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INTRODUCTION

General

This is the third publication of statistics from the ICAO Accident/Incident Reporting (ADREP) System. These statistics are based on 1033 accidents and incidents which occurred in 1979 to aircraft of a maximum take-off weight of more than 2 250 kg (5 000 lb). The statistics were compiled in April 1982.

Purpose

The purpose of the ADREP statistics is to provide simple data which 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 1033 reported occurrences. Of these, 981 were Data Reports. Unfortunately 52 occurrences were reported only as Preliminary Reports, which do not include factors and cannot be used for statistics on factors.

Limitations

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

- a) Only occurrences reported to ICAO on the ADREP system are included;
- b) The ADREP Manual contains specific coding instructions. Nonetheless there may be some unintentional bias on the part of persons coding since ultimately the coding must be done by humans one cannot assume that judgemental bias has been totally eliminated in the ADREP reporting forms, particularly with respect to the coding of factors;
- c) Factors statistics are based only on the 981 Accident/Incident Data Reports received from States;
- d) Some accidents are reported to ICAO on computer tapes and are processed through a conversion programme before they are entered in the ADREP data bank. Since the data so reported may not be fully compatible with the ADREP system recording precision is not attainable in all cases. For example, the ADREP system for type of occurrence subdivides "Gear Collapsed" into "Nose gear, Main gear, Complete gear and Other gear" with a specific code for each. However, the information received on a computer tape may indicate only "Gear collapsed".

Notes on the Statistical Tables

For each accident or incident there may be two Types of Occurrence, two Phases of Operation, and up to 13 factors. Thus, the totals within these categories will frequently exceed the total number of accidents or incidents reported.

Additionally, factors may be related to the first type of occurrence, the second type of occurrence or to both. Accordingly, the same factor may be listed twice for each accident or incident.

Percentages are rounded off to the nearest full number. Numbers less than one are shown as zero.

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 sub-section is the same, showing the following:

- The ten 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.

Aircraft Weight Categories

The aircraft weight categories used are for Airline Operations; "over 27 000 kg" and "2 250 to 27 000 kg" and for General Aviation; "over 5 700 kg" and "2 250 to 5 700 kg".

TABLE I - ACCIDENTS AND INCIDENTS BY TYPE OF OPERATION AND AIRCRAFT WEIGHT (1979)

	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.	Others	Total	
I. ACCIDENTS TO AEROPLANES										
Scheduled Airline Operations										
Aeroplanes over 27 000 kg	8	39	14	33	47	73	702	6	781	14
Aeroplanes between 2 250 and 27 000 kg	4	36	18	22	40	23	137	1	161	18
Non-scheduled Airline Operations										
Aeroplanes over 27 000 kg	4	7	3	8	11	25	243	0	268	3
Aeroplanes between 2 250 and 27 000 kg	10	80	17	73	90	19	67	0	86	21
Other Airline Operations										
Aeroplanes over 27 000 kg	1	5	2	4	6	9	0	0	9	4
Aeroplanes between 2 250 and 27 000 kg	2	7	4	5	9	8	4	0	12	5
Airline Operations (Total by weight)										
Aeroplanes over 27 000 kg	13	51	19	45	64	107	945	6	1058	21
Aeroplanes between 2 250 and 27 000 kg	16	123	39	100	139	50	208	1	259	44
General Aviation										
Aeroplanes over 5 700 kg	4	49	16	37	53	29	21	2	52	26
Aeroplanes between 2 250 and 5 700 kg	8	614	142	480	622	157	188	2	347	209
II. ACCIDENTS TO HELICOPTERS										
Airline Operations	1	7	3	5	8	1	7	1	9	3
General Aviation	1	23	6	18	24	11	1	0	12	11
III. INCIDENTS										
Airline Operations	1	66	3	64	67	3	0	0	3	0
General Aviation	0	38	0	38	38	0	0	0	0	0

1) Preliminary Report

2) Accident/Incident Data Report

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TABLE II - ACCIDENTS AND INCIDENTS TO AEROPLANES BY TYPE OF OPERATION AND POWERPLANT (1979)

