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INTRODUCTION

General

This is the second publication of statistics from the ICAO Accident/Incident Reporting (ADREP) System. These statistics are based on 888 accidents and incidents which occurred in 1978 to aircraft of a maximum take-off weight of more than 2 250 kg (5 000 lb).

Purpose

The purpose of the ADREP statistics is to provide simple statistics 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 888 reported occurrences. Of these, 811 were Data Reports. Unfortunately 77 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 811 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".

Accident Rates

ICAO has not yet been able to collect the flight hour and departure information required for calculating accident rates. It is hoped that such information will be available for the 1979 ADREP Statistics.

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 (1978)

	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	14	33	13	34	47	52	542	12	606	13
Aeroplanes between 2 250 and 27 000 kg	10	15	8	17	25	15	85	0	100	8
Non-scheduled Airline Operations										
Aeroplanes over 27 000 kg	2	4	0	6	6	0	0	0	0	1
Aeroplanes between 2 250 and 27 000 kg	9	56	13	52	65	19	57	1	77	11
Other Airline Operations										
Aeroplanes over 27 000 kg	0	3	0	3	3	0	0	0	0	1
Aeroplanes between 2 250 and 27 000 kg	3	5	3	5	8	6	1	0	7	5
Airline Operations (Total by weight)										
Aeroplanes over 27 000 kg	16	40	13	43	56	52	542	12	606	15
Aeroplanes between 2 250 and 27 000 kg	22	76	24	74	98	40	143	1	184	24
General Aviation										
Aeroplanes over 5 700 kg	3	51	18	36	54	32	7	0	39	24
Aeroplanes between 2 250 and 5 700 kg	22	514	154	382	536	176	285	5	466	188
II. ACCIDENTS TO HELICOPTERS										
Airline Operations	0	3	2	1	3	3	19	0	22	1
General Aviation	7	40	13	34	47	7	6	2	15	16
III. INCIDENTS										
Airline Operations	4	61	0	65	0	0	0	0	0	0
General Aviation	3	26	0	29	29	0	0	0	0	0

1) Preliminary Report

2) Accident/Incident Data Report



Documents

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TABLE II - ACCIDENTS AND INCIDENTS TO AEROPLANES BY TYPE OF OPERATION AND POWERPLANT (1978)

	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	16	65	12	69	81	48	542	12	602	11
Turbo-Prop	9	20	5	24	29	11	79	0	90	5
Piston	3	13	4	12	16	8	6	0	14	5
Non-Scheduled Airline Operations										
Jet	2	7	0	9	9	0	0	0	0	1
Turbo-Prop	0	12	2	10	12	1	0	1	2	1
Piston	9	49	11	47	58	18	57	0	75	10
Other Airline Operations										
Jet	1	3	0	4	4	0	0	0	0	1
Turbo-Prop	1	2	1	2	3	3	0	0	3	2
Piston	1	4	1	4	5	1	0	0	1	3
General Aviation										
Jet	2	29	5	26	31	12	3	0	15	9
Turbo-Prop	4	62	16	50	66	21	36	1	58	17
Piston	22	500	151	371	522	175	253	4	432	186

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 27000		2250 TO 27000	
	NO.	%	NO.	%	NO.	%
LOSS OF CONTROL - GROUND/WATER	8	8	2	3	6	16
INJURIES IN FLIGHT/TURBULENCE	8	8	7	11	1	3
OVERRUN	5	5	5	8	0	0
COLLISION LEVEL SURFACE-CONTROLLED	5	5	1	2	4	12
HARD LANDING	4	4	4	6	0	0
UNDERSHOOT	4	4	4	6	0	0
LOSS OF CONTROL IN FLIGHT/OTHER	4	4	2	3	2	6
OTHER GROUND INJURIES	4	4	4	6	0	0
WHEELS UP LANDING/UNINTENTIONAL	3	3	1	2	2	6
NOSE GEAR COLLAPSED	3	3	2	3	1	3
* TOTAL ABOVE *	48	48	32	50	16	47
* TOTAL REMAINING *	50	51	32	50	18	52
*** TOTAL ***	98	100	64	100	34	100

