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INTRODUCTION

General

The information in this publication is based on 508 accident and 15 incident reports of the ICAO ADREP SYSTEM for the year 1988 for aircraft of a maximum certificated take-off mass over 2 250 kg. The statistics were compiled in August 1991.

A new coding scheme for factors was introduced in 1988. Old data were recoded to the new format. Factors were recoded only for the years 1983 and following. Some precision may have been lost in the process.

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 523 occurrences. Of these, 432 were Data Reports and 91 were Preliminary Reports. Preliminary reports do not contain factors and are therefore excluded from 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 coding instructions; nonetheless, there may be some unintentional bias on the part of the person coding the information;
- b) some occurrences 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 on these tapes are not compatible with the ADREP coding system, precision is not attainable in all cases; and
- c) accidents reported to ICAO before 1988 were classified in a format that differs from the one used now. These data were recoded to the extent possible.

Notes on the Statistical Tables

- a) Each accident/incident may be described by up to five events. For each event, a type of event, a corresponding phase of operation and up to 10 descriptive factors can be coded.
- b) 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
- Part III – Incidents

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

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

- Phases of operation;
- Types of events;
- A comparison of the year 1988 with the preceding five years by:
 - phase of operation,
 - type of event,
 - personnel factors,
 - airframe factors,
 - powerplant factors,
 - aircraft systems factors,
 - helicopter components factors (when applicable),
 - aerodrome factors, and
 - weather factors.

Table I – Accidents and incidents by type of operation and aircraft mass (1988)

	Number of reports		Number of occurrences			Number of fatalities				Number of aircraft destroyed
	PR ¹	DR ²	Fatal	Non-fatal	Total	Crew	Pax	Other	Total	
I. ACCIDENTS TO AEROPLANES										
Scheduled airline operations										
Aeroplanes: over 27 000 kg	16	36	12	40	52	58	862	11	931	13
Aeroplanes: 2 250 to 27 000 kg	10	34	8	36	44	14	59	1	74	10
Non-scheduled airline operations										
Aeroplanes: over 27 000 kg	4	6	6	4	10	26	40	1	67	6
Aeroplanes: 2 250 to 27 000 kg	22	81	33	70	103	46	76	2	124	39
Other airline operations										
Aeroplanes: over 27 000 kg	0	1	0	1	1	0	0	0	0	0
Aeroplanes: 2 250 to 27 000 kg	2	12	5	9	14	9	0	0	9	5
Airline operations (total by mass)										
Aeroplanes: over 27 000 kg	20	44	19	45	64	90	903	12	1 005	20
Aeroplanes: 2 250 to 27 000 kg	34	128	46	116	162	69	135	3	207	54
General aviation										
Aeroplanes: over 5 700 kg	2	13	5	10	15	4	4	0	8	6
Aeroplanes: 2 250 to 5 700 kg	28	202	65	165	230	73	60	2	135	75
II. ACCIDENTS TO HELICOPTERS										
Airline operations	3	5	4	4	8	2	6	0	8	6
General aviation	4	25	1	28	29	2	0	0	2	9
III. INCIDENTS										
Airline operations	0	12	0	12	12	0	0	0	0	0
General aviation	0	3	0	3	3	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 (1988)

	Number of reports		Number of occurrences			Number of fatalities				Number of aircraft destroyed
	PR ¹	DR ²	Fatal	Non-fatal	Total	Crew	Pax	Other	Total	
Scheduled airline operations										
Jet	16	40	11	45	56	48	764	11	823	12
Turboprop	8	29	9	28	37	24	157	1	182	10
Piston	2	9	0	11	11	0	0	0	0	1
Non-scheduled airline operations										
Jet	5	12	9	8	17	31	48	1	80	9
Turboprop	9	20	10	19	29	15	29	0	44	11
Piston	12	59	20	51	71	26	39	2	67	25
Other airline operations										
Jet	0	1	0	1	1	0	0	0	0	0
Turboprop	2	5	3	4	7	6	0	0	6	3
Piston	0	7	2	5	7	3	0	0	3	2
General aviation										
Jet	4	9	4	9	13	4	3	0	7	5
Turboprop	9	25	9	25	34	12	13	0	25	8
Piston	17	184	57	144	201	61	48	2	111	68

