Human Factors Training Program Review
Human Factors Introduction

Why Do I Need to Know About Human Factors?

- The Government Audit Office (GAO) and the FAA recommended the introduction of Human Factors into Maintenance Training in May 2004.
- Recurrent (continuation) Training has also been introduced at all maintenance levels including Management, Supervisory, Technician and Mechanic.
- This is to harmonize FAR and EASA 145-147-65 and 66 from May 2005.
- Human Factors awareness improves Safety, Efficiency and Harmony in the workplace.
Learning Objective

- Examine and explain how the working environment and human factors affect personnel.
- Show and develop ways to prevent or lessen the seriousness of these effects.
WHAT IS HUMAN FACTORS ANYWAY?

• How does it affect me?
• Why should I care .. Isn’t it just another tool for management to make my life difficult?
• HOW WILL IT MAKE ME MONEY?
Definition: Human Factors

- Human Factors covers a range of issues including the perceptual, physical and mental capabilities, the interaction and effects on individuals of their job and working environments, the influence of equipment and system design on human performance and finally the organizational characteristics which influence safety related behavior at work.
Human Factors covers three areas of influence on people at work

1. The organization
2. The job
3. Personal factors

These three areas are affected by:

- The systems of communication within the organization
- The training system and procedures in operation

all of which are directed at preventing human error and accidents
Everyone has seen these characters at work and many more...

- Micro Manager
- Jobs worth
- Secret Sam
- Jack of all Trades
- Master of none
- Promoted Peter
How did they get that way?
Genetics

Experience

Learning
Event Reaction Chain

A person reacts to circumstances in different ways. The reaction is determined internal and external factors.

<table>
<thead>
<tr>
<th>Event</th>
<th>RATIONAL MIND</th>
<th>EMOTIONAL MIND</th>
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**ADULT / CHILD**

Genetics Experience Learning

A balanced rational reaction can be pushed towards an emotional reaction if stressors affect a person too much.
**Stress management**
Everyone is stressed to some degree almost all the time. A certain amount of stress is good since it keeps a person alert and prevents complacency. However, effects of stress are cumulative and, if not coped with adequately, they eventually add up to an intolerable burden. Performance generally increases with the onset of stress, peaks, and then begins to fall off rapidly as stress levels exceed a person’s ability to cope. The ability to make effective decisions during flight can be impaired by stress. Factors, referred to as stressors, can increase the risk of error.

### STRESSORS

- **Physical Stress**—Conditions associated with the environment, such as temperature and humidity extremes, noise, vibration, and lack of oxygen.
- **Physiological Stress**—Physical conditions, such as fatigue, lack of physical fitness, sleep loss, missed meals (leading to low blood sugar levels), and illness.
- **Psychological Stress**—Social or emotional factors, such as a death in the family, a divorce, a sick child, or a demotion at work. This type of stress may also be related to mental workload, such as analyzing a problem, navigating an aircraft, or making decisions.
Implementing a decision and evaluating the outcome

The decision-making process normally consists of several steps before choosing a course of action. To help remember the elements of the decision-making process, a six-step model has been developed using the acronym “DECIDE.”

<table>
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<tr>
<th>DECIDE MODEL</th>
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<tr>
<td><strong>Detect</strong> the fact that a change has occurred.</td>
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<tr>
<td><strong>Estimate</strong> the need to counter or react to the change.</td>
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<tr>
<td><strong>Choose</strong> a desirable outcome for the success of the flight.</td>
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<tr>
<td><strong>Identify</strong> actions which could successfully control the change.</td>
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<tr>
<td><strong>Do</strong> the necessary action to adapt to the change.</td>
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<tr>
<td><strong>Evaluate</strong> the effect of the action.</td>
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Recognizing hazardous attitudes

Being fit to work depends on more than just a mechanics physical condition and recency of experience. For example, attitude will affect the quality of decisions. Attitude can be defined as a personal motivational predisposition to respond to persons, situations, or events in a given manner. Studies have identified five hazardous attitudes that can interfere with the ability to make sound decisions and exercise authority properly.

