

ICAO

CIRCULAR

CIRCULAR 203-AN/124



1987

ACCIDENT/INCIDENT REPORTING (ADREP)

ANNUAL STATISTICS — 1984

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

**INTERNATIONAL
CIVIL AVIATION
ORGANIZATION
MONTREAL • CANADA**

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

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Greville House, 37 Gratton Road, Cheltenham, Glos., GL50 2BN.

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INTRODUCTION

General

The information in this publication is based on 625 accident and 101 incident reports of the ICAO ADREP system for the year 1984 for aircraft of a maximum certificated take-off mass over 2 250 kg. The statistics were compiled in February 1987.

Purpose

The purpose of the ADREP statistics is to provide data that may be useful for general safety studies and accident prevention. For more specific needs the ADREP system provides information in response to specific ADREP requests.

Data Base

These statistics are based on 726 occurrences. Of these, 637 were Data Reports and 89 were Preliminary Reports. Preliminary reports do not contain factors and are therefore excluded in the compilation of statistics on factors.

Limitations

When considering the information presented, the reader must be aware of the following limitations and conventions:

- a) The ADREP manual contains specific coding instructions; nonetheless, there may be some unintentional bias on the part of the person coding the information particularly in the coding of factors.
- b) Some accidents are reported to ICAO on computer tapes and processed through a conversion programme before they are entered in the ADREP data bank. Since some of the data reported are not compatible with the ADREP coding system, precision is not attainable in all cases.

Notes on the Statistical Tables

- a) For each accident/incident there may be up to two types of occurrences and up to 13 factors. Thus, the totals in these categories will frequently exceed the total number of reports.
- b) Factors may be related to the first as well as to the second type of occurrence or to both. Accordingly, a factor may be counted twice for a given occurrence.

- c) Factors are combined in groups of related factors. For instance, the factors "Pilot misjudged speed" and "Pilot misjudged distance" are both included in the group "Flight Crew - Perception". Groups of factors are listed only if they occur more than twice.
- d) In the lists presenting comparisons, only data representing significant differences are presented. "Significant" here means that the difference exceeds the average difference in a given list by more than one standard deviation. Accordingly, lists in which none of the groups of factors show a significant difference are omitted.

Format

There are three parts:

- Part I Accidents to Aeroplanes;
- Part II Accidents to Helicopters; and
- Part III Incidents.

Each part is divided into separate sections for "Airline Operations" and "General Aviation".

The format within each section or subsection is the same, showing the following:

- A comparison of the year 1984 with the preceding five years:
 - by phase of operation,
 - by type of occurrence,
 - by personnel factors,
 - by aircraft/powerplant factors,
 - by aerodrome factors,
 - by weather factors;
- The most frequent phases of operation for that section;
- The ten most frequent types of occurrence for that section;
- The most frequent factors related to each of the types of occurrence.

TABLE I - ACCIDENTS AND INCIDENTS BY TYPE OF OPERATION AND AIRCRAFT MASS (1984)

I. ACCIDENTS TO AEROPLANES	Number of Reports		Number of Occurrences			Number of Fatalities				Number of Aircraft Destroyed
	1) P.R.	2) D.R.	Fatal	Non-Fatal	Total	Crew	Pax.	Other	Total	
Scheduled Airline Operations										
Aeroplanes over 27 000 kg	10	20	4	26	30	8	48	1	57	6
Aeroplanes between 2 250 and 27 000 kg	7	28	13	22	35	18	129	1	148	12
Non-scheduled Airline Operations										
Aeroplanes over 27 000 kg	2	9	4	7	11	17	17	49	83	6
Aeroplanes between 2 250 and 27 000 kg	19	95	31	83	114	39	103	0	142	40
Other Airline Operations										
Aeroplanes over 27 000 kg	1	0	0	1	1	0	0	0	0	0
Aeroplanes between 2 250 and 27 000 kg	4	19	10	13	23	14	8	0	22	9
Airline Operations (Total by mass)										
Aeroplanes over 27 000 kg	13	29	8	34	42	25	65	50	140	12
Aeroplanes between 2 250 and 27 000 kg	30	142	54	118	172	71	240	1	312	61
General Aviation										
Aeroplanes over 5 700 kg	6	25	9	22	31	13	22	0	35	15
Aeroplanes between 2 250 and 5 700 kg	31	298	80	249	329	86	83	6	175	110
II. ACCIDENTS TO HELICOPTERS										
Airline Operations	2	11	4	9	13	6	6	0	12	4
General Aviation	6	32	12	26	38	14	10	0	24	15
III. INCIDENTS										
Airline Operations	0	86	0	86	86	0	0	0	0	0
General Aviation	1	14	0	15	15	0	0	0	0	0