1. Preliminary report

2. Accident/incident data report

PART I
ACCIDENTS TO AEROPLANES

AIRLINE OPERATIONS

Distribution of cases and percentage according to phase of operation

PHASE OF OPERATION	CASES	PERCENT
AIRCRAFT STANDING	14	2.8
TAXIING	24	4.8
TAKE-OFF	95	19.2
EN-ROUTE	105	21.2
MANOEUVRING	11	2.2
APPROACH	84	16.9
LANDING	128	25.8
POST-IMPACT	35	7.1
TOTAL	496	100.0

Distribution of cases and percentage according to type of event

TYPE OF EVENT	CASES	PERCENT
AIRFRAME FAILURE	13	2.6
CARGO RELATED	1	0.2
COLLISION WITH OBJECT	61	12.3
COLLISION WITH TERRAIN	67	13.5
COLLISION WITH MOVING AIRCRAFT	2	0.4
COMPONENT/SYSTEM FAILURE	34	6.9
DAMAGE TO AIRCRAFT	9	1.8
EVACUATION	7	1.4
FIRE/EXPLOSION/FUMES	46	9.3
GEAR COLLAPSED/RETRACTED	46	9.3
INJURIES TO PERSONS	16	3.2
LOSS OF CONTROL	64	12.9
NOSE DOWN/OVERTURNED	3	0.6
OVERRUN	21	4.2
POWER LOSS - FIRST ENGINE	31	6.3
POWER LOSS - ADDITIONAL ENGINE	11	2.2
SECURITY OCCURRENCE	2	0.4
SEPARATION IN FLIGHT	2	0.4
TAKE-OFF/LANDING OCCURRENCE	7	1.4
LANDING OCCURRENCE	25	5.0
WHEELS-UP LANDING	12	2.4
NAVIGATION ERROR	1	0.2
ALTITUDE RELATED EVENT	3	0.6
EQUIPMENT/SYSTEM RELATED EVENT	1	0.2
WEATHER RELATED EVENT	6	1.2
OTHER	4	0.8
UNKNOWN	1	0.2
TOTAL	496	100.0

Comparison of the year 1988 with the preceding five years

PHASE OF OPERATION

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING	671	29.9	128	25.8	*****	
EN-ROUTE	549	24.4	105	21.2	*****	
MANOEUVRING	35	1.6	11	2.2		***
TAXIING	90	4.0	24	4.8		****
APPROACH	338	15.0	84	16.9		*****
TAKE-OFF	381	17.0	95	19.2		*****
POST-IMPACT	106	4.7	35	7.1		*****

EVENT

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
POWER LOSS - FIRST ENGINE	200	8.9	31	6.3	*****	
COLLISION WITH MOVING AIRCRAFT	48	2.1	2	0.4	*****	
LANDING OCCURRENCE	146	6.5	25	5.0	*****	
WHEELS-UP LANDING	80	3.6	12	2.4	*****	
WEATHER RELATED EVENT	51	2.3	6	1.2	*****	
NOSE DOWN/OVERTURNED	23	1.0	3	0.6		**
LOSS OF CONTROL	298	13.3	64	12.9		**
DAMAGE TO AIRCRAFT	32	1.4	9	1.8		**
ALTITUDE RELATED EVENT	3	0.1	3	0.6		***
COLLISION WITH OBJECT	255	11.4	61	12.3		*****
OVERRUN	70	3.1	21	4.2		*****
AIRFRAME FAILURE	29	1.3	13	2.6		*****
COMPONENT/SYSTEM FAILURE	114	5.1	34	6.9		*****
COLLISION WITH TERRAIN	257	11.4	67	13.5		*****
FIRE/EXPLOSION/FUMES	161	7.2	46	9.3		*****

PERSONNEL FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FLIGHT CREW DECISIONS	319	19.0	42	17.1	*****	
FLIGHT CREW OPERATION OF EQUIPMENT	271	16.1	37	15.0	*****	
FLIGHT CREW PERCEPTION	186	11.1	25	10.2	*****	
ATC USE OF PROCEDURES	31	1.8	3	1.2		**
A/C HANDLING MISCELLANEOUS	17	1.0	1	0.4		**
AERODROME/HELIPORT OPERATION	31	1.8	7	2.8		****
FLIGHT CREW A/C HANDLING	360	21.4	63	25.6		*****

AIRFRAME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING GEAR	251	63.9	43	50.6	*****	
WING	45	11.5	11	12.9		**
WINDOW	8	2.0	3	3.5		**
AIRFRAME	14	3.6	6	7.1		*****
FUSELAGE	21	5.3	8	9.4		*****

