

Accidents in Civil Aviation Industry (A Study of 1495 Accidents on Ground in Air-India)

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This paper has taken into account 1495 cases of accidents on ground in our International airline carrier, Air-India, over the last 5 years. Their causes, different types of accidents, resultant human morbidity and mortality, issues of compensation etc. have been studied and various comprehensive approaches to maintaining the highest standards of safety and health in our industry have been discussed.

Keywords: Accident statistics, types of disabilities, compensation statistics, accident preventions

Industrial accidents remain the most appalling human tragedy of modern industry resulting in significant human morbidity and mortality. This in turn results in loss of man hours and economic waste. Aviation industry too has its own share of accidents on and off the ground.

Accident - Definition

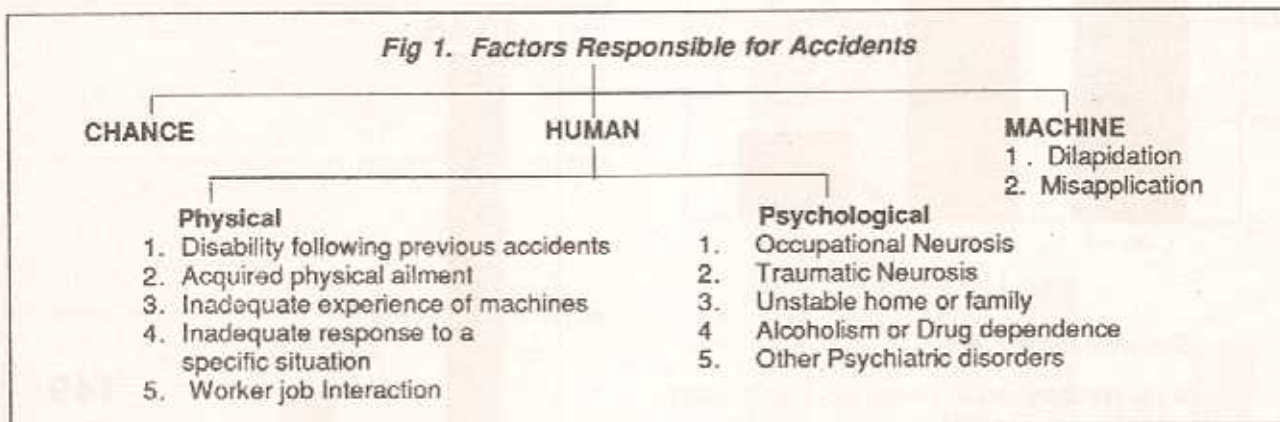
'An unexpected, unplanned occurrence which may result in injury or death may be termed as an accident'.

An accident in industry is regarded as an index of dysfunction in a system formed by a production unit and by the worker involved in it.

Different factors responsible for such accidents are shown in Fig 1.

However, seldom does an accident arise from a single cause. It generally results from combined effects of physical circumstances which can often be recognised and hazards engineered out of the working system or human factors which can be improved by training, instruction and supervision. Human operator is an organic sensor, data processor and controller located between the displays and controls of the machine. An input to the machine is transferred into a signal which is displayed and later sensed by the operator, processed mentally and translated into control responses. However, performance of operator depends a lot on variety of factors such as working environments, noise, vibration, noxious gases, temperature, humidity etc. The optimum integration of the man with the machine cannot be achieved, in a human engineering sense, unless various physical variables are taken into account while designing the working place. An increased error rate is

Fig 1. Factors Responsible for Accidents



often a result of exceeding an operator's performance tolerance for one or more of these variables.

Statistical data of our study

Age-wise distribution

A large proportion (more than 50%) of employees were less than 30 years of age and very small proportion (12% only) belong to more than 45 years of age. The reasons for this could be : 1.Younger employees are generally allotted more duties to perform which involve strenuous physical labour. 2.Inexperience, overconfidence and a rush of young blood may lead to inadvertant errors. 3.Older employees on the contrary are wiser, more experienced, carry out less strenuous duties and work generally in supervisory capacity (Fig 2).

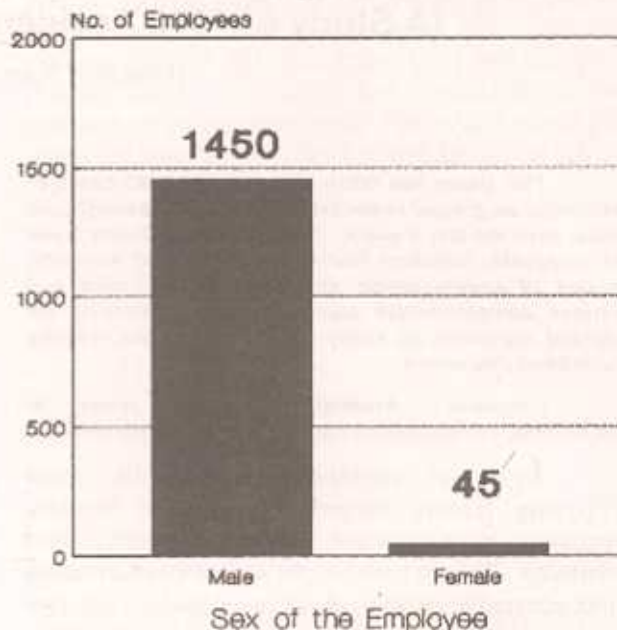
Fig 2. Age wise Distribution of Air-India Employees



Sex wise distribution

Male predominance needs no explanation as most of the ground jobs in various workshops are being carried out by the males (Fig 3).

