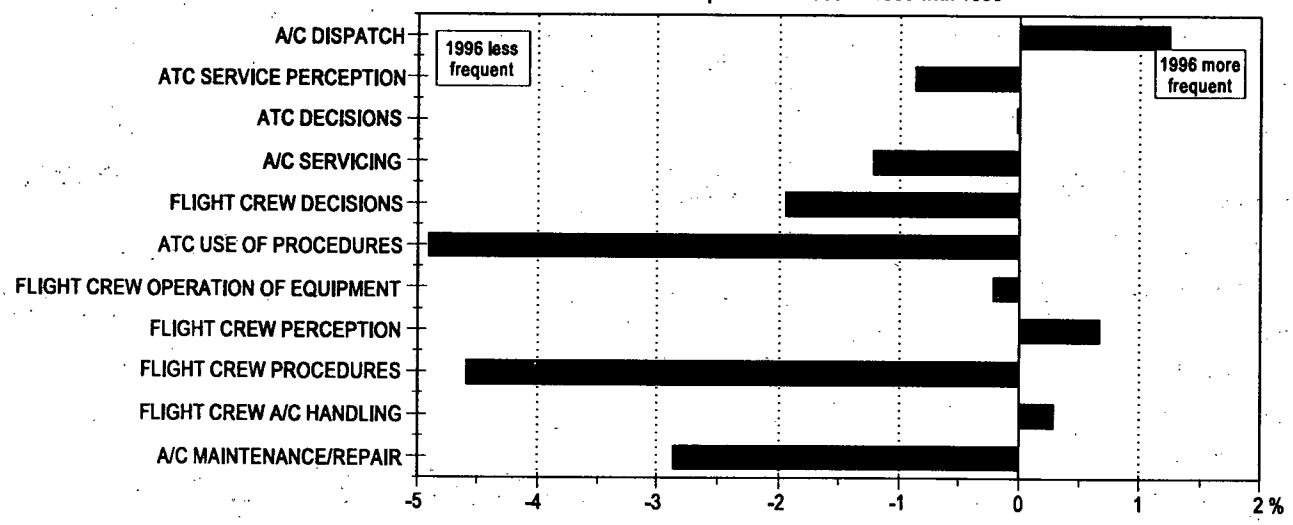

Type of event
SEPARATION IN FLIGHT
LANDING OCCURENCE
DAMAGE TO AIRCRAFT
WHEELS-UP LANDING
A/C OPERATION RELATED EVENT
WEATHER RELATED EVENT
ATC RELATED EVENT
OVERRUN
TAKE-OFF/LANDING OCCURRENCE
GEAR COLLAPSED/RETRACTED
EQUIPMENT/SYSTEM RELATED EVENT
EVACUATION
LOSS OF CONTROL
COLLISION WITH OBJECT
DIVERSION
FIRE/EXPLOSION/FUMES
POWER LOSS — FIRST ENGINE
NEAR COLLISION
COMPONENT/SYSTEM FAILURE
1996
86-95
0
5
10
15
20
25
30 %

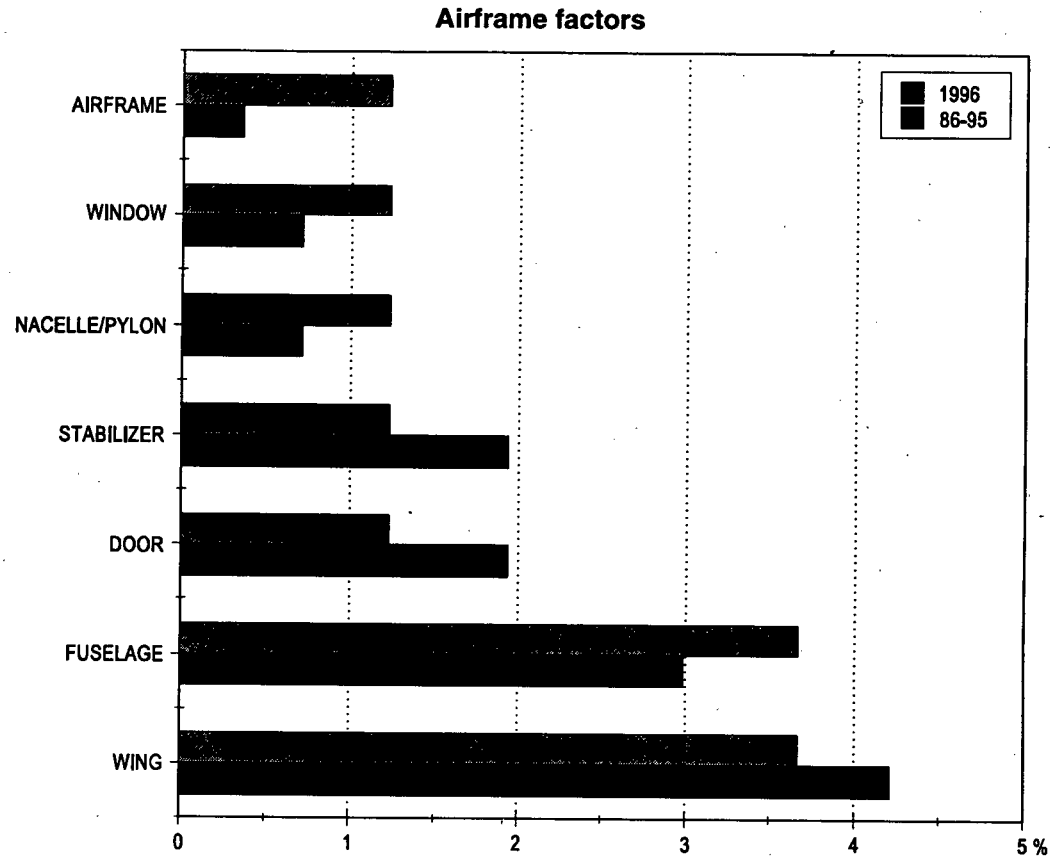

Comparison of 1986 — 1995 with 1996
1996 less frequent
1996 more frequent
SEPARATION IN FLIGHT
LANDING OCCURENCE
DAMAGE TO AIRCRAFT
WHEELS-UP LANDING
A/C OPERATION RELATED EVENT
WEATHER RELATED EVENT
ATC RELATED EVENT
OVERRUN
TAKE-OFF/LANDING OCCURRENCE
GEAR COLLAPSED/RETRACTED
EQUIPMENT/SYSTEM RELATED EVENT
EVACUATION
LOSS OF CONTROL
COLLISION WITH OBJECT
DIVERSION
FIRE/EXPLOSION/FUMES
POWER LOSS — FIRST ENGINE
NEAR COLLISION
COMPONENT/SYSTEM FAILURE
-4
-2
0
2
4
6
8 %

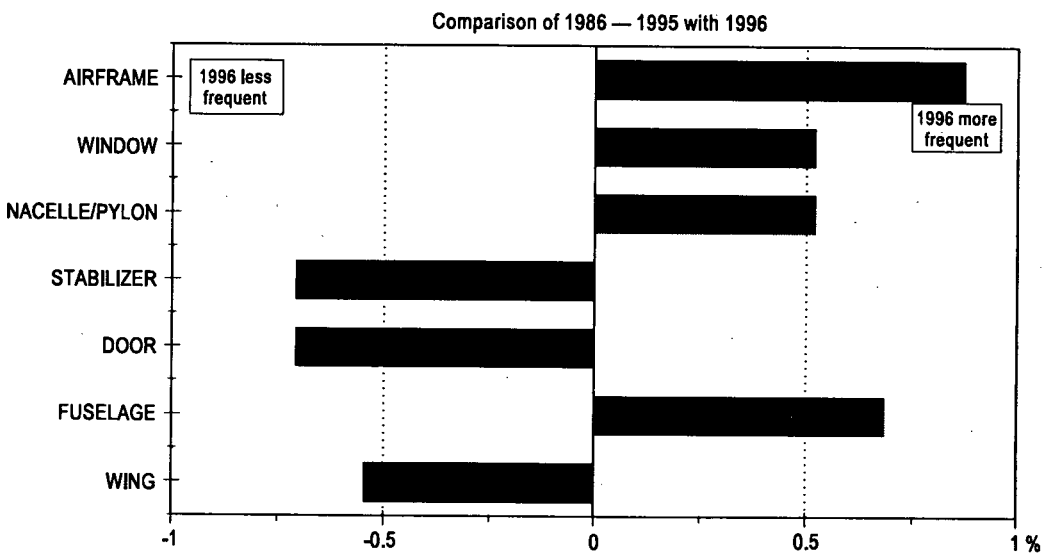
**Personnel factors**



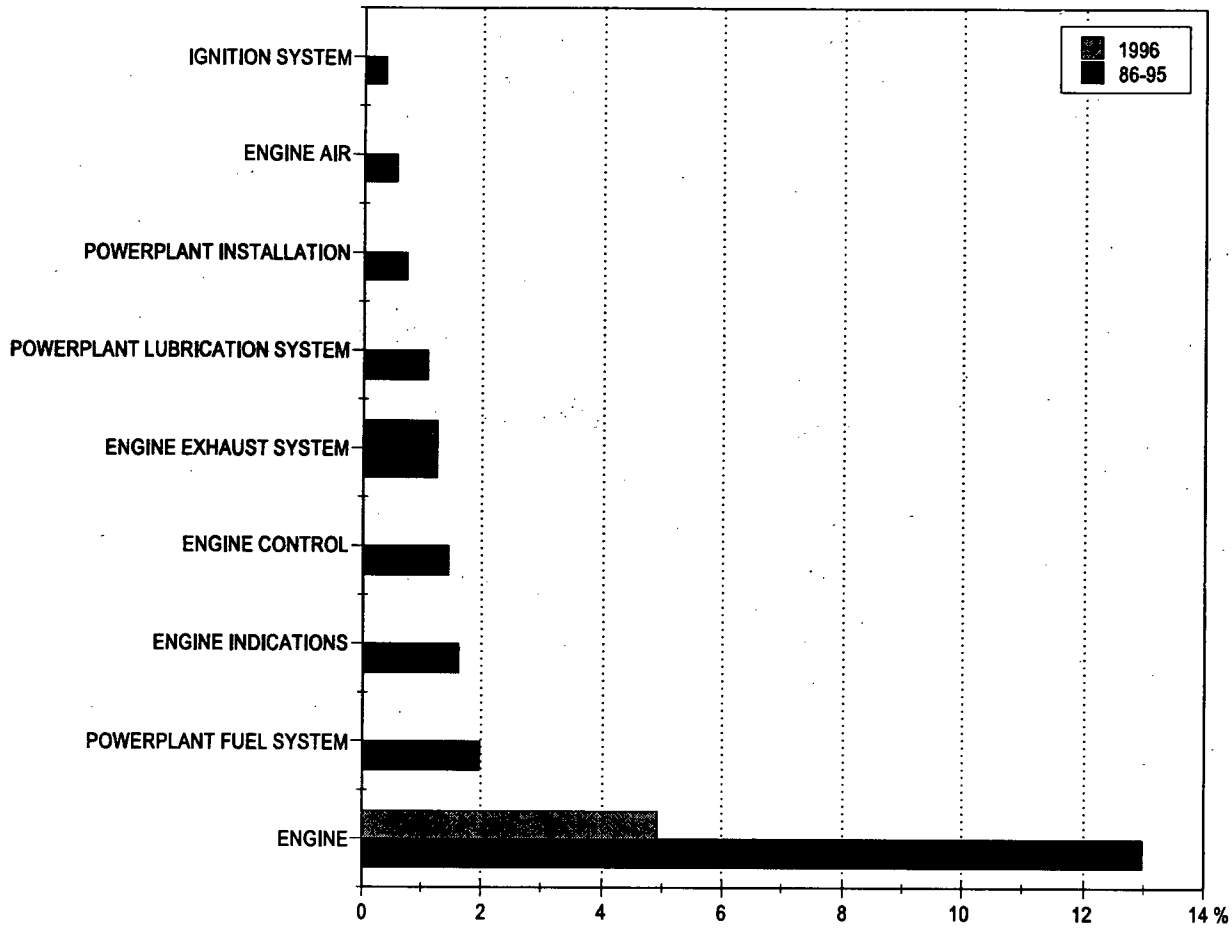

Comparison of 1986 — 1995 with 1996



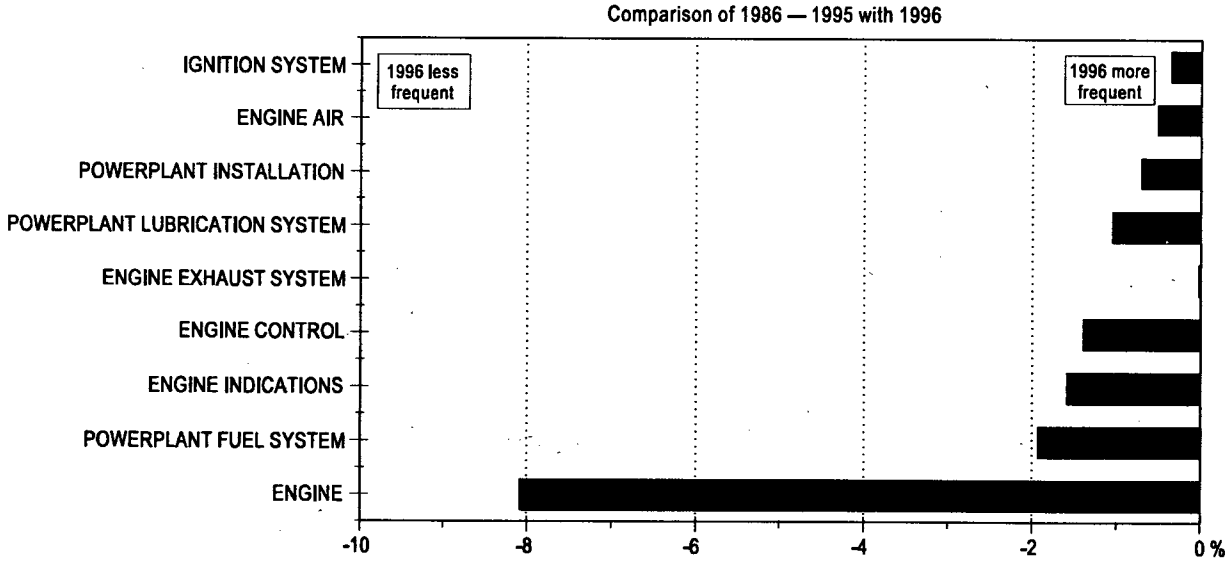

Airframe factors
AIRFRAME
WINDOW
NACELLE/PYLON
STABILIZER
DOOR
FUSELAGE
WING
1996
86-95
0
1
2
3
4
5 %

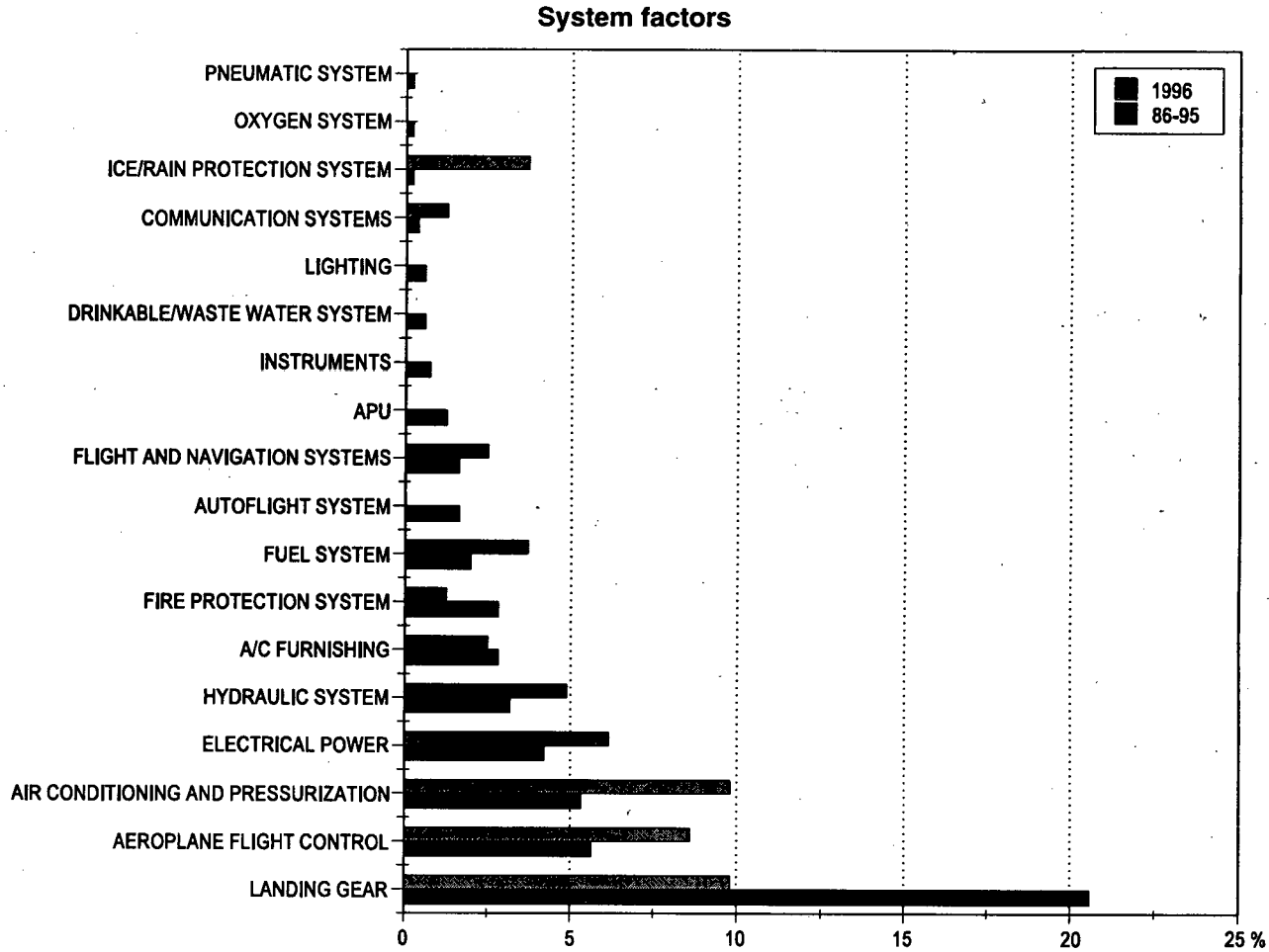

Comparison of 1986 — 1995 with 1996
AIRFRAME
WINDOW
NACELLE/PYLON
STABILIZER
DOOR
FUSELAGE
WING
1996 less frequent
1996 more frequent
-1
-0.5
0
0.5
1 %