POWERPLANT FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
POWERPLANT FUEL SYSTEM	19	9.2	1	3.6	*****	
PROPELLER	23	11.1	2	7.1	*****	
IGNITION SYSTEM	5	2.4	1	3.6		**
POWERPLANT LUBRICATION SYSTEM	19	9.2	3	10.7		***
ENGINE INDICATIONS	4	1.9	2	7.1		*****
ENGINE	117	56.5	18	64.3		*****

AIRCRAFT SYSTEMS FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FUEL SYSTEM	98	39.2	11	25.0	*****	
AEROPLANE FLIGHT CONTROL	28	11.2	8	18.2		*****
HYDRAULIC SYSTEM	31	12.4	14	31.8		*****

AERODROME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
RUNWAY SURFACE STATE	126	79.7	13	61.9	*****	
RUNWAY DESCRIPTION	4	2.5	2	9.5		*****
AERODROME/HELIPORT LIGHTING	13	8.2	5	23.8		*****

WEATHER FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
SKY CONDITION	83	24.3	9	16.7	*****	
WIND	167	49.0	32	59.3		*****

GENERAL AVIATION

Distribution of cases and percentage according to phase of operation

PHASE OF OPERATION

	CASES	PERCENT
AIRCRAFT STANDING	4	0.7
TAXIING	12	2.0
TAKE-OFF	84	14.0
EN-ROUTE	162	27.1
MANOEUVRING	52	8.7
APPROACH	69	11.5
LANDING	170	28.4
POST-IMPACT	41	6.9
UNKNOWN	4	0.7
TOTAL	598	100.0

Distribution of cases and percentage according to type of event

TYPE OF EVENT	CASES	PERCENT
AIRFRAME FAILURE	4	0.7
COLLISION WITH OBJECT	74	12.4
COLLISION WITH TERRAIN	103	17.2
COLLISION WITH MOVING AIRCRAFT	10	1.7
COMPONENT/SYSTEM FAILURE	28	4.7
DAMAGE TO AIRCRAFT	6	1.0
EVACUATION	2	0.3
FIRE/EXPLOSION/FUMES	42	7.0
FLIGHT CREW ILLNESS/INCAPACITATION	3	0.5
GEAR COLLAPSED/RETRACTED	42	7.0
LOSS OF CONTROL	82	13.7
MISSING AIRCRAFT	2	0.3
NOSE DOWN/OVERTURNED	31	5.2
OVERRUN	11	1.8
POWER LOSS - FIRST ENGINE	83	13.9
POWER LOSS - ADDITIONAL ENGINE	13	2.2
PROPELLER FAILURE	4	0.7
SEPARATION IN FLIGHT	1	0.2
TAKE-OFF/LANDING OCCURRENCE	6	1.0
LANDING OCCURRENCE	19	3.2
WHEELS-UP LANDING	13	2.2
NAVIGATION ERROR	1	0.2
EQUIPMENT/SYSTEM RELATED EVENT	1	0.2
UNSTABILIZED APPROACH	1	0.2
WEATHER RELATED EVENT	12	2.0
ABRUPT MANOEUVRE	1	0.2
OTHER	3	0.5
TOTAL	598	100.0

Comparison of the year 1988 with the preceding five years

PHASE OF OPERATION

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING	1099	31.1	170	28.4		*****!
TAKE-OFF	577	16.3	84	14.0		*****!
APPROACH	457	12.9	69	11.5		*****!
POST-IMPACT	188	5.3	41	6.9		!*****
EN-ROUTE	776	21.9	162	27.1		!*****

EVENT

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING OCCURRENCE	216	6.1	19	3.2	*****!	
COLLISION WITH OBJECT	490	13.9	74	12.4	*****!	
OVERRUN	117	3.3	11	1.8	*****!	
GEAR COLLAPSED/RETRACTED	300	8.5	42	7.0	*****!	
OTHER	62	1.8	3	0.5	*****!	
WHEELS-UP LANDING	108	3.1	13	2.2	*****!	
FLIGHT CREW ILLNESS/INCAPACITATION	3	0.1	3	0.5		!***
COLLISION WITH MOVING AIRCRAFT	39	1.1	10	1.7		!***
FIRE/EXPLOSION/FUMES	226	6.4	42	7.0		!****
COMPONENT/SYSTEM FAILURE	139	3.9	28	4.7		!*****
NOSE DOWN/OVERTURNED	131	3.7	31	5.2		!*****
POWER LOSS - FIRST ENGINE	423	12.0	83	13.9		!*****
COLLISION WITH TERRAIN	500	14.1	103	17.2		!*****

