

Psycho-Social Aspects of Aircraft Accidents

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Introduction

SINCE early 20th century there has been a tremendous change in the designing and functioning of aircraft. The aeroplanes have become bigger, faster and have more striking power but the design and functioning of human being has remained the same. To compensate for this, human engineers are trying their best to suit the machine to man and to introduce automatic systems so that load on human psycho-physiological functions is kept within optimal limits. Still accidents happen which are attributable primarily to human error. Thirty to sixty percent of the aircraft accidents are due to human error¹. In the Indian Air Force it has been reported that around 25% of our total accidents and 50% of the serious accidents in the past have been caused primarily or secondarily due to human error². In an aircraft accident involving human error, an attempt should be made to find out the cause of the error by investigating the psycho-social aspects of the individual responsible for the accident. Psycho-social investigations become much more important in non fatal accidents where the flier lives to give the facts.

Psycho-Social Factors

Attention: It is one of the basic psychological functions which is vital in the completion of any work successfully. The failure in attention can be of four types viz, inattention, shifting of attention, error after a period of high concentration and fascination.

(a) *Inattention:* It results due to giving attention to a wrong stimulus. This can be caused in many ways e.g. as a result of poor training, relevant information is not being made available in the proper form for interpretation or due to preoccupation with one's own thoughts.

(b) *Shifting of attention:* In flying, shifting of attention from one aspect of the task to another is important so that no stimulus is neglected. The difficulty in shifting of attention can be due to poor training or emotional arousal caused by an emergency. Further, under emergency there is strong motivation to follow the escape path which is most obvious at that moment, but it may be the least desirable.

(c) *Error after a period of high concentration:* During the course of a sortie where high concentration has been in use, the concentration might drop towards the end of the sortie and this is the critical phase where accident may occur due to lack of proper attention.

(d) *Fascination:* Here a flier gets so engrossed in one aspect of the task that he fails to respond to another significant stimulus, which he has perceived. It can occur in normal flying or under stressful situation. It is more likely to occur in inexperienced pilots as compared to experienced pilots.

Emotional stability: Emotional stability is a sign of maturity. Under the effects of emotions, thinking is affected adversely. An emergency in flying is bound to give rise to an emotional reaction of fear or anxiety, which should be kept under control so that one is able to take proper action. One should be able to recover from minor emotions like dejection, elation and irritation quickly, which is an important feature of emotional stability. Fliers who are not emotionally stable are more likely to commit mistakes under stress. Minor emotional upsets like feeling irritated or angry due to unexpected snags, bad weather etc. may cause distraction in attention, which may lead to an accident.

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Motivation : Motivation in flying is important. It is not always the financial incentives which keep up the motivation, but other factors like psychological needs, which are more important. The psychological needs like job satisfaction, success in profession, feeling of belonging to a group, getting due recognition for work etc. are vital for making motivation strong. Lack of motivation towards flying can make a flier prone to an accident.

Motivation in other spheres of life may have its repercussions on one's performance in flying. A flier who is motivated to get home soon, so that he does not miss a party, wife's birthday, wedding anniversary etc. may indulge in short cuts, i. e. cutting corners or disregard various factors like bad weather, minor snags in aircraft etc. and land himself in an accident.

Experience : Experience generates confidence. Though at times the overconfidence in an experienced pilot, as under-confidence in an inexperienced pilot, can prove to be risky.

Skill : Many times accidents occur because of one reason or the other, the flier does not have the skill to cope up with a situation in which he finds himself. There is a correlation between the level of skill of a flier and the probability of his being involved in an accident^{2,3}. The Squadron Commander/Flight Commander should know the level of skill of their pilots so that appropriate task in flying is given to them.

Self esteem : Every human being has the need of satisfying his self esteem. However low the work may be in social or professional ladder, the individual must be given due recognition. A tyre checker or a runway sweeper is important as far as flight safety is concerned. Any lapse on their part can result in an avoidable accident.

Fatigue : It is well known that fatigue decreases the performance of the pilot. He may need a higher than normal level of stimulus for an appropriate response and he may show fixation in preception. This entity of fatigue is well recognised by fliers though there is no objective quantitative measure for it and it is nearly impossible to prove that it may have caused an accident, but still it is an important factor which should be looked into.