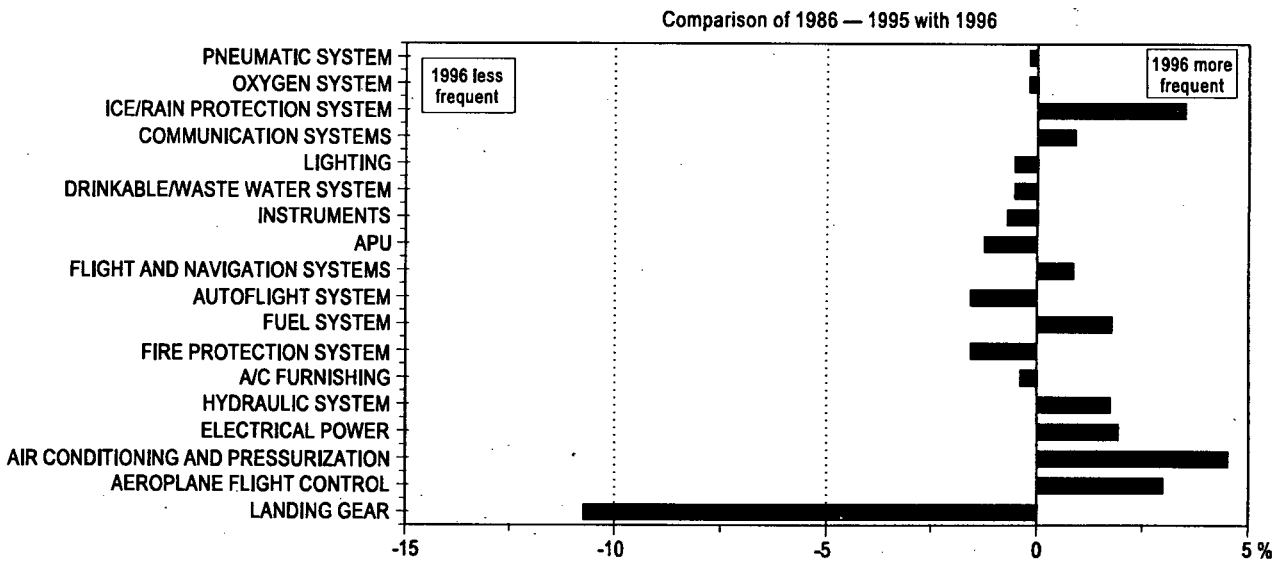
**Powerplant factors**



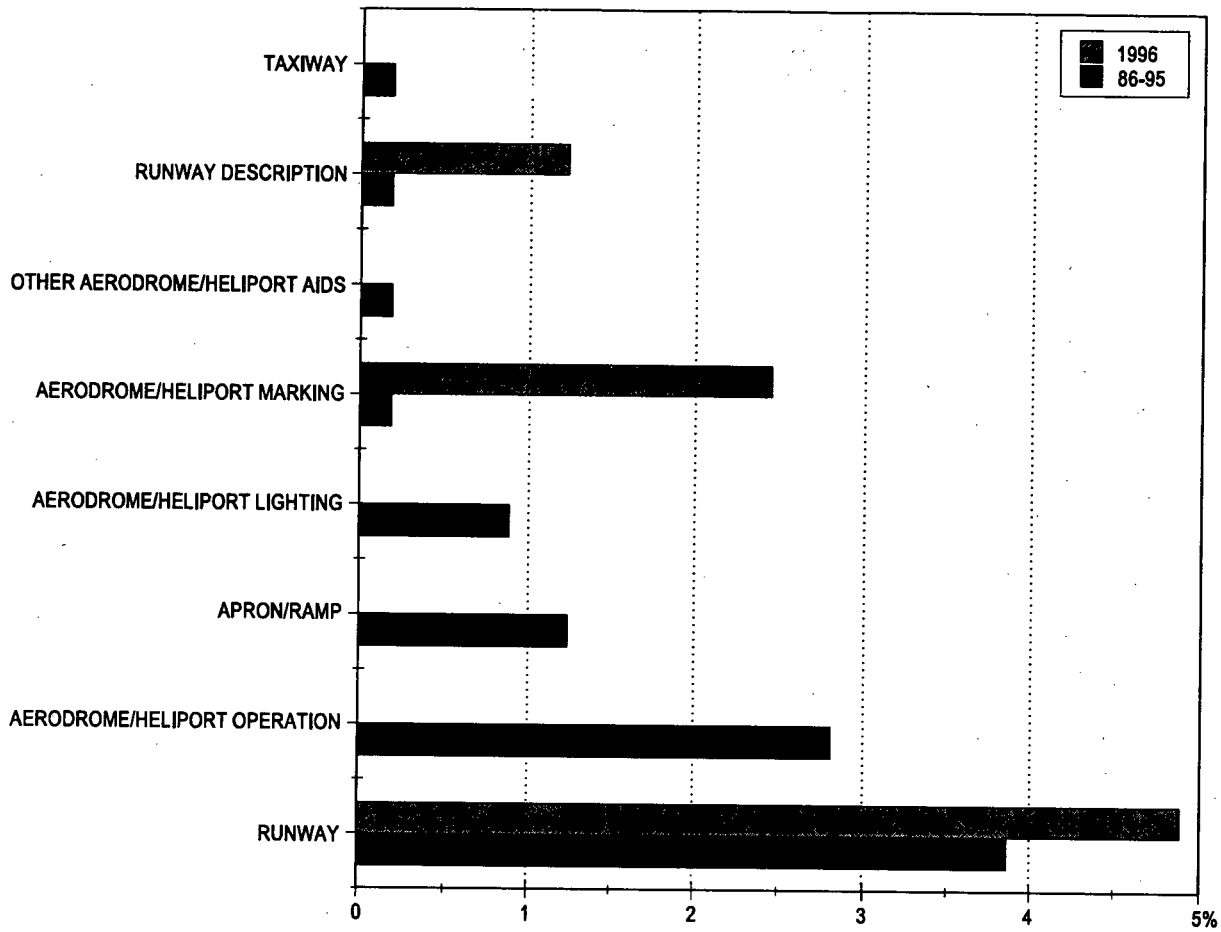

Comparison of 1986 — 1995 with 1996



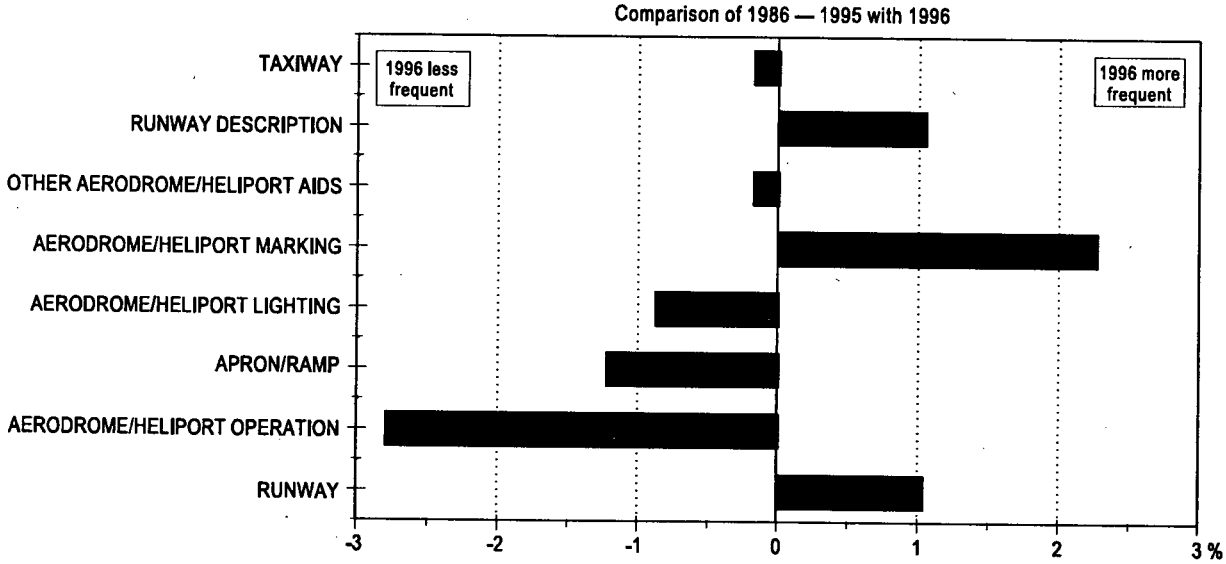

System factors
PNEUMATIC SYSTEM
OXYGEN SYSTEM
ICE/RAIN PROTECTION SYSTEM
COMMUNICATION SYSTEMS
LIGHTING
DRINKABLE/WASTE WATER SYSTEM
INSTRUMENTS
APU
FLIGHT AND NAVIGATION SYSTEMS
AUTOFLIGHT SYSTEM
FUEL SYSTEM
FIRE PROTECTION SYSTEM
A/C FURNISHING
HYDRAULIC SYSTEM
ELECTRICAL POWER
AIR CONDITIONING AND PRESSURIZATION
AEROPLANE FLIGHT CONTROL
LANDING GEAR
1996
86-95
0
5
10
15
20
25 %

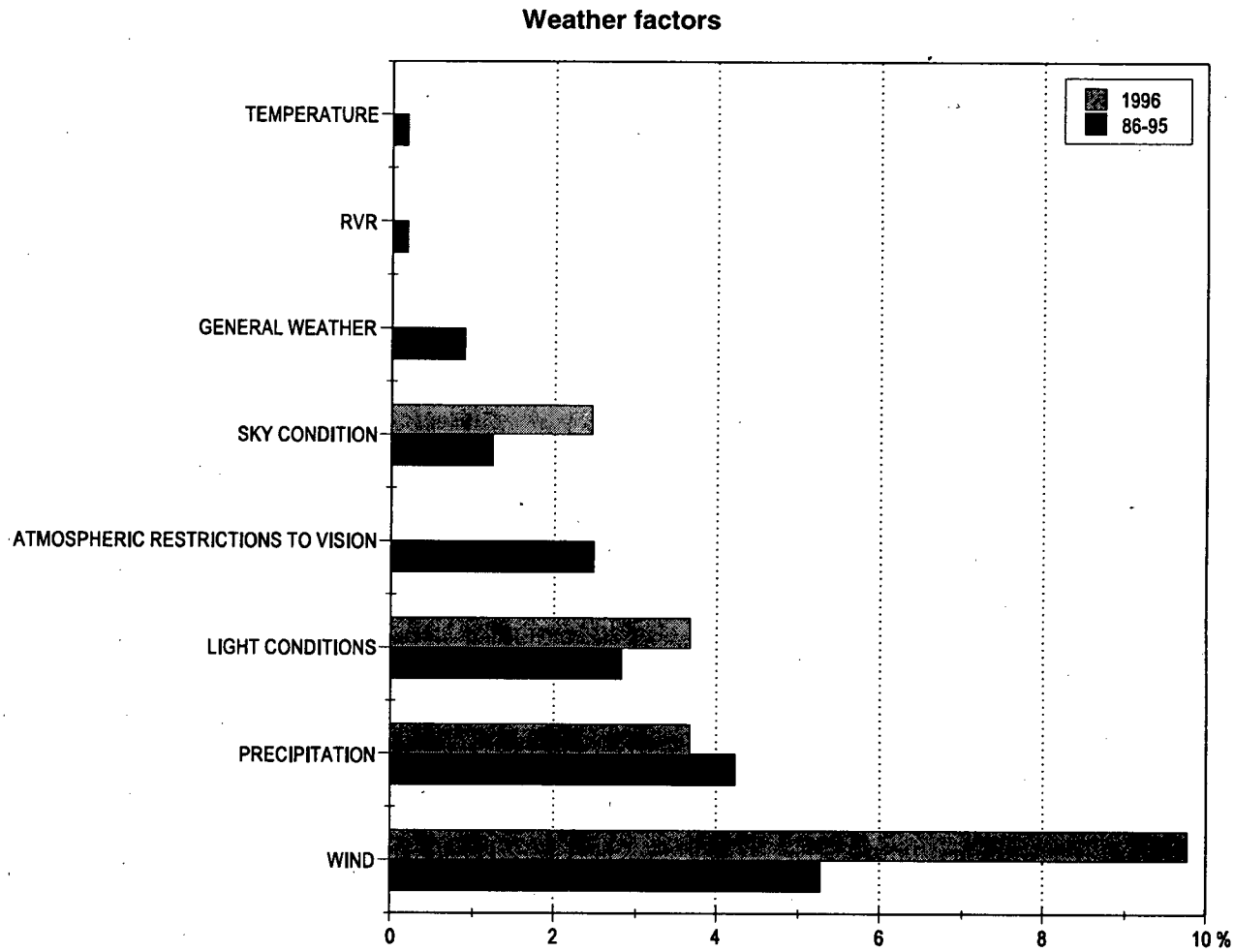

Comparison of 1986 — 1995 with 1996
1996 less frequent
1996 more frequent
PNEUMATIC SYSTEM
OXYGEN SYSTEM
ICE/RAIN PROTECTION SYSTEM
COMMUNICATION SYSTEMS
LIGHTING
DRINKABLE/WASTE WATER SYSTEM
INSTRUMENTS
APU
FLIGHT AND NAVIGATION SYSTEMS
AUTOFLIGHT SYSTEM
FUEL SYSTEM
FIRE PROTECTION SYSTEM
A/C FURNISHING
HYDRAULIC SYSTEM
ELECTRICAL POWER
AIR CONDITIONING AND PRESSURIZATION
AEROPLANE FLIGHT CONTROL
LANDING GEAR
-15
-10
-5
0
5 %

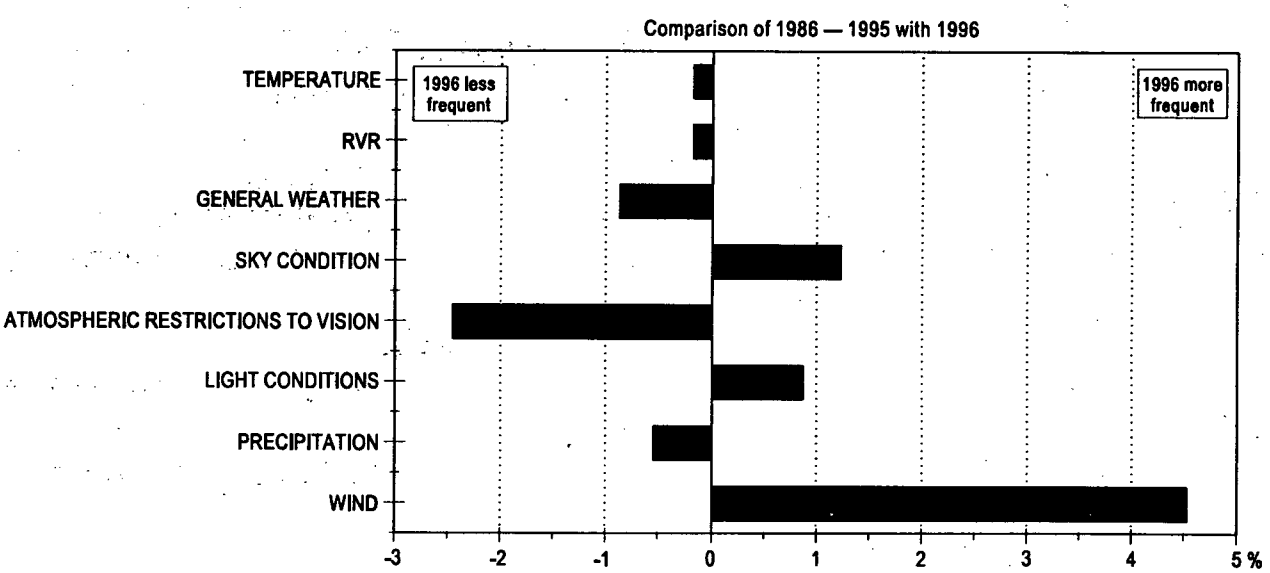
**Aerodrome factors**




Comparison of 1986 — 1995 with 1996




Weather factors
TEMPERATURE
RVR
GENERAL WEATHER
SKY CONDITION
ATMOSPHERIC RESTRICTIONS TO VISION
LIGHT CONDITIONS
PRECIPITATION
WIND
1996
86-95
0
2
4
6
8
10 %

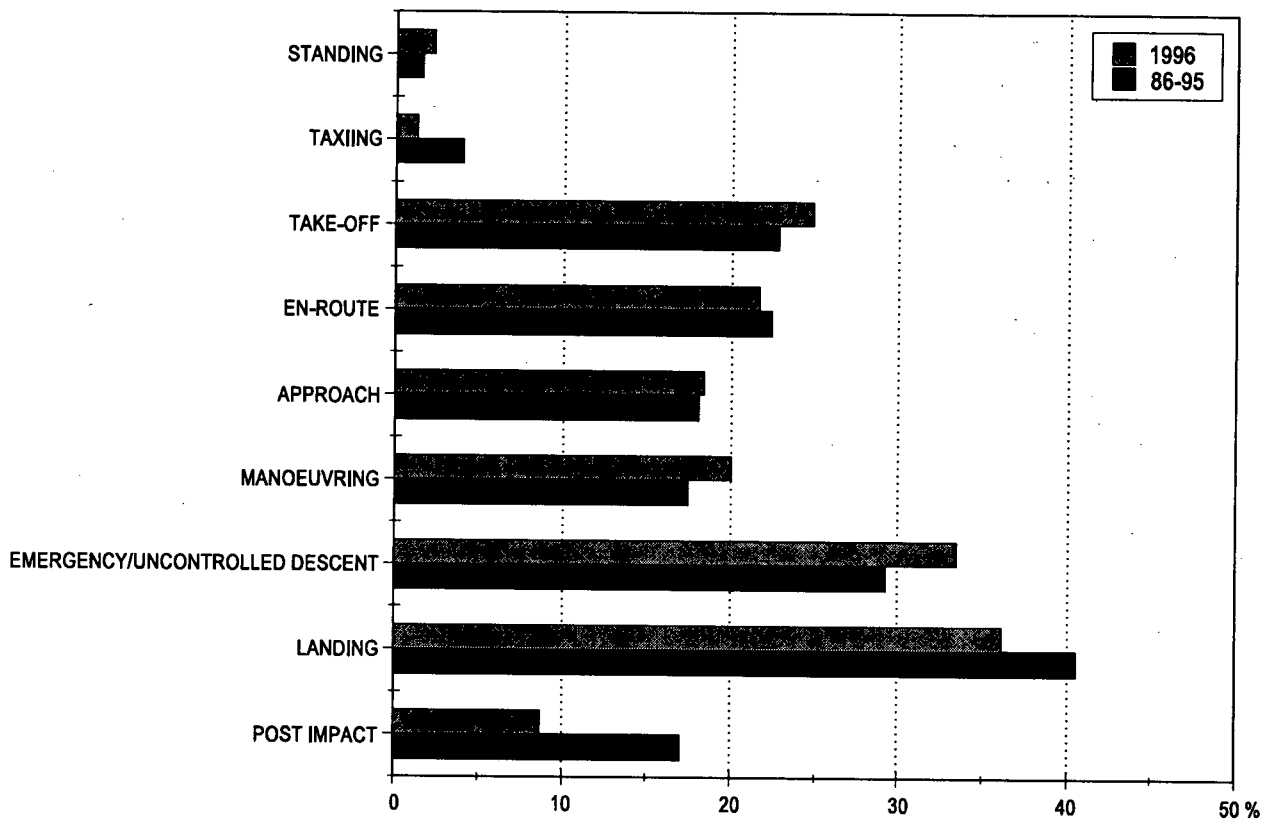

Comparison of 1986 — 1995 with 1996
1996 less frequent
1996 more frequent
TEMPERATURE
RVR
GENERAL WEATHER
SKY CONDITION
ATMOSPHERIC RESTRICTIONS TO VISION
LIGHT CONDITIONS
PRECIPITATION
WIND
-3
-2
-1
0
1
2
3
4
5 %