PERSONNEL FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FLIGHT CREW DECISIONS	543	20.9	53	17.5	*****!	
FLIGHT CREW PROCEDURES	594	22.8	65	21.5	*****!	
FLIGHT CREW OPERATION OF EQUIPMENT	424	16.3	46	15.2	*****!	
A/C HANDLING MISCELLANEOUS	12	0.5	3	1.0	***	
FLIGHT CREW PERCEPTION	291	11.2	39	12.9	*****	
FLIGHT CREW A/C HANDLING	692	26.6	93	30.8	*****	

AIRFRAME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
STABILIZER	24	4.9	1	1.8	*****!	
LANDING GEAR	354	72.1	38	69.1	*****!	
AIRFRAME	27	5.5	2	3.6	****!	
WINDOW	10	2.0	5	9.1	*****	
DOOR	9	1.8	6	10.9	*****	

POWERPLANT FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
ENGINE	209	58.2	38	55.9	*****!	
IGNITION SYSTEM	24	6.7	3	4.4	*****!	
ENGINE CONTROL	7	1.9	2	2.9	****	
POWERPLANT LUBRICATION SYSTEM	34	9.5	8	11.8	*****	
PROPELLER	37	10.3	9	13.2	*****	
POWERPLANT FUEL SYSTEM	29	8.1	8	11.8	*****	

AIRCRAFT SYSTEMS FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
ELECTRICAL POWER	30	10.7	2	3.8	*****!	
FLIGHT AND NAVIGATION SYSTEMS	20	7.1	1	1.9	*****!	
HYDRAULIC SYSTEM	28	10.0	4	7.5	****!	
FUEL SYSTEM	175	62.5	38	71.7	*****	
AEROPLANE FLIGHT CONTROL	11	3.9	8	15.1	*****	

AERODROME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
RUNWAY SURFACE STATE	113	76.9	6	66.7	*****!	
RUNWAY DESCRIPTION	5	3.4	1	11.1	*****	
AERODROME/HELIPORT LIGHTING	15	10.2	2	22.2	*****	

WEATHER FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
SKY CONDITION	133	31.4	17	23.6	*****!	
WIND	194	45.8	39	54.2	*****	

PART II

ACCIDENTS TO HELICOPTERS

AIRLINE OPERATIONS

Distribution of cases and percentage according to phase of operation

PHASE OF OPERATION	CASES	PERCENT
AIRCRAFT STANDING	2	7.7
TAKE-OFF	3	11.5
EN-ROUTE	11	42.3
MANOEUVRING	2	7.7
LANDING	1	3.8
POST-IMPACT	7	26.9
TOTAL	26	100.0

Distribution of cases and percentage according to type of event

TYPE OF EVENT	CASES	PERCENT
COLLISION WITH OBJECT	1	3.8
COLLISION WITH TERRAIN	5	19.2
DAMAGE TO AIRCRAFT	4	15.4
EVACUATION	3	11.5
FIRE/EXPLOSION/FUMES	2	7.7
DYNAMIC SYSTEM FAILURE	5	19.2
LOSS OF CONTROL	3	11.5
EQUIPMENT/SYSTEM RELATED EVENT	2	7.7
WEATHER RELATED EVENT	1	3.8
TOTAL	26	100.0

Comparison of the year 1988 with the preceding five years

PHASE OF OPERATION

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING	13	16.9	1	3.8	*****!	
APPROACH	9	11.7	0	0.0	*****!	
TAKE-OFF	11	14.3	3	11.5	**!	
POST-IMPACT	3	3.9	7	26.9		*****!

EVENT

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LOSS OF CONTROL	22	28.6	3	11.5	*****!	
COLLISION WITH TERRAIN	11	14.3	5	19.2		*****!
DAMAGE TO AIRCRAFT	3	3.9	4	15.4		*****!
DYNAMIC SYSTEM FAILURE	5	6.5	5	19.2		*****!

PERSONNEL FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FLIGHT CREW DECISIONS	15	24.6	0	0.0	*****!	
FLIGHT CREW PERCEPTION	6	9.8	0	0.0	*****!	
FLIGHT CREW OPERATION OF EQUIPMENT	5	8.2	0	0.0	*****!	
FLIGHT CREW A/C HANDLING	13	21.3	2	33.3		*****
FLIGHT CREW PROCEDURES	21	34.4	4	66.7		*****

AIRFRAME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
A/C FURNISHING	4	30.8	1	100.0		*****

HELICOPTER COMPONENTS FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
TAIL ROTOR	3	23.1	2	40.0		*****

GENERAL AVIATION

Distribution of cases and percentage according to phase of operation.