1) Preliminary Report

2) Accident/Incident Data Report

TABLE II - ACCIDENTS AND INCIDENTS TO AEROPLANES BY TYPE OF OPERATION AND POWERPLANT (1984)

	Number of Reports		Number of Occurrences			Number of Fatalities				Number of Aircraft Destroyed
	1) P.R.	2) D.R.	Fatal	Non-Fatal	Total	Crew	Pax.	Other	Total	
Scheduled Airline Operations										
Jet	10	62	3	69	72	5	47	1	53	5
Turbo-Prop	3	34	8	29	37	16	108	0	124	7
Piston	4	17	6	15	21	5	22	1	28	6
Non-Scheduled Airline Operations										
Jet	2	12	4	10	14	17	16	49	82	4
Turbo-Prop	8	19	10	17	27	15	49	0	64	13
Piston	11	83	21	73	94	24	55	0	79	29
Other Airline Operations										
Jet	2	7	3	6	9	5	1	0	6	3
Turbo-Prop	1	6	1	6	7	2	1	0	3	1
Piston	2	15	6	11	17	7	6	0	13	5
General Aviation										
Jet	2	21	3	20	23	5	6	0	11	4
Turbo-Prop	5	46	12	39	51	15	13	0	28	13
Piston	31	270	74	227	301	79	86	6	171	108

1) Preliminary Report

2) Accident/Incident Data Report

PART I

ACCIDENTS TO AEROPLANES

ACCIDENTS TO AEROPLANES

AIRLINE OPERATIONS

PHASE OF OPERATION

	1979-1983		1984		COMPARISON OF 84 WITH 78-83	
	NO.	%	NO.	%	1984 LESS FREQUENT	1984 MORE FREQUENT
LANDING	672	47.9	147	45.2	*****!	
EN-ROUTE	313	22.3	87	26.7		!*****

TYPE OF OCCURRENCE

	1979-1983		1984		COMPARISON OF 84 WITH 78-83	
	NO.	%	NO.	%	1984 LESS FREQUENT	1984 MORE FREQUENT
OVERRUN	81	5.7	14	4.2	*****!	
DAMAGE TO AIRCRAFT IN FLIGHT	21	1.5	0	0.0	*****!	
NOSE-DOWN/OVER	20	1.4	0	0.0	*****!	
COLLISION TERRAIN	151	10.7	31	9.4	*****!	
HARD LANDING	47	3.3	7	2.1	*****!	
DAMAGE TO AIRCRAFT ON GROUND	16	1.1	0	0.0	*****!	
UNDERSHOOT	57	4.0	17	5.2		!*****
LOSS OF CONTROL - GROUND/WATER	83	5.9	28	8.5		!*****
FORCED/PRECAUTIONARY LANDING	40	2.8	18	5.5		!*****
ENGINE FAILURE/DISINTEGRATION	121	8.6	40	12.2		!*****

PERSONNEL FACTORS

	1979-1983		1984		COMPARISON OF 84 WITH 78-83	
	NO.	%	NO.	%	1984 LESS FREQUENT	1984 MORE FREQUENT
FLIGHT CREW - DECISIONS	269	30.5	33	19.3	*****!	
FLIGHT CREW - PROCEDURES	566	64.3	101	59.0	*****!	
SUPERVISORY PERS./INADEQUATE DIRECTIVES, MANUALS, EQUIP.	19	2.1	0	0.0	***!	
MISC. PERS./PILOT OF OTHER A/C	10	1.1	5	2.9		!***
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	31	3.5	16	9.3		!*****
FLIGHT CREW - OPERATION OF EQUIPMENT	139	15.8	40	23.3		!*****

AIRCRAFT/POWERPLANT FACTORS

	1979-1983		1984		COMPARISON OF 84 WITH 78-83	
	NO.	%	NO.	%	1984 LESS FREQUENT	1984 MORE FREQUENT
ELECTRICAL SYSTEM	28	3.1	3	1.7	****!	
WINGS	14	1.5	8	4.6		!*****
FUEL SYSTEM (RECIP.)	17	1.9	11	6.4		!*****
LANDING GEAR	217	24.6	53	30.9		!*****

AERODROME FACTORS

	1979-1983		1984		COMPARISON OF 84 WITH 78-83	
	NO.	%	NO.	%	1984 LESS FREQUENT	1984 MORE FREQUENT
AERODROME CONDITION	144	16.3	22	12.8	*****!	

