

THE DIRTY DOZEN

12 human factors that lead to maintenance errors have been identified, they are entitled “The Dirty Dozen”.

The Dirty Dozen is typically realized in an out of balance condition where there is too much or not enough.

too much

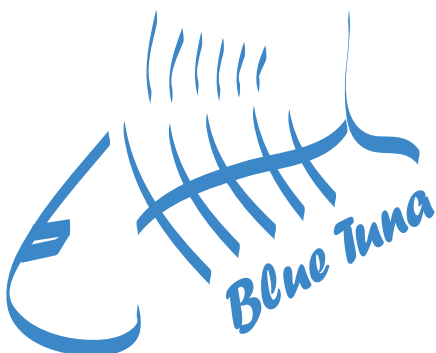
not enough

*Pressure
*Stress
Norms
*Fatigue
Distraction
Complacency

Communication
Resources
Assertiveness
Awareness
Teamwork
Knowledge

* These three factors can aggravate the other factors, accelerating or compounding the circumstances.

The objective of this training is to identify and explain the dirty dozen and create safety nets to ensure these factors do not erupt into maintenance errors.



Communication

“The transmission of something from one location to another.”

Transmission of a . . .

Message

Signal

Meaning



In order to have communication both the transmitter and the receiver must share a common code, so that the meaning or information contained in the message may be interpreted without error.

Lack of Communication results in . . .

- * Reduced quality of work and / or output
- * Loss of time & money because important information is not communicated or messages are misinterpreted
- * Frustration and high levels of stress

3 Basic Types of Communication

- (a) Verbal communication,
- (b) Non-verbal communication, commonly referred to as “body language.”
- (c) Written or asynchronous communication which includes everything that is memorialized in writing or in electronic form, such as publications, letters, forms, signs, e-mail, etc

Build a Safety Net for Communication

Log Books, Worksheets, Check Lists

Discuss work to be done or what has been completed

Never assume anything

Complacency

com•pla•cen•cy Pronunciation: (kum-plā'sun-sē), [key] —n., —pl. -cies. 1. a feeling of quiet pleasure or security, often while unaware of some potential danger, defect, or the like; self-satisfaction or smug satisfaction with an existing situation, condition, etc.

Complacency is defined as satisfaction with a situation to the extent that the degradation of vigilance occurs.

Put simply, a complacent person fails to pay attention when performing a task.

This, in turn, normally leads to error or deviations from SOPs.

Three primary factors encouraging complacency are . . .

- 1) Fatigue
- 2) Too many things happening simultaneously
- 3) Too few things happening

A major problem with complacency is repetitive tasks. Repetitive tasks like checking rivets, or inspecting air-frame and hardware for stress cracks becomes a real issue.

Safety Nets for Complacency

1. Never sign for anything you didn't do or see done.
2. Train yourself to find fault.

Knowledge . . . cuts straight to the heart of competency.



Competency must be demonstrated in

1. Knowledge
2. Application
3. Skill

Knowledge is a prerequisite.

Safety Nets for Knowledge

1. Get type training
2. Use current manuals
3. When you don't know ask someone

Distraction is the cause of about **15%** of all maintenance errors.

Distraction . . . occurs when one leaves a task physically or mentality.

Selective Attention occurs when a person is monitoring several sources of input, with greater attention being given to one or more sources which appear more important. This is the **cocktail effect**, like a person at a party who overhears their name.

Focused attention is merely the skill of focusing one's attention upon a single source and avoiding distraction.

Cognitive 'blackholing' is the negative side of focused attention, where attention is so focused on one area that other important information is not noticed.

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Divided attention is common in most work situations, where people are required to do more than one thing at the same time. Usually, one task suffers at the expense of the other, more so if they are similar in nature.

Sustained attention as its name implies, refers to the ability to maintain attention and remain alert over long periods of time, often on one task

Safety Nets for Distraction

1. Finish job or disconnect
2. Mark incomplete work
3. Double Inspect
4. Go back 3 steps when returning to job

Lack of Teamwork . . . it is hard to do everything alone

Safety Nets for Teamwork

1. Discuss what, who and how a job is to be done.
2. Be sure everyone understands and agrees.



Fatigue . . . can be either physiological or subjective.

Physiological fatigue reflects the body's need for replenishment and restoration.

