

## 9.4 - FACTORS AFFECTING PERFORMANCE

### INTRODUCTION

There are many factors that adversely affect an Aircraft Maintenance Technician (AMT). Some of the main human factors include fitness and health, stress, time pressures and deadlines, workload, fatigue, shift work, and the effects of alcohol and drugs. In this chapter we will explore how these factors affect us adversely and can put safety at risk.

### FITNESS AND HEALTH



There are two aspects to fitness and health: The disposition of the AMT prior to taking on employment and the day to day well being once employed.

#### PREEMPLOYMENT PHYSICAL

Some employers may require a medical preemployment physical. This allows the employer to judge the fitness and health of the applicant. There is an obvious effect upon an AMT's ability to perform his or her job if through poor physical fitness or health, the applicant is constrained in some way (such as freedom of movement). In addition, an airworthiness authority when considering issuing a license, will consider these factors and may judge the condition to be of such significance that a license could not be issued.

#### DAY TO DAY FITNESS AND HEALTH

Fitness and health can have a significant effect upon job performance (both physical and cognitive). Day to day fitness can be reduced through illness (physical or mental) or injury.

EASA Part-66 imposes a requirement that "certifying staff must not exercise the privileges of their certification authorization if they know or suspect that their physical or mental condition renders them unfit".



Responsibility often falls upon the individuals to determine whether or not they are well enough to work on a particular day. Alternatively, team members or supervisors may intervene. Many conditions can impact on the health and fitness of an individual, such as:

- Minor physical illness (such as colds, flu, etc.);
- More significant physical illness (such as cancer, heart conditions, etc.);
- Mental illness (such as depression, anxiety, etc.)
- Minor injury (such as a sprained wrist, etc.)
- Major injury (such as a broken arm, etc.);
- Latent Medical and Environmental Conditions (LMECs) such as ongoing deterioration, possibly associated with the aging such as hearing loss, visual defects, obesity, heart problems, etc.);
- Effects of toxins and other foreign substances (such as carbon monoxide poisoning, alcohol, illicit drugs, etc.).

There is no hard and fast guidelines as to what constitutes 'unfit for work'. This is a complex issue dependent upon the nature of the illness or condition, its effect upon the individual, the type of work to be done, environmental conditions, etc. Instead, it is important that the AMT is aware that his/her performance, and consequently the safety of aircraft he/she works on, might be affected adversely by illness or lack of fitness.

AMTs may consider that they are letting down coworkers by not going to work when ill, especially if there are ongoing manpower shortages. However, management should generally allow for contingency for illness. The burden should not be placed upon an individual to turn up to work when unfit if no such contingency is available. If the individual has a contagious illness such as the flu, other workers become at risk as well.

## POSITIVE MEASURES

There are many things AMTs can do to help maintain fitness and health. These include:

- Eating regular meals and a well balanced diet;
- Regular exercise (sufficient to double the resting pulse rate for 20 minutes, three times a week is often recommended);
- Stop smoking;
- Sensible alcohol intake.

## STRESS: DOMESTIC AND WORK RELATED

### INTRODUCTION



Stress is the high level of emotional arousal typically associated with an overload of mental and/or physical activity. Stress is often associated with anxiety, fear, fatigue, and hostility. It can also arise as a result of feelings of inadequacy, where we may feel we don't have the appropriate experience, knowledge, or capability to complete our allocated tasks. All these feelings can have a direct and negative impact on performance.

Stress is an inevitable and necessary part of life. It can motivate us and heighten our response to meeting the challenges we face. In fact, our performance will generally improve with the onset of stress, but will peak and then begin to degrade rapidly as stress levels exceed our adaptive abilities to handle the situation.

High levels of stress are a problem for any individual or team, since the effects of stress are often subtle and difficult to assess. Although complex and difficult maintenance activities can generate stress, there is also both physical and mental stress that a team member may bring to the situation and which others may not be able to detect.

### CHARACTERISTICS OF STRESS

Stress is often described as being insidious; that is, it develops slowly and has a gradual and cumulative effect. It can be well established before we are aware that it is degrading our performance. We may think that we are handling everything quite well, when in fact there are subtle signs that our performance has degraded to a point where we can no longer respond appropriately.

## STRESS IS CUMULATIVE



We are all under a certain level of stress at any given time, but there is a limit to any individual's capability to adapt to increasing stress. This stress tolerance level is based on our ability to cope with a given set of circumstances. If the number or intensity of stressors becomes too great, we can become overloaded. At this point, our performance begins to decline and our judgment deteriorates.

### CAUSES OF STRESS

Any changes in personal circumstances such as marital separation, bereavement, difficult family affairs, or financial concerns can lead to stress and affect our emotional state. There is also work related stress, which may include real or imagined commercial pressures, such as the need to juggle deadlines to get an aircraft on line, and balance economic considerations with the understanding that lives depend on the quality of our work. To complicate matters even further, admitting to suffering from these stresses is often viewed by coworkers as an admission of weakness or failure. Early symptoms of stress such as depression or sleep disruption are often denied. In this situation we tend to look for other ways to cope with our high levels of stress, such as aggression, drugs or alcohol.

### STRESSORS

Different stressors affect different people to varying extents. Typical stressors include:

- Physical, such as heat, cold, noise, or the onset of fatigue;
- Psychological, such as worries about real or imagined problems (e.g. financial problems, ill health, etc.);
- Reactive, such as events occurring in everyday life (e.g. working under unrealistic time pressure, bullying, encountering unexpected situations, etc.).