PHASE OF OPERATION

	CASES	PERCENT
AIRCRAFT STANDING	2	2.9
TAXIING	1	1.5
TAKE-OFF	4	5.9
EN-ROUTE	16	23.5
MANOEUVRING	19	27.9
APPROACH	3	4.4
LANDING	21	30.9
POST-IMPACT	2	2.9
TOTAL	68	100.0

Distribution of cases and percentage according to type of event

TYPE OF EVENT

	CASES	PERCENT
AIRFRAME FAILURE	1	1.5
COLLISION WITH OBJECT	5	7.4
COLLISION WITH TERRAIN	11	16.2
COMPONENT/SYSTEM FAILURE	1	1.5
DAMAGE TO AIRCRAFT	3	4.4
FIRE/EXPLOSION/FUMES	1	1.5
GEAR COLLAPSED/RETRACTED	4	5.9
DYNAMIC SYSTEM FAILURE	6	8.8
INJURIES TO PERSONS	1	1.5
LOSS OF CONTROL	1	1.5
LOSS OF CONTROL	11	16.2
OVERRUN	1	1.5
POWER LOSS - FIRST ENGINE	9	13.2
POWER LOSS - ADDITIONAL ENGINE	1	1.5
TAKE-OFF/LANDING OCCURRENCE	1	1.5
LANDING OCCURRENCE	8	11.8
WEATHER RELATED EVENT	1	1.5
ABRUPT MANOEUVRE	1	1.5
OTHER	1	1.5
TOTAL	68	100.0

Comparison of the year 1988 with the preceding five years

PHASE OF OPERATION

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
EN-ROUTE	121	29.8	16	23.5		*****
TAKE-OFF	39	9.6	4	5.9		*****
POST-IMPACT	27	6.7	2	2.9		*****
MANOEUVRING	103	25.4	19	27.9		****
LANDING	77	19.0	21	30.9		*****

EVENT

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FIRE/EXPLOSION/FUMES	25	6.2	1	1.5	*****	*****
COLLISION WITH OBJECT	47	11.6	5	7.4	*****	*****
POWER LOSS - FIRST ENGINE	68	16.7	9	13.2	*****	*****
OTHER	11	2.7	1	1.5	****	****
COMPONENT/SYSTEM FAILURE	10	2.5	1	1.5	***	***
POWER LOSS - ADDITIONAL ENGINE	9	2.2	1	1.5	**	**
AIRFRAME FAILURE	3	0.7	1	1.5		**
WEATHER RELATED EVENT	3	0.7	1	1.5		**
DAMAGE TO AIRCRAFT	13	3.2	3	4.4		****
LANDING OCCURRENCE	38	9.4	8	11.8		*****
LOSS OF CONTROL	53	13.1	11	16.2		*****
GEAR COLLAPSED/RETRACTED	3	0.7	4	5.9		*****

PERSONNEL FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FLIGHT CREW PERCEPTION	33	20.6	3	9.4	*****!	
FLIGHT CREW DECISIONS	23	14.4	3	9.4	*****!	
ATC USE OF PROCEDURES	3	1.9	0	0.0	***!	
FLIGHT CREW A/C HANDLING	53	33.1	11	34.4	!***	
FLIGHT CREW PROCEDURES	26	16.3	6	18.8	!****	
FLIGHT CREW OPERATION OF EQUIPMENT	16	10.0	7	21.9	!*****	

AIRFRAME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FUSELAGE	7	29.2	1	16.7	*****!	
LANDING GEAR	10	41.7	3	50.0	!*****	
A/C FURNISHING	5	20.8	2	33.3	!*****	

POWERPLANT FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
ENGINE	49	69.0	1	25.0	*****!	
POWERPLANT FUEL SYSTEM	8	11.3	2	50.0	!*****	

AIRCRAFT SYSTEMS FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FUEL SYSTEM	14	70.0	4	66.7	***!	