WEATHER FACTORS

	1979-1983		1984		COMPARISON OF 84 WITH 78-83	
	NO.	%	NO.	%	1984 LESS FREQUENT	1984 MORE FREQUENT
WEATHER/SNOW	24	2.7	1	0.5	*****!	
WEATHER/DOWNDRAFT-UPDRAFT OR MOUNTAIN WAVE	23	2.6	1	0.5	*****!	
WEATHER/RAIN	34	3.8	9	5.2		!*****
WEATHER/OBSTRUCTIONS TO VISION-SMOKE, HAZE, SAND, DUST	8	0.9	5	2.9		!*****
WEATHER/UNFAVOURABLE WIND CONDITIONS	38	4.3	11	6.4		!*****



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ACCIDENTS TO AEROPLANES

AIRLINE OPERATIONS

PHASES OF OPERATION	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
LANDING	147	45.3	23	39.0	124	46.7
EN-ROUTE	87	26.8	13	22.1	74	27.9
TAKE-OFF	57	17.6	14	23.8	43	16.2
TAXI	23	7.1	6	10.2	17	6.4
STANDING	11	3.4	3	5.1	8	3.1
TOTAL	325	100.0	59	100.0	266	100.0

TEN MOST FREQUENT TYPES OF OCCURRENCE	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
ENGINE FAILURE	40	12.3	6	10.2	34	12.7
GEAR COLLAPSED	35	10.8	3	5.1	32	12.0
COLLISION OBJECT	33	10.1	8	13.6	25	9.4
COLLISION TERRAIN	31	9.5	0	0	31	11.6
LOSS OF CONTROL - GROUND/WATER	28	8.6	5	8.5	23	8.6
LOSS OF CONTROL IN FLIGHT	22	6.8	1	1.7	21	7.9
FORCED/PRECAUTIONARY LANDING	18	5.6	0	0	18	6.8
UNDERSHOOT	17	5.2	1	1.7	16	6.0
WHEELS-UP LANDING	14	4.3	2	3.4	12	4.5
OVERRUN	14	4.3	6	10.2	8	3.0
* TOTAL ABOVE *	252	77.1	32	54.2	220	82.1
* TOTAL NUMBER OF OCCURRENCES NOT LISTED *	75	22.9	27	45.8	48	17.9
* TOTAL *	327	100.0	59	100.0	268	100.0

ACCIDENTS TO AEROPLANES

AIRLINE OPERATIONS

TYPES OF OCCURRENCE

RELATED FACTORS WITH PERCENTAGES OF THE OCCURRENCE IN WHICH THE FACTOR WAS CODED

ENGINE FAILURE OCCURS 40 TIMES (12 PERCENT) OF TOTAL 327

FLIGHT CREW - PROCEDURES	35.0
FLIGHT CREW - OPERATION OF EQUIPMENT	30.0
MAINTENANCE, SERVICING, INSPECTION PERSONNEL	20.0
FUEL SYSTEM (RECIP.)	20.0
POWERPLANT ALL TYPES - MISCELLANEOUS	12.5
OPERATIONAL SUPERVISORY PERSONNEL	10.0
ENGINE STRUCTURE (RECIP.)	10.0

GEAR COLLAPSED OCCURS 35 TIMES (11 PERCENT) OF TOTAL 327

LANDING GEAR	77.1
FLIGHT CREW - DECISIONS	17.1
MAINTENANCE, SERVICING, INSPECTION PERSONNEL	17.1
MISCELLANEOUS	11.4
FLIGHT CREW - OPERATION OF EQUIPMENT	8.6
AERODROME CONDITION	8.6

COLLISION OBJECT OCCURS 33 TIMES (10 PERCENT) OF TOTAL 327

AERODROME CONDITION	30.3
FLIGHT CREW - PERCEPTION	24.2
WEATHER	24.2
FLIGHT CREW - OPERATION OF EQUIPMENT	18.2
FLIGHT CREW - DECISIONS	15.2
FLIGHT CREW - PROCEDURES	15.2
LANDING GEAR	12.1
TERRAIN	9.1

COLLISION TERRAIN OCCURS 31 TIMES (10 PERCENT) OF TOTAL 327

FLIGHT CREW - PROCEDURES	38.7
WEATHER	38.7
FLIGHT CREW - PERCEPTION	12.9
FLIGHT CREW - DECISIONS	12.9
MISCELLANEOUS	9.7