TEN MOST FREQUENT PHASES OF OPERATION	TOTAL		OVER 27000		2250 TO 27000	
	NO.	%	NO.	%	NO.	%
APP & LANDING/LANDING ROLL	14	14	9	14	5	15
APP & LANDING/LEVEL OFF/TOUCHDOWN	13	13	10	16	3	9
TAKE-OFF INITIAL CLIMB	12	12	5	8	7	21
ENROUTE/NORMAL CRUISE	8	8	6	9	2	6
TAKE-OFF RUN	7	7	5	8	2	6
TAKE-OFF ABORTED	6	6	5	8	1	3
APP & LANDING/FINAL APP - IFR	6	6	6	9	0	0
ENROUTE/CLIMB TO CRUISE	5	5	5	8	0	0
STANDING/IDLING ENGINE(S)/RUN-DOWN	3	3	3	5	0	0
TAXIING TO TAKE-OFF	3	3	0	0	3	9
* TOTAL ABOVE *	77	78	54	84	23	67
* TOTAL REMAINING *	21	21	10	15	11	32
*** TOTAL ***	98	100	64	100	34	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
LOSS OF CONTROL - GROUND/WATER OCCURS 8 TIMES(8 PERCENT) OF TOTAL 98		
PILOT:IMPROPER OPERATION OF BRAKES ON FLIGHT CONTROLS ON GROUND	1	6
CO-PILOT:FAILED TO MAINTAIN DIRECTIONAL CONTROL	1	6
SUPERVISORY PERS./COMP. EQUIP., SERVICES, MANUALS DEFICIENT	1	6
A/P SUPER. PERS./HAZARDS/OBSTRUCTION-NO WARNING	1	6
A/P SUPER. PERS./IMPROPER/INADEQUATE SNOW REMOVAL	1	6
LANDING GEAR/NOSEWHEEL STEERING	1	6
ENGINE STRUCTURE-RECIPROCATING/CYLINDER ASSEMBLY	1	6
HYDRAULIC SYS./RESERVOIR, LINES, FITTINGS	1	6
AERODROME COND./WATER/ICE/SLUSH ON RUNWAY	1	6
AERODROME COND./SNOW ON RUNWAY	1	6
* TOTAL ABOVE *	10	66
* TOTAL REMAINING *	5	33
*** TOTAL ***	15	100
INJURIES IN FLIGHT/TURBULENCE OCCURS 8 TIMES(8 PERCENT) OF TOTAL 98		
SEAT BELT SIGN ON AND NOT OBEYED	5	16
SEAT BELT NOT FASTENED	5	16
WEATHER/CLEAR AIR TURBULENCE	4	13
WEATHER/TURBULENCE IN CLOUDS, THUNDERSTORMS	3	10
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	2	6
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	2	6
MISC. PERS./PASSENGER	2	6
FLIGHT ATTENDANT	2	6
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	3
WEATHER/DOWNDRAFT-UPDRAFT OR MOUNTAIN WAVE	1	3
* TOTAL ABOVE *	27	90
* TOTAL REMAINING *	3	10
*** TOTAL ***	30	100
OVERRUN OCCURS 5 TIMES(5 PERCENT) OF TOTAL 98		
PILOT:DELAYED ACTION IN ABORTING TAKE-OFF	1	11
PILOT:DIVERTED ATTENTION FROM OPERATION OF A/C	1	11
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	11
PILOT:MISJUDGED DISTANCE AND SPEED	1	11
PILOT:MISUSED OR FAILED TO USE LIFT DUMP DEVICES	1	11
PILOT:FAILED TO INITIATE GO-AROUND/MISSED APPROACH/OVERSHOOT	1	11
CO-PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	11
SUPERVISORY PERS./COMP. EQUIP., SERVICES, MANUALS DEFICIENT	1	11
EMERGENCY PROCEDURES IMPROPERLY/NOT USED	1	11
*** TOTAL ***	9	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
COLLISION LEVEL SURFACE-CONTROLLED OCCURS 5 TIMES(5 PERCENT) OF TOTAL 98		
PILOT:IMPROPER OPERATION OF PRIMARY FLIGHT CONTROLS	1	25
PILOT:IMPROPER COMPENSATION FOR WIND	1	25
PILOT:MISUSED OR FAILED TO USE FLAPS (LIFT DEVICES)	1	25
WEATHER/UNFAVOURABLE WIND CONDITIONS	1	25
*** TOTAL ***	4	100
HARD LANDING OCCURS 4 TIMES(4 PERCENT) OF TOTAL 98		
PILOT:IMPROPER LANDING FLARE	3	23
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	1	7
PILOT:IMPROPER RECOVERY FROM BOUNCED LANDING	1	7
FLIGHT ENGINEER/OTHER	1	7
OPERATIONS OFFICER/OTHER	1	7
OPS. OFFICER/DISREGARD OF ADVERSE WEATHER	1	7
AERODROME COND./WATER/ICE/SLUSH ON RUNWAY	1	7
WEATHER/LOW CEILING	1	7
WEATHER/RAIN	1	7
WEATHER/UNFAVOURABLE WIND CONDITIONS	1	7
* TOTAL ABOVE *	12	92
* TOTAL REMAINING *	1	7
*** TOTAL ***	13	100
UNDERSHOOT OCCURS 4 TIMES(4 PERCENT) OF TOTAL 98		
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	33
CO-PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	33
MISREAD OR FAILED TO READ INSTRUMENTS	1	33
*** TOTAL ***	3	100
LOSS OF CONTROL IN FLIGHT/OTHER OCCURS 4 TIMES(4 PERCENT) OF TOTAL 98		
PRODUCTION/DESIGN/POOR/INADEQUATE DESIGN	2	8
FAILURE/FAILED	2	8
PILOT:DIVERTED ATTENTION FROM OPERATION OF A/C	1	4
PILOT:FAILED TO SEE OR AVOID OBJECTS	1	4
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	1	4
PILOT:OPERATED CARELESSLY (UNINTENTIONAL, FORGOT)	1	4
PILOT:ENCOUNTERED UNFORSEEN CIRCUMSTANCES BEYOND HIS CAPABILITY	1	4
MAINT. SER. PERS./IMPRPER MAINT./MAINT. PERS.	1	4
MISC. PERS./AIRPORT SAFETY SERVICE	1	4
FLIGHT CONTROLS/FLAP ASSEMBLIES (TRAILING EDGE)	1	4
* TOTAL ABOVE *	12	50
* TOTAL REMAINING *	12	50
*** TOTAL ***	24	100