# FIXED WING AIRCRAFT

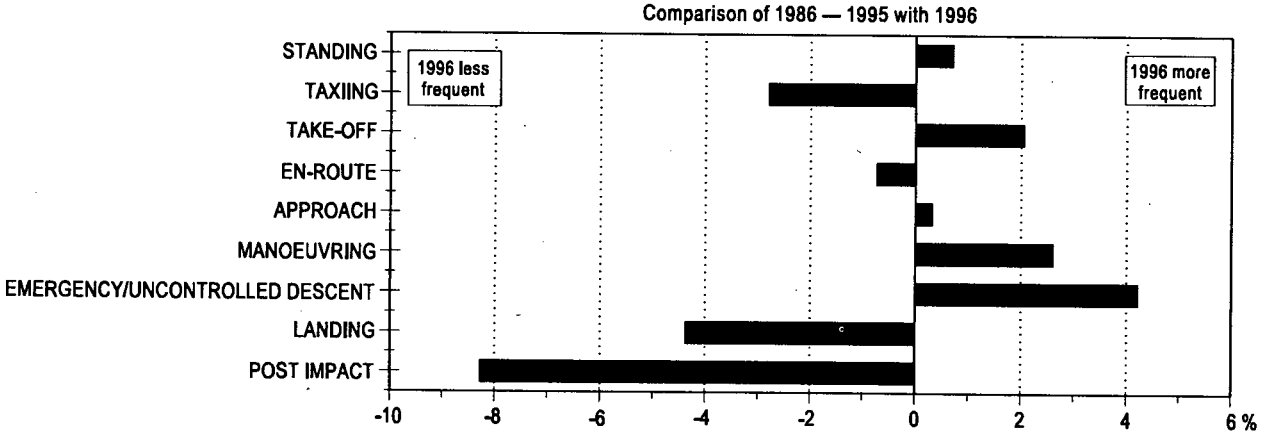
## General Aviation

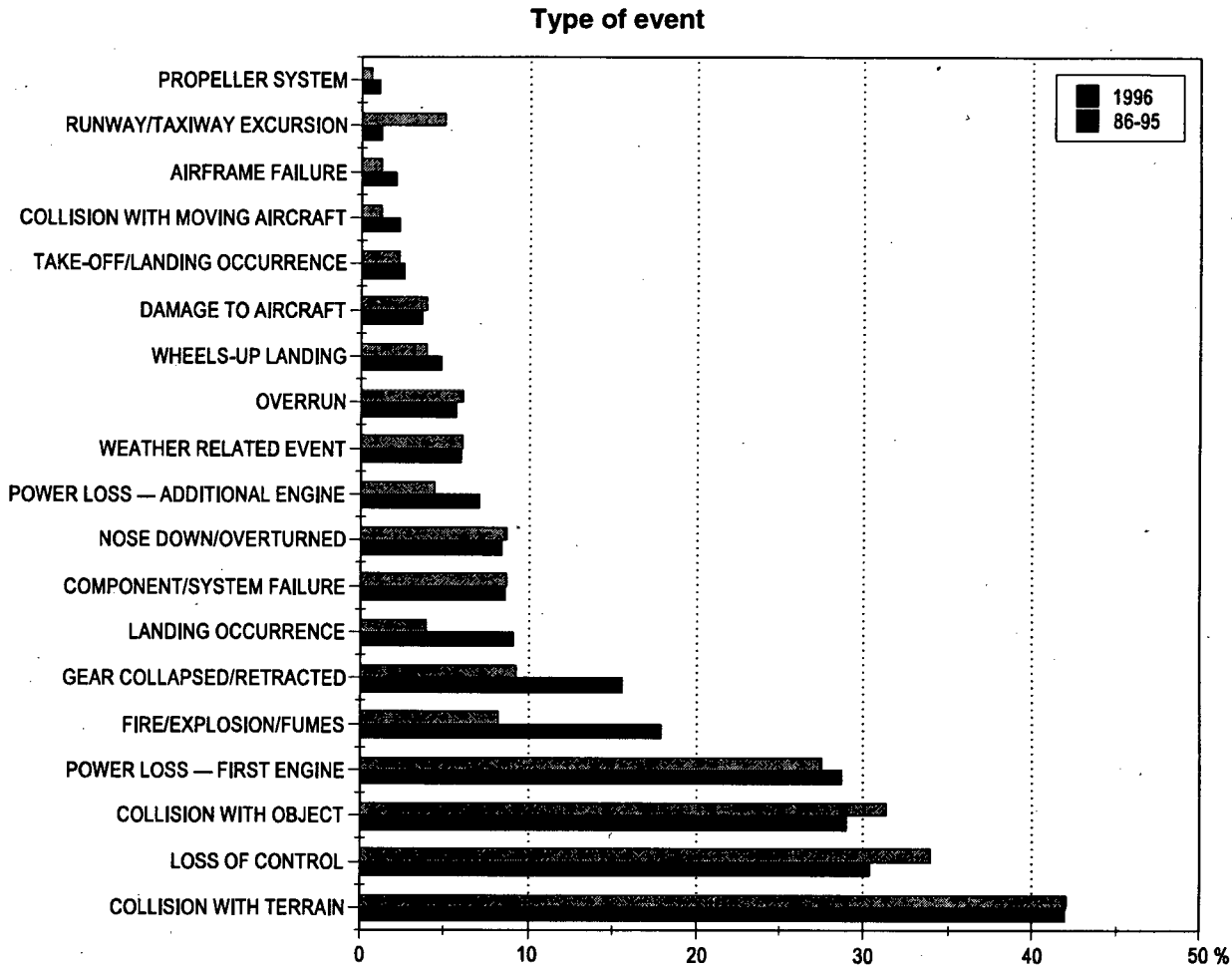
## Accidents

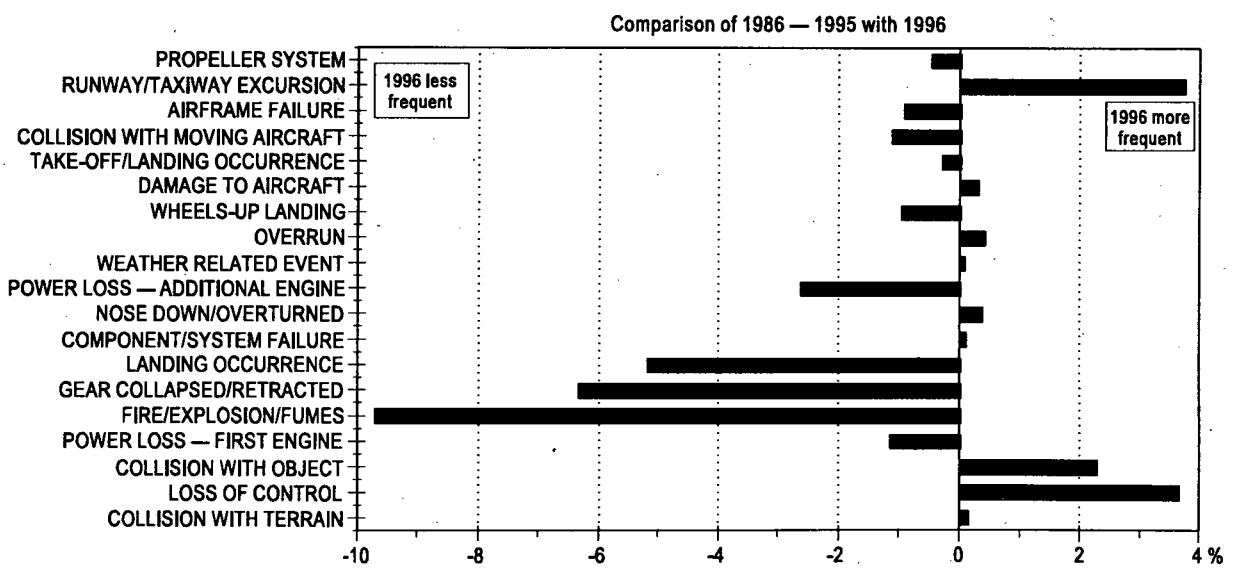
### Phase of operation



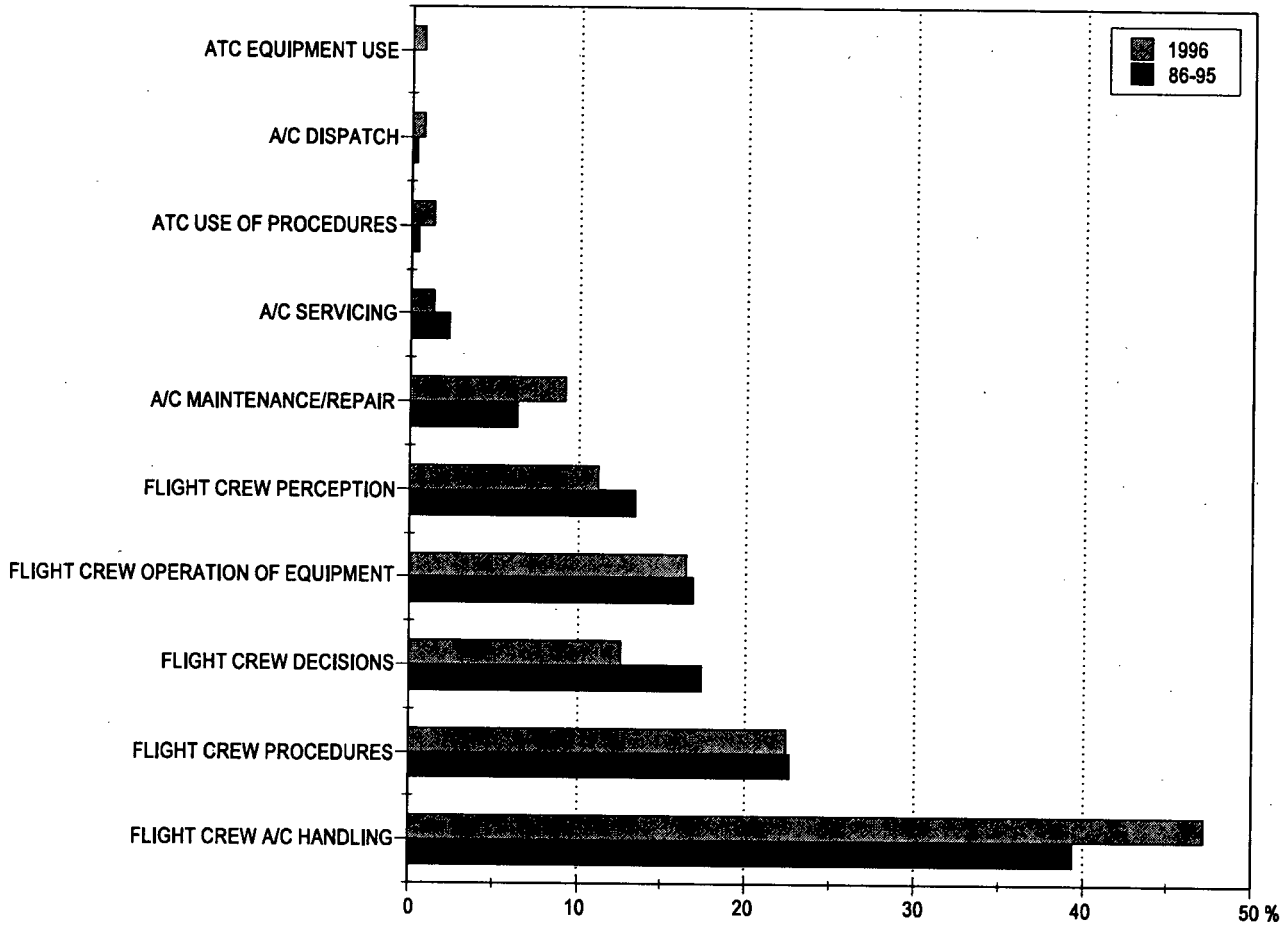

Comparison of 1986 — 1995 with 1996



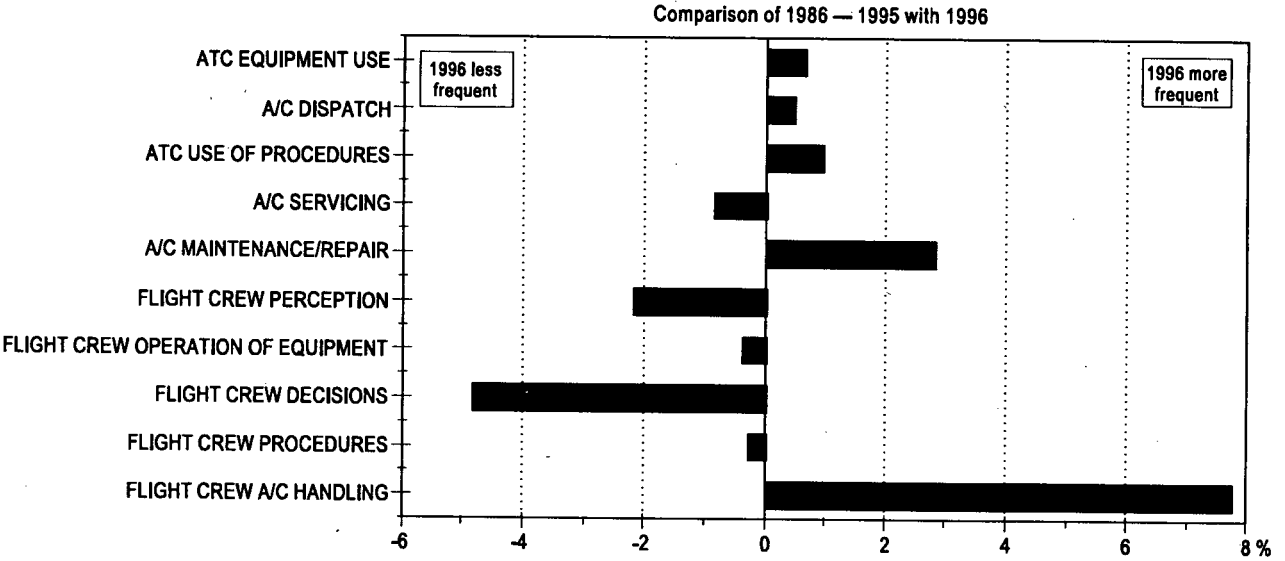

Type of event
PROPELLER SYSTEM
RUNWAY/TAXIWAY EXCURSION
AIRFRAME FAILURE
COLLISION WITH MOVING AIRCRAFT
TAKE-OFF/LANDING OCCURRENCE
DAMAGE TO AIRCRAFT
WHEELS-UP LANDING
OVERRUN
WEATHER RELATED EVENT
POWER LOSS — ADDITIONAL ENGINE
NOSE DOWN/OVERTURNED
COMPONENT/SYSTEM FAILURE
LANDING OCCURRENCE
GEAR COLLAPSED/RETRACTED
FIRE/EXPLOSION/FUMES
POWER LOSS — FIRST ENGINE
COLLISION WITH OBJECT
LOSS OF CONTROL
COLLISION WITH TERRAIN
1996
86-95
0
10
20
30
40
50 %


Comparison of 1986 — 1995 with 1996
PROPELLER SYSTEM
RUNWAY/TAXIWAY EXCURSION
AIRFRAME FAILURE
COLLISION WITH MOVING AIRCRAFT
TAKE-OFF/LANDING OCCURRENCE
DAMAGE TO AIRCRAFT
WHEELS-UP LANDING
OVERRUN
WEATHER RELATED EVENT
POWER LOSS — ADDITIONAL ENGINE
NOSE DOWN/OVERTURNED
COMPONENT/SYSTEM FAILURE
LANDING OCCURRENCE
GEAR COLLAPSED/RETRACTED
FIRE/EXPLOSION/FUMES
POWER LOSS — FIRST ENGINE
COLLISION WITH OBJECT
LOSS OF CONTROL
COLLISION WITH TERRAIN
1996 less frequent
1996 more frequent
-10
-8
-6
-4
-2
0
2
4 %