	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.	Others	Total	
Scheduled Airline Operations										
Jet	8	70	17	61	78	76	702	6	784	14
Turbo-Prop	4	29	8	25	33	16	101	0	117	7
Piston	1	29	10	20	30	7	36	1	44	11
Non-Scheduled Airline Operations										
Jet	3	11	3	11	14	23	246	0	269	4
Turbo-Prop	2	17	5	14	19	10	44	0	54	7
Piston	9	71	12	68	80	11	20	0	31	13
Other Airline Operations										
Jet	1	3	1	3	4	6	0	0	6	2
Turbo-Prop	1	3	2	2	4	6	1	0	7	3
Piston	1	7	3	5	8	5	3	0	8	4
General Aviation										
Jet	0	22	3	19	22	6	5	2	13	4
Turbo-Prop	4	75	23	56	79	33	26	1	60	28
Piston	8	604	132	480	612	147	178	1	326	203

1) Preliminary Report

2) Accident/Incident Data Report

PART I

ACCIDENTS TO AEROPLANES

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TEN MOST FREQUENT TYPES OF OCCURRENCE	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
COLLISION HILL/MOUNTAIN-CONTROLLED	8	7	4	7	4	9
WHEELS UP LANDING/INTENTIONAL	6	6	3	5	3	7
HARD LANDING	6	6	4	7	2	4
LOSS OF CONTROL IN FLIGHT/OTHER	6	6	2	3	4	9
MAIN GEAR COLLAPSED	5	5	2	3	3	7
INJURIES IN FLIGHT/TURBULENCE	5	5	4	7	1	2
NOSE GEAR COLLAPSED	4	4	3	5	1	2
OVERRUN	4	4	2	3	2	4
COLLISION LEVEL SURFACE-CONTROLLED	4	4	2	3	2	4
LOSS OF CONTROL - GROUND/WATER	3	3	2	3	1	2
* TOTAL ABOVE *	51	47	28	45	23	50
* TOTAL REMAINING *	56	52	33	54	23	50
*** TOTAL ***	107	100	61	100	46	100