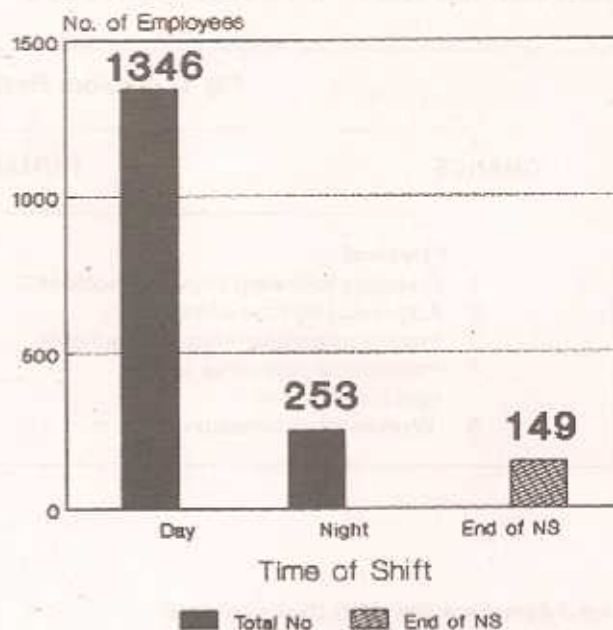
Fig 3. Sex wise Distribution of Accidents in Air India



Time of accidents

Since most of the activity in workshops takes place during the day time, almost 90% of the accidents have taken place at that time (Fig. 4). Whereas, during night shifts, it has been

Fig 4. Shift wise Distribution of Accidents in Air-India



observed that a significant number of accident have taken place just about the time the shift is supposed to get over in the early morning hours, probably, due to lack of sleep and fatigue.

Department wise distribution

Engineering and ground services division have taken major brunt of accidents obviously due to presence of greater industrial activity as compared to other departments (Fig 5).

Accident classification

Different types of accidents and their causes based on ILO standards are shown in Table I. It can be appreciated from this table that the majority of accidents have taken place due to handling goods or articles, by persons falling, by handling tools or by stepping or striking against the objects.

Table - I Accident Classification (as per ILO standards)

Accident causation Numbers	Causes of accident	Number of Accidents	% of total accidents
1-9	Accident for purely Textile machinery	—	—
101-112	Accident for other than Textile Industry	105	7
113-116	Transport Accidents	90	6
117	Electricity	15	1
118	Explosions		
119	Fire	2	1
120	Gassing	19	1
121	Accident due to not wearing personal protective equipment	60	4
124	Hand tools	194	13
125	Struck by falling body	111	7
126-128	Persons falling	224	15
129	Stepping on or striking against object	187	12
130	Handling goods or articles	398	28
131, 122-123	Others	90	6
	Total	1495	100

Incidence rates of accidents

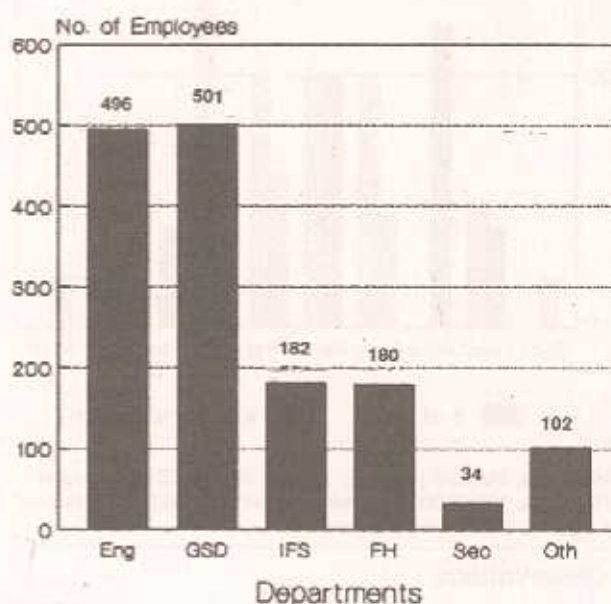
These have been compared with various industries in India as well as in U.S.A. In our study, incidence rates of accidents (per 1000 employees) are comparable to those belonging to aircrafts industries in U.S.A. It has also been observed that airlines industry, being a light engineering industry, accidents are proportionately less as compared to all other industries in India as well as abroad (Table II).

