

Maintenance Human Factors Presentation System

Human Error

Prepared by
Aviation Safety Organization
Flight Standards Service

Animations provided by  **Lufthansa
Technical Training**

[Video Instructions for
Presenter – Click here](#)



Federal Aviation
Administration



5 Human Error



Human Error

- Definition of human error
- Types of errors
- The “dirty dozen”
- Examples of errors
- Event investigations –
Maintenance Error
Decision Aid (MEDA)



The Greatest Hazard to Aircraft is...?

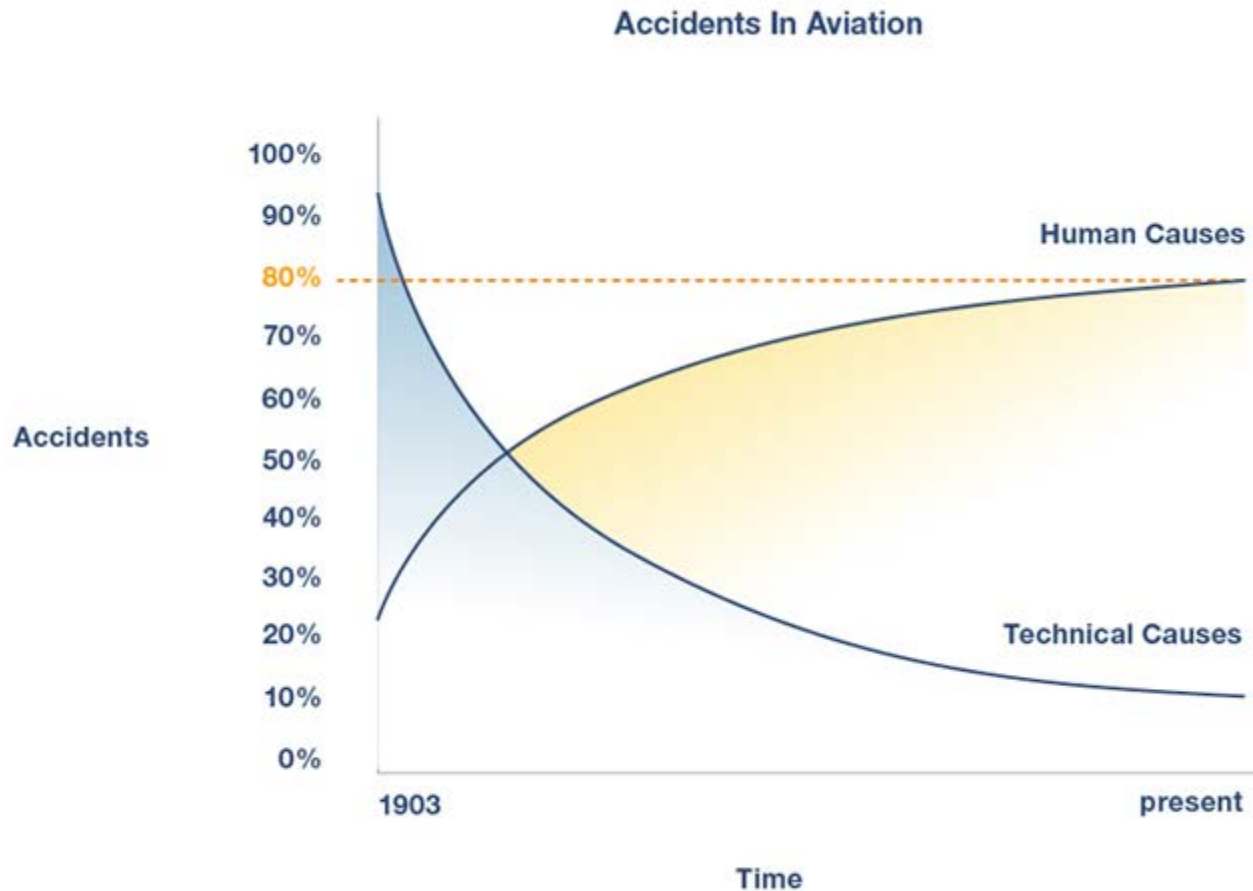
Gravity



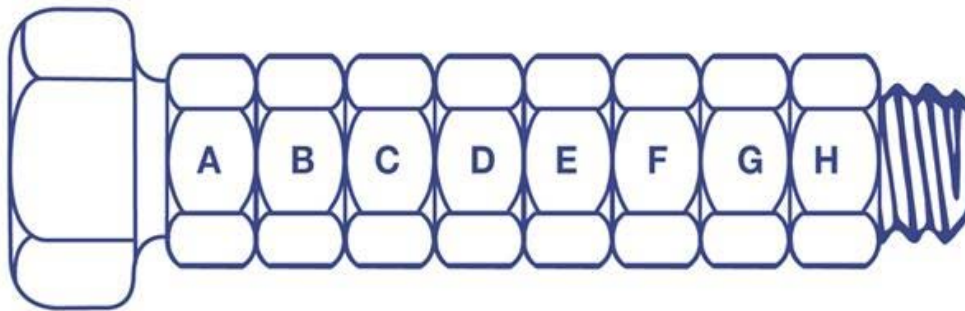
Humans



80% of Events are Caused by Human Error



The Odds are Against Doing it Right!



Only one way to
disassemble

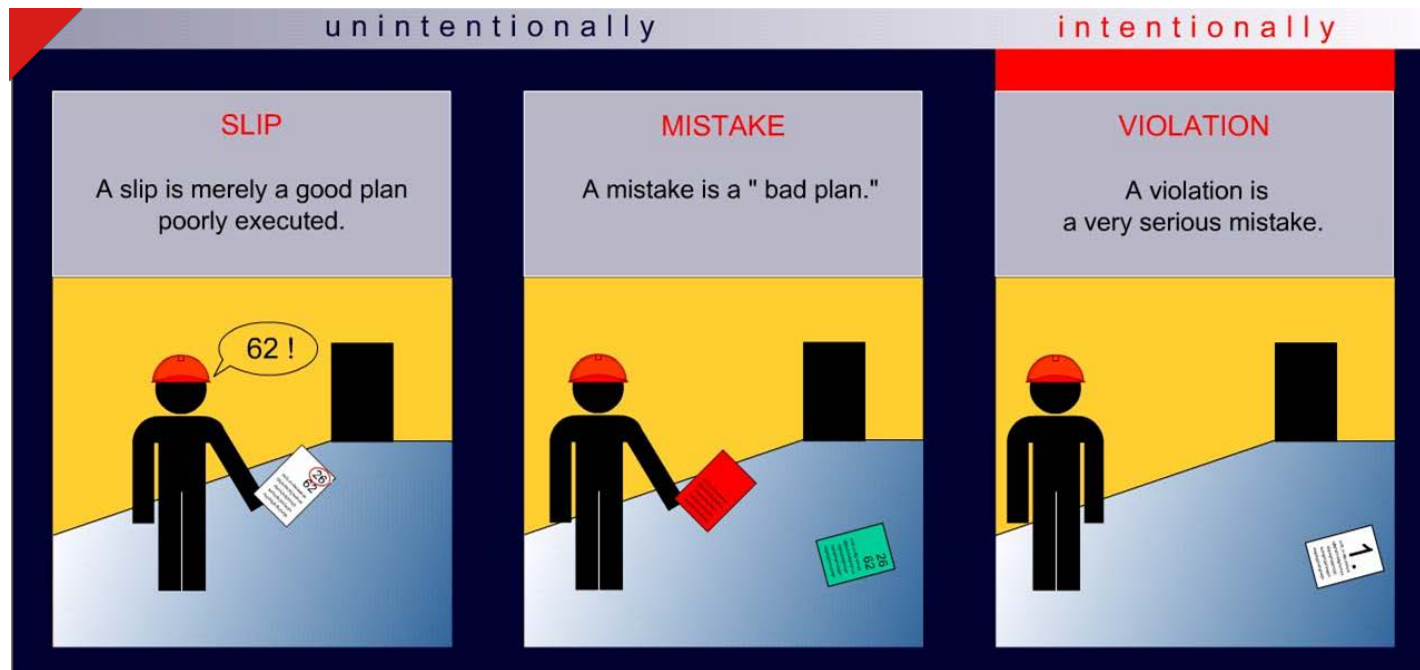
40,000+ ways to
incorrectly
reassemble!