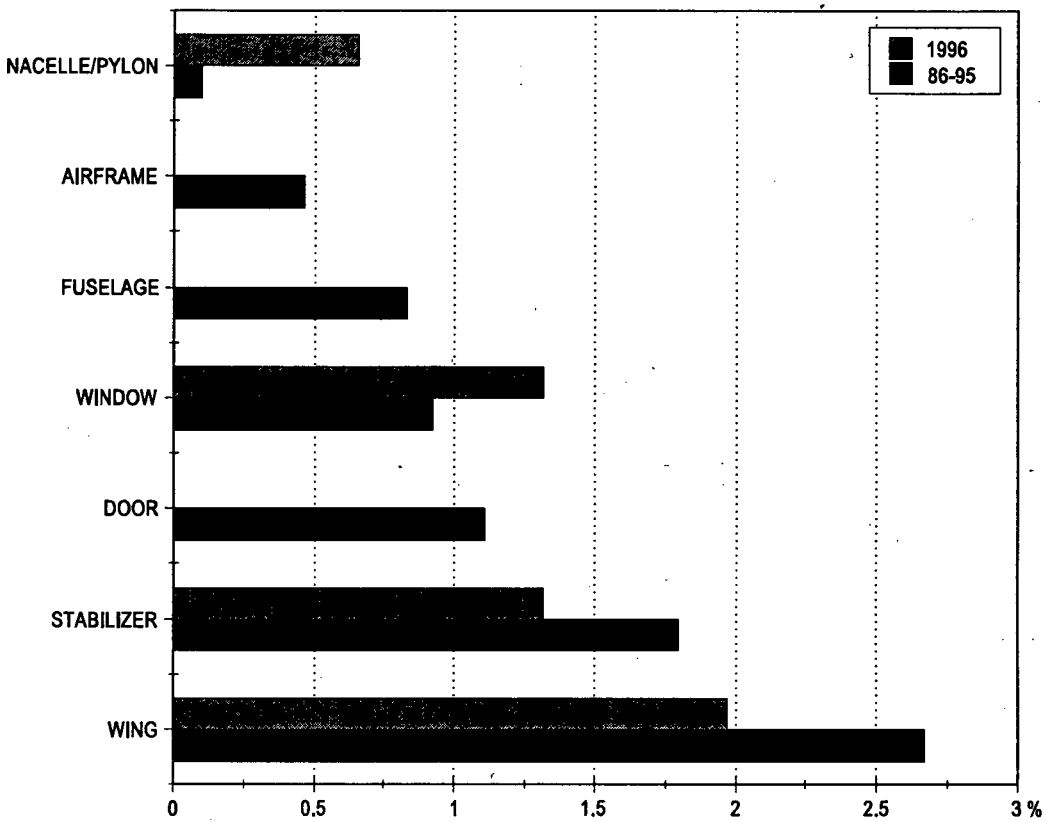
**Personnel factors**



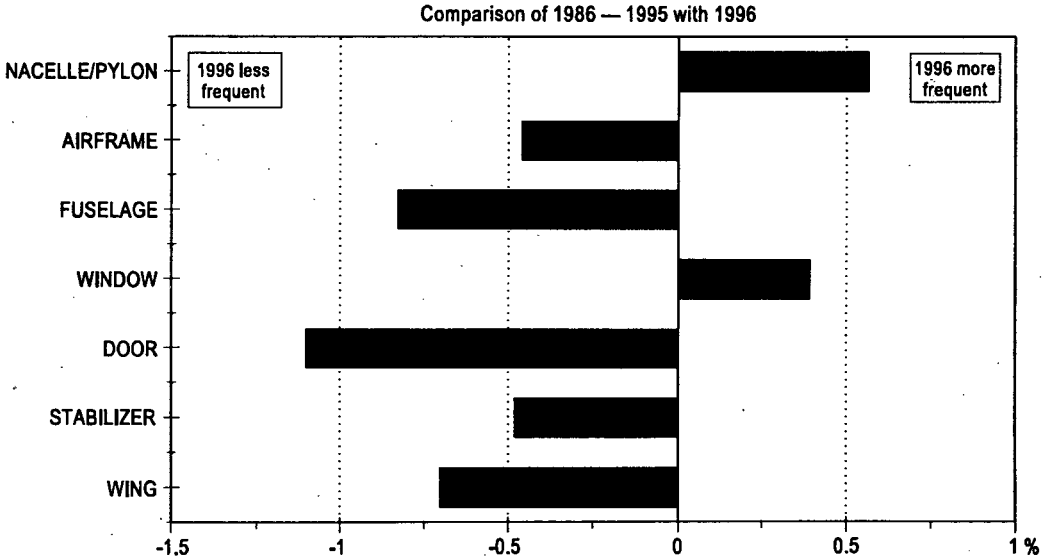

Comparison of 1986 — 1995 with 1996

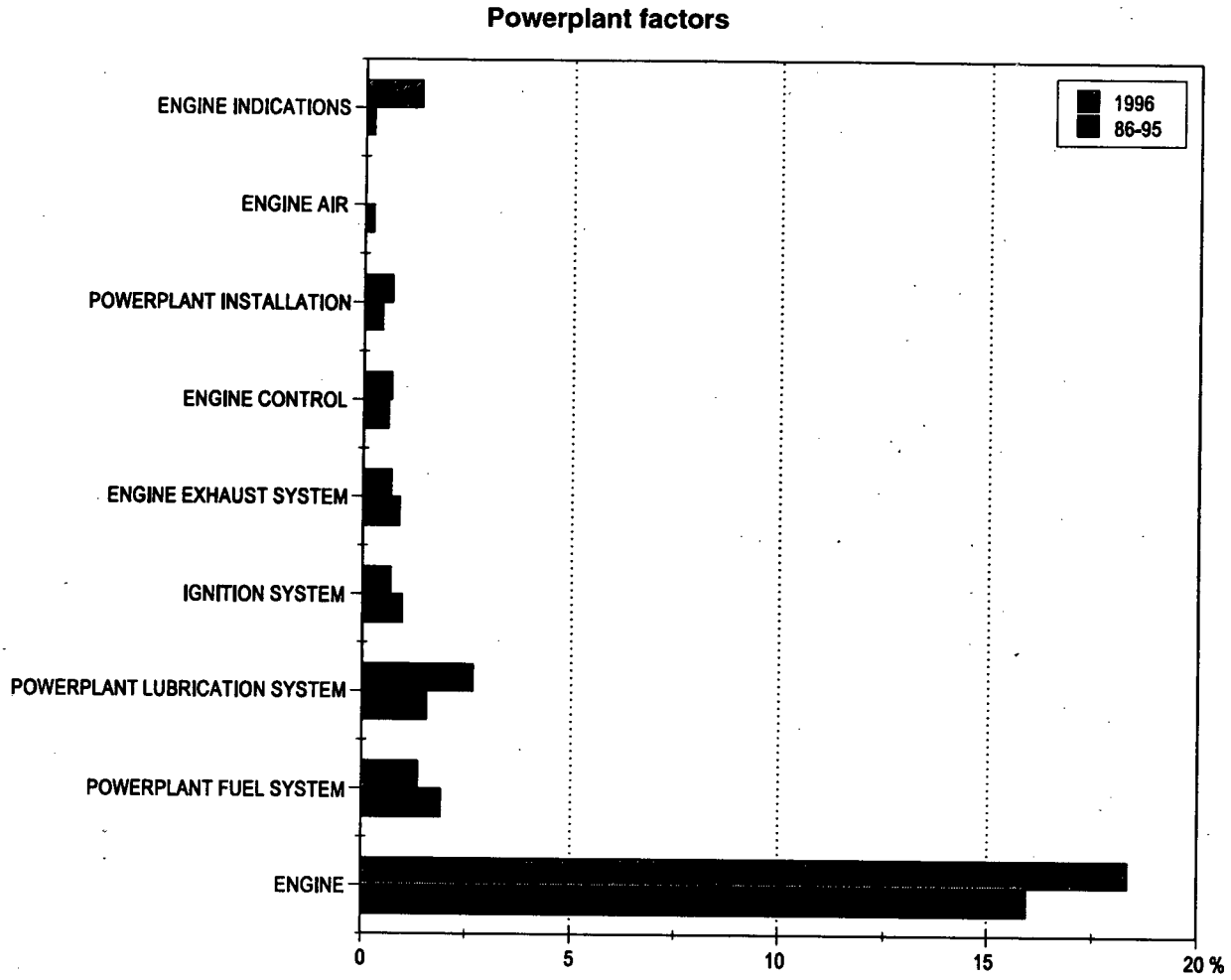


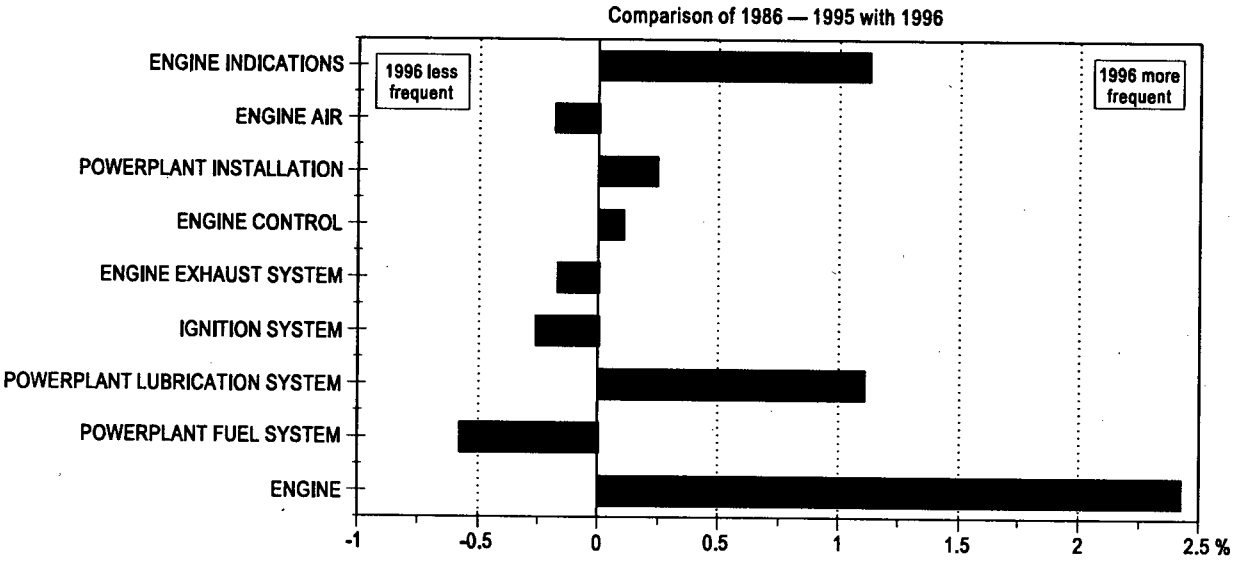
**Airframe factors**



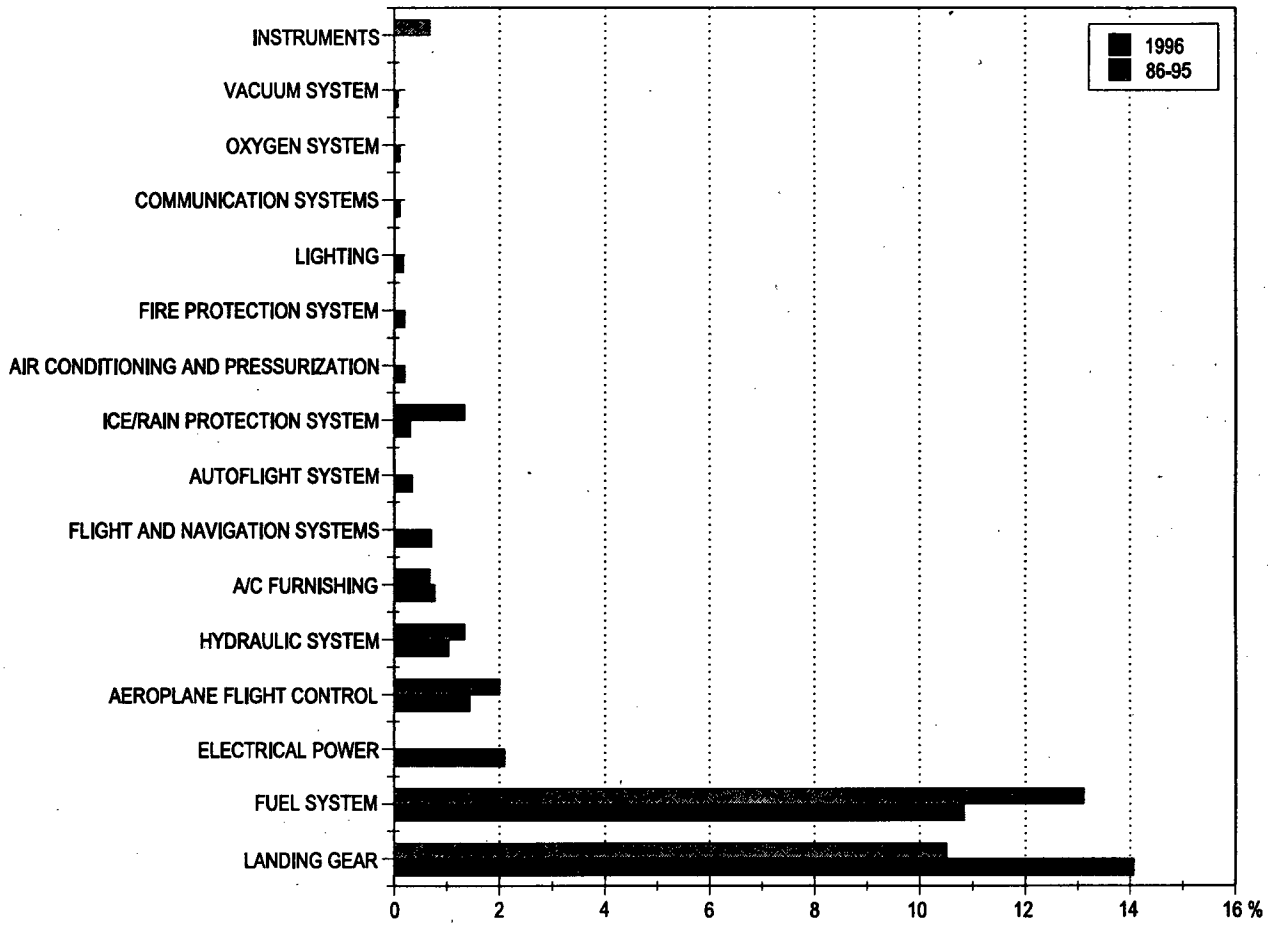

Comparison of 1986 — 1995 with 1996

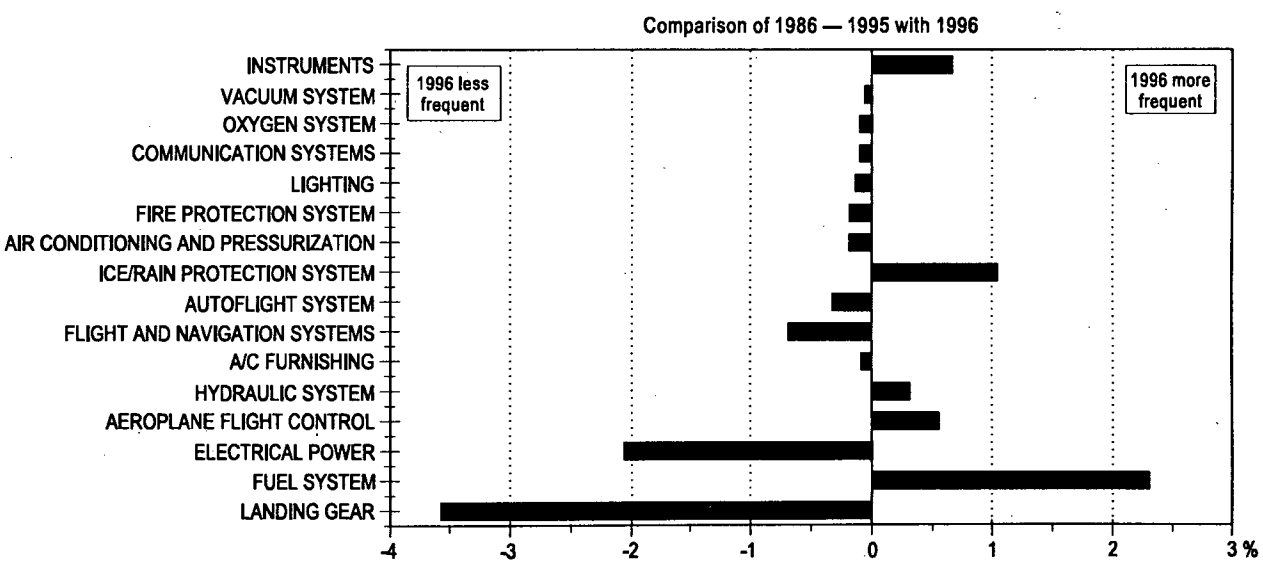


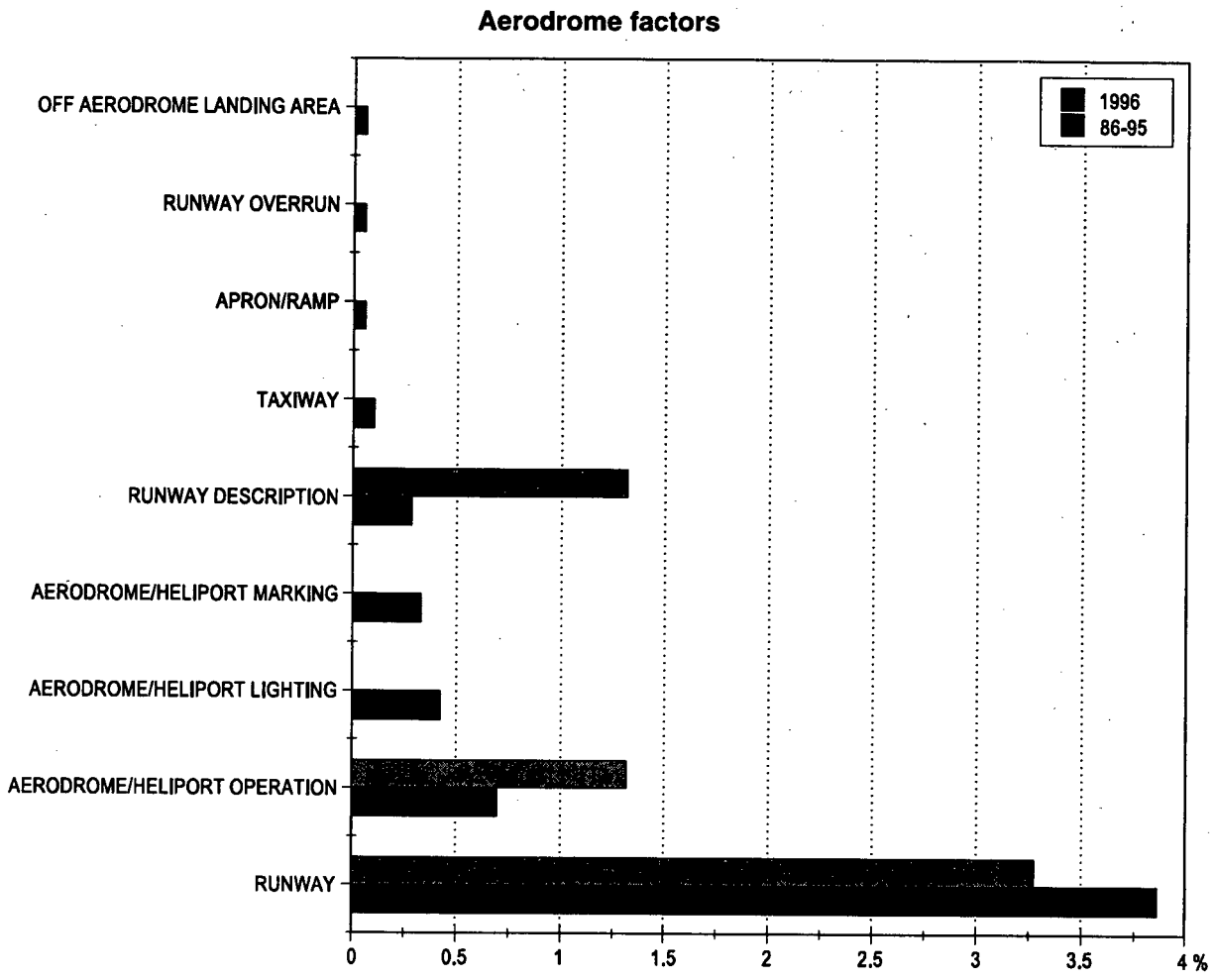

Powerplant factors
ENGINE INDICATIONS
ENGINE AIR
POWERPLANT INSTALLATION
ENGINE CONTROL
ENGINE EXHAUST SYSTEM
IGNITION SYSTEM
POWERPLANT LUBRICATION SYSTEM
POWERPLANT FUEL SYSTEM
ENGINE
1996
86-95
0
5
10
15
20 %

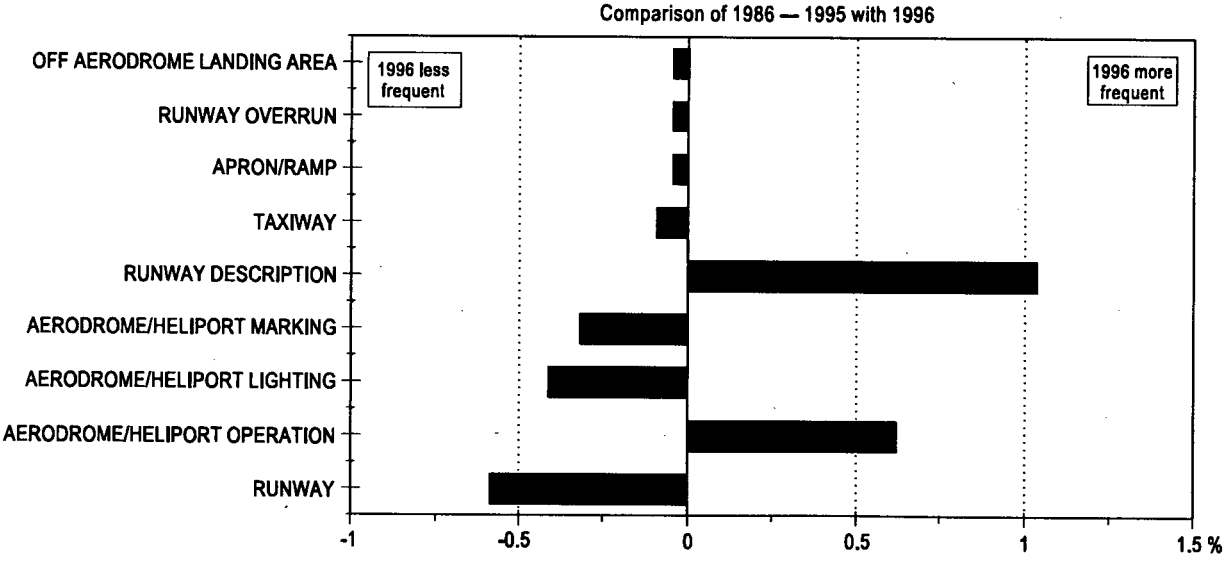

Comparison of 1986 — 1995 with 1996
ENGINE INDICATIONS
ENGINE AIR
POWERPLANT INSTALLATION
ENGINE CONTROL
ENGINE EXHAUST SYSTEM
IGNITION SYSTEM
POWERPLANT LUBRICATION SYSTEM
POWERPLANT FUEL SYSTEM
ENGINE
1996 less frequent
1996 more frequent
-1
-0.5
0
0.5
1
1.5
2
2.5 %

**System factors**

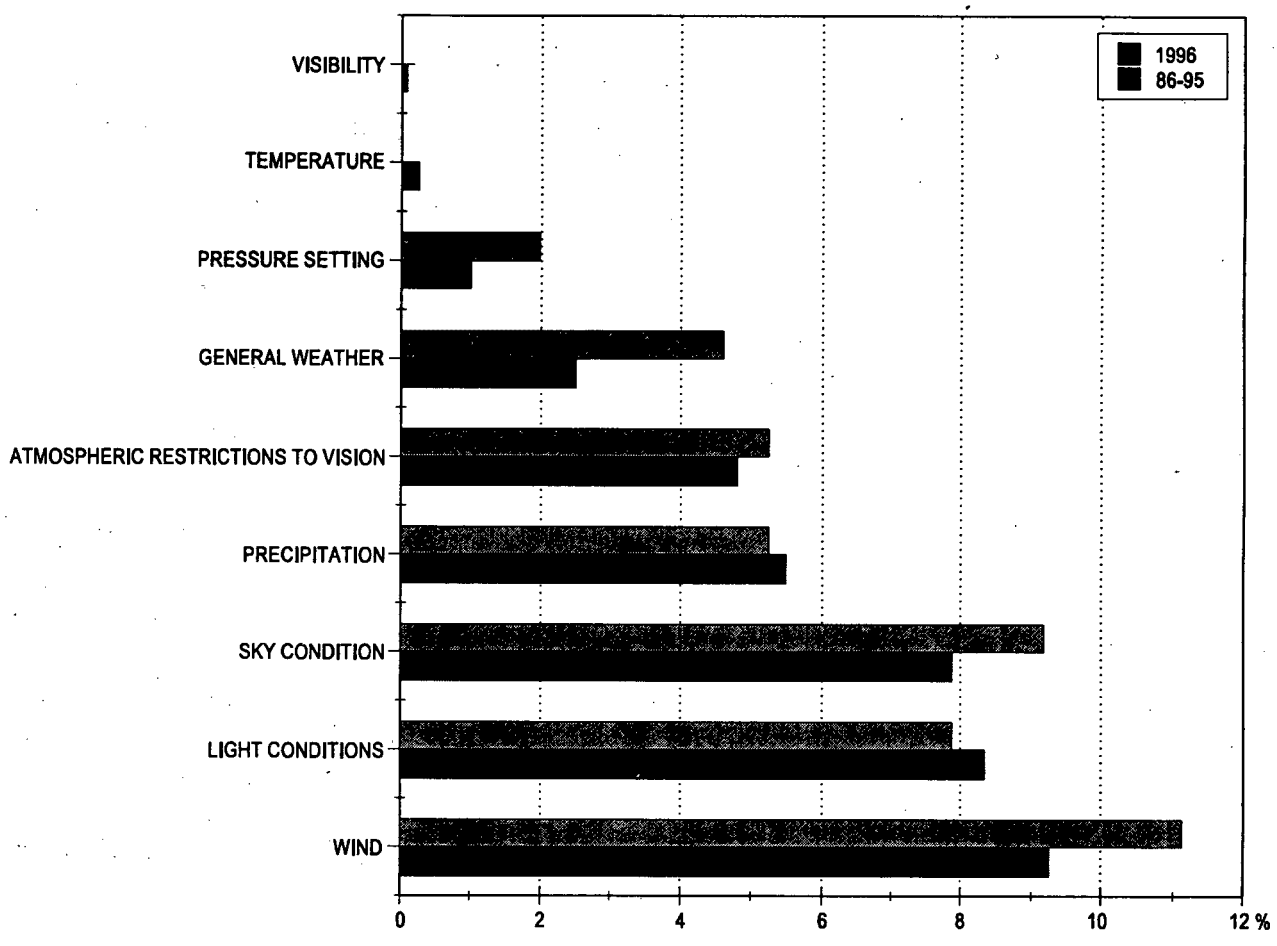


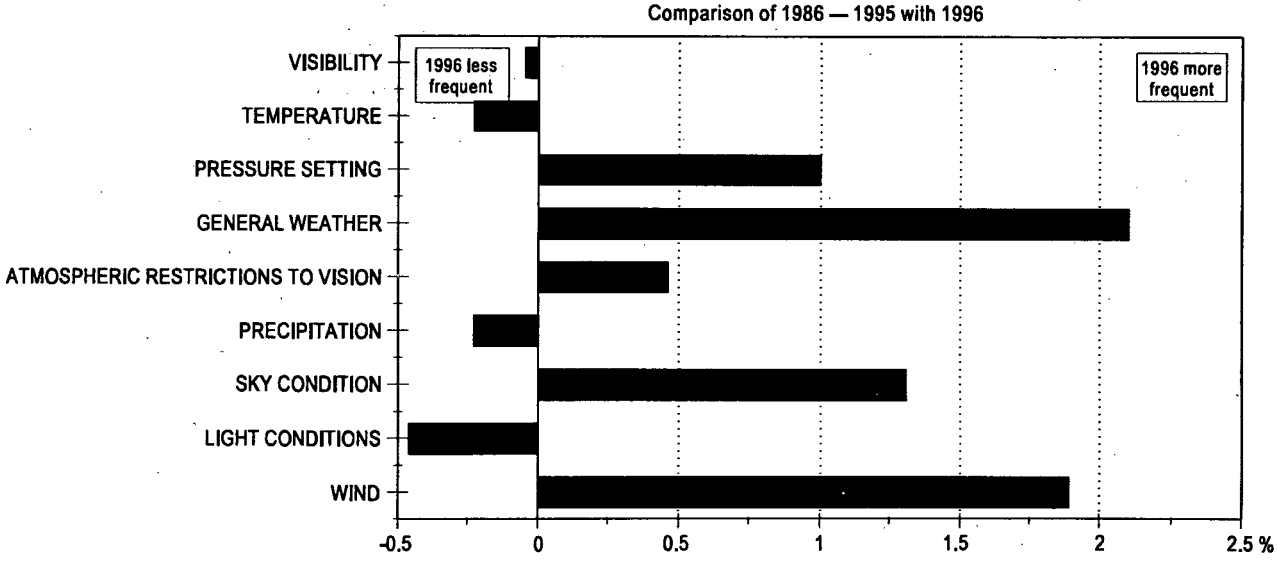

Aerodrome factors
OFF AERODROME LANDING AREA
RUNWAY OVERRUN
APRON/RAMP
TAXIWAY
RUNWAY DESCRIPTION
AERODROME/HELIPORT MARKING
AERODROME/HELIPORT LIGHTING
AERODROME/HELIPORT OPERATION
RUNWAY
1996
86-95
0
0.5
1
1.5
2
2.5
3
3.5
4 %


Comparison of 1986 — 1995 with 1996
OFF AERODROME LANDING AREA
RUNWAY OVERRUN
APRON/RAMP
TAXIWAY
RUNWAY DESCRIPTION
AERODROME/HELIPORT MARKING
AERODROME/HELIPORT LIGHTING
AERODROME/HELIPORT OPERATION
RUNWAY
1996 less frequent
1996 more frequent
-1
-0.5
0
0.5
1
1.5 %