ACCIDENTS TO AEROPLANES

SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
OTHER GROUND INJURIES OCCURS 4 TIMES(4 PERCENT) OF TOTAL 98		
MISC. PERS./GROUND CREWMAN	2	20
PILOT:INADEQUATE SUPERVISION OF FLIGHT	1	10
MISC. PERS./PASSENGER	1	10
FLIGHT ATTENDANT	1	10
WEATHER/TURBULENCE IN CLOUDS, THUNDERSTORMS	1	10
WEATHER/DOWNDRAFT-UPDRAFT OR MOUNTAIN WAVE	1	10
WEATHER/THUNDERSTORM ACTIVITY	1	10
SEAT BELT SIGN ON AND NOT OBEYED	1	10
SEAT BELT NOT FASTENED	1	10
*** TOTAL ***	10	100
WHEELSUP LANDING/UNINTENTIONAL OCCURS 3 TIMES(3 PERCENT) OF TOTAL 98		
PILOT:FAILED TO EXTEND LANDING GEAR	3	30
PILOT:FAILED TO CHECK POSITION AND LOCKING OF LANDING GEAR	2	20
CO-PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	1	10
MAINT. SER. PERS./IMPROPER SERV. GROUND CREW	1	10
LANDING GEAR/L.G. WARNING/INDICATING COMPONENTS	1	10
PILOT/CREW MADE EQUIPMENT/SYSTEM INOPERATIVE	1	10
IMPROPER ADJUSTMENT/ALIGNMENT	1	10
*** TOTAL ***	10	100
NOSE GEAR COLLAPSED OCCURS 3 TIMES(3 PERCENT) OF TOTAL 98		
PILOT:SELECTED UNSUITABLE TAKE-OFF, LANDING, TAXIING AREA	1	14
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	1	14
LANDING GEAR/NOSEWHEEL ASSEMBLIES	1	14
LANDING GEAR/L.G. WARNING/INDICATING COMPONENTS	1	14
LANDING GEAR/G. LOCKING MECHANISM (INCLUDES DRAG LINKAGE)	1	14
FALSE INDICATION	1	14
OVERLOAD FAILURE	1	14
*** TOTAL ***	7	100
TOTAL NUMBER OF FACTORS REMAINING	124	53
TOTAL NUMBER OF ALL FACTORS	106	46
TOTAL NUMBER OF FACTORS ABOVE	230	100

ACCIDENTS TO AEROPLANES

NON-SCHEDULED AIRLINE OPERATIONS

TEN MOST FREQUENT PHASES OF OPERATION	TOTAL		OVER 27000		2250 TO 27000	
	NO.	%	NO.	%	NO.	%
APP & LANDING/LANDING ROLL	25	26	2	29	23	26
APP & LANDING/LEVEL OFF/TOUCHDOWN	17	18	2	29	15	17
TAKE-OFF RUN	10	10	0	0	10	11
TAKE-OFF INITIAL CLIMB	10	10	0	0	10	11
APP & LANDING/FINAL APP - VFR	7	7	0	0	7	8
ENROUTE/NORMAL CRUISE	6	6	1	14	5	6
TAKE-OFF ABORTED	4	4	0	0	4	4
STANDING/IDLING ENGINE(S)/RUN-DOWN	3	3	0	0	3	3
TAXIING FROM LANDING	2	2	1	14	1	1
ENROUTE/CHANGE OF ALTITUDE	2	2	1	14	1	1
* TOTAL ABOVE *	86	88	7	100	79	87
* TOTAL REMAINING *	11	11	0	0	11	12
*** TOTAL ***	97	100	7	100	90	100