<table>
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<th>THE FIVE HAZARDOUS ATTITUDES</th>
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<tbody>
<tr>
<td><strong>1. Anti-Authority:</strong> &quot;Don't tell me.&quot;</td>
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<td>This attitude is found in people who do not like anyone telling them what to do. In a sense, they are saying, &quot;No one can tell me what to do.&quot; They may be resentful of having someone tell them what to do, or may regard rules, regulations, and procedures as silly or unnecessary. However, it is always your prerogative to question authority if you feel it is in error.</td>
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<td><strong>2. Impulsivity:</strong> &quot;Do it quickly.&quot;</td>
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<td>This is the attitude of people who frequently feel the need to do something, anything, immediately. They do not stop to think about what they are about to do; they do not select the best alternative, and they do the first thing that comes to mind.</td>
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<tr>
<td><strong>3. Invulnerability:</strong> &quot;It won't happen to me.&quot;</td>
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<tr>
<td>Many people feel that accidents happen to others, but never to them. They know accidents can happen, and they know that anyone can be affected. They never really feel or believe that they will be personally involved. Pilots who think this way are more likely to take chances and increase risk.</td>
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<td><strong>4. Macho:</strong> &quot;I can do it.&quot;</td>
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<tr>
<td>Pilots who are always trying to prove that they are better than anyone else are thinking, &quot;I can do it—I'll show them.&quot; Pilots with this type of attitude will try to prove themselves by taking risks in order to impress others. While this pattern is thought to be a male characteristic, women are equally susceptible.</td>
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<tr>
<td><strong>5. Resignation:</strong> &quot;What's the use?&quot;</td>
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<tr>
<td>Pilots who think, &quot;What's the use?&quot; do not see themselves as being able to make a great deal of difference in what happens to them. When things go well, the pilot is apt to think that it is good luck. When things go badly, the pilot may feel that someone is out to get me, or attribute it to bad luck. The pilot will leave the action to others, for better or worse. Sometimes, such pilots will even go along with unreasonable requests just to be a &quot;nice guy.&quot;</td>
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Hazardous attitudes can lead to poor decision making and actions that involve unnecessary risk.

**HAZARDOUS ATTITUDES**

- **Anti-Authority** — Although he knows that flying so low to the ground is prohibited by the regulations, he feels that the regulations are too restrictive in some circumstances.

- **Impulsivity** — As he is buzzing the park, the airplane does not climb as well as Steve had anticipated and without thinking, Steve pulls back hard on the yoke. The airspeed drops and the airplane is close to a stalling attitude as the wing brushes a power line.

- **Invulnerability** — Steve is not worried about an accident since he has flown this low many times before and he has not had any problems.

- **Macho** — Steve often brags to his friends about his skills as a pilot and how close to the ground he flies. During a local pleasure flight in his single-engine airplane, he decides to buzz some friends barbecuing at a nearby park.

- **Resignation** — Although Steve manages to recover, the wing sustains minor damage. Steve thinks to himself, "It's dangerous for the power company to put those lines so close to a park. If somebody finds out about this, I'm going to be in trouble, but it seems like no matter what I do, somebody's always going to criticize."

  - **Follow the rules. They are usually right.**
  - **Not so fast. Think first.**
  - **It could happen to me.**
  - **Taking chances is foolish.**
  - **I'm not helpless. I can make a difference.**
OK, Nice graphics but what’s that got to do with me and how well I do my job?
Individual reactions to events will be affected by:

- COMPLACENCY
- DISTRACTION
- PRESSURE
- LACK OF RESOURCES
- LACK OF KNOWLEDGE
- POOR AWARENESS
Individual reactions to events will be affected by:

- STRESS
- FATIGUE
- POOR COMMUNICATION
- LACK OF ASSERTIVENESS
- LACK OF TEAMWORK
- DEPENDANCE ON NORMS

We’ll look at them, one at a time . .
As well as some solutions for each one
COMPLACENCY

What Is Complacency? The Feeling That You Know Everything About A Subject Or Situation “I’ve being doing this for years, I don’t need any manuals or training”.

Complacency Causes: Accidents, Loss Of Profit, Damaged Equipment.
Solutions To Complacency Are:

- Always follow the checklist or work cards
- Never work from memory
- Be sure to vary your routine periodically
- Be aware of the dangers of complacency
- Recurrent Training And Human Factors Programs
DISTRACTION

Solutions To Distraction Are:

- Use a detailed check list.
- Always finish the job.
- Double inspect the work.
- Use torque seal and/or safety wire.
- Record or tag uncompleted work.
- When you go back to the job, always go back three (3) steps.
- Recurrent Training And Human Factors Programs
PRESSURE
What Is Pressure: It’s The Feeling That It’s All To Much, I Can’t Do It On Time, I Can’t Tell Anyone.
Pressure Causes: Stress, Increased Safety Risks, Loss Of Profit Through Sick Time and lower efficiency
Solutions To Pressure Are:

- STOP! assess the situation.
- LOOK at the situation rationally.
  1. Can I safely do the job on time?
  2. Have I voiced my concerns clearly?
  3. What is the worst thing that can happen to me?
- LISTEN to your rational mind!
- ACT Speak up, ask for help or time.
- Recurrent Training And Human Factors Programs
SHOW ME THE MONEY!!!
LACK OF RESOURCES
What is Lack Of Resources? Not Having The Right Tools To Do The Job.
Lack Of Resources Causes: Wasted man hours, Loss Of Profit, Stressed Workers.
Solutions To Lack of Resources Are:

• Check all suspect areas at the beginning of all inspections and AOG the required parts.
• Order & stock parts before they’re required.
• Know your sources, arrange for pooling a/o loaning.
• Maintain aircraft to the highest standards, if in doubt check.
• Initial and Recurrent Training Programs
LACK OF KNOWLEDGE

What Is Lack Of Knowledge? Not Having The Knowledge, Skill Or Experience To Do The Job.