## Weather factors




Comparison of 1986 — 1995 with 1996

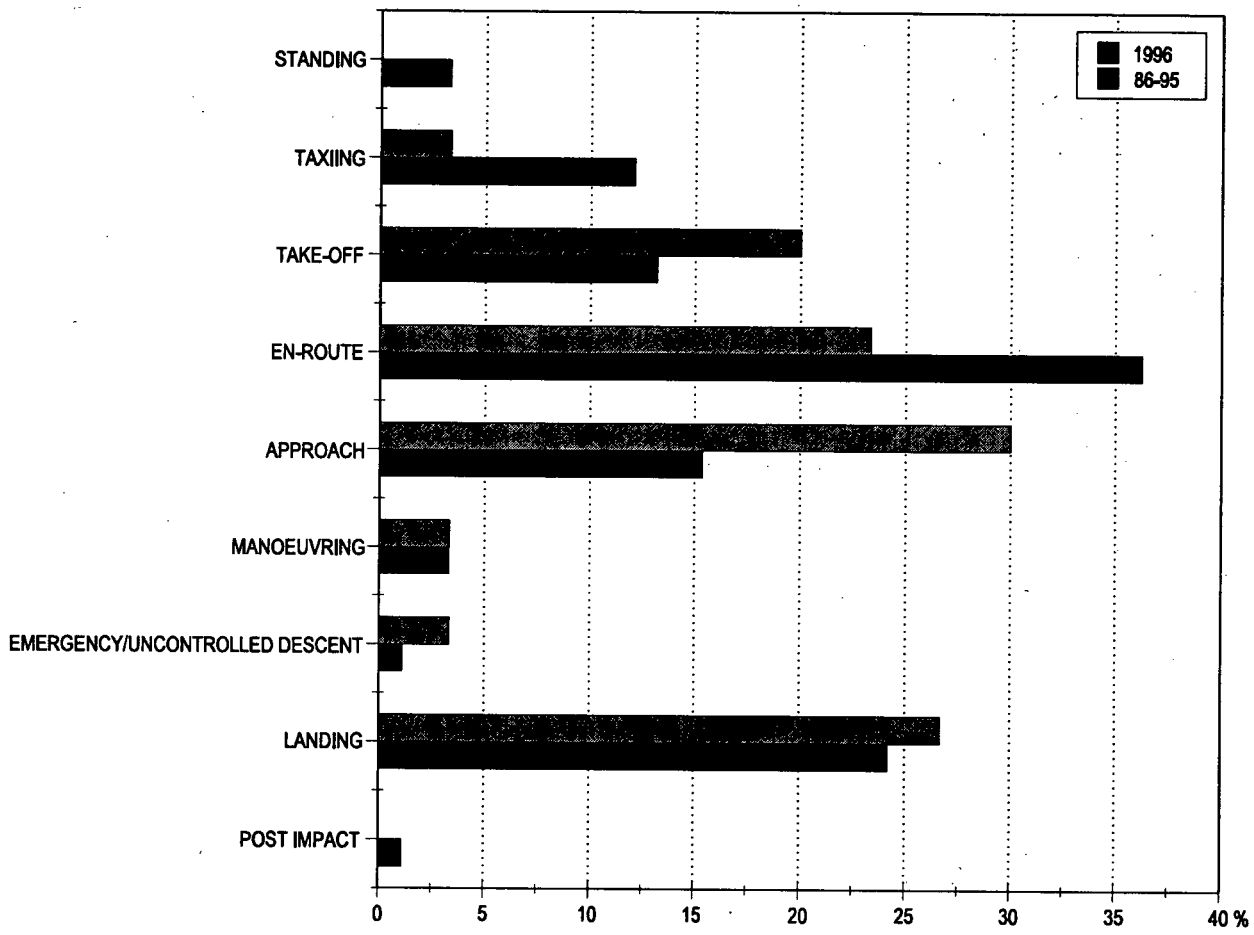


# FIXED WING AIRCRAFT

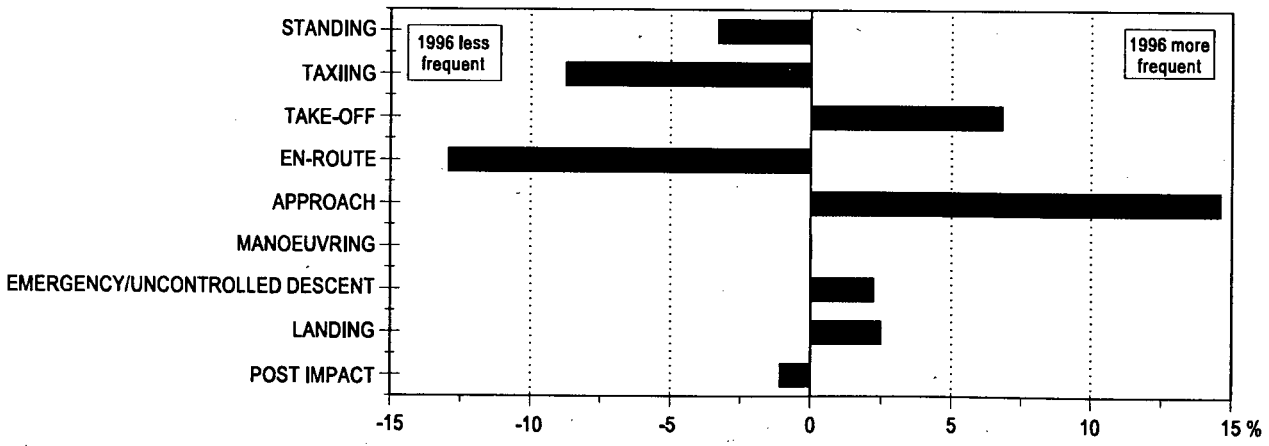
## General Aviation

## Incidents

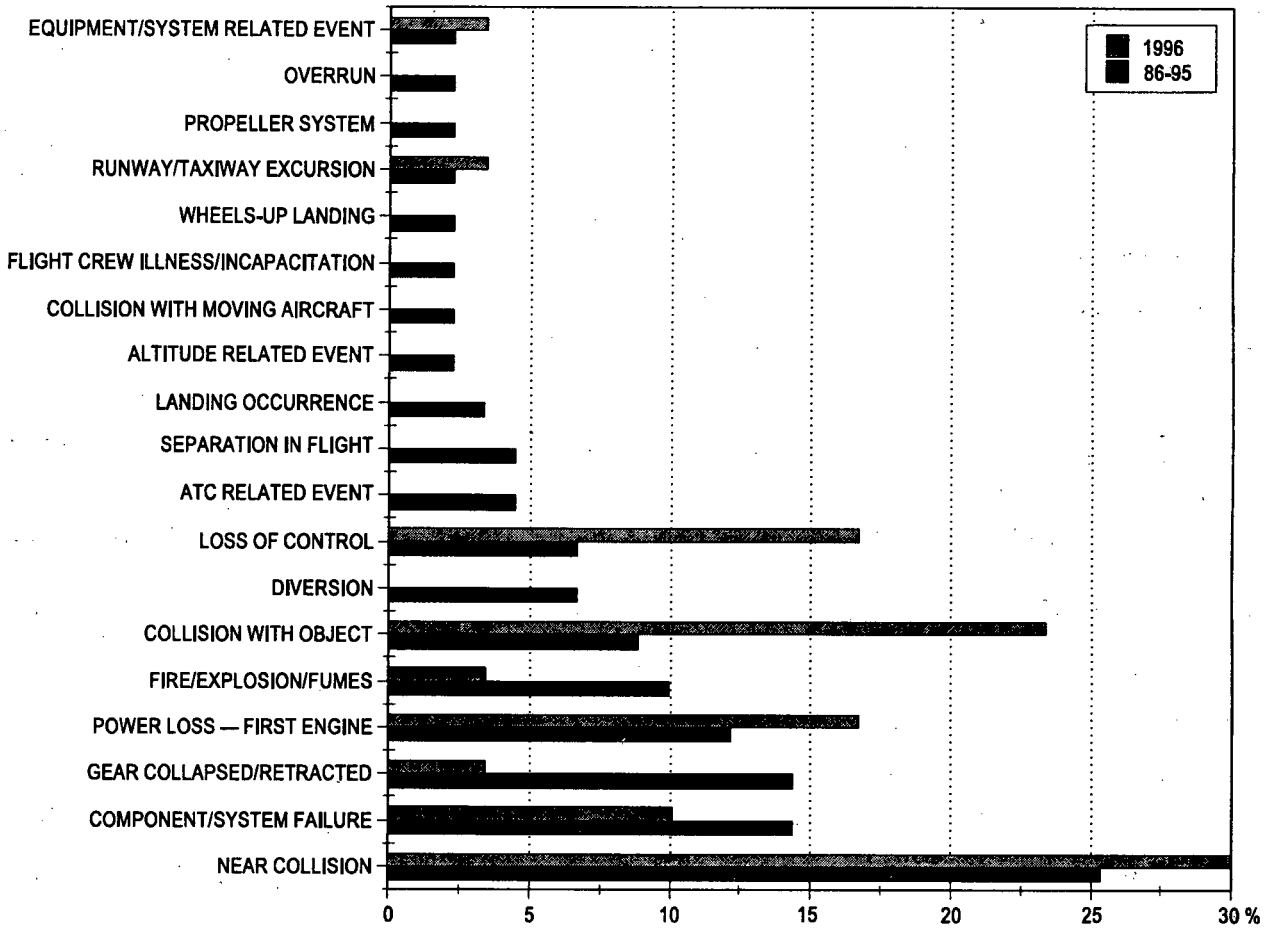
### Phase of operation



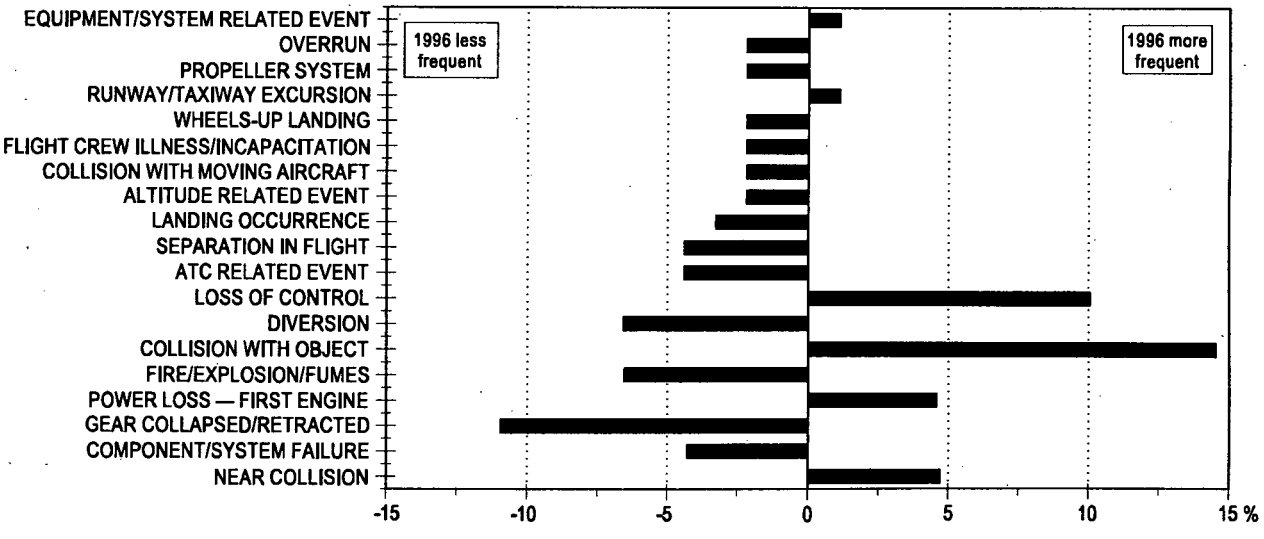

Comparison of 1986 — 1995 with 1996



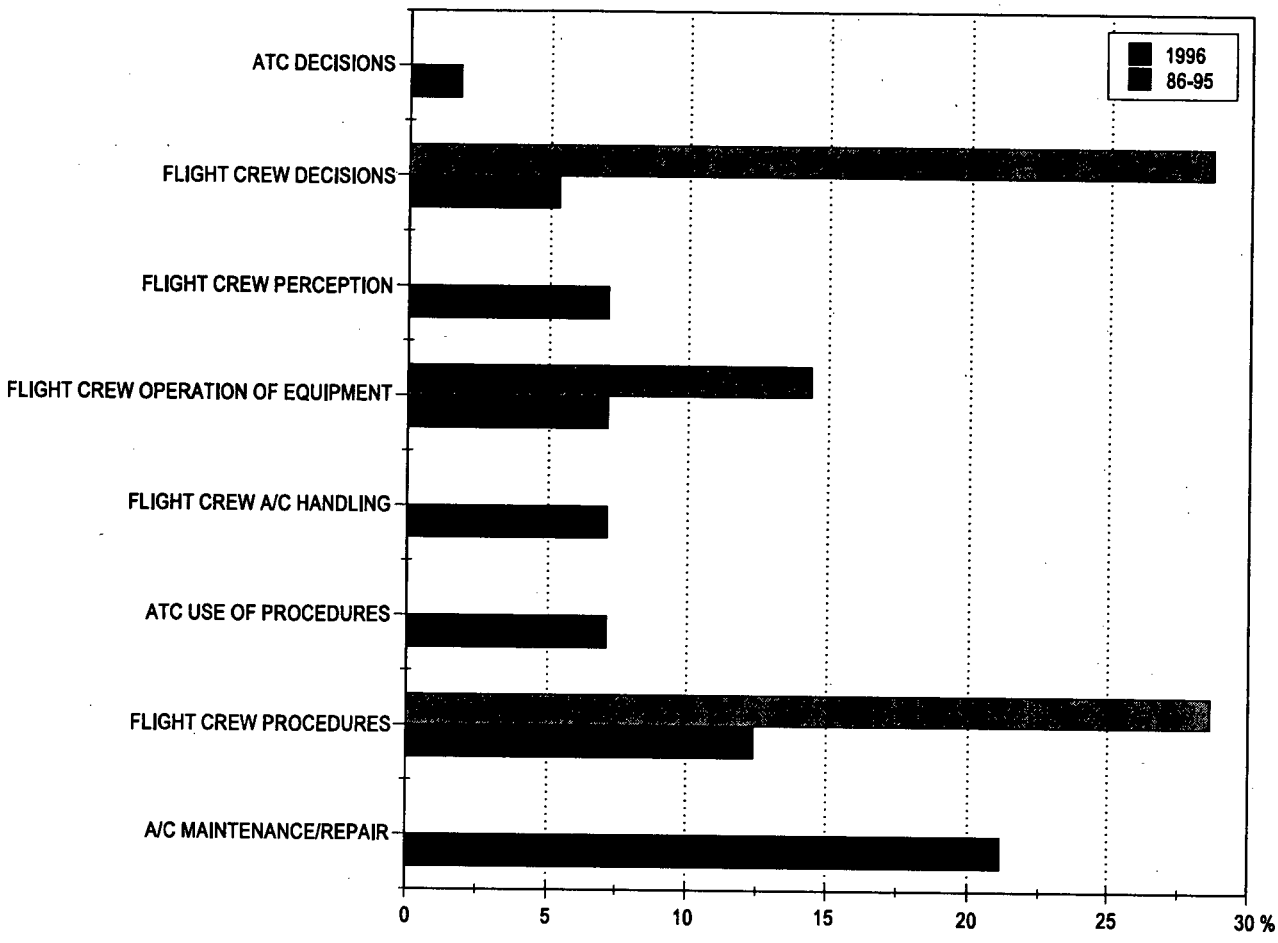
## Type of event



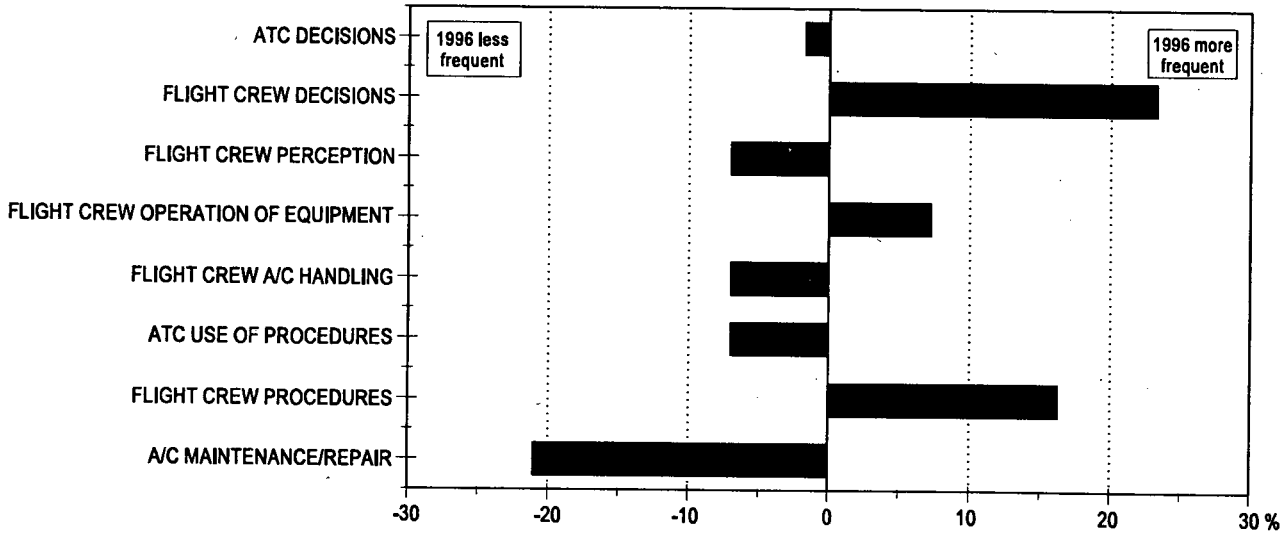

Comparison of 1986 — 1995 with 1996

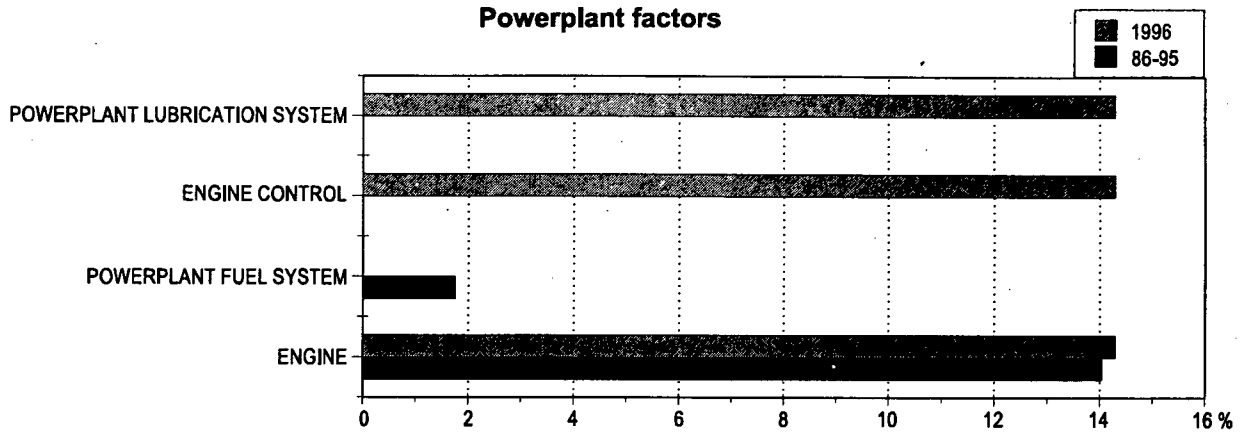


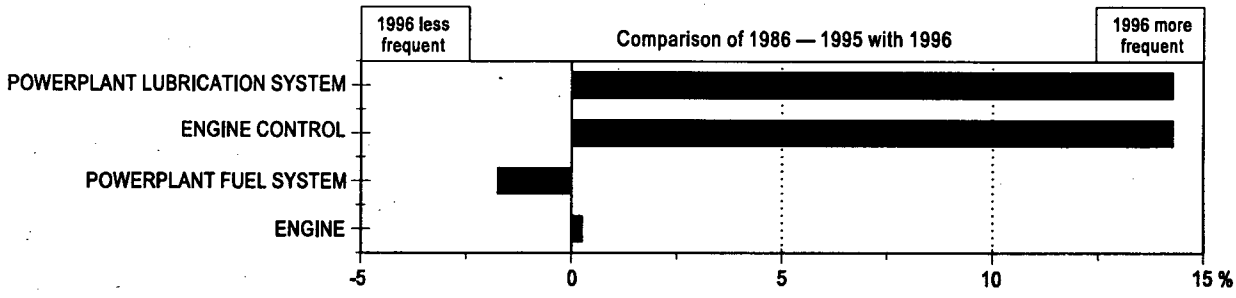
## Personnel factors

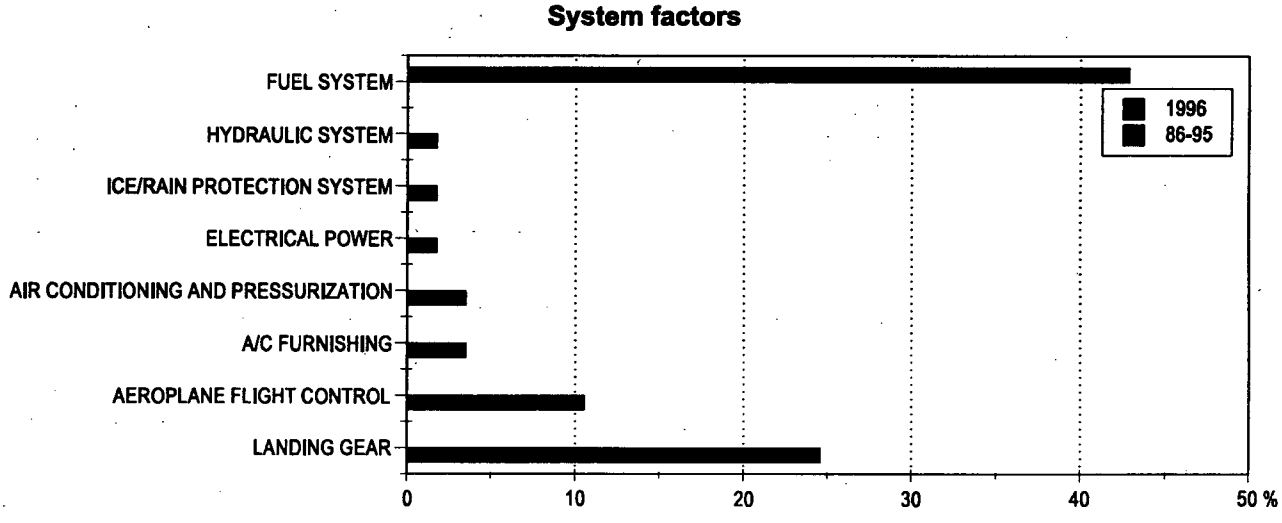


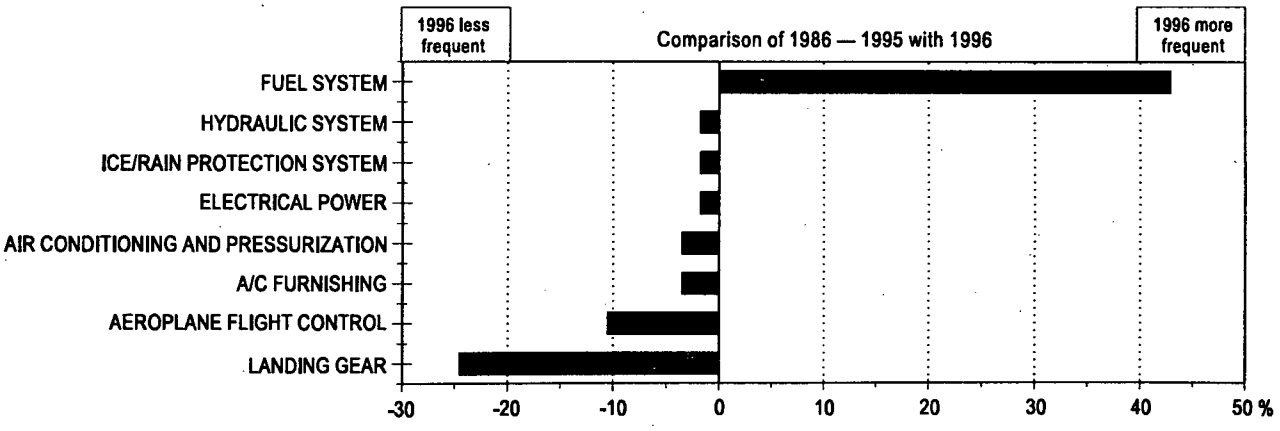

Comparison of 1986 — 1995 with 1996

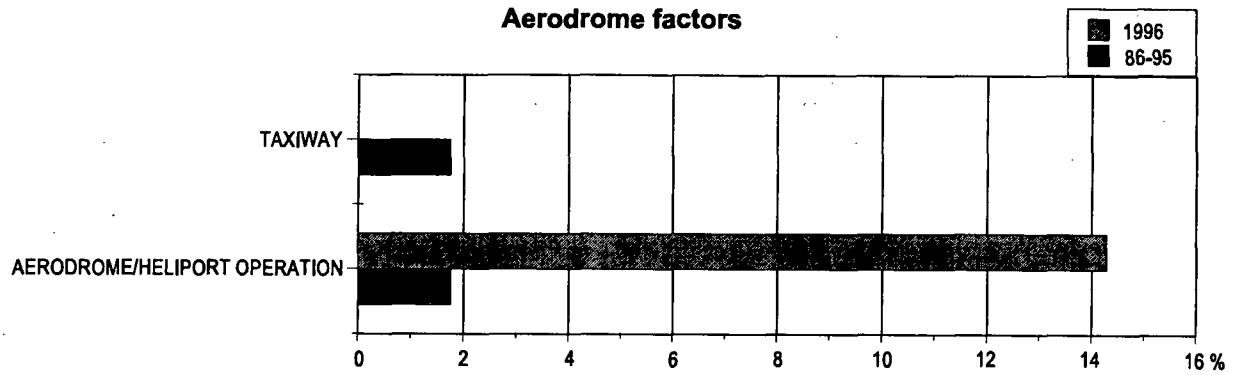


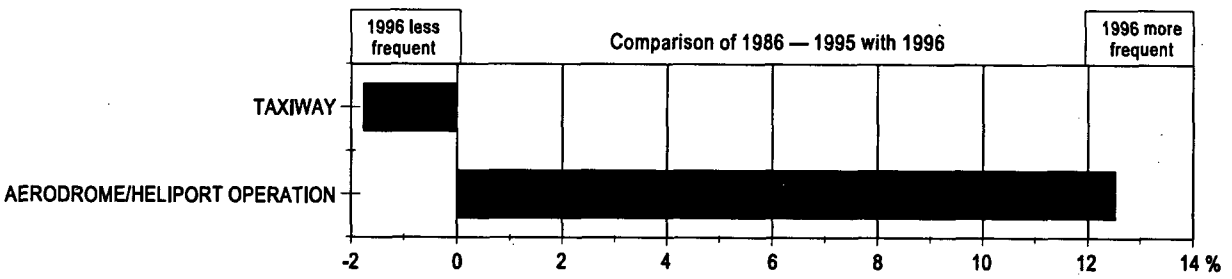

Powerplant factors
1996
86-95
POWERPLANT LUBRICATION SYSTEM
ENGINE CONTROL
POWERPLANT FUEL SYSTEM
ENGINE
0
2
4
6
8
10
12
14
16 %

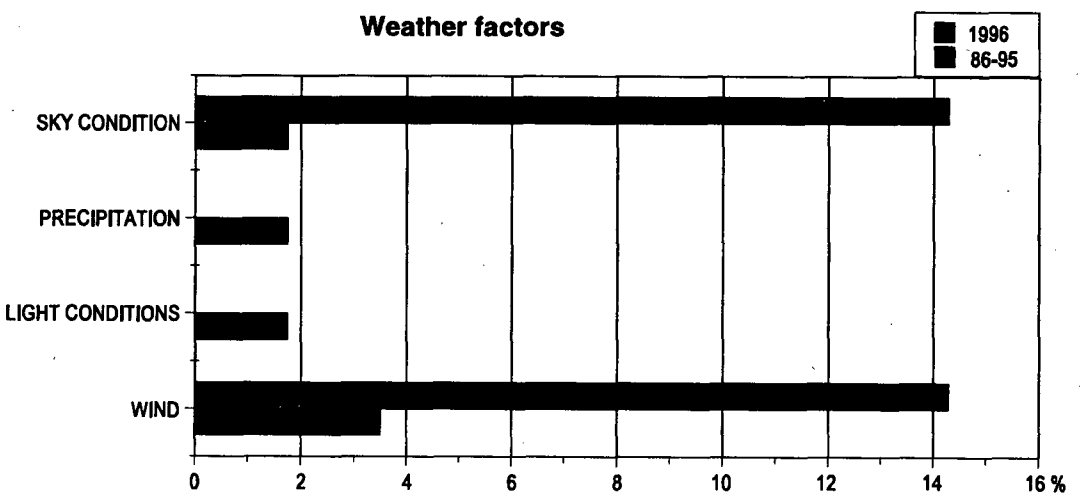

1996 less frequent
Comparison of 1986 — 1995 with 1996
1996 more frequent
POWERPLANT LUBRICATION SYSTEM
ENGINE CONTROL
POWERPLANT FUEL SYSTEM
ENGINE
-5
0
5
10
15 %