Definition of Human Error

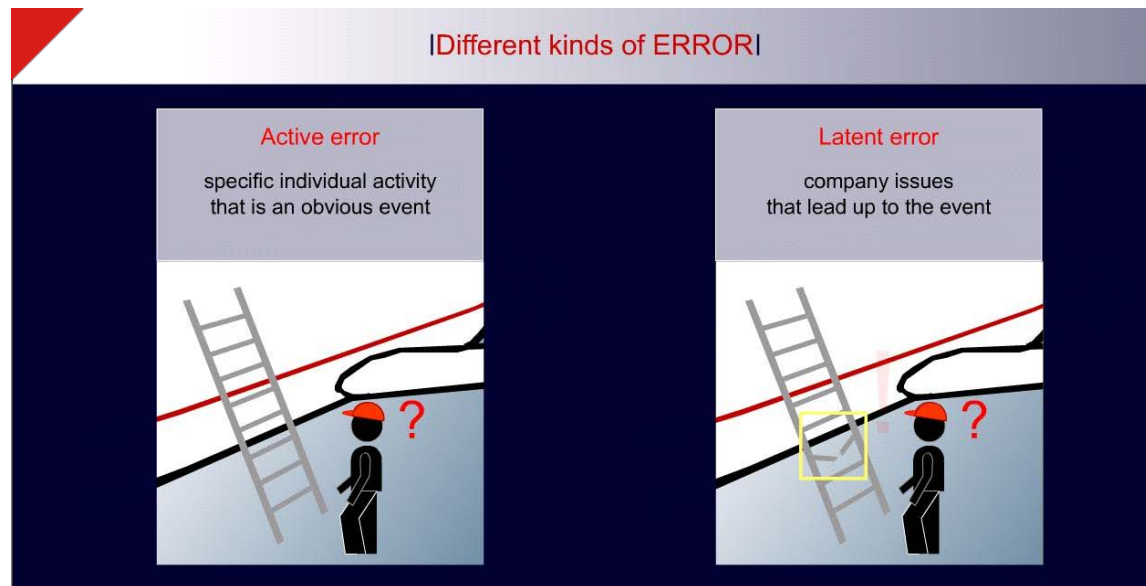


A human action with
unintended consequences

Types of Human Error



Active and Latent Errors



Why Things Go Wrong



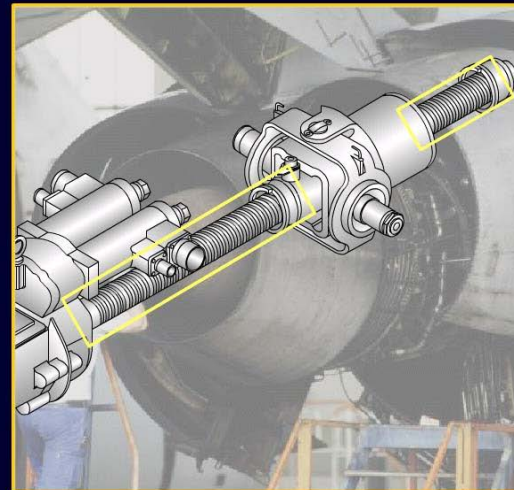
- Incomplete installation (33%)
- Damage on installation (14.5%)
- Improper installation (11%)
- Equipment not installed or missing (11%)
- Foreign object damage (6.5%)
- Improper troubleshooting, inspection, test (6%)
- Equipment not activated or deactivated (4%)

Data from Boeing study of 276 in-flight engine shutdowns (1994)

The Civil Aviation Authority's List of Errors

List of maintenance errors over 3 years

- 1.) Incorrect installation
- 2.) Electrical wiring
- 3.) Cross connections
- 4.) Forgotten tools and parts
- 5.) Failure to lubricate

