Avoid the Dirty Dozen

12 Common Causes of Human Factors Errors

About 80 Percent of Maintenance Mistakes Involve Human Factors
... and if Not Detected... Would Lead to Accidents.

Put Safety First and Minimize the 12 Common Causes of Mistakes in the Aviation Workplace

1. Lack of Communication
   - Failure to transmit, receive, or provide enough information to complete a task. Never assume anything.
   - Only 30% of verbal communication is received and understood by either side in a conversation. Others usually remember the first and last part of what you say.
   - Improve your communication—
     - Say the most important things in the beginning and repeat them at the end.
     - Use checklists.

2. Complacency
   - Overconfidence from repeated experience performing a task.
   - Avoid the tendency to see what you expect to see—
     - Expect to find errors.
     - Don’t sign off if you didn’t do it.
     - Use checklists.
     - Learn from the mistakes of others.

3. Lack of Knowledge
   - Shortage of the training, information, and/or ability to successfully perform.
   - Don’t guess, know—
     - Use current manuals.
     - Ask when you don’t know.
     - Participate in training.

Avoid These Common Causes of Mistakes in the Aviation Workplace

4. Distractions
   - Anything that draws your attention away from the task at hand.
   - Distractions are the #1 cause of forgetting things, including what has or has not been done in a maintenance task.
   - Get back in the groove after a distraction—
     - Use checklists.
     - Go back 3 steps when restarting the work.

5. Lack of Teamwork
   - Failure to work together to complete a shared goal.
   - Build solid teamwork—
     - Discuss how a task should be done.
     - Make sure everyone understands and agrees.
     - Trust your teammates.

6. Fatigue
   - Physical or mental exhaustion threatening work performance.
   - Eliminate fatigue-related performance issues—
     - Watch for symptoms of fatigue in yourself and others.
     - Have others check your work.

7. Lack of Resources
   - Not having enough people, equipment, documentation, time, parts, etc., to complete a task.
   - Improve supply and support—
     - Order parts before they are required.
     - Have a plan for pooling or loaning parts.

8. Pressure
   - Real or perceived forces demanding high-level job performance.
   - Reduce the burden of physical or mental distress—
     - Communicate concerns.
     - Ask for extra help.
     - Put safety first.

9. Lack of Assertiveness
   - Failure to speak up or document concerns about instructions, orders, or the actions of others.
   - Express your feelings, opinions, beliefs, and needs in a positive, productive manner—
     - Express concerns but offer positive solutions.
     - Resolve one issue before addressing another.

10. Stress
    - A physical, chemical, or emotional factor that causes physical or mental tension.
    - Manage stress before it affects your work—
      - Take a rational approach to problem solving.
      - Take a short break when needed.
      - Discuss the problem with someone who can help.

11. Lack of Awareness
    - Failure to recognize a situation, understand what it is, and predict the possible results.
    - See the whole picture—
      - Make sure there are no conflicts with an existing repair or modifications.
      - Fully understand the procedures needed to complete a task.

12. Norms
    - Expected, yet unwritten, rules of behavior.
    - Help maintain a positive environment with your good attitude and work habits—
      - Existing norms don’t make procedures right.
      - Follow good safety procedures.
      - Identify and eliminate negative norms.

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The Human Factors “Dirty Dozen”

1. Lack of communication
2. Complacency
3. Lack of knowledge
4. Distraction
5. Lack of teamwork
6. Fatigue
7. Lack of resources
8. Pressure
9. Lack of assertiveness
10. Stress
11. Lack of awareness
12. Norms

Definition
It is now a cornerstone of Human Factors in Maintenance training courses worldwide. The Dirty Dozen refers to twelve of the most common human error preconditions, or conditions that can act as precursors, to accidents or incidents. These twelve elements influence people to make mistakes.

Countermeasures
The Dirty Dozen list has increased awareness of how humans can contribute towards accidents and incidents, so the focus of attention and resources can be put towards reducing and capturing human error. Countermeasures listed below

Lack of communication
Often top in accident reports – failure to transmit receive or provide enough info. Never assume anything. Often unclear, inaccessible & misunderstood Assumptions made to the meaning or if received & understood 30% of verbal messages are correctly received & understood - Detailed info needs to be passed before, during & after a task (shifts) - Complex need to be written down

Written
- Logbooks, Worksheets, checklists
Verbal
- Keep short
- Emphasize critical parts at start & repeat at end

Complacency
Overconfidence from repeated experience performing a task. Routine work now habitual & “easy & safe” Feeling of self-satisfaction, not aware of potential dangers General relaxation of vigilance results and important signals missed & only see what expects to see. Also in a highly intense activity such as recovering from a possible disaster; the relief felt at the time can result in physical relaxation and reduced mental vigilance and awareness (Lacana) Either too much pressure and demand (over stress) or under-stress (boredom, complacency) both give reduced performance

Routine tasks (fatigued)
- Maintain adequate/optimum stress – different stimulation
- Expect to find a fault
- Add written instructions, checklists
- Inspection routines. Only sign if do it
- Not work from memory, cross check
- Learn from errors

Lack of Knowledge
Lack of on-the-job experience, training, ability and specific knowledge can lead workers into misjudging situations and making unsafe decisions. Systems and procedures can change employees’ knowledge can quickly become out-of-date. Employees to undertake continuing professional development and for the most experienced workers to share their knowledge with colleagues. Look at human error performance, not a sign of weakness

