

SENSE and SENSIBILITY

Do you have it in you?



Like any difficult situation, the key to hazardous weather avoidance is knowledge. This knowledge consists of a thorough understanding of weather phenomena prior to a mission and frequent weather updates subsequently. This allows all of us to make intelligent and safe decisions. But that is **only** half of the safety equation. In the history of aviation, one would find numerous weather related accidents which occurred because an aircrew failed to obtain complete and accurate information, attempted to exceed aircraft capability or simply continued flight beyond his or her capability or below safe minima. Virtually all were preventable.....But courtesy the human factor.

One must observe 'Safe does not mean risk free'. There are number of items, although not necessarily weather related, that an aircrew must consider. These include terrain, time of day, alternate air fields and last but not the least the physical and psychological condition of aircrew itself i.e. total environment. Other factors include an aircrew's training and experience. The aircrew must set his personal minimum based on all these factors.

OBJECTIVE

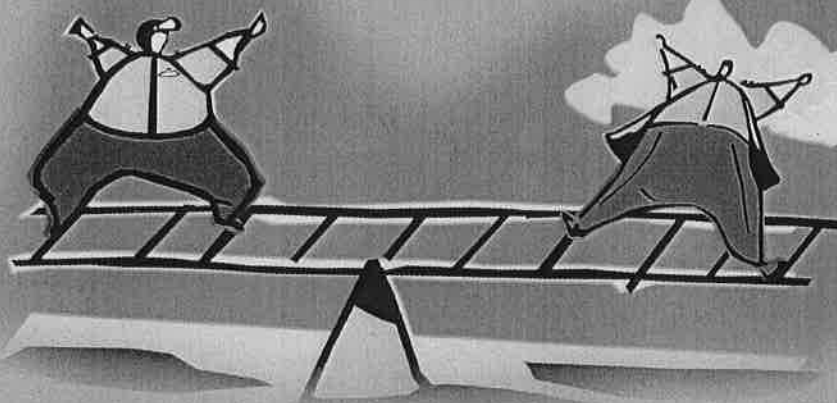
If we have a complete picture of the weather, know our aircraft capability and own limitations; how do we decide if a particular flight is safe? How do we assess risk and manage it too? This article aims to answer these questions involving the risk assessment and suggest desired procedure to manage the risk.

FLIGHT PLANNING STRATEGY

Personal Minima

Flight planning strategy starts with assessment of personal minima. The certificate (rating) awarded to an aircrew should be considered as a licence to learning, rather than a ticket to play with the safety umbrella. When we talk about 'personal minima'; there are a number of factors to consider namely, training, experience, currency, aircraft capability, weather, time of day and physical/psychological condition.

Consider a situation, where an aircrew obtained an instrument rating without having flown sufficiently in clouds. Does this aircrew have the experience to operate in actual instrument conditions? Currency with the type of operation is another personal minimum. Here



again, 'legal' does not necessarily mean 'safe'. Legality is to be related with training and experience. The aircraft capability here refers to density altitude, service ceiling, availability of Oxygen, ice protection equipment, etc. Therefore, it is important that an aircrew or supervisor understands his own as well as the aircraft limitation with respect to the existing environment (more precisely weather and associated issues).

Preparation

In order to apply a weather briefing to a flight, one should also consider the following:-

- ▶ The type of terrain
- ▶ Minimum altitudes
- ▶ Suitable diversions
- ▶ Whether the aircraft is fit for specific weather conditions?
- ▶ Alternate plan

An example is a planned flight below the freezing level; but due to traffic or any other unavoidable reason; you are forced to climb to icing levels. The objective of preparation should be to have a plan, in case the chips are down. If there are no 'outs', prudence demands the decision "No go" to the mission.