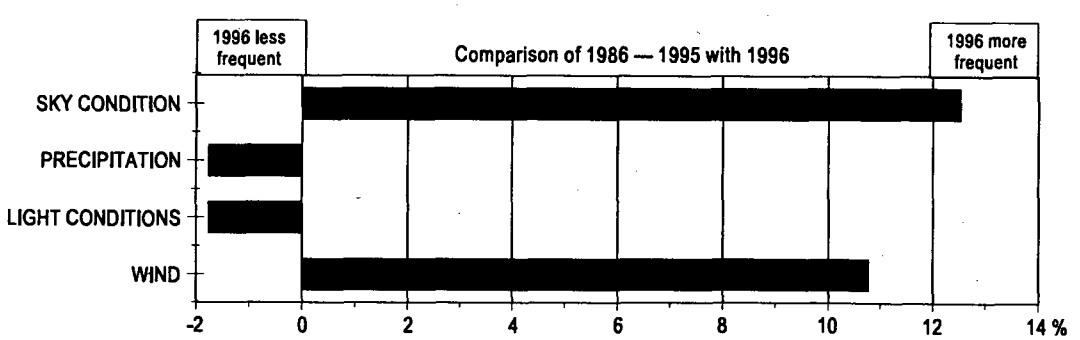

System factors
FUEL SYSTEM
HYDRAULIC SYSTEM
ICE/RAIN PROTECTION SYSTEM
ELECTRICAL POWER
AIR CONDITIONING AND PRESSURIZATION
A/C FURNISHING
AEROPLANE FLIGHT CONTROL
LANDING GEAR
1996
86-95
0
10
20
30
40
50 %


1996 less frequent
Comparison of 1986 — 1995 with 1996
1996 more frequent
FUEL SYSTEM
HYDRAULIC SYSTEM
ICE/RAIN PROTECTION SYSTEM
ELECTRICAL POWER
AIR CONDITIONING AND PRESSURIZATION
A/C FURNISHING
AEROPLANE FLIGHT CONTROL
LANDING GEAR
-30
-20
-10
0
10
20
30
40
50 %


Aerodrome factors
1996
86-95
TAXIWAY
AERODROME/HELIPORT OPERATION
0
2
4
6
8
10
12
14
16 %


1996 less frequent
Comparison of 1986 — 1995 with 1996
1996 more frequent
TAXIWAY
AERODROME/HELIPORT OPERATION
-2
0
2
4
6
8
10
12
14 %


Weather factors
1996
86-95
SKY CONDITION
PRECIPITATION
LIGHT CONDITIONS
WIND
0
2
4
6
8
10
12
14
16 %

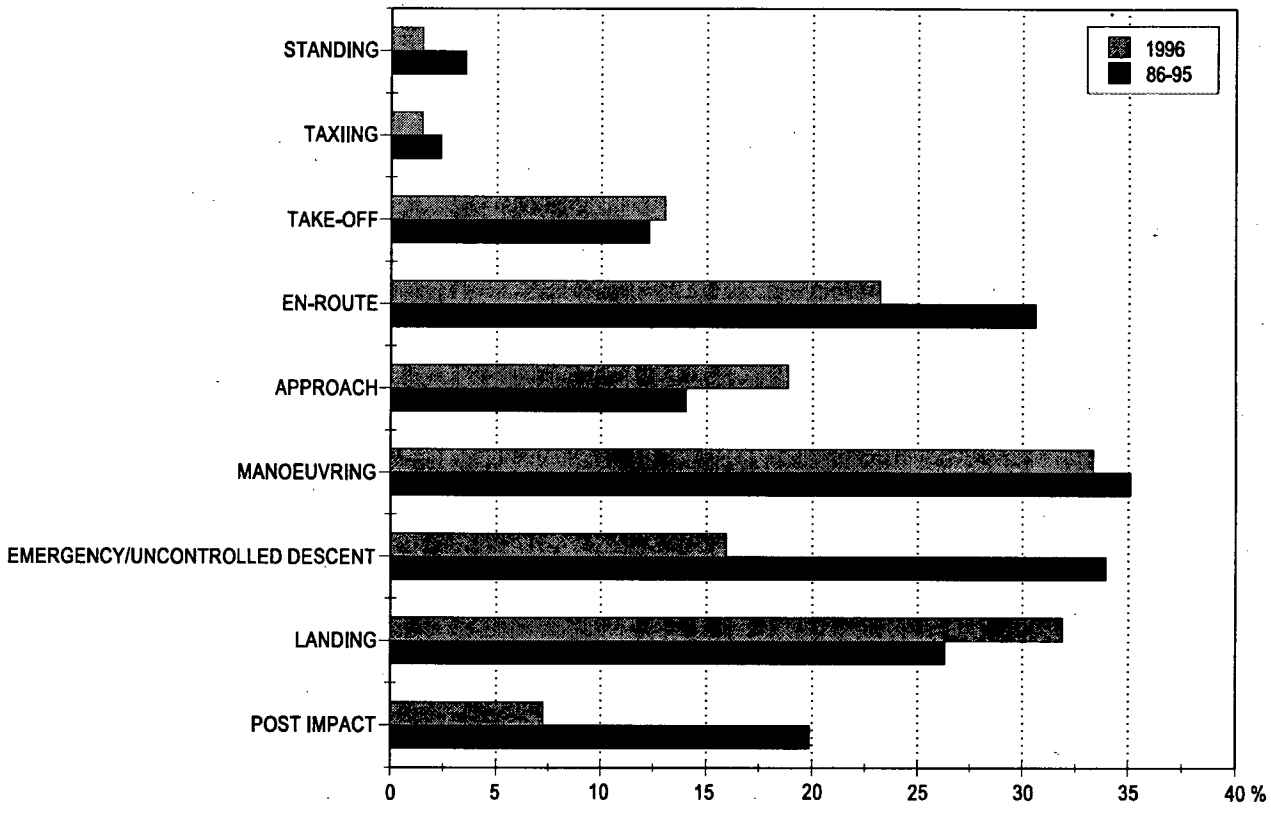

1996 less frequent
Comparison of 1986 — 1995 with 1996
1996 more frequent
SKY CONDITION
PRECIPITATION
LIGHT CONDITIONS
WIND
-2
0
2
4
6
8
10
12
14 %

# HELICOPTERS

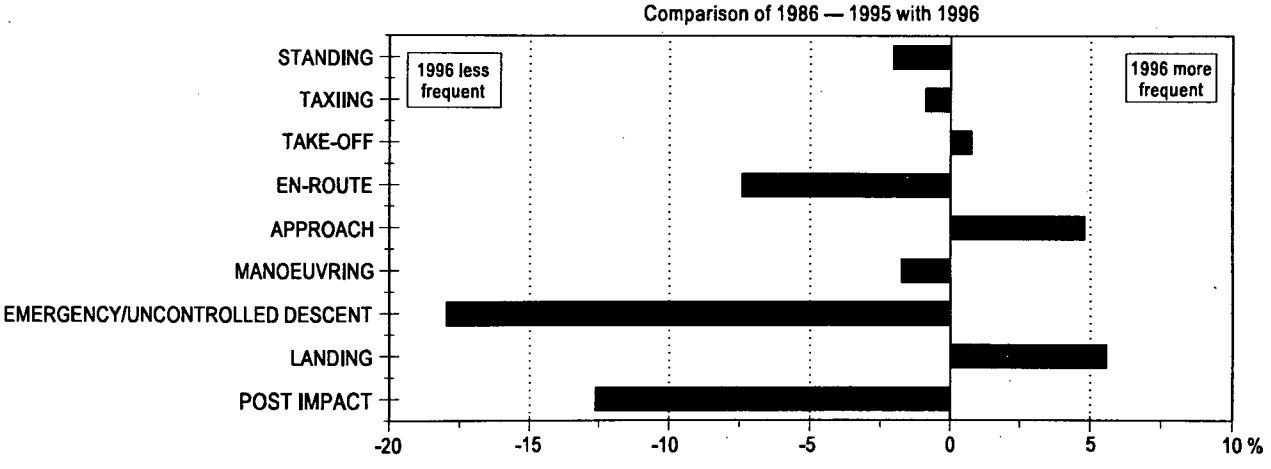
## General Aviation and Airline Operations

