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INTRODUCTION

General

This is the fifth publication of statistics from the ICAO Accident/Incident Reporting (ADREP) System. These statistics are based on 775 accidents and incidents which occurred in 1981 to aircraft of a maximum take-off weight of more than 2 250 kg (5 000 lb). The statistics were compiled in December 1983.

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 775 reported occurrences. Of these, 695 were Data Reports. Unfortunately 30 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 695 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 1 - ACCIDENTS AND INCIDENTS BY TYPE OF OPERATION AND AIRCRAFT WEIGHT (1981)

	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	13	31	10	34	44	23	148	2	173	7
Aeroplanes between 2 250 and 27 000 kg	10	19	13	16	29	25	133	0	158	14
Non-scheduled Airline Operations										
Aeroplanes over 27 000 kg	5	3	3	5	8	12	184	0	196	3
Aeroplanes between 2 250 and 27 000 kg	11	72	15	68	83	22	73	0	95	16
Other Airline Operations										
Aeroplanes over 27 000 kg	1	1	0	2	0	0	0	0	0	0
Aeroplanes between 2 250 and 27 000 kg	1	5	2	4	6	2	2	0	4	3
Airline Operations (Total by weight)										
Aeroplanes over 27 000 kg	19	35	13	41	54	35	332	2	369	10
Aeroplanes between 2 250 and 27 000 kg	22	96	30	88	118	49	208	0	257	33
General Aviation										
Aeroplanes over 5 700 kg	2	25	7	20	27	11	21	0	32	11
Aeroplanes between 2 250 and 5 700 kg	28	401	140	289	429	163	381	0	544	178
II. ACCIDENTS TO HELICOPTERS										
Airline Operations	6	8	4	10	14	5	23	0	28	8
General Aviation	3	48	13	38	51	16	33	0	49	20
III. INCIDENTS										
Airline Operations	0	37	0	37	37	0	0	0	0	0
General Aviation	0	45	0	45	45	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 (1981)

	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	12	60	9	63	72	18	98	2	118	6
Turbo-Prop	7	18	8	17	25	20	149	0	169	8
Piston	4	8	6	6	12	10	34	0	44	7
Non-Scheduled Airline Operations										
Jet	5	2	2	5	7	10	184	0	0	2
Turbo-Prop	3	12	2	13	15	3	22	0	25	4
Piston	8	61	14	55	69	21	51	0	72	13
Other Airline Operations										
Jet	1	1	0	2	2	0	0	0	0	0
Turbo-Prop	1	2	1	2	3	1	1	0	2	1
Piston	0	4	1	3	4	1	1	0	2	2
General Aviation										
Jet	3	15	7	11	18	11	22	0	33	7
Turbo-Prop	10	72	28	54	82	38	85	0	123	29
Piston	17	377	112	282	394	125	295	0	420	153

1) Preliminary Report

2) Accident/Incident Data Report

PART I

ACCIDENTS TO AEROPLANES

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TEN MOST FREQUENT PHASES OF OPERATION	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
ENROUTE/NORMAL CRUISE	15	15	9	16	6	14
APP & LANDING/LANDING ROLL	15	15	10	18	5	12
TAKE-OFF RUN	7	7	6	11	1	2
APP & LANDING/FINAL APP - IFR	7	7	1	2	6	14
APP & LANDING/LEVEL OFF/TOUCHDOWN	7	7	4	7	3	7
TAKE-OFF INITIAL CLIMB	6	6	1	2	5	12
STANDING/PARKED - ENGINES OFF	5	5	5	9	0	0
TAKE-OFF ABORTED	5	5	3	5	2	5
ENROUTE/CLIMB TO CRUISE	5	5	4	7	1	2
ENROUTE/DESCENDING	5	5	2	4	3	7
* TOTAL ABOVE *	77	78	45	81	32	74
* TOTAL REMAINING *	21	21	10	18	11	25
*** TOTAL ***	98	100	55	100	43	100