Evaluating the Weather

The next stage is to apply our own knowledge about weather and briefing by Met Offr to flight situations subject to personal minima. At this

stage both Met and aircrew need to have a balanced approach. Consider a situation where Met Offr issues a Weather Warning for Rain/ThunderShowers. An aircrew / supervisor asking the Met Offr to make or comment upon the "GO – NO GO" decision is definitely not the proper safety equation. The Met Offr is just a resource for facilitation of efficient and effective safe operations, and hence an advisory authority in a limited sense. On the other hand, a Met Offr always playing safe just to avoid embarrassment at a later stage is not a desirable. There is a real requirement of having synergy between two for the optimisation of effort in pursuance of safe operations.

Physical / Psychological Condition

This aspect range from the personal comfort (dress, survival kit, etc.) to the fit physical / psychological condition, which prepares you to commit flying. For example, minimum time between alcohol consumption and flying is contained in the regulations. However, as is often the case, 'minimum' does not necessarily equate to 'safe'. The other factors like fatigue, stress, emotional upsets are equally capable of creating an unsafe flying conditions. "I am safe" is an attitude which every aircrew should guard against.

There are five identified attitudes that adversely affect our ability to make sound decisions. They are Macho, Anti-Authority, Vulnerability, Impulsiveness & Resignation. Although the first attitude Macho (I am the best) is typically associated with men, women can be

just as vulnerable. Closely associated with 'Macho' is 'Anti authority' (Don't tell me what I can do). The third attitude 'Invulnerability' (Bad things happen to others only) comes after gaining sufficient training and experience. Let us now talk about 'Impulsiveness' (something must be done at any cost). A prime example is when an engine of a multiengine aircraft fails and aircrew responded by shutting down the good engines. Finally, let us understand people who demonstrate the attitude of 'Resignation'. Consider an aircrew making a statement just prior to an accident "My gravy is just 150 litres, God only can save me."

Let me share with you an apt example on the above mentioned attitudes. On the fateful night, I was the D Met O, somewhere in the SW Sector. There was enough evidence on weather charts that situation has enough potential for the occurrence of a duststorm. Flying started at 2000 h. The reports from the airborne aircraft and GCA radar about the existence of certain hot spots around the base started pouring in. However, there was no visible manifestation of any lightning or thunder, not even a speck of cloud on the horizon. The state of sky was fine, though it was not in its usual complexion. All the diversions reported fine weather (however, only one diversion was standing by for my base). I was on my toes and could not bear this anxiety any more. I trusted the airborne reports and issued a Weather Warning for a duststorm at 2100 h with its validity from 2130 h. This resulted into immediate recovery action by the DATCO. There were eight fighter aircraft in the air at that time. At 2102 h, I got a call from the COO, who opined that "weather is fine and nothing alarming is going to take place". Interestingly, my one year of association with COO always gave me an impression that he has tremendous confidence in my abilities as a Met professional. I tried to reason out but he insisted that I change the validity commencement from 2130 h to 2145 h and asked DATCO to stop the recovery action so that sorties could go through. On the contrary, I decided to stick to my guns and did not make any suggested

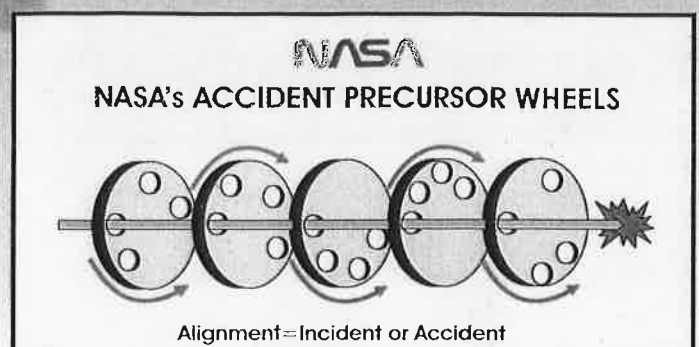
amendments, though I communicated the COO's instructions to DATCO immediately.