Written
- Continuing professional development
- Share experience, manuals, procedures
- Incl human error performance
- Encourage help for info - ask
- Checklist followed – approp training
- No assumptions from memory

Distraction
No 1 for forgetting as draws attention away from the task on which they are employed. Avoid distracting & being distracted. We think ahead so when returning to task actually think you are further ahead than are Some unavoidable (loud noise, request assistance, safety problem solving) Avoid or delay: messages from home, Mgt non-immediate decisions i.e. shift patterns leave entitlement, meeting dates, administrative tasks

Clear defined
- Select team (experience, cover)
- Discuss aims & goals, roles, respons’y
- Communicate methods, limits
- Expectations, emergency procedures
- Trust, outcomes, debrief, OFI

Lack of Teamwork
Failure to work together to complete task: No single person (or org) is responsible for the safe outcomes of all tasks, but poor contribution can lead to unsafe outcomes. All parties must give support & rely on each & prove competence Key: competence, leadership, effective communication, trust, motivation Effective team: discussed, clarified, agreed, and understood by all parties,

Self Management
- Look awareness of signs & symptom
- Regular sleep, good diet & exercise
- Don’t underestimate & how cope
- Don’t work in low body points i.e. 03.00-05.00am & check work
- Check work

Fatigue
Physical or mental exhaustion threatening work performance A natural physiological reaction to prolonged physical and/or mental stress Become fatigued following long periods of work and hard work If chronic (no self medication) More fatigue: ability to concentrate, remember and make decisions reduces So easily distracted & lose situational awareness. Also affect mood, can be more withdrawn, irrational & angry

Check work

- Look/awareness of signs & symptom
- Regular sleep, good diet & exercise
- Don’t underestimate & how cope
- Don’t work in low body points i.e. 03.00-05.00am & check work
- Check work

Lack of awareness

12. Norms

- Look at experienced workers to share their knowledge with colleagues.
- Incl human error procedures can change employees’ knowledge can lead from repeated experience performing a task. Routine work now habitual & “easy & safe” Feeling of self-satisfaction, not aware of potential dangers General relaxation of vigilance results and important signals missed & only see what expects to see. Also in a highly intense activity such as recovering from a possible disaster; the relief felt at the time can result in physical relaxation and reduced mental vigilance and awareness (Lacana) Either too much pressure and demand (over stress) or under-stress (boredom, complacency) both give reduced performance

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Lack of Resource
Lack of/not available (people, equipment, documentation, time, parts) to complete a task, then there may be pressure to complete using old, or inappropriate parts. Regardless of the task, resources include personnel, time, data, tools, skill, experience and knowledge etc. A lack of any of these resources (may ne of low quality or inadequate) can interfere with one’s ability to complete a task. Correct resource assists effective completion

Pressure
Real or perceived forces demanding high level of performance. Pressure is to be expected when working in a dynamic environment but pressure to meet a deadline can interfere with ability to complete (too much) i.e. Quantity versus Quality (do not reduce quality) Pressure can be created by lack of resources, especially time; own inability to cope with a situation, direct, or indirect, pressure from the Co or colleagues Most common is ourselves: take on more than an handle (others problems), saving face, promoting powers don’t possess. Assumptions of what is expected

Lack of Assertiveness
Failure to speak up or document concerns: instructions, orders or others actions If self or others are unable to express concerns creates ineffective communications and damages teamwork. Unassertive team members can be forced to go with a majority decision, even when they believe it is wrong and dangerous to do so. Assertiveness is a communication and behavioural style that allows us to express feelings, opinions, concerns, beliefs and needs in a positive and productive manner. When assertive it invites and allows others to assert themselves without feeling threatened, undermined or that we’ve lost face. Speaking one’s mind assertively is not to be confused with aggression. It is about communicating directly, but honestly and appropriately; giving respect to the opinions and needs of others, but not compromising our own standards.

Stress
A physical, chemical or emotional factor that causes physical or mental tension Many types of stress mainly acute and chronic Acute: real-time demands placed on our senses, mental processing, physical body i.e. dealing with emergency, working under time pressure, inadequate resources Chronic: accumulated, results from long-term demands placed on the physiology by life’s demands i.e. family, relations, finances, illness, bereavement, divorce Result: threshold of reaction to demands and pressure at work can be lowered. Thus at work, we may overreact inappropriately, too often and too easily. Lack of stimulation (covers under complacency) Early signs: changes in personality and moods, errors of judgement, lack of concentration and poor memory, difficulty sleeping, increased fatigue, digestion Long term: susceptibility to infections, increased use of stimulants and self-medication, absence from work, illness and depression.

Lack of Awareness
Failure to recognise a situation, understand what it is & predict results Working in isolation and only considering one’s own responsibilities can lead to tunnel vision; a partial view, and a lack of awareness of the affect our actions can have on others and the wider task. Such lack of awareness may also result from other human factors, such as stress, fatigue, pressure and distraction. Build experience, roles & responsibilities of teams, develop foresight, question “what-if”, check, challenge develops experience. Vigilance

Norms
Expected yet unwritten rules & behaviour - workplace practices develop over time, through experience, and often under the influence of a specific workplace culture. These practices can be both, good and bad, safe and unsafe; they are referred to as “the way we do things round here” and become Norms. Unfortunately such practices follow unwritten rules or behaviours, which deviate from the required rules, procedures and instructions. These Norms can then be enforced through peer pressure and force of habit. It is important to understand that most Norms have not been designed to meet all circumstances, and therefore are not adequately tested against potential threats.