Accident statistics of principal industries from India shows that mining probably has highest fatalities and least non-fatal accidents whereas various factories have maximum number of non-fatal accidents with proportionately very small percentage of fatal accidents. Air India, also being covered under the factories, shows a similar trend with just one accidental death reported over the last five years.

Compensation awarded

Fig 6 indicates different parts of body injured in compensation cases and amount spent by Air-India in such cases.

Fig 5. Department wise Distribution of Accidents in Air India

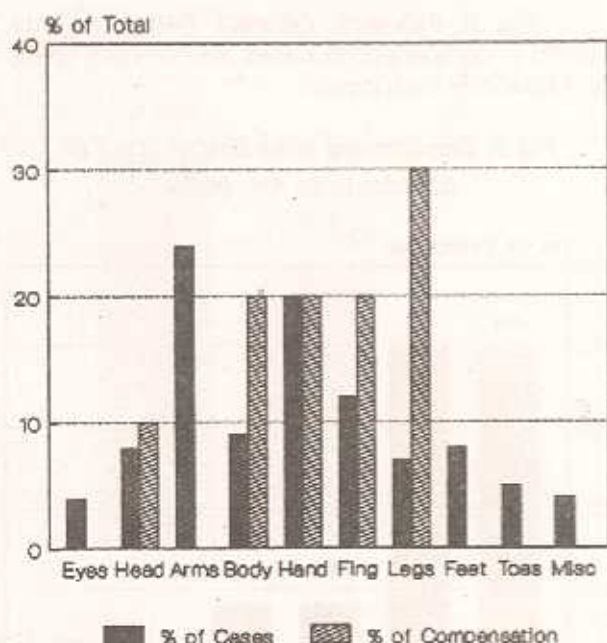


**Table - II Accident Statistics of Principal Industries in India during 1981-85
(Incidence Rates (IR) per 1000 Employees)**

Type	1981 No./IR	1982 No./IR	1983 No./IR	1984 No./IR	1985 No./IR	Industry
Fatal	6870.16	5490.13	4560.13	3050.10	—	Factories
Non-fatal	332885\ 76.57	295478\ 68.97	212704\ 55.50	108625\ 36.62	—	
Fatal	2540.34	2630.33	2660.34	2510.31	2730.34	Mines
Non-fatal	2783\ 3.71	2637\ 3.37	2600\ 3.35	1684\ 2.15	1492\ 1.88	
Fatal	3110.20	3600.16	3380.21	3270.20	2730.17	Railways
Non-fatal	24120\ 15.31	24341\ 14.89	23541\ 15.29	22709\ 14.68	—	
Fatal	—	—	1	—	—	Air-India
Non-fatal	375\ 25.2	273\ 24.9	284\ 25.3	268\ 24.8	295\ 25.4	

Average annual compensation awarded in industrial accidents in India as well as abroad in airline and other industries are shown in Table III.

Fig 6. Part of the Body Injured and compensation awarded by Air-India



Head-Rs. 3450.00 (1 case) Body Rs. 19050.00 (2 cases)
Hand Rs. 19890.00 (2 cases) Finger Rs. 3453.00 (2 cases)
Legs Rs. 38530.00 (3 cases)

Observations :

- 1 Accident incidence rates are very much lower in Air-India compared to other industries.

Table - III Average Annual Compensation Awarded in Different Types of Cases

Type of Disability	All Industries in USA (\$)	All Industries in India Rs (in lakhs)	Air-India Rs (in lakhs)
Death	83301	161	0.500
Permanent partial disability	8208	65	0.164
Permanent total disability	123790	85	—

2. These rates are parallel to those from other airline industries abroad.
3. They were very much higher in young males and employees working on day shifts and amongst those who were just about to finish their night shifts.
4. Maximum incidence rate was seen in Engineering and Ground Services Department. However, it has been observed that the accident frequency rate has been gradually coming down over the years.
5. Most accidents took place while handling goods or articles and due to persons falling.
6. Just one case of fatal accident was reported.
7. In most accidents with compensation claims, extremities were involved.

8. Amongst compensation cases, except one case of fatal accident, rest all resulted in permanent partial disabilities.
9. In general, Air-India being light engineering industry, accident rates, compensation and loss of man hours are much lower compared to other industries.

Suggestions for accident prevention

Role of medical department.

1. Pre employment medical assessment for selection of right candidates for the right job.
2. Periodic medical assessment and audiometry.
3. Drawing up of a causal tree and detection of all the antecedents of an accident.
4. Psychiatric counselling.
5. Alcoholic anonymous.

6. First aid, treatment at O.P.D., Hospitalisation, Rehabilitation and other welfare activities.

Role of the Management

1. Accident analysis.
2. Appropriate corrective measures.
3. Worker training programmes.
4. Rational application of ergonomic methods.
5. Installation of safety devices.
6. Provision of protective clothings.
7. Maintenance of good housekeeping.
8. Maintenance of proper ventilation and control of heat,noise etc.
9. Maintenance of machines and instruments.
10. Industrial welfare activities.
11. Safety posters.