TEN MOST FREQUENT TYPES OF OCCURRENCE	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
ENGINE FAILURE	8	8	3	6	5	12
INJURIES IN FLIGHT/TURBULENCE	7	7	7	13	0	0
OVERRUN	6	6	5	9	1	2
UNDERSHOOT	6	6	0	0	6	14
OTHER GROUND INJURIES	5	5	5	9	0	0
LOSS OF CONTROL - GROUND/WATER	4	4	2	4	2	5
COLLISION HILL/MOUNTAIN-CONTROLLED	4	4	1	2	3	7
WHEELSUP LANDING/INTENTIONAL	3	3	1	2	2	5
COLLISION OBJECT/VEHICLE	3	3	2	4	1	2
LOSS OF CONTROL IN FLIGHT/OTHER	3	3	0	0	3	7
* TOTAL ABOVE *	49	51	26	49	23	54
* TOTAL REMAINING *	46	48	27	50	19	45
*** TOTAL ***	95	100	53	100	42	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
ENGINE FAILURE OCCURS 8 TIMES (8 PERCENT) OF TOTAL 95		
FUEL STARVATION	3	15
PILOT:FUEL MISMANAGEMENT	2	10
POWERPLANT-MISC./COMPRESSOR STALL	2	10
PILOT:DIVERTED ATTENTION FROM OPERATION OF A/C	1	5
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	5
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	1	5
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	5
MAINT. SER. PERS./IMPRPER MAINT./MAINT. PERS.	1	5
SUPERVISORY PERS./COMP. EQUIP., SERVICES, MANUALS DEFICIENT	1	5
FUEL SYS.-RECIPROCATING/SELECTOR VALVES	1	5
* TOTAL ABOVE *	14	73
* TOTAL REMAINING *	5	26
*** TOTAL ***	19	100
INJURIES IN FLIGHT/TURBULENCE OCCURS 7 TIMES (7 PERCENT) OF TOTAL 95		
FLIGHT ATTENDANT	4	22
SEAT BELT NOT FASTENED	4	22
SEAT BELT SIGN ON AND NOT OBEYED	3	16
WEATHER/TURBULENCE IN CLOUDS, THUNDERSTORMS	2	11
MISC. PERS./PASSENGER	1	5
WEATHER/CLEAR AIR TURBULENCE	1	5
WEATHER/THUNDERSTORM ACTIVITY	1	5
MISC./VORTEX TURBULENCE	1	5
SEAT BELT SIGN OFF	1	5
*** TOTAL ***	18	100
OVERRUN OCCURS 6 TIMES (6 PERCENT) OF TOTAL 95		
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	8
PILOT:IMPROPER OPERATION OF BRAKES OR FLIGHT CONTROLS ON GROUND	1	8
PILOT:MISJUDGED DISTANCE AND SPEED	1	8
FLIGHT ENGINEER/OTHER	1	8
POWERPLANT-MISC./FAILURE-UNDETERMINED REASON	1	8
POWERPLANT-MISC./COMPRESSOR STALL	1	8
AERODROME COND./WET RUNWAY/STRIP-OIL ON MOVEMENT AREA	1	8
AERODROME COND./OTHER	1	8
WEATHER/RAIN	1	8
WEATHER/UNFAVOURABLE WIND CONDITIONS	1	8
* TOTAL ABOVE *	10	83
* TOTAL REMAINING *	2	16
*** TOTAL ***	12	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
UNDERSHOOT OCCURS 6 TIMES (6 PERCENT) OF TOTAL 95		
PILOT:CONTINUED VFR FLIGHT INTO ADVERSE WEATHER	2	8