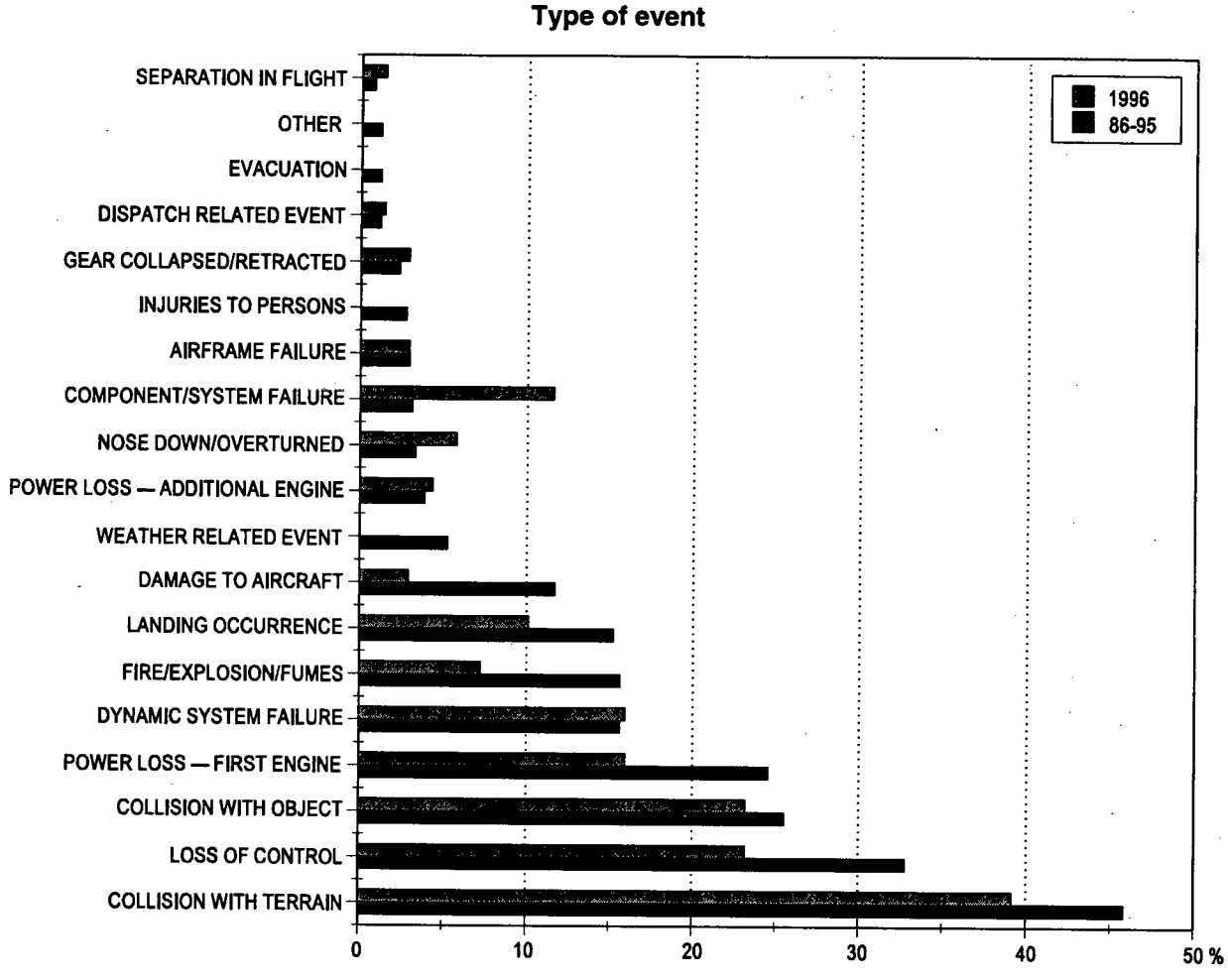
## Accidents and Incidents

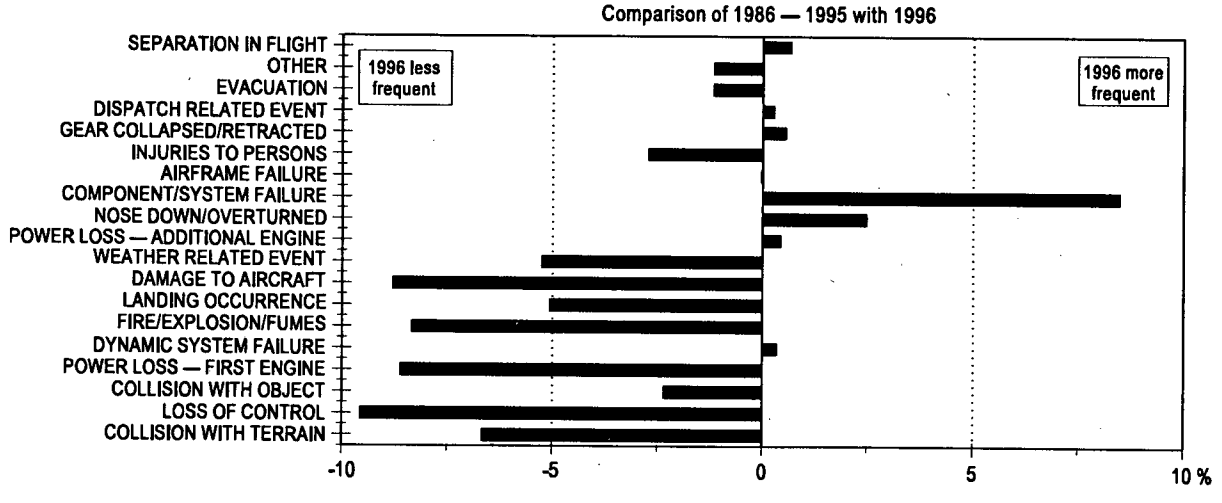
### Phase of operation



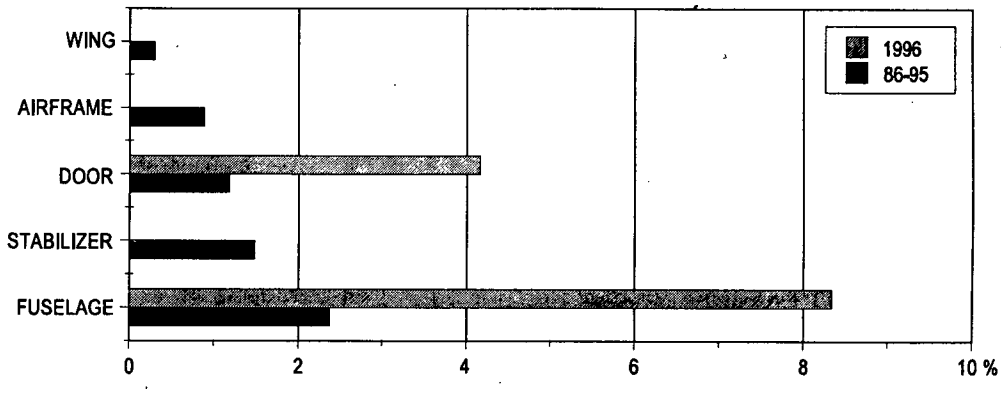

### Comparison of 1986 — 1995 with 1996

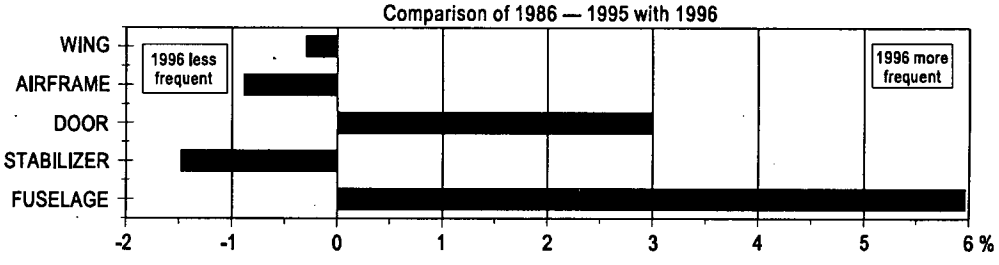



Type of event
SEPARATION IN FLIGHT
OTHER
EVACUATION
DISPATCH RELATED EVENT
GEAR COLLAPSED/RETRACTED
INJURIES TO PERSONS
AIRFRAME FAILURE
COMPONENT/SYSTEM FAILURE
NOSE DOWN/OVERTURNED
POWER LOSS — ADDITIONAL ENGINE
WEATHER RELATED EVENT
DAMAGE TO AIRCRAFT
LANDING OCCURRENCE
FIRE/EXPLOSION/FUMES
DYNAMIC SYSTEM FAILURE
POWER LOSS — FIRST ENGINE
COLLISION WITH OBJECT
LOSS OF CONTROL
COLLISION WITH TERRAIN
1996
86-95
0
10
20
30
40
50 %

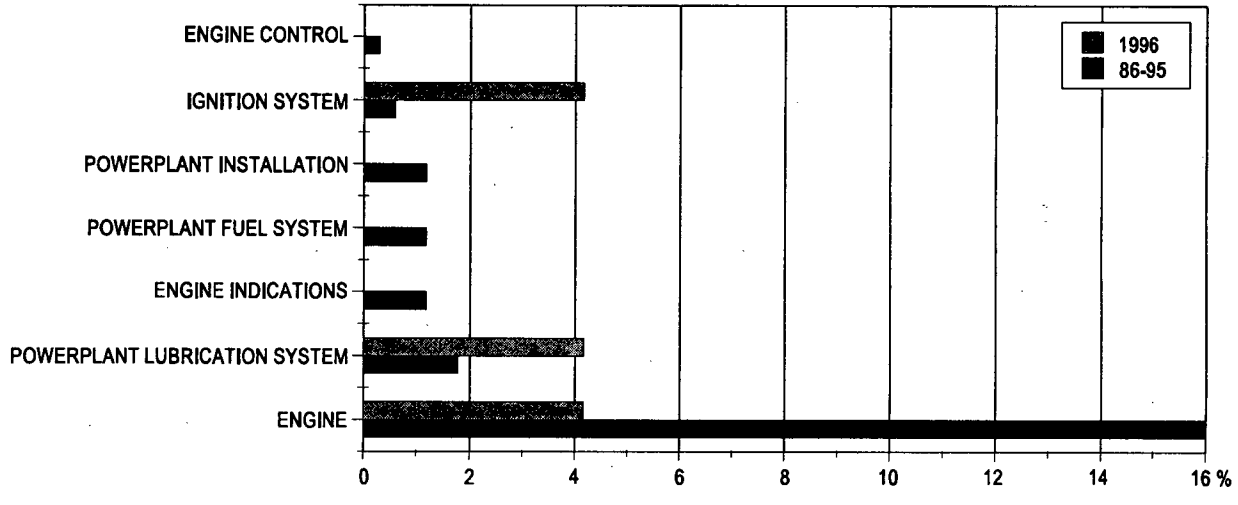

Comparison of 1986 — 1995 with 1996
1996 less frequent
1996 more frequent
SEPARATION IN FLIGHT
OTHER
EVACUATION
DISPATCH RELATED EVENT
GEAR COLLAPSED/RETRACTED
INJURIES TO PERSONS
AIRFRAME FAILURE
COMPONENT/SYSTEM FAILURE
NOSE DOWN/OVERTURNED
POWER LOSS — ADDITIONAL ENGINE
WEATHER RELATED EVENT
DAMAGE TO AIRCRAFT
LANDING OCCURRENCE
FIRE/EXPLOSION/FUMES
DYNAMIC SYSTEM FAILURE
POWER LOSS — FIRST ENGINE
COLLISION WITH OBJECT
LOSS OF CONTROL
COLLISION WITH TERRAIN
-10
-5
0
5
10 %

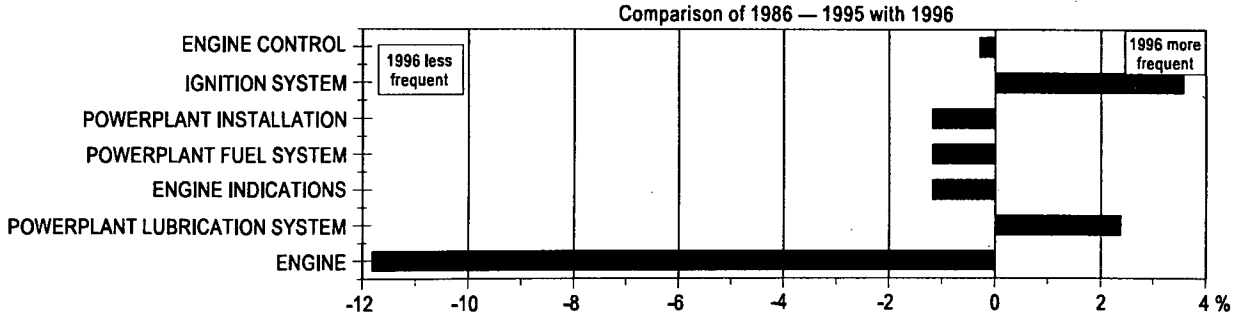
## Airframe factors



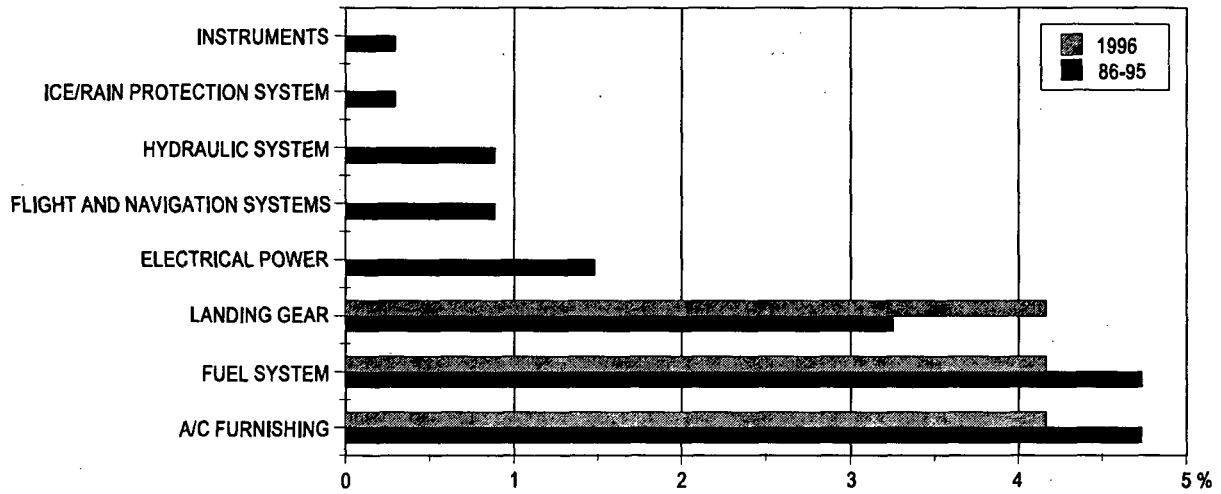



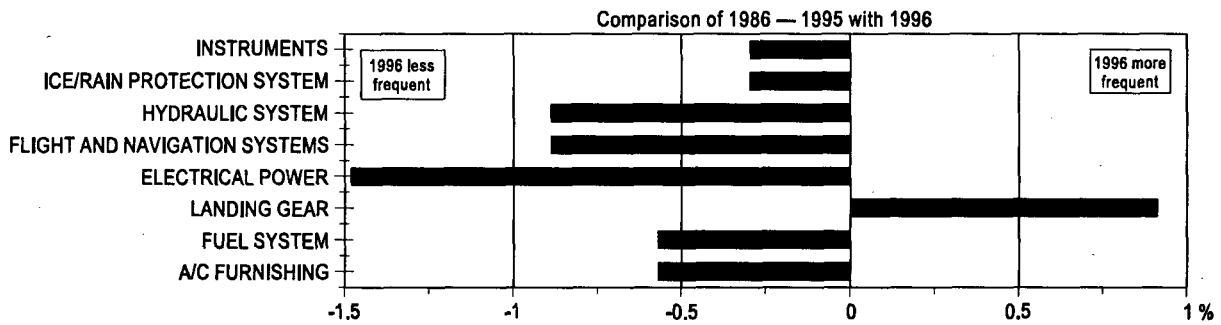

## Powerplant factors



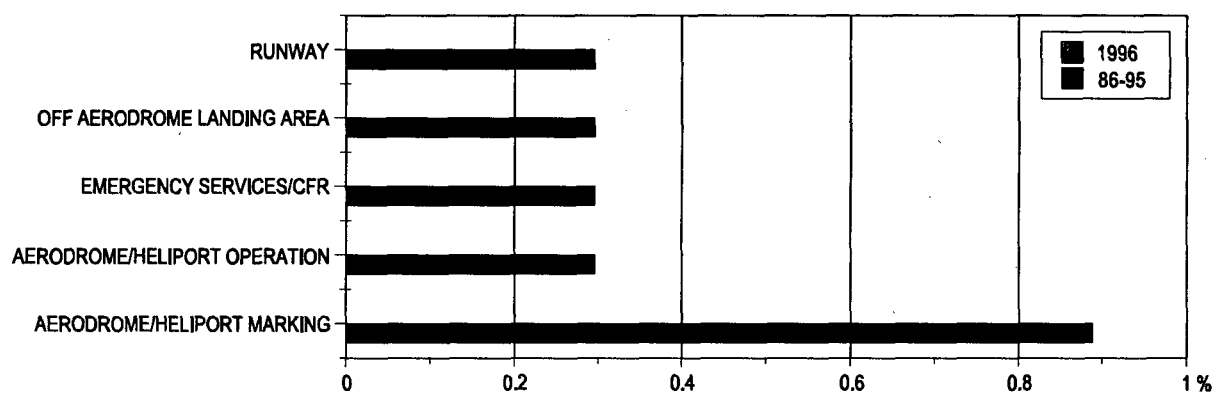



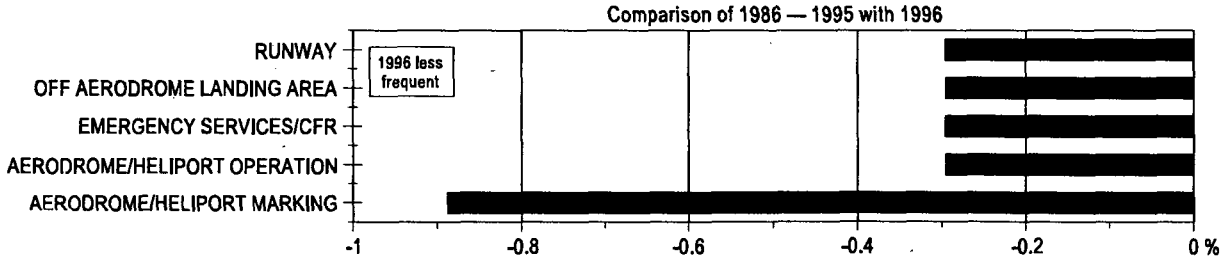
## System factors

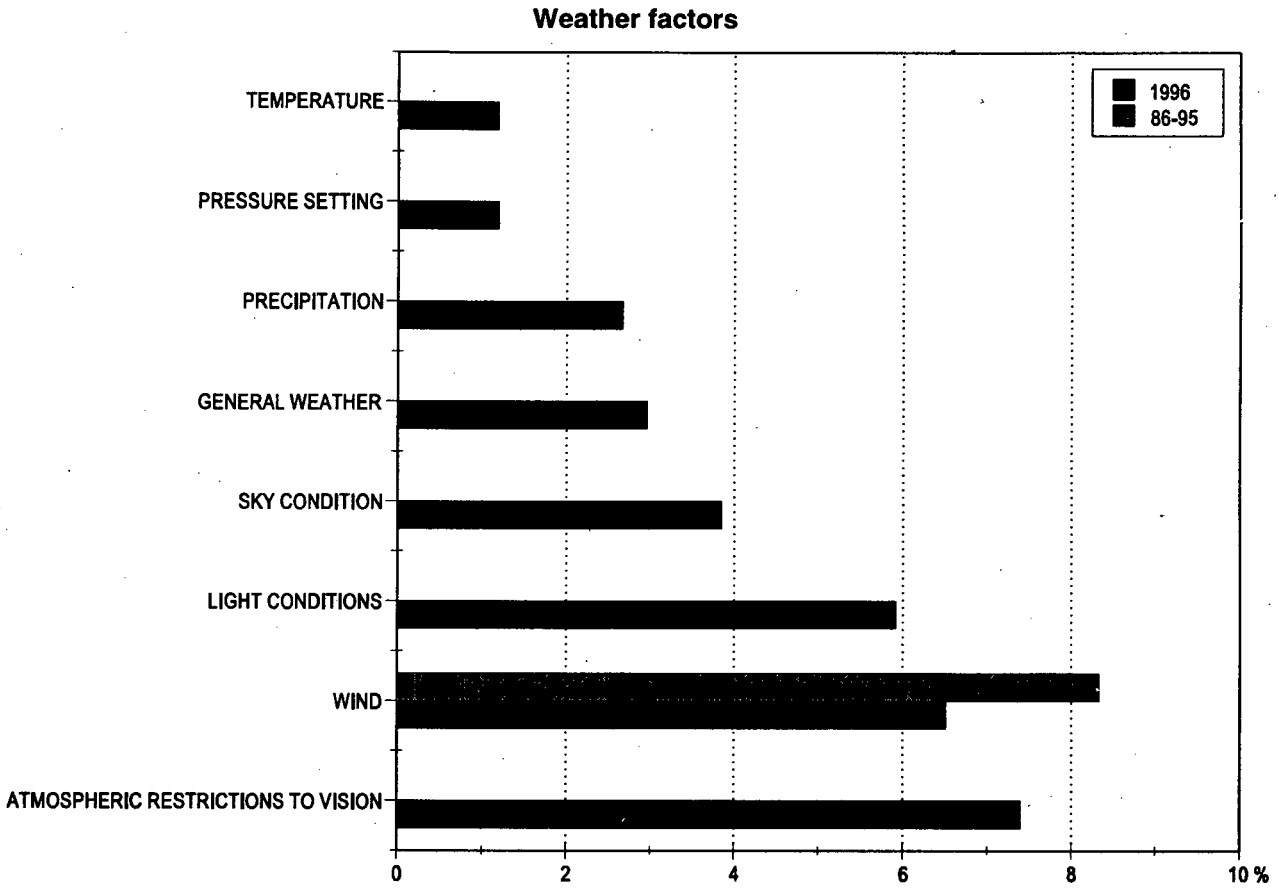


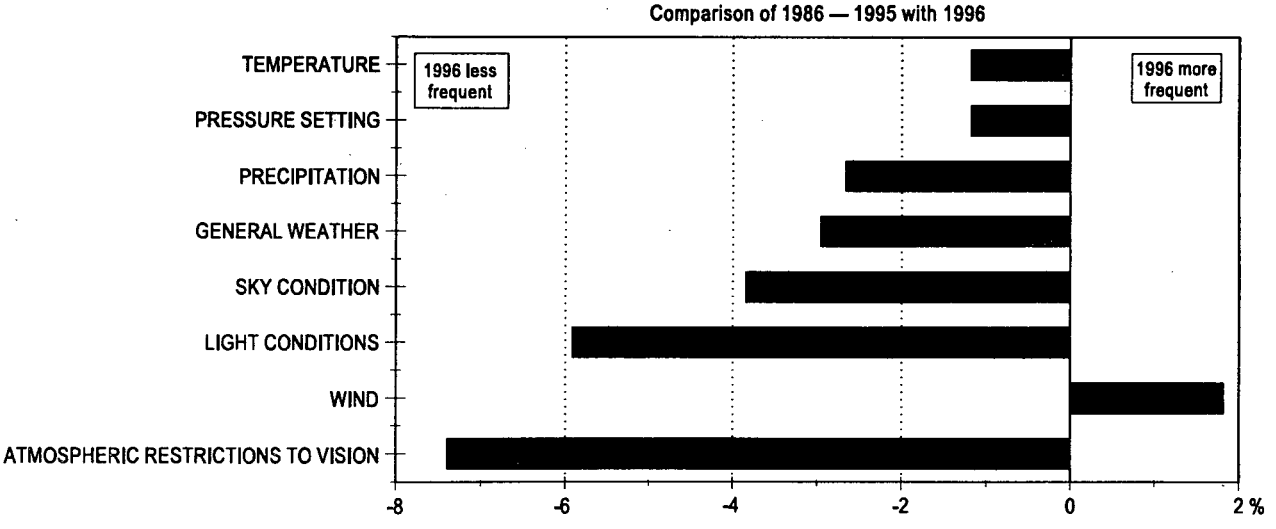




## Aerodrome factors




Weather factors
TEMPERATURE
PRESSURE SETTING
PRECIPITATION
GENERAL WEATHER
SKY CONDITION
LIGHT CONDITIONS
WIND
ATMOSPHERIC RESTRICTIONS TO VISION
1996
86-95
0
2
4
6
8
10 %


Comparison of 1986 — 1995 with 1996
TEMPERATURE
PRESSURE SETTING
PRECIPITATION
GENERAL WEATHER
SKY CONDITION
LIGHT CONDITIONS
WIND
ATMOSPHERIC RESTRICTIONS TO VISION
1996 less frequent
1996 more frequent
-8
-6
-4
-2
0
2 %

# Part IV

# TREND INFORMATION AND PRELIMINARY DATA FOR THE YEAR 1998

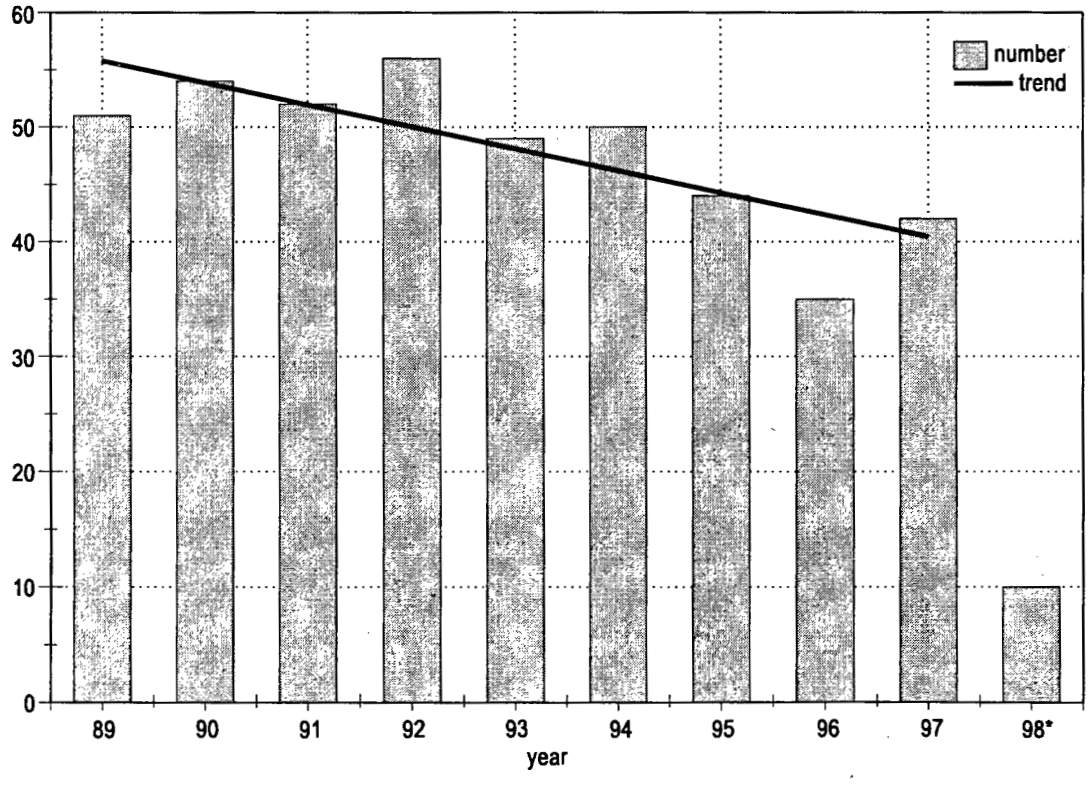
### Accident trends

1. The number of hull losses (aircraft destroyed) is being provided for fixed wing operations in respect to airline scheduled, airline non-scheduled and general aviation. In addition, the number of helicopters destroyed is provided. The data includes occurrences which have been reported in the media but have not been reported by States.

