

HUMAN ERROR

Human error is involved in over 80% of maintenance mistakes. It is not because those involved are not skilled or professional. Human error is inevitable whenever people are involved in a task. We can work to:

1. Minimize that error.
2. Identify when it occurs.

Top concepts for limiting human error include:

1. **Fatigue Management** – After 18 hours of being awake, human performance is comparable to that of an intoxicated person. Studies have shown that individuals working 12-hour days are twice as likely to be injured at work vs. someone working an 8-hour day. Set maximum duty day limits and minimum rest periods between shifts and stick to them.
2. **Distractions** – limit distractions when maintenance personnel are working on aircraft. Policy and procedures should limit phone calls, non-essential conversation from other employees and pulling personnel away for other tasks while in the middle of maintenance.
3. **Staffing** - Staffing levels determine workload on employees maintaining aircraft. Higher workload = higher risk of human error. High workload also increases the likelihood of aircraft being unavailable for agency operations. Staffing must consider both scheduled maintenance and inevitable unscheduled maintenance.

DIRTY DOZEN

The 12 Common Causes of Human Factors Errors in Maintenance:

1. Lack of Communication
2. Complacency
3. Lack of Knowledge
4. Distractions
5. Lack of Teamwork
6. Fatigue
7. Lack of Resources
8. Pressure
9. Lack of Assertiveness
10. Stress
11. Lack of Awareness
12. Norms

SAFETY IS NO ACCIDENT

TOOL CONTROL

- Tools left inside the aircraft after maintenance is a frequent cause of aircraft incidents. This hazard can be controlled with a tool control system.
- No tool control system is perfect. Have two layers of safety:
 1. Physical Control – Foam organizers, electronic tracking, shadowed storage...
 2. Quality Control Inspections – have other maintenance or aircrew check for tools left behind. USE A CHECKLIST!
- Do not forget to control 'consumables' such as rags, disposable brushes, etc.

SMS

A **Safety Management System** will give you the means to control all of the risks listed in this pamphlet:

1. Prioritized Risk Management based on *real threats* to your operation instead of guesses
2. **The opportunity to stop hazards before they cause an incident**
3. A clear view of your Return on Investment and impact on safety
4. **Ability to identify and correct failing safety policies or procedures**
5. **Free SMS tools** and Unit Manager Safety training can be found on the website:
<http://www.alea.org/safety>

CRITICAL TIPS

- 1 Establish a Safety Management System (SMS) and include maintenance.
- 2 Have a fatigue policy that covers maintenance.
- 3 Send maintenance staff to refresher training at least once a year.
- 4 Have a tool control system.
- 5 Have a distractions policy.
- 6 Employ enough staff to cover planned and unplanned maintenance workload.
- 7 Have an Emergency Response Plan in place to deal with agency aircraft incidents and accidents. Include maintenance tasks in the plan to secure, investigate cause and recover the aircraft.
- 8 Use a Risk Assessment Tool to reduce human error in maintenance.
- 9 Follow PSAAC Standards and consider accreditation. Do a gap analysis to see how your unit measures up to industry standards.

MAINTENANCE RELATED DATA

ALEA Database: 2000 - 2017
Mechanical Related Accidents

Engine Failure	26
Drive Shaft Failure	2
Control Linkage	2
Tail Rotor	3
Component Fatigue	4

Note: These accidents are not all related to 'human error'. See next page

Maintenance Staffing Survey

Average maintenance staffing:
1.6 people per 2 aircraft

Average flight hours:
702 hours per mechanic

Staff with Inspection Authorization:
1 per 2.7 aircraft

Reason fleet was grounded:
Not enough maintenance staff – 47%

AVIATION MAINTENANCE & SAFETY

AIRBORNE LAW ENFORCEMENT ASSOCIATION



CRITICAL CONCEPTS:
MAINTENANCE
IN PUBLIC SAFETY
AVIATION OPERATIONS