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	2	8
PILOT:IMPROPER IFR OPERATION	2	8
PILOT:MISJUDGED ALTITUDE & CLEARANCE	2	8
PILOT:MISJUDGED DISTANCE, SPEED, ALTITUDE OR CLEARANCE	1	4
PILOT:EXERCISED POOR JUDGEMENT	1	4
PILOT:SPONTANEOUS - IMPROPER ACTION	1	4
PILOT:MISJUDGED DISTANCE AND ALTITUDE	1	4
SUPERVISORY PERS./INADEQUATE FL. TRAINING PROCEDURES	1	4
OTHER PILOT SAME A/C IMPROPER USE/OPER. OF EQUIP.	1	4
 * TOTAL ABOVE *	 14	 58
* TOTAL REMAINING *	10	41
*** TOTAL ***	24	100
OTHER GROUND INJURIES OCCURS 5 TIMES (5 PERCENT) OF TOTAL 95		
MISC. PERS./GROUND CREWMAN	3	30
MISC. PERS./PASSENGER	2	20
SUPERVISORY PERS./INADEQUATE DIRECTIVES, MANUALS, EQUIP.	1	10
PRODUCTION/DESIGN/OTHER	1	10
FLIGHT ATTENDANT	1	10
MISC. EQUIP./OTHER	1	10
MATERIAL FAILURE	1	10
*** TOTAL ***	10	100
LOSS OF CONTROL - GROUND/WATER OCCURS 4 TIMES (4 PERCENT) OF TOTAL 95		
PILOT:FAILED TO MAINTAIN DIRECTIONAL CONTROL	1	33
FIRE WARNING SYS./POWERPLANT	1	33
MATERIAL FAILURE	1	33
*** TOTAL ***	3	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
COLLISION HILL/MOUNTAIN-CONTROLLED OCCURS 4 TIMES (4 PERCENT) OF TOTAL 95		
PILOT:CONTINUED VFR FLIGHT INTO ADVERSE WEATHER	1	100
*** TOTAL ***	1	100
WHEELSUP LANDING/INTENTIONAL OCCURS 3 TIMES (3 PERCENT) OF TOTAL 95		
LANDING GEAR/NOSEWHEEL ASSEMBLIES	2	22
JAMMED (RESTRICTION)	2	22
MAINT. SER. PERS./IMPROPER MAINT./OWNER	1	11
LANDING GEAR/M. GEAR-SHOCK ASSEMBLY, STRUTS, ETC.	1	11
LANDING GEAR/G. LOCKING MECHANISM (INCLUDES DRAG LINKAGE)	1	11
FATIGUE FRACTURE	1	11
IMPROPER ADJUSTMENT/ALIGNMENT	1	11
*** TOTAL ***	9	100
COLLISION OBJECT/VEHICLE OCCURS 3 TIMES (3 PERCENT) OF TOTAL 95		
CO-PILOT:MISJUDGED HORIZONTAL/VERTICAL CLEARANCE	2	25
PILOT:FAILED TO SEE OR AVOID OBJECTS	1	12
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	12
PILOT:TAXIED/PARKED WITHOUT PROPER ASSISTANCE	1	12
A/P SUPER. PERS./HAZARDS/OBSTRUCTION-NO WARNING	1	12
AERODROME COND./OBSTRUCT./HAZARDS TOO CLOSE TO RWY	1	12
CREW CO-ORDINATION INADEQUATE	1	12
*** TOTAL ***	8	100
LOSS OF CONTROL IN FLIGHT/OTHER OCCURS 3 TIMES (3 PERCENT) OF TOTAL 95		
PILOT:IMPROPER OPERATION, POWERPLANT CONTROLS	1	50
PILOT:FAILED TO MAINTAIN DIRECTIONAL CONTROL	1	50
*** TOTAL ***	2	100
TOTAL NUMBER OF FACTORS ABOVE	105	50
TOTAL NUMBER OF FACTORS REMAINING	103	49
TOTAL NUMBER OF ALL FACTORS	208	100