Lack Of Knowledge Causes: Wasted Resources, Accidents, Unhappy stressed workers.
Solutions To Lack of knowledge Are:

- Obtain school training on type, and model.
- Get supervised OJT
- Use current manuals, old data doesn’t cut it!
- Tech Rep’s are there for a purpose...use them.
- Initial And Recurrent Training Programs.
LACK OF AWARENESS
What Is Lack Of Awareness?
Not Focusing Of The World Around You.
Lack Of Awareness causes accidents, damaged equipment, wasted man hours.
Solutions To Lack Of Awareness Are:

- **THINK** ... what could occur in the event of an accident.
- **CHECK** ... will your work conflict with a previous or existing repair a/o modification.
- **ASK** ... see if anyone else can spot a problem you overlooked.
- Human Factors and Recurrent Training Programs.
STRESS leads to DISTRESS
What Is Stress? It Is Over Reacting Physically and Emotionally To External And Internal Pressures Stress Can Cause Physical And Emotional Illnesses
PERFORMANCE

BASIC LIVING STRESS

BASIC JOB STRESS

CAPACITY TO COPE

CAUTION

DISTRESS

STRESS
Solutions To Stress Are:

If you don’t manage stress, it **will** manage YOU!

- **STOP** stop burning up emotional energy
- **LOOK** rationally at the problem
- **LISTEN** to your rational not emotional mind
- **ACT** once you have a plan, do it!
- Human Factors and Recurrent Training Programs.
OTHER SOLUTIONS AND STRESS HELPERS ARE:

• Be sure the solution starts with “I”
• Be realistic and practical.
• TAKE a BREAK !!
• Talk to someone who is not emotionally involved with the problem.
• Don’t expect miracles......just keep trying.
• Exercise, Good Diet and Relaxation.
• At all times “manners maketh the man” a polite word and a smile can solve most of the stress problems in a working environment
FATIGUE
What Is Fatigue?

- Fatigue is the body's normal reaction to a physical or mental stress of a prolonged duration.
- Fatigue Causes: Physically and emotionally drained and unable to carry out the job.
- There are TWO types of fatigue.
  - ACUTE... short duration, cured with good nights sleep.
  - CHRONIC... occurs over a period long period of time, long recovery!
Causes Of Fatigue Are:

- Long hours of labour/work.
- Stress of high intensity.
- Large temperature variations.
- Noise ... above 80 db for long duration.
- Vibration for long periods and sufficient intensity.
- STRONG lighting.
SYMPTOMS OF FATIGUE

- Enhanced stimulus required in order to respond.
- Attention reduced
- Memory diminished
- Mood becomes withdrawn.
- Circadian Rhythm (time of day effect).
Solutions To Fatigue Are:

Work Sensible Hours.
Take Break
Have An Interest Outside Of Work.
Exercise, Good Diet and Relaxation
Follow Sensible Health And Safety Regulations
LACK OF COMMUNICATION
What is Communication? Passing On To Others Your Meaning And Intent.
Lack Of Communication will cause: misunderstandings, wasted hours of work, safety problems, stress.
This is Communications....

“ I have to tell you that what you heard and what I said are two different things and what you think I said is definitely not what I meant @*~<!!!”

SOUND FAMILIAR ?
THE SECRET TO GOOD COMMUNICATIONS

You have

2 Ears

2 Eyes

1 Mouth

Use them in that order
Solutions: To Improve Communication

“Learn to Listen”

• Don’t:
  1) Debate
  2) Detour
  3) Pre-plan
  4) Tune-out

• Do:
  1) Ask Questions
  2) Paraphrase
  3) Make eye contact
  4) Use positive body language
  5) Human Factors Communication Training
LACK OF ASSERTIVENESS
What is it Lack Of Assertiveness anyhow?
Not knowing when to say NO!!
Lack Of Assertiveness Causes: Lack Of Communication, Safety Risks Are Increased, Loss Of Profit.
Solutions To Lack Of Assertiveness Are:

- Never answer a request immediately, take a moment to breathe, think then reply.
- Record all the work you do in the log book, and only sign for what you have done and seen.
- Refuse to compromise your standards
- Human Factors Development Training
LACK OF TEAMWORK
Lack Of Team Work Causes: Loss Of Profit, Inefficient Operations, Stress On Workers.
Solutions To Lack Of Teamwork Are:

- Always discuss and plan the WHO, WHAT, WHEN, WHERE, and HOW the job is to be done.
- Insure that everyone understands and agrees!
- Human Factors Teamwork Development Training
NORMS
What Are Norms? It’s a way of doing business that’s not approved but it’s been done locally for so long it’s now a NORM. Norms. Causes: Inefficient Operation, Safety Hazards, Non Compliance With Regulations.
Solutions To Norms:

- ALWAYS work In Accordance With The Relevant Manual the manual.
- Be aware that “NORMS” doesn’t make it right!
- Recurrent Training And Human Factors Training Programs
THE END