TEN MOST FREQUENT TYPES OF OCCURRENCE	TOTAL		OVER 27000		2250 TO 27000	
	NO.	%	NO.	%	NO.	%
OVERRUN	8	8	0	0	8	9
ENGINE FAILURE	8	8	0	0	8	9
LOSS OF CONTROL - GROUND/WATER	6	6	0	0	6	7
WHEELSUP LANDING/INTENTIONAL	6	6	0	0	6	7
WHEELSUP LANDING/UNINTENTIONAL	5	5	1	14	4	4
MAIN GEAR COLLAPSED	5	5	0	0	5	6
UNDERSHOOT	5	5	0	0	5	6
LOSS OF CONTROL IN FLIGHT/MUSH	5	5	0	0	5	6
NOSE GEAR COLLAPSED	4	4	1	14	3	3
COLLISION HILL/MOUNTAIN-CONTROLLED	4	4	0	0	4	4
* TOTAL ABOVE *	56	57	2	28	54	60
* TOTAL REMAINING *	41	42	5	71	36	40
*** TOTAL ***	97	100	7	100	90	100

ACCIDENTS TO AEROPLANES

NON-SCHEDULED AIRLINE OPERATIONS

TYPE OF OCCURRENCE RELATED FACTORS	CASES	PERCENT
OVERRUN OCCURS 8 TIMES(8 PERCENT) OF TOTAL 97		
PILOT:DELAYED ACTION IN ABORTING TAKE-OFF	2	9
PILOT:FAILED TO FOLLOW PROCEDURES, INSTRUCTIONS, ETC.	2	9
PILOT:MISJUDGED DISTANCE AND SPEED	2	9
PILOT:FAILED TO INITIATE GO-AROUND/MISSED APPROACH/OVERSHOOT	2	9
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:MISUSED OR FAILED TO USE FLAPS (LIFT DEVICES)	1	4
MET. PERS./INADEQUATE/INCORRECT WEATHER BRIEFING	1	4
POWERPLANT-MISC./FAILURE-UNDETERMINED REASON	1	4
* TOTAL ABOVE *	14	66
* TOTAL REMAINING *	7	33
*** TOTAL ***	21	100
ENGINE FAILURE OCCURS 8 TIMES(8 PERCENT) OF TOTAL 97		
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	3	11
POWERPLANT-MISC./FAILURE-UNDETERMINED REASON	3	11
PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	2	7
FALSE INDICATION	2	7
PILOT:ATTEMPTED OPERATION WITH KNOWN EQUIPMENT DEFICIENCIES	1	3
PILOT:CONTINUED VFR FLIGHT INTO ADVERSE WEATHER	1	3
PILOT:IMPROPER IN-FLIGHT DECISION OR PLANNING	1	3
PILOT:FUEL MISMANAGEMENT	1	3
PILOT:MISJUDGED DISTANCE AND ALTITUDE	1	3
IGNITION SYSTEM - RECIPROCATING/MAGNETUS	1	3
* TOTAL ABOVE *	16	59
* TOTAL REMAINING *	11	40
*** TOTAL ***	27	100
LOSS OF CONTROL - GROUND/WATER OCCURS 6 TIMES(6 PERCENT) OF TOTAL 97		
PILOT:IMPROPER OPERATION OF BRAKES OR FLIGHT CONTROLS ON GROUND	3	8
MAINT. SER., PERS./INADEQUATE MAINT./INSPECTION	2	5
PILOT:IMPROPER OPERATION, POWERPLANT CONTROLS	1	2
PILOT:IMPROPER OPERATION OF PRIMARY FLIGHT CONTROLS	1	2
PILOT:IMPROPER COMPENSATION FOR WIND	1	2
PILOT:INADEQUATE PRE-FLIGHT PREPARATION OR PLANNING	1	2
PILOT:FAILED TO MAINTAIN DIRECTIONAL CONTROL	1	2
PILOT:SELECTED WRONG RUNWAY RELATIVE TO WIND	1	2
PILOT:FAILED TO ABORT TAKE-OFF	1	2
PILOT:FAILED TO INITIATE GO-AROUND/MISSED APPROACH/OVERSHOOT	1	2
* TOTAL ABOVE *	13	38
* TOTAL REMAINING *	21	61
*** TOTAL ***	34	100