Stress and a flier : Here I will restrict myself to psychological stress. In a court of inquiry following an accident, one may find that the individual has disturbed sleep due to domestic, financial or marital problems. But it is difficult to establish the definite relation between the psychological stress and the cause of the accident. Further, it is also important to find the intensity of stress, duration of stress and the impact it had on a particular individual. At the same time it is well understood that a flier who had a fight with his wife before flying, may carry its effect in the flight, which may crowd his mind to the exclusion of important information.

High level of domestic stress or any other psychological stress is not desirable from flight safety point of view. Aitken⁴ demonstrated that from squadron with higher accident rates more pilots worried particularly about flying, bereavement, about their wives and love life than pilots from squadrons with lower accident rates.

Accident proneness : It is the idea that some people are inherently more likely to have accidents than others. Certain workers accept this concept while others do not. Shaw and Sichel⁵ found in a survey of motor drivers that accident prone individuals scored high on both neurotic and extraversion scales. It is also reported that probability of having another accident is more with one who has had one accident earlier⁴. Another view is that even if this concept of accident proneness is taken into consideration, it is of limited use in aviation, where the number of accidents is few, pilots are a selected lot and by the time the concept of accident proneness is proved, then it is too late to isolate him for special treatment like flying in good weather during day only, which of course will be bad for his own morale and morale of the squadron⁶.

Perhaps a more realistic concept is short term accident liability i.e. a pilot is prone to an accident because of personal pressures on him at the time e.g. child is ill, quarrel with his wife etc⁶. It is important that both the pilot and the Squadron Commander/Flight Commander should realize the impact of these stresses and make the necessary adjustment till the pilot is out of the stress.

Attitudes and flying : One should develop mature attitudes towards flying. Certain attitudes can prove to be risky in flying e.g. cutting corners, haste, indis-

cipline, ignoring minor snags etc. One should feel responsible, and avoid developing these attitudes in flying, which can prove to be risky.

Habit interference: It is the human behaviour that an action which has been performed for more number of times in the past, is more likely to be performed that way in future specially under stress. In flying most of the time the previously learned habits are beneficial, but at times due to change in aircraft, they can become inappropriate and provide potential for an accident. It must be kept in mind that all habits lie deep and lack of attention or stress may awaken a habit which has been dormant for months or years.

Crew behaviour: The behavioural intercrew dynamics are important from the flight safety point of view. They may indulge in discussions or talks with the result that a significant stimulus may be neglected or not interpreted properly leading to a disastrous situation. There may be communication gap among the members, which can prove to be risky. Another situation which can prove risky is when dominant ego of one person persuades the egos of other persons to concur, resulting in a behaviour leading to self destruction.⁹ Some times the crew may be so engrossed in their own conversation that they do not perceive the information rightly from the ground staff, which may result in an accident.

Man in a group: Man is a social being. He likes to be with the group and tries to identify himself with the group. In a group, if individuals indulge in cutting corners or in indiscipline in flying to show off manhood or to show off skill, then a new comer will also probably like to do the same. This involves risks resulting in accidents. If the members of the group behave in a mature and disciplined manner, then the newcomers will follow the same resulting in safe and efficient flying.

After-effects of alcohol and flying: It has been proved beyond doubt that flying is not compatible with alcohol. One should be rather careful of 'hang over' which one has next morning after consuming alcohol the previous night. It was shown in our study that a flier who has taken three large pegs of whisky or rum the previous night should not fly next morning as his psychophysiological functioning remains below his normal⁵.

Maintenance crew and air traffic control: Maintenance crew and Air Traffic Control staff play important role in flight safety. Their psychological state of mind and professional knowledge are also of importance in avoiding air accident. This aspect is to be kept in mind while carrying out investigations for aircraft accident.

Recommendations

In order to find out the cause of human error, the essential feature is that people at the station where accident has occurred should be free from any fear of making a truthful statement. This can only be possible when there is no fear of punishment. This means, the concept of holding professional and administrative enquiries separately may be looked into.

While carrying out the investigations, the information regarding the person involved in the accident should be obtained from all possible relevant sources. The nature of circumstances under which the error occurred has to be determined.

For making psycho-social studies very meaningful, it is suggested that behaviour profiles of individuals should be maintained by recording the periodic observations of their behaviour. This can be done by medical officers who have been trained in Aviation Medicine.

In some countries the aircraft accident investigation team has a trained psychologist as its member. In my opinion, in our setting a psychiatrist who is already experienced in interview technique and in the analysis of human behaviour, should form a part of the team, specially where non-fatal accidents are being investigated.

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