TEN MOST FREQUENT PHASES OF OPERATION	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
APP & LANDING/LANDING ROLL	19	18	11	18	8	17
APP & LANDING/LEVEL OFF/TOUCHDOWN	15	14	8	13	7	15
ENROUTE/NORMAL CRUISE	14	13	9	15	5	11
TAKE-OFF INITIAL CLIMB	10	9	2	3	8	17
TAXIING TO TAKE-OFF	5	5	5	8	0	0
ENROUTE/DESCENDING	5	5	4	7	1	2
APP & LANDING/INTERMEDIATE APP - IFR	5	5	2	3	3	7
APP & LANDING/FINAL APP - IFR	5	5	2	3	3	7
STANDING/STARTING ENGINE(S)	4	4	4	7	0	0
TAKE-OFF RUN	4	4	3	5	1	2
* TOTAL ABOVE *	86	80	50	81	36	78
* TOTAL REMAINING *	21	19	11	18	10	21
*** TOTAL ***	107	100	61	100	46	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
COLLISION HILL/MOUNTAIN-CONTROLLED OCCURS 6 TIMES (7 PERCENT) OF TOTAL 107		
PILOT:INADEQUATE SUPERVISION OF FLIGHT	2	10
PILOT:CONTINUED VFR FLIGHT INTO ADVERSE WEATHER	1	5
PILOT:IMPROPER IFR OPERATION	1	5
PILOT:SPATIAL DISORIENTATION (VEKTIG)	1	5
DUAL STUDENT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	1	5
DUAL STUDENT:MISUNDERSTANDING OF ORDERS, INSTRUCTIONS, CLEARANCES	1	5
DUAL STUDENT:NAVIGATION ERROR	1	5
SUPERVIS. PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	5
SUPERVIS. PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	1	5
SUPERVIS. PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	5
* TOTAL ABOVE *	11	57
* TOTAL REMAINING *	8	42
*** TOTAL ***	19	100
WHEELS UP LANDING/INTENTIONAL OCCURS 6 TIMES (6 PERCENT) OF TOTAL 107		
LANDING GEAR/NORMAL RETRACTION/EXTENSION ASSEMBLY	3	15
LANDING GEAR/G. LOCKING MECHANISM (INCLUDES DRAG LINKAGE)	3	15
JAMMED (RESTRICTION)	2	10
FATIGUE FRACTURE	2	10
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	1	5
LANDING GEAR/EMERGENCY/EXTENSION ASSEMBLY	1	5
LANDING GEAR/SWITCHES, LEVERS, CRANKING MECHANISM, ETC.	1	5
ELECTRICAL SYS./MOTORS	1	5
SLIDING	1	5
ELECTRICAL FAILURE	1	5
* TOTAL ABOVE *	16	80
* TOTAL REMAINING *	4	20
*** TOTAL ***	20	100
HARD LANDING OCCURS 6 TIMES (6 PERCENT) OF TOTAL 107		
PILOT:IMPROPER LANDING FLARE	3	23
PILOT:INADEQUATE SUPERVISION OF FLIGHT	2	15
CO-PILOT:IMPROPER LANDING FLARE	2	15
PILOT:MISJUDGED SPEED & ALTITUDE	1	7
PILOT:IMPROPER RECOVERY FROM BOUNCED LANDING	1	7
PILOT:APPROACH HIGH AND FAST	1	7
CO-PILOT:IMPROPER OPERATION, POWERPLANT CONTROLS	1	7
CO-PILOT:IMPROPER OPERATION OF PRIMARY FLIGHT CONTROLS	1	7
ACTION - LACK OF	1	7
*** TOTAL ***	13	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
LOSS OF CONTROL IN FLIGHT/OTHER OCCURS 6 TIMES (6 PERCENT) OF TOTAL 107		
PILOT:IMPROPER IFR OPERATION	2	6
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	2	6
WEATHER/FUG	2	6
SEPARATION IN FLIGHT	2	6
PILOT:DELAYED IN INITIATING MISSED APPROACH/OVERSHOOT	1	3
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	3
PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	1	3
PILOT:FAILED TO INITIATE GO-AROUND/MISSED APPROACH/OVERSHOOT	1	3
MAINT. SER. PERS./IMPRPER MAINT./MAINT. PERS.	1	3
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	1	3
* TOTAL ABOVE *	14	43
* TOTAL REMAINING *	18	56
*** TOTAL ***	32	100
MAIN GEAR COLLAPSED OCCURS 5 TIMES (5 PERCENT) OF TOTAL 107		
LANDING GEAR/M. GEAR-SHOCK ASSEMBLY,STRUTS,ETC.	2	12
FATIGUE FRACTURE	2	12
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	6
CO-PILOT:IMPROPER LANDING FLARE	1	6
MAINT. SER. PERS./IMPRPER MAINT./MAINT. PERS.	1	6
LANDING GEAR/NORMAL RETRACTION/EXTENSION ASSEMBLY	1	6
LANDING GEAR/OTHER	1	6
AERODROME COND./POOR RUNWAY SURFACE-ROUGH ETC.	1	6
POOR WELD	1	6
ELONGATED	1	6
* TOTAL ABOVE *	12	75
* TOTAL REMAINING *	4	25
*** TOTAL ***	16	100
INJURIES IN FLIGHT/TURBULENCE OCCURS 5 TIMES (5 PERCENT) OF TOTAL 107		
WEATHER/TURBULENCE IN CLOUDS, THUNDERSTORMS	3	21
MISC. PERS./PASSENGER	2	14
WEATHER/CLEAR AIR TURBULENCE	2	14
SEAT BELT SIGN ON AND NOT OBEYED	2	14
FLIGHT ATTENDANT	1	7
COMM./NAV. SYS./AIRBORNE RADAR	1	7
UNSERVICEABLE EQUIPMENT/SYSTEM	1	7
SEAT BELT NOT FASTENED	1	7
SEAT BELT SIGN OFF	1	7
*** TOTAL ***	14	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
NOSE GEAR COLLAPSED OCCURS 4 TIMES (4 PERCENT) OF TOTAL 107		
LANDING GEAR/NOSEWHEEL ASSEMBLIES	2	15
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	7
CO-PILOT:IMPROPER RECOVERY FROM BOUNCED LANDING	1	7
MAINT. SER. PERS./IMPROPER MAINT./MAINT. PERS.	1	7
AERODROME COND./SOFT SHOULDERS	1	7
AERODROME COND./HIDDEN HAZARD-DRAINS ETC.	1	7
ACTION - LACK OF	1	7
SCORED	1	7
STRESS CORROSION	1	7
FAILURE/FAILED	1	7
* TOTAL ABOVE *	11	84
* TOTAL REMAINING *	2	15
*** TOTAL ***	13	100
OVERRUN OCCURS 4 TIMES (4 PERCENT) OF TOTAL 107		
PILOT:FAILED TO INITIATE GO-AROUND/MISSED APPROACH/OVERSHOOT	2	9
PILOT:ATTEMPTED OPERATION BEYOND EXPERIENCE/ABILITY	1	4
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	4
PILOT:IMPROPER OPERATION OF BRAKES OR FLIGHT CONTROLS ON GROUND	1	4
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	1	4
PILOT:IMPROPER COMPENSATION FOR WIND	1	4
PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	1	4
PILOT:ENCOUNTERED UNFORESEEN CIRCUMSTANCES BEYOND HIS CAPABILITY	1	4
PILOT:APPROACH HIGH/FAST	1	4
SUPERVIS. PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	4
* TOTAL ABOVE *	11	52
* TOTAL REMAINING *	10	47
*** TOTAL ***	21	100
COLLISION LEVEL SURFACE-CONTROLLED OCCURS 4 TIMES (4 PERCENT) OF TOTAL 107		
PILOT:IMPROPER IFR OPERATION	3	18
FATIGUE, PILOT	2	12
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	6
PILOT:ENCOUNTERED UNFORESEEN CIRCUMSTANCES BEYOND HIS CAPABILITY	1	6
PILOT:PHYSICAL IMPAIRMENT	1	6
SUPERVISORY PERS./INADEQUATE FL. TRAINING PROCEDURES	1	6
SUPERVISORY PERS./COMP. EQUIP., SERVICES, MANUALS DEFICIENT	1	6
FLIGHT/NAV. INSTRU./ALTIMETERS	1	6
WEATHER/FOG	1	6
WEATHER/DOWNDRAFT-UPDRAFT OR MOUNTAIN WAVE	1	6
* TOTAL ABOVE *	13	81
* TOTAL REMAINING *	3	18
*** TOTAL ***	16	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
LOSS OF CONTROL - GROUND/WATER OCCURS 3 TIMES (3 PERCENT) OF TOTAL 107		
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	6
PILOT:IMPROPER OPERATION OF BRAKES OR FLIGHT CONTROLS ON GROUND	1	6
PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	1	6
PILOT:ENCOUNTERED UNFORSEEN CIRCUMSTANCES BEYOND HIS CAPABILITY	1	6
PILOT:FAILED TO INITIATE GO-AROUND/MISSED APPROACH/OVERSHOOT	1	6
PILOT:APPROACH HIGH/FAST	1	6
SUPERVIS. PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	6
SUPERVISORY PERS. INADEQUATE GN. TRAINING PROCEDURES	1	6
SUPERVISORY PERS./INADEQUATE DIRECTIVES, MANUALS, EQUIP.	1	6
MET. PERS./INCOMPLETE WEATHER REPORT	1	6
* TOTAL ABOVE *	10	62
* TOTAL REMAINING *	6	37
*** TOTAL ***	16	100
TOTAL NUMBER OF FACTORS ABOVE	177	51
TOTAL NUMBER OF FACTORS REMAINING	169	48
TOTAL NUMBER OF ALL FACTORS	346	100