HELICOPTER COMPONENTS FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
HELICOPT CONTROL SYSTEMS	18	23.4	1	8.3	*****!	
MAIN ROTOR	17	22.1	2	16.7	*****!	
POWER DRIVE SYSTEM	15	19.5	3	25.0	!*****	
TAIL ROTOR DRIVE SYSTEM	14	18.2	4	33.3	!*****	

WEATHER FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
ATMOSPHERIC RESTRICTIONS TO VISION	9	36.0	1	20.0	*****!	
WIND	9	36.0	4	80.0	!*****	

PART III INCIDENTS

AIRLINE OPERATIONS

Distribution of cases and percentage according to phase of operation

PHASE OF OPERATION	CASES	PERCENT
TAKE-OFF	11	55.0
EN-ROUTE	2	10.0
APPROACH	2	10.0
LANDING	5	25.0
TOTAL	20	100.0

Distribution of cases and percentage according to type of event

TYPE OF EVENT	CASES	PERCENT
COLLISION WITH OBJECT	1	5.0
COMPONENT/SYSTEM FAILURE	4	20.0
GEAR COLLAPSED/RETRACTED	1	5.0
NEAR COLLISION	6	30.0
OVERRUN	2	10.0
POWER LOSS - FIRST ENGINE	3	15.0
LANDING OCCURRENCE	1	5.0
ATC RELATED EVENT	1	5.0
OTHER	1	5.0
TOTAL	20	100.0

Comparison of the year 1988 with the preceding five years

PHASE OF OPERATION

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
EN-ROUTE	117	24.6	2	10.0	*****	
TAXIING	45	9.5	0	0.0	*****	
AIRCRAFT STANDING	31	6.5	0	0.0	***	
TAKE-OFF	96	20.2	11	55.0	*****	

EVENT

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
COLLISION WITH OBJECT	41	8.6	1	5.0	**	
COMPONENT/SYSTEM FAILURE	109	22.9	4	20.0	**	
OTHER	5	1.1	1	5.0	***	
POWER LOSS - FIRST ENGINE	52	10.9	3	15.0	****	
OVERRUN	14	2.9	2	10.0	*****	
NEAR COLLISION	24	5.0	6	30.0	*****	

PERSONNEL FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FLIGHT CREW PERCEPTION	35	13.5	0	0.0	*****!	
FLIGHT CREW OPERATION OF EQUIPMENT	42	16.2	1	7.7	*****!	
ATC USE OF PROCEDURES	19	7.3	0	0.0	*****!	
FLIGHT CREW DECISIONS	31	11.9	3	23.1	*****!	*****
FLIGHT CREW A/C HANDLING	61	23.5	6	46.2	*****!	*****

AIRFRAME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING GEAR	120	67.0	5	100.0		*****

POWERPLANT FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
ENGINE	71	68.3	1	20.0	*****!	

AIRCRAFT SYSTEMS FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
AEROPLANE FLIGHT CONTROL	17	17.7	1	33.3		*****
HYDRAULIC SYSTEM	13	13.5	1	33.3		*****
AIR CONDITIONING AND PRESSURIZATION	12	12.5	1	33.3		*****

AERODROME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
RUNWAY SURFACE STATE	22	75.9	1	100.0		*****

WEATHER FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
WIND	19	48.7	1	100.0		*****

GENERAL AVIATION

Distribution of cases and percentage according to phase of operation

PHASE OF OPERATION	CASES	PERCENT
EN-ROUTE	2	66.7
LANDING	1	33.3
TOTAL	3	100.0

Distribution of cases and percentage according to type of event

TYPE OF EVENT

	CASES	PERCENT
LOSS OF CONTROL	1	33.3
NEAR COLLISION	2	66.7
TOTAL	3	100.0

Comparison of the year 1988 with the preceding five years

PHASE OF OPERATION

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
TAKE-OFF	14	17.7	0	0.0	*****!	
APPROACH	7	8.9	0	0.0	****!	
TAXIING	5	6.3	0	0.0	***!	
EN-ROUTE	24	30.4	2	66.7		*****!

EVENT

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LOSS OF CONTROL	13	16.5	1	33.3		*****!
NEAR COLLISION	8	10.1	2	66.7		*****!

PERSONNEL FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
FLIGHT CREW OPERATION OF EQUIPMENT	12	25.0	0	0.0	*****!	
FLIGHT CREW A/C HANDLING	6	12.5	0	0.0	*****!	
FLIGHT CREW DECISIONS	4	8.3	0	0.0	*****!	
FLIGHT CREW PERCEPTION	3	6.3	0	0.0	*****!	
ATC USE OF PROCEDURES	4	8.3	1	25.0		*****!
FLIGHT CREW PROCEDURES	15	31.3	2	50.0		*****!

AIRFRAME FACTORS

	1983-1987		1988		COMPARISON OF 1983-1987 WITH 1988	
	NO.	%	NO.	%	1988 LESS FREQUENT	1988 MORE FREQUENT
LANDING GEAR	13	68.4	1	100.0		*****!

- 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.

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