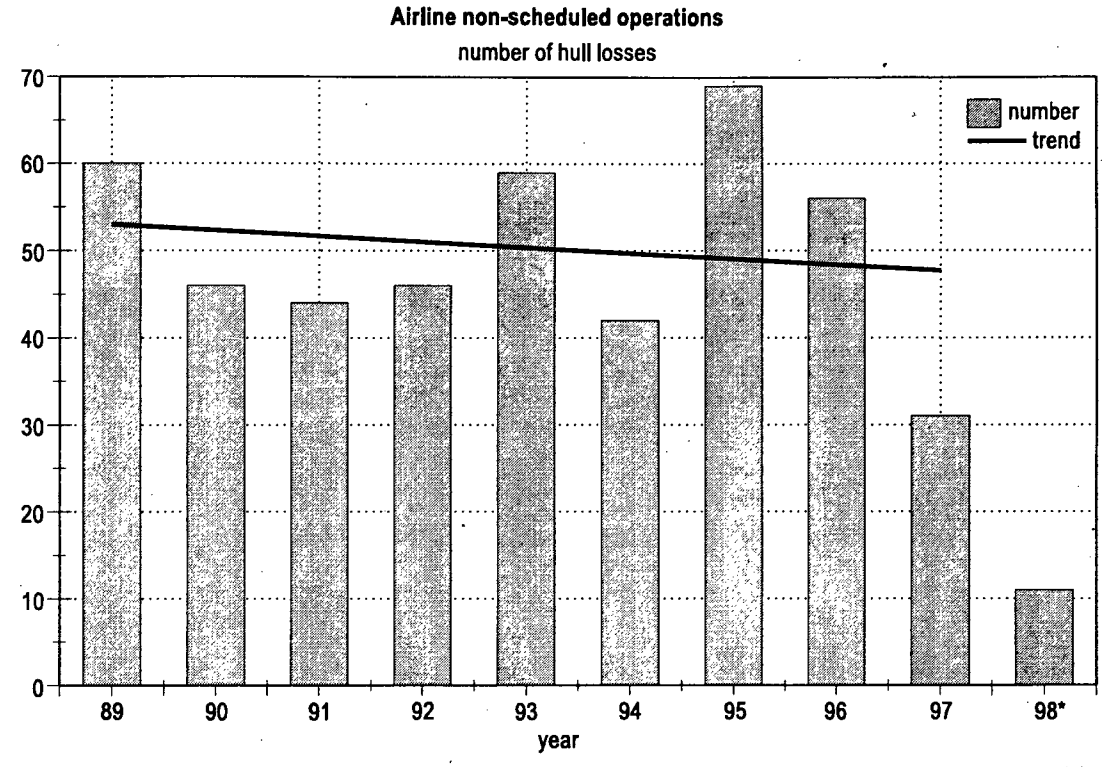
2. The data for 1998 are based on initial information (including unofficial information) available to ICAO by the end of May 1998 and are likely to understate the total number of occurrences for the period under review. Trend lines were calculated based on the data for the period from 1989 to 1997.

**Airline scheduled operations**

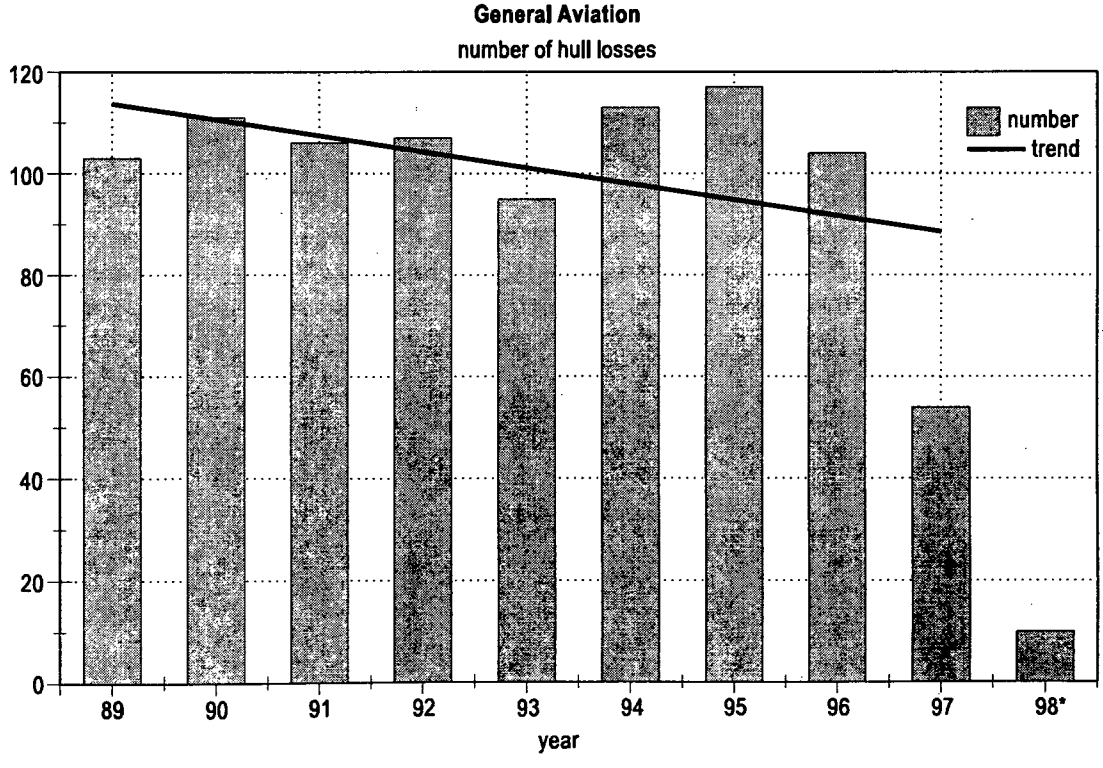
number of hull losses



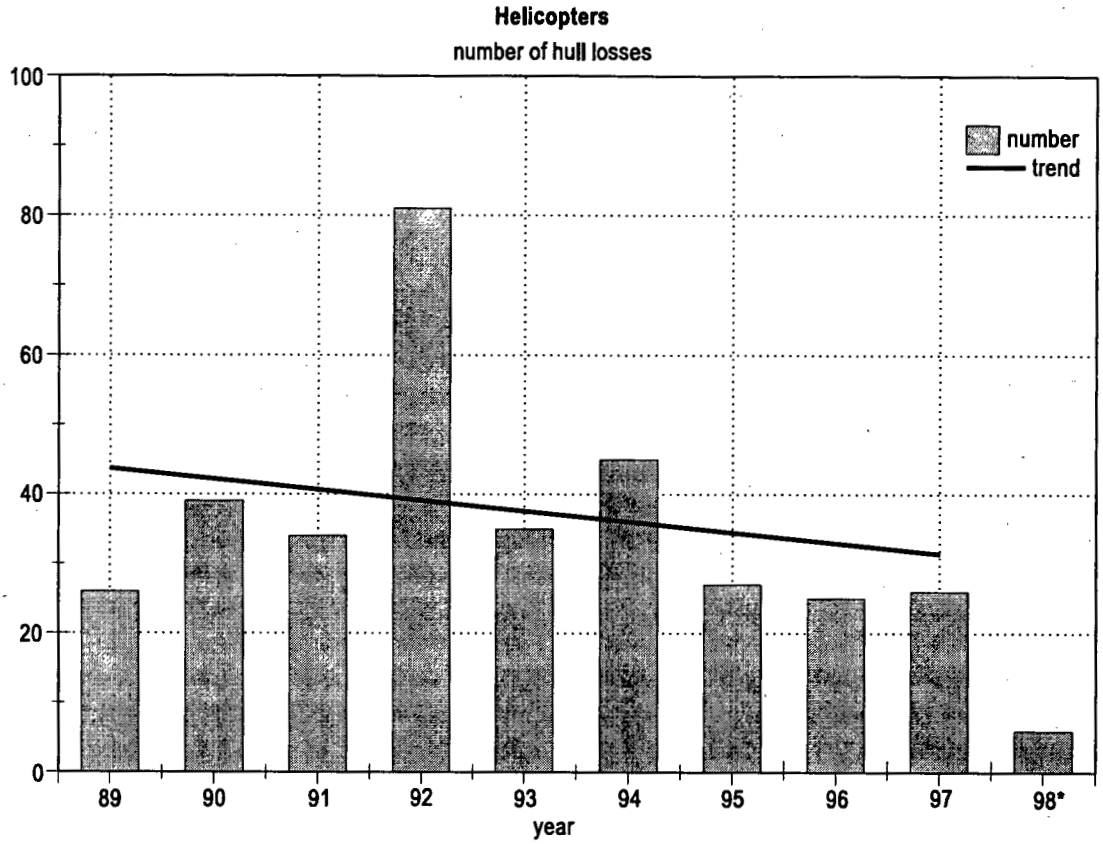

** 1998 data is based on initial information available to ICAO by the end of May 1998.*




** 1998 data is based on initial information available to ICAO by the end of May 1998.*




** 1998 data is based on initial information available to ICAO by the end of May 1998.*




** 1998 data is based on initial information available to ICAO by the end of May 1998.*

# Part V

# LIST OF ACCIDENTS INVOLVING PASSENGER FATALITIES IN SCHEDULED AND NON-SCHEDULED OPERATIONS IN 1997

*See Tables V-1 and V-2 on the following pages.*

## Table V-1. Scheduled operations

| Date | State-Location | Registration | Aircraft | Passenger fatalities | Crew fatalities | Remark |
|---|---|---|---|---|---|---|
| 97-JAN-08 | SAMOA-MOAMOA | 5W-FAU | DE HAVILLAND-DHC6 TWIN OTTER | 2 | 1 | |
| 97-JAN-09 | UNITED STATES-MONROE,MI | N265CA | EMBRAER-120 BRASILIA | 26 | 3 | |
| 97-FEB-08 | VIRGIN ISLANDS (U.S.)-CARIBBEAN SEA | N318AB | CESSNA-402 | 2 | 0 | |
| 97-APR-10 | UNITED STATES-WAINWRIGHT, AK | N408GV | CESSNA-208 CARAVAN I | 4 | 1 | |
| 97-APR-19 | INDONESIA-BELITUNG | PK-MTX | BRITISH AEROSPACE-ATP | 11 | 4 | |
| 97-MAY-08 | CHINA-SHENZHEN | B2925 | BOEING-737-300 | 33 | 2 | |
| 97-JUN-10 | MONGOLIA-MANDALGOBI | | HARBIN-Y-12 | 7 | 0 | |
| 97-JUL-09 | BRAZIL-NEAR SAO PAULO | PT-WHK | FOKKER-100 | 1 | 0 | |
| 97-JUL-11 | CUBA-AGUADORES | CU-T1262 | ANTONOV-AN-24 | 39 | 5 | |
| 97-JUL-17 | INDONESIA-BANDUNG | PK-YPM | FOKKER-F27 MK 500 | 28 | 5 | |
| 97-AUG-02 | PERU-LIMA | N14114 | BOEING-757-200 | 1 | 0 | |
| 97-AUG-06 | GUAM-GUAM | HL7468 | BOEING-747-300 | 206 | 22 | |
| 97-AUG-10 | TAIWAN ISLAND-MATSU ISLAND | B12256 | DORNIER-228 100/200 | 14 | 2 | (1) |
| 97-AUG-29 | COLOMBIA-MIRIDA | FAC1115 | PILATUS-PC-6 PORTER | 7 | 2 | |
| 97-SEP-03 | CAMBODIA-PHNOM PENH | VN-A120 | TUPOLEV-TU-134 | 59 | 6 | |
| 97-SEP-06 | MALAYSIA-NEAR MIRI | 9M-MIA | DORNIER-228 100/200 | 8 | 2 | |
| 97-SEP-08 | NORWAY-NORWEGIAN COAST | LN-OPG | AEROSPATIALE-AS 332 SUPER PUMA | 10 | 2 | |
| 97-SEP-26 | INDONESIA-BUAH NABAR / SIBOLANGIT | PK-GAI | AIRBUS INDUSTRIES-A300 | 222 | 12 | |
| 97-OCT-10 | URUGUAY-NUOVO BERLIN | LV-WEG | MCDONNELL-DOUGLAS-DC-9-30 | 69 | 6 | |
| 97-OCT-29 | AFGHANISTAN-JALALABAD | YA-KAE | YAKOLEV-YAK-40 | 1 | 1 | |
| 97-NOV-08 | UNITED STATES-BARROW, AK | N750GC | CESSNA-208 CARAVAN I | 7 | 1 | |
| 97-DEC-09 | CANADA-LITTLE GRAND RAPIDS | C-GVRO | EMBRAER-110 BANDEIRANTE | 3 | 1 | |
| 97-DEC-17 | GREECE-NEAR THESSALONIKI | UR42334 | YAKOLEV-YAK-42 | 62 | 8 | |
| 97-DEC-19 | INDONESIA-PALEMBANG | 9V-TRF | BOEING-737-300 | 97 | 7 | |
| 97-DEC-22 | CHINA | | AIRBUS INDUSTRIES-A300 | 1 | 0 | (2) |
| 97-DEC-28 | NORTH PACIFIC OCEAN-EN-ROUTE | | BOEING-747-100/200 | 1 | 0 | |
| 97-DEC-31 | PANAMA-RIO SIDRA | HP986PS | BRITTEN-NORMAN-BN-2A ISLANDER | 9 | 1 | |
| | | | Total | 930 | 94 | |

(1) Aircraft accident statistics in ICAO are based on aircraft registered in ICAO Contracting States. This accident was not included in the statistics in Doc 9700.
(2) Aviation security related occurrences are not included in the aircraft accident statistics in ICAO, but reported separately under aviation security in Doc 9700.

## Table V-2. Non-scheduled operations

| Date | State-Location | Registration | Aircraft | Passenger fatalities | Crew fatalities | Remark |
|---|---|---|---|---|---|---|
| 97-JAN-31 | NIGERIA-YOLA | 5N-AXS | EMBRAER-110 BANDEIRANTE | 2 | 3 | |
| 97-FEB-01 | SENEGAL-TAMBACOUNDA | 6V-AEO | BRITISH AEROSPACE-748 | 20 | 3 | |
| 97-FEB-19 | GUATEMALA-NEAR GUATEMALA CITY | YV160 | ISRAEL-IAI-1124 | 4 | 1 | |
| 97-MAR-02 | VENEZUELA-CARACAS | YV784 | CESSNA-402 | 5 | 1 | |
| 97-MAR-07 | COLOMBIA-CALDAS | HK3885 | CESSNA-500/501 CITATION | 2 | 2 | |
| 97-MAR-12 | ANGOLA-NORTHERN ANGOLA | D2-FVG | ANTONOV-AN-12 | 11 | 4 | |
| 97-MAR-18 | RUSSIAN FEDERATION-CHERKESSK | RA46516 | ANTONOV-AN-24 | 44 | 6 | |
| 97-JUN-06 | CONGO-BUNIA | 9Q-CWL | VICKERS-ARMSTRONG-VC-2 VISCOUNT | 20 | 7 | |
| 97-JUN-17 | RUSSIAN FEDERATION-NEAR TULA | RA84700 | ANTONOV-AN-2 | 3 | 1 | |
| 97-JUL-05 | UNITED STATES-SKWENTNA, AK | N5164G | DE HAVILLAND-DHC2 MK. I BEAVER | 3 | 1 | |
| 97-JUL-18 | PAPUA NEW GUINEA-NEAR GOROKA | P2-MMU | DE HAVILLAND-DHC6-300 | 1 | 1 | |
| 97-SEP-12 | CONGO-NEAR UVIRA | 9Q-CBO | DE HAVILLAND-DHC6-300 | 21 | 1 | |
| 97-OCT-02 | AZERBAIJAN-CASPIAN SEA | 4K-24017 | MIL-MI-8 | 18 | 3 | |
| 97-OCT-08 | UNITED STATES-MONTROSE, CO | N12022 | CESSNA-208 CARAVAN I | 8 | 1 | |
| 97-OCT-09 | GAMBIA-NEAR BANJUL INT'L A/P | EC-ERQ | BEECH-200 KING AIR | 6 | 2 | |
| 97-OCT-10 | MONACO-EN-ROUTE | F-GHCK | AEROSPATIALE-SA 360 DAUPHIN | 2 | 0 | |
| 97-OCT-20 | COSTA RICA-SAN CARLOS | YN-BVP | CESSNA-208 CARAVAN I | 5 | 1 | |
| 97-DEC-11 | RUSSIAN FEDERATION-NARYAN MAR | | MIL-MI-8 | 8 | 0 | |
| 97-DEC-13 | BOLIVIA-LA VERIENTE | CP-1635 | SWEARINGEN-SA226 TC METRO II | 9 | 1 | |
| 97-DEC-15 | UNITED ARAB EMIRATES-NEAR SHARJAH | EY85281 | TUPOLEV-TU-154 | 77 | 8 | |
| 97-DEC-16 | CANADA-MACKENZIE, 25 NM N | C-GKWV | CESSNA-402 | 2 | 1 | |
| 97-DEC-20 | NETHERLANDS-NORTH SEA | PH-KHB | SIKORSKY-S-76 | 1 | 0 | |
| | | | Total | 272 | 158 | |

— END —

# ICAO TECHNICAL PUBLICATIONS

*The following summary gives the status, and also describes in general terms the contents of the various series of technical publications issued by the International Civil Aviation Organization. It does not include specialized publications that do not fall specifically within one of the series, such as the* Aeronautical Chart Catalogue *or the* Meteorological Tables for International Air Navigation.

**International Standards and Recommended Practices** are adopted by the Council in accordance with Articles 54, 37 and 90 of the Convention on International Civil Aviation and are designated, for convenience, as Annexes to the Convention. The uniform application by Contracting States of the specifications contained in the International Standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the Recommended Practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation. Knowledge of any differences between the national regulations or practices of a State and those established by an International Standard is essential to the safety or regularity of international air navigation. In the event of non-compliance with an International Standard, a State has, in fact, an obligation, under Article 38 of the Convention, to notify the Council of any differences. Knowledge of differences from Recommended Practices may also be important for the safety of air navigation and, although the Convention does not impose any obligation with regard thereto, the Council has invited Contracting States to notify such differences in addition to those relating to International Standards.

**Procedures for Air Navigation Services** (PANS) are approved by the Council for world-wide application. They contain, for the most part, operating procedures regarded as not yet having attained a sufficient degree of maturity for adoption as International Standards and Recommended Practices, as well as material of a more permanent character which is considered too detailed for incorporation in an Annex, or is susceptible to frequent amendment, for which the processes of the Convention would be too cumbersome.

**Regional Supplementary Procedures** (SUPPS) have a status similar to that of PANS in that they are approved by the Council, but only for application in the respective regions. They are prepared in consolidated form, since certain of the procedures apply to overlapping regions or are common to two or more regions.

---

*The following publications are prepared by authority of the Secretary General in accordance with the principles and policies approved by the Council.*

**Technical Manuals** provide guidance and information in amplification of the International Standards, Recommended Practices and PANS, the implementation of which they are designed to facilitate.

**Air Navigation Plans** detail requirements for facilities and services for international air navigation in the respective ICAO Air Navigation Regions. They are prepared on the authority of the Secretary General on the basis of recommendations of regional air navigation meetings and of the Council action thereon. The plans are amended periodically to reflect changes in requirements and in the status of implementation of the recommended facilities and services.

**ICAO Circulars** make available specialized information of interest to Contracting States. This includes studies on technical subjects.

---

1/99, E/P1/1400

Order No. CIR272
Printed in ICAO