This type of fatigue is impacted by . . .

recent activity level overall health alcohol consumption circadian rhythms

Subjective fatigue is an individual's perception of how sleepy they feel.

This type of fatigue is based upon
recent sleep activity motivation environment

Review the 5 Stages of Sleep

Get quality sleep.

Safety Nets for Fatigue

1. Be aware of the symptoms and look for them in yourself and others.
2. Plan to avoid complex tasks at the bottom of your circadian rhythm.
3. Sleep and exercise regularly.
4. Ask others to check your work.
5. Use common sense.

Lack of Parts . . . it is hard to overcome, produces stress . . .

Safety Nets for Lack of Parts

- 1) Know all available parts sources and arrange for a pooling or loaning.
- 2) Maintain a standard and if in doubt ground the aircraft.
- 3) Anticipate, order and stock parts.

Pressure . . . comes from within and without . . .



Pressure can . . .
accelerate a circumstance
compound a problem
be the last straw in a series of events.
very damaging.

Safety Nets for Pressure

- 1) Communicate your concerns and your feelings to others . . . sometimes this acts as a good relief valve.
- 2) When the pressure gets to great ask for help.
- 3) Just say “No”. There are times when other solutions don’t work, you may want to avoid the situation completely.

Stress . . . is a part of life, but excessive stress is trouble . . .



Safety Nets for Stress

- 1) Be aware of how stress can effect your work.
- 2) Stop and look rationally at the problem.
- 3) Determine a rational course of action and follow it.
- 4) Take time off at least have a short break.
- 5) Discuss it with someone.
- 6) Exercise your body.

Lack of Situational Awareness . . . can be catastrophic

Situation Awareness relates to maintaining a collective awareness (or consciousness) of important job-related conditions and events.

Safety Nets

1) Shared Mental Models

A mental model is simply how to depict a system mentally--how the subsystems are put together and how the system works. Such shared mental models are provided by developing a good understanding of what other team members know, don't know, or need to know.

Team members need to share not only data, but also the significance of data relative to their jobs and the team's goals.

Good situational awareness at the team level depends on all team members having a clear understanding of what information means when it is conveyed to team members.

2) Verbalization of decisions.

At times team members may find it necessary to take actions that deviate from the norm or are otherwise unexpected.

These unexpected actions may cause confusion or other adverse reactions by other team members.

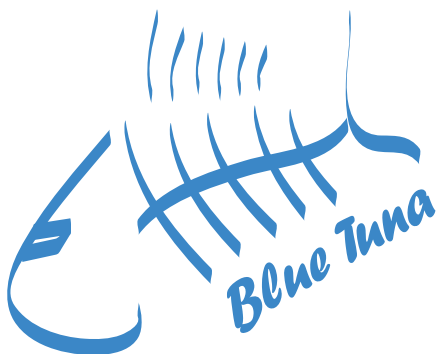
It is very difficult to know why a team member has taken a course of action unless he or she tells us.

Individual team members need to do a better job of communicating information regarding why they decide to (or not to) take a particular course of action.

3) Team meetings

Team meetings are critical to sharing valuable and necessary information.

Team meetings may be used to share information among team members on the same shift and for passing information across shifts.



An Abundance of Norms

Norms are an adaptation of behavior that is informally determined by the group as a whole. These behaviors may exceed shop rules or they may fall short. *Typically they arise from ambiguous situations.*

Here is how it works . . .

When faced with an ambiguous situation, an individual may use another's behavior as a frame of reference around which to form his or her own reactions.

As this process continues, group norms develop and stabilize.

Newcomers to the situation are then accepted into the group based on adherence to norms.

Very rarely do newcomers initiate change in a group with established norms.

Here is the problem . . .

Some norms are unsafe in that they are non-productive or detract from the productivity of the group.

Taking shortcuts in aircraft maintenance, working from memory, or not following procedures are examples of unsafe norms. 1) Always work as per the instructions or have the instructions changed.

2) Be aware that "norms" don't make it right.

Safety Nets for Norms

1) Always work as per the instructions or have the instructions changed.

2) Be aware that "norms" don't make it right.

Assertiveness . . . means to be inclined to bold or confident assertion, to be self-assured.

Safety Nets for Assertiveness

1) Refuse to compromise the standard.