STRESS, CRIBS AND SAFETY Article Technical-5
YES ! THEY HAVE A COMMON LINK

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The tendency towards error is such a pervading human trait that it has given rise to literary expressions like "to err is human, to forgive divine". However, our profession demands 'error-free' performance It is because errors of various kinds, more often than not, result in accidents, leading to injuries, fatalities and loss of precious aircraft. But there is a subtle difference between the two. Unlike errors, accidents do not just happen. Rather, they can be considered as being brought about by certain preceeding circumstances and events, some of which may be associated with situational (also known as mechanical) factors, others with human beings. Now, the sources of errors and accidents, attributable to individuals, may be many and varied. One of them is fatigue.

It may be interesting to discover that, out of hundreds of accident investigations, hardly any, if at all, has ever pinpointed fatigue to be 'the cause'. It is not surprising, for our general understanding of the term is often limited to tiredness. This facet of fatigue is termed as physiological fatigue and is related to output. It can be defined as a state of lowered efficiency in the organism, brought about by the expenditure of energy in doing work. It generally manifests itself either in the impairment of the quality of the work subsequently done, or in the diminution of the quantity, or in both. There are well established theories to explain the phenmenon of this fatigue.

When energy is expended in doing work by a muscle, there is consumption of energy-producing material. In addition, in the muscle itself, there is production of substances which are designated as toxic i.e. which act as poison to the tissue. The substance in the muscle which produces the energy and which, therefore, acts as a fuel is glycogen. The chief toxic substances produced are carbon di-oxide and lactic acid, which are taken up by the blood. Glycogen, in the form of 'animal starch' is stored in the muscle cells and the liver, which acts as a store-house. In strenuous muscular work, the blood brings glycogen from the storehouse to keep the muscles supplied with it. Complete fatigue would be produced if this store gets exhausted. But this does not happen. Before this, another stage reaches where accumulation of the toxic substances in the muscles, produce effects which tend to cease all the muscular activity. A person in such a condition is 'physically fatigued'. The measurable symptoms of this condition are changes in the heart-rate, blood pressure, oxygen consumption, breathing rate, blood consumption and electrical resistance in the skin. The natural cure for physiological fatigue, of course, is rest.

The question that any one of us could ask, is whether we all, wearing khakhis, ever get fatigued from this angle. The answer, I am sure, will be, barring few exceptions, an emphatic 'No'. Seven-to-two routine five days a week with sixty days of annual leave with more than a dozen of gazetted holidays offer ample rest. This scenario may not be applicable to those on-the-tarmac-in overalls. But the very fact that they are on the tarmac, indicates they are not fatigued !

The fatigue, like a coin, however, has another side. Anyone who has driven a vehicle a very long distance to reach an important destination (back home, on a week end, vacation etc.) knows that interest in reaching the place is often maintained long after the body, from physiological viewpoint, would rather sleep. On the other hand, anyone who had to do a routine, uninteresting, mechanical work would feel 'fatigued' long before an excessive amount of work in the physiological sense has been performed. This is subjective or psychological fatigue and demands our concern.

Subjectively, fatigue is a state of consciousness, usually more or less disagreeable, determined by a mass of sensations and psychlogical reactions. It is accompanied by a disinclination for work and a desire to rest alongwith a felt incapacity for work. The state as described is not clearly marked off from the state we call 'boredom', which is due mainly to lack

of interest rather than the expenditure of energy in activity and is basically an attitudinal reaction of the individual. Weariness is probably a better word to employ for the subjective state, inclusive of both boredom and real fatigue. Another type of reaction often leading to fatigue is psychological stress. It basically arises due to the competition between two incompatible tendencies. Thus, situations in which frustrations, conflict, fear or anxiety can arise, might give rise to psychological stress. Anther wiew point states that stress can occur under conditions of motivation, when there is some threat to the attainment of some goal. This aspect is being brought out in the case studies a little later.

Thus, we see it is rather difficult to define and differentiate between boredom, weariness, subjective fatigue and psychological stress. The problem is further compounded when we realize that there are no precise and well defined measures to ascertain its level in individuals, unlike physiological measures.

The only way to ascertain its presence is to ask individuals directly. The big question is : will affected persons ever admit it? In addition, it raises another interesting problem of semantics. Some words have different meanings for different people. Therefore, in expressing different degrees of boredom or subjective fatigue, one has to use words that have similar meanings to both the parties; the person expressing his feelings and the person to whom he is expressing them. Now, this is a difficult task, probably as difficult as devising and filling a form P–57. Not many, including probably the best COs, can do it perfectly each time!

There is however, a proverbial silver lining in the dark clouds. The problem, though difficult, is not insurmountable. Our working environment in squadrons and wings, is fairly cordial, personal and humane (exceptions, of course are there). Factors, like stress and psychological fatigue, do stand out quite clearly amongst individuals. What is required is some timely corrective measures, taken well before these factors force the individual to commit an error leading to an accident. Listed below are few seemingly innocent, but highly charged and almost explosive situations of this type :—

* A competent and trained technician working at second line servicing is shifted to DSS for whatsoever reasons. However, he prefers ten-hour hangar job to six hours tarmac duty and is unhappy to start with. His, is a case of wrong placement. In due course of time it can lead to stress or fatigue. A step further and he too might prove Murphy's law as true.

* A dedicated, no-nonsense type fully ops, master green flight commander is posted-in. His family, including an always ailing three years old child is left behind at the old duty station since accommodation at the base is not available. Now, whenever he gets airborne, with or without a pupil, he cannot leave all his worries behind, even if flight safety calendar reminds him to do so! As time passes, worry gives way to weariness, stress and fatigue.

*Annual gunnery meet is a short time away. Practice at the range is in full swing. The squadron is motivated to retain the gunnery trophy it won last year. But the huge fifteen-by-fifteen white target appears as a small dot from the air. How to make it look bigger appears to be the common concern. As time approaches, excitement builds up giving rise to tension and fatigue. Then the inevitable, a ricochet, happens.

* When AOC-in-C and DASI are to visit the station everything is being geared up. Bringing up the sections to the inspection standard, making all equipment serviceable, practicising various SOPs and procedures, grass cutting in the surroundings and practice parades, to name a few. Despite general afternoons, there is never enough time to do all this. In addition, hectic flying is going on. Squadron has come back from detachment only a fortnight ago. Under such circumstances, an error can be expected from any one of the few fatigued airmen. That it cannot be accepted will be another part of the sad story.

These few cases, picked up at random, could be observed at any flying station, sometime or the other. A slightly thoughtful analysis of these will bring out a common feature in all these cases : 'The concerned person never spoke about it or in common parlance, he did not crib'.

Well, this is a curious happening, contrary to what we apparently do believe. But then, it does have a plausible explanation. Human beings, follow normal distribution very closely for all psychological attributes. For other human aspects, too, they do follow such distributions though not so closely and rigidly. From our experience we know that we have about 10—15 percent people who are hard working and dedicated. They will perform any and every task ungrudgingly. On the other side we have an almost equal percentage of hardly working people who shirk work, find excuses and almost always manage in not doing a thing. Such people normally come out with difficulties, genuine as well as self created. They are, normally of the 'cribbing' type. The majority of the people, in between these two extremes, are the normal human beings, who do just whatever is told to them.

Errors could be committed by anyone belonging to any category and many of these could be chance errors. However, stress and fatigue errors would be made mostly by the highly professional personnel belonging to the first category, namely, hardworking category. This is because, even if they feel anything genuinely wrong in the set-up or working environments, they will not complain about it. And more often than not, their mistakes are hushed-up. While this could (such an action) be justified on more than one account, it does great harm to the organisation-- the factors which were basically responsible for the initial errors do not receive the light they deserve.

One way to overcome the problem is to encourage and listen to cribbing. Even when a shammer, habitual and hardly working type person complains, he might be talking about something that is genuinely wrong and demands remedial action. Another method is to make dedicated, hard working people to talk about their work, environments and surroundings. It is quite possible that during their normal talk they might point out towards a weak area. For all we know, what they term as weak area might be a dangerous area. All said and done, talking and listening to the people, under our charge is going to do us a lot of good-even if it is in the form of a crib. Listening to cribs, one may get fatigued, but then it may lead to additional safety somewhere. In that case, induced fatigue would turn out to be 'Really-Worth-It'.

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A Meter is a Meter, is a Meter. . .

People who are not familiar with the metric system often have difficulties converting units of measurement into the system. There is no reason why this should be so if one understands the basic simplicity of the metrics. An international conference of scientists long ago determined the exact length of a meter. It is 1,650,763.37 times the wave length of orange light of ositopic krypton of mass 86 at 760 millimeters of pressure at 15 degrees centigrate. Seeing how easily the length of a meter is determined, we wonder that all the hassle is about.

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