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ACCIDENTS TO AEROPLANES

NON-SCHEDULED AIRLINE OPERATIONS

TEN MOST FREQUENT PHASES OF OPERATION	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
APP & LANDING/LANDING ROLL	43	28	3	17	40	30
APP & LANDING/LEVEL OFF/TOUCHDOWN	20	13	7	39	13	10
TAKE-OFF RUN	15	10	1	6	14	10
ENROUTE/NORMAL CRUISE	10	7	1	6	9	7
ENROUTE/CLIMB TO CRUISE	8	5	0	0	8	6
APP & LANDING/FINAL APP - VFR	7	5	2	11	5	4
TAKE-OFF INITIAL CLIMB	6	4	0	0	6	4
TAKE-OFF ABORTED	6	4	1	6	5	4
TAXIING FROM LANDING	5	3	0	0	5	4
APP & LANDING/FINAL APP - IFR	5	3	0	0	5	4
* TOTAL ABOVE *	125	82	15	83	110	82
* TOTAL REMAINING *	27	17	3	16	24	17
*** TOTAL ***	152	100	18	100	134	100

TEN MOST FREQUENT TYPES OF OCCURRENCE	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
OVERRUN	13	9	1	6	12	9
LOSS OF CONTROL - GROUND/WATER	12	8	1	6	11	8
MAIN GEAR COLLAPSED	11	7	2	11	9	7
ENGINE FAILURE	11	7	1	6	10	7
HARD LANDING	8	5	3	17	5	4
UNDERSHOOT	7	5	2	11	5	4
NOSE GEAR COLLAPSED	6	4	3	17	3	2
GEAR RETRACTED/MALFUNCTION	5	3	0	0	5	4
COLLISION OBJECT/SNOWBANK	5	3	0	0	5	4
LOSS OF CONTROL IN FLIGHT/MUSH	5	3	0	0	5	4
* TOTAL ABOVE *	83	54	13	72	70	52
* TOTAL REMAINING *	69	45	5	27	64	47
*** TOTAL ***	152	100	18	100	134	100