The youngster was in a great dilemma and so was the SFS. Well! both of them went by the book and acted as per SOPs and recovered the last aircraft by 2122 h. At 2130 h, COO entered the ATC and ripped me apart for not following instructions and abruptly left the Tower at 2135h leaving me high and dry – well frustrated too. The weather was still fine. However, at 2139 h the visibility suddenly deteriorated to 500 m and winds started gusting to 38 knots. COO himself got stranded on the road because of the weather. The weather at the only diversion also deteriorated subsequently at 2155 h. I never got any appreciation for making a correct decision, though contrary to the instructions. Of course, I did get counselled by the COO for being a bit obstinate in my ways. The point I am making is not that who was proved right, because I too could have gone miserably wrong in my assessment. All the attitudes like Macho, Anti-Authority, Vulnerability and Impulsiveness in the above situation could have proved very costly and lethal in terms of loss of life and property.

EVALUATING THE RISK

Precursor Wheels

In the case of risk its often helpful to look at statistics. This is not the end of assessment and management, but the beginning. Of all the accidents in the IAF, majority involved young aircrew. In order to evaluate the risk, your best bet could be Precursor Wheels conceptualised by the NASA. A "Precursor" is a factor that precedes and indicates or suggests the likelihood of an



accident. It might be physical incapability, poor judgement, aircraft deficiency, weather, failure of ATC or any other factor that in itself would not create an incident or accident, but when combined with other factors would lead to disaster.


Let us understand it through an example. At a small base in the Western Sector, one aircraft was being taxied in rain for takeoff. While taxiing, the pilot acknowledged receiving the information that the wind was from 290° at 20 gusting to 30 knots. Just ten minutes prior to the start up of this aircraft, another departing aircraft reported Low Level Wind Shear (LLWS) on take off path. When the concerned aircraft departed; it was in the vicinity of a thunder storm cell. As reported by eyewitnesses the aircraft's climb rate and speed was slow. Soon the aircraft entered a roll and went into descent that was consistent with a stall. Let us analyse the cause of this accident. The probable cause was the aircrew's improper decision to take off into deteriorating weather (turbulence, gusty winds and an advancing thunderstorm cell). In fact the aircraft itself was grossly overweight.

So how do we assess and manage risk? One must evaluate all the factors for a particular flight and decide if the risk is worth the mission. "Our main goal should be to prevent a situation in which all the precursors are aligned together". (ALIGNMENT = INCIDENT/ACCIDENT). The requirement is to make the 'Risk Assessment and Management Decision Tree' as given in the flow chart, whenever conditions are marginal.

CONCLUSION

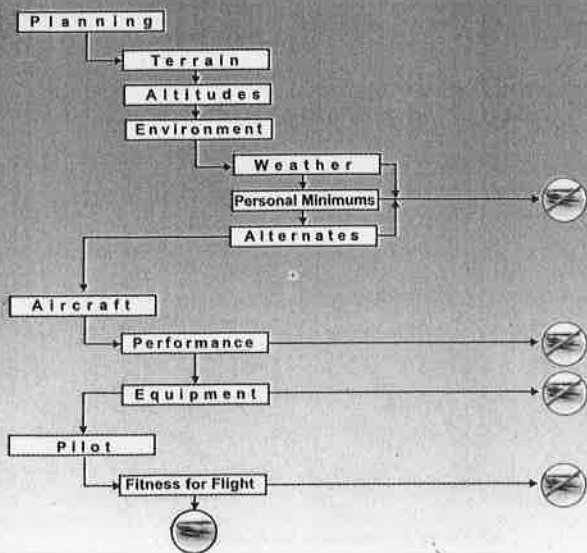
An aircrew's ability to handle weather systems depends on a number of factors such as: -

- ▶ The weather system to be negotiated.
- ▶ The aircraft's capability and equipment.
- ▶ An aircrew's capability, experience and currency.

The fact is that most accidents are a combination of events and the existing techniques for applying risk assessment and management. This approach of having adequate sense and utilising it sensibly may not prevent all accidents, but if consistently followed, will result in an excellent Flight Safety record for the IAF. 

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RISK ASSESSMENT AND MANAGEMENT DECISION TREE



Hane's Law:

There is no limit to how bad things can get.

Lackland's Laws:

1. Never be first.
2. Never be last.
3. Never volunteer for anything.