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	22	16	1	8	19	15
APP & LANDING/LEVEL OFF/TOUCHDOWN	19	14	3	23	16	13
TAKE-OFF INITIAL CLIMB	16	11	1	8	15	12
ENROUTE/NORMAL CRUISE	14	10	1	8	13	11
TAKE-OFF RUN	12	9	1	8	11	9
APP & LANDING/FINAL APP - VFR	10	7	3	23	7	6
TAKE-OFF ABORTED	8	6	1	8	7	6
TAXIING TO TAKE-OFF	5	4	0	0	5	4
APP & LANDING/FINAL APP - IFR	4	3	0	0	4	3
ENROUTE/DESCENDING	3	2	0	0	3	2
* TOTAL ABOVE *	113	80	11	84	100	81
* TOTAL REMAINING *	27	19	2	15	23	18
*** TOTAL ***	140	100	13	100	123	100

TEN MOST FREQUENT TYPES OF OCCURRENCE	TOTAL		OVER 27 000		2250 TO 27 000	
	NO.	%	NO.	%	NO.	%
ENGINE FAILURE	15	11	0	0	15	12
OVERRUN	10	7	0	0	9	7
LOSS OF CONTROL - GROUND/WATER	7	5	0	0	7	6
UNDERSHOOT	7	5	2	15	5	4
MAIN GEAR COLLAPSED	6	4	1	8	5	4
HARD LANDING	6	4	0	0	6	5
NOSE GEAR COLLAPSED	5	4	1	8	4	3
COLLISION LEVEL SURFACE-CONTROLLED	5	4	1	8	3	2
COLLISION OBJECT/TREE	5	4	0	0	5	4
LOSS OF CONTROL IN FLIGHT/OTHER	5	4	0	0	5	4
* TOTAL ABOVE *	71	50	5	38	64	52
* TOTAL REMAINING *	69	49	8	61	59	47
*** TOTAL ***	140	100	13	100	123	100

ACCIDENTS TO AEROPLANES

NON-SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
ENGINE FAILURE OCCURS 15 TIMES (11 PERCENT) OF TOTAL 140		
PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	4	8
PILOT:FUEL MISMANAGEMENT	3	6
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	2	4
PILOT:IMPROPER OPERATION, POWERPLANT CONTROLS	2	4
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	2	4
ENGINE STRUCTURE-RECIPROCATING/VALVE ASSEMBLIES	2	4
ENGINE STRUCTURE-RECIPROCATING/BLOWER, IMPELLER ASSEMBLY	2	4
POWERPLANT-MISC./FAILURE-UNDETERMINED REASON	2	4
FAILURE/FAILED	2	4
FUEL CONSUMPTION MISCALCULATED	2	4
* TOTAL ABOVE *	23	51
* TOTAL REMAINING *	22	48
*** TOTAL ***	45	100
OVERRUN OCCURS 10 TIMES (7 PERCENT) OF TOTAL 140		
AERODROME COND./WATER/ICE/SLUSH ON RUNWAY	3	8
PILOT:APPROACH HIGH AND FAST	2	5
APPROACH POORLY PLANNED	2	5
PILOT:ATTEMPTED OPERATION WITH KNOWN EQUIPMENT DEFICIENCIES	1	2
PILOT:DELAYED ACTION IN ABORTING TAKE-OFF	1	2
PILOT:DELAYED IN INITIATING MISSED APPROACH/OVERSHOOT	1	2
PILOT:MISJUDGED DISTANCE, SPEED, ALTITUDE OR CLEARANCE	1	2
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	2
PILOT:IMPROPER LANDING FLARE	1	2
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	1	2
* TOTAL ABOVE *	14	37
* TOTAL REMAINING *	23	62
*** TOTAL ***	37	100
LOSS OF CONTROL - GROUND/WATER OCCURS 7 TIMES (5 PERCENT) OF TOTAL 140		
PILOT:SELECTED UNSUITABLE TAKE-OFF, LANDING, TAXIING AREA	3	12
AERODROME COND./SNOW ON RUNWAY	3	12
WEATHER/SNOW	2	8
FAILURE/FAILED	2	8
PILOT:DELAYED ACTION IN ABORTING TAKE-OFF	1	4
PILOT:IMPROPER OPERATION OF BRAKES OR FLIGHT CONTROLS ON GROUND	1	4
PILOT:INITIATED FLIGHT IN ADVERSE WEATHER	1	4
PILOT:ENCOUNTERED UNFORSEEN CIRCUMSTANCES BEYOND HIS CAPABILITY	1	4
PILOT:FAILED TO MAINTAIN DIRECTIONAL CONTROL	1	4
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	1	4
* TOTAL ABOVE *	16	66
* TOTAL REMAINING *	8	33
*** TOTAL ***		