## SYMPTOMS OF STRESS

The symptoms of stress can include:

- Physiological symptoms, such as sweating, dryness of the mouth etc.;
- Health effects, such as nausea, headaches, sleep problems, stomach upsets;
- Behavioral symptoms, such as restlessness, shaking, nervous laughter, taking longer over tasks, changes to appetite, excessive drinking or smoking etc.;
- Cognitive effects, such as poor concentration, indecision, forgetfulness etc.;
- Subjective effects, such as anxiety, irritability, depression, moodiness, aggression etc.

## CONSEQUENCES FOR AMTS

Inappropriately high levels of stress can significantly degrade performance and as a result can also compromise safety. Under extreme levels of stress, the following behaviors can be evident:

- Poor judgment;
- Compromised, or accepting of lower standards;
- Inattention, loss of vigilance and alertness;
- Preoccupation with a single task at the expense of others;
- Forgetting or omitting procedural steps;
- Greater tendency towards losing things;
- Misreading maintenance manuals and procedural steps;
- Loss of time perception;
- Loss of situational awareness.

## DOMESTIC STRESS



Domestic stress typically results from major life changes such as divorce, the birth of a child, or the death of a family member or close friend. Preoccupation with domestic stress can play on our mind during working hours, distracting us from our tasks. This inability to concentrate fully may affect task performance, error rates and our ability to pay sufficient attention to safety.

## WORK RELATED STRESS



Carrying out tasks that are new, or very challenging or difficult, can make us feel stressed. Time pressure, lack of standard procedures or appropriate resources, lack of guidance or supervision, and interpersonal

conflicts all intensify this stress. Some of these stressors can be reduced by appropriate workload management, good communication, good training etc. The social and managerial aspects of work can also be stressful; for example if you feel your job is under threat due to a company reorganization.

## MANAGING STRESS



If we all work with a certain amount of stress, how can we ensure it is kept to an appropriate level? Recognizing high stress situations such as undergoing divorce, suffering a bereavement; or having an argument with a spouse or boss are worries which can build to an unbearable level. Even with low levels of stress, levels can build; particularly when there is a multitude of decisions to make or tasks to complete. Before this occurs, we need to be proactive in managing the stress load so that it does not become unmanageable. We can control physiological stressors by strategies like:

- Maintaining good physical fitness and bodily function;
- Engaging in a program of regular physical exercise;
- Getting enough sleep to prevent fatigue;
- Eating a balanced diet;
- Learning and practicing relaxation techniques.

We can also reduce the physical stressors by making the work environment as stress free as possible.

In high pressure situations, relieve stress by establishing priorities and by appropriately delegating tasks and responsibilities to other members of the team. In a low pressure situation, where fatigue, boredom and over familiarity with the task are the greatest hazards, paying careful attention to environmental conditions such as heat, humidity, noise, and lighting can help to maintain alertness. You can often reduce mental stressors by making your physical work environment as stress free as possible.



## STRESS COPING STRATEGIES

If coping strategies are to be effective, we need to identify and deal with the source of the stress, and not just the symptoms. For example, delegate workload when necessary, appropriately prioritize tasks, and sort out problems rather than letting them fester. We cannot always change the situation—it may be outside our control—but even when this is the case, there are a number of coping strategies we can use.

### *Achieving Relaxation*

There are almost as many techniques, practices, and treatments for dealing with stress as there are causes of it. From ancient relaxation techniques to the latest thinking on proper nutrition; from breathing exercises to repetitive prayer, there are numerous tools to help people cope. Some techniques can be especially beneficial under certain circumstances but not as helpful under others.

Understanding what works for us as individuals and for the stressful circumstances at hand can require an exploration of a number of stress reduction methods. And as always, it is important to know when to seek professional help. These efforts can reward you richly with better health, greater peace of mind, and a smoother course through life.

### *How stressed are you?*

This quick quiz may make you more aware of the impact of significant life events on your level of stress. The following table lists a number of life events the average person could expect to experience. To test yourself, just go through the list and add up the points of the events you have experienced in the last year. Add the points allocated to each of these events in the right hand column to find your total cumulative score.

*(Table 4-1, Page 4.6)*

### *What Your Score Means*

Each of us has personal stress adaption limitations. When we exceed this level, stress overload may lead to poor health or illness. Although different people have different capacities to cope with stress, for the average person a score of 250 points or more may indicate that you are suffering from high levels of stress.

Studies revealed that people who had become ill had accumulated a total of 300 stress points or more in a single year. Look at the last twelve months of changes

in your life. It is important to understand that 'ripples of stress' can circulate a long time after the actual change has taken place. High stress levels will adversely affect your immune system and lead to mental or physical illness if something is not done. It is very important to lighten the stress load and develop mechanisms to cope with stress before something happens. The message for AMTs is clear. If stress brought on by life changes is not managed well, and is added to the stresses in the workplace, performance will be adversely affected.

## TIME PRESSURE AND DEADLINES

### TIME PRESSURE AND SELF IMPOSED PRESSURE



There are two types of pressure; actual pressure and self imposed pressure. The first is real pressure, applied directly or indirectly, for the task to be completed in a given time. On the other hand, individuals or teams may feel self imposed pressure to complete a task within a given time, even when the time available may be unrealistic or the task may not be achievable with the allocated resources and time frame.

For an individual, the self imposed pressure is real. For them it is no different from any actual pressure being applied to the completion of the task. All pressure (self imposed or otherwise) will affect the performance of those subjected to it. Inappropriate pressure applied to an individual or maintenance team to achieve a task is a safety risk. Actual and self imposed pressure can be significant drivers for error and taking maintenance short cuts.

### *How can inappropriate actual or self imposed pressure be managed?*

- Allocate appropriate time for all maintenance tasks
- Carry out a comprehensive pretask briefing to outline the task priorities;
- Ensure open two way communication to identify and mitigate the effects of pressure on performance and behavior.

Communicating any problems encountered during the task is vital, particularly when you cannot complete the task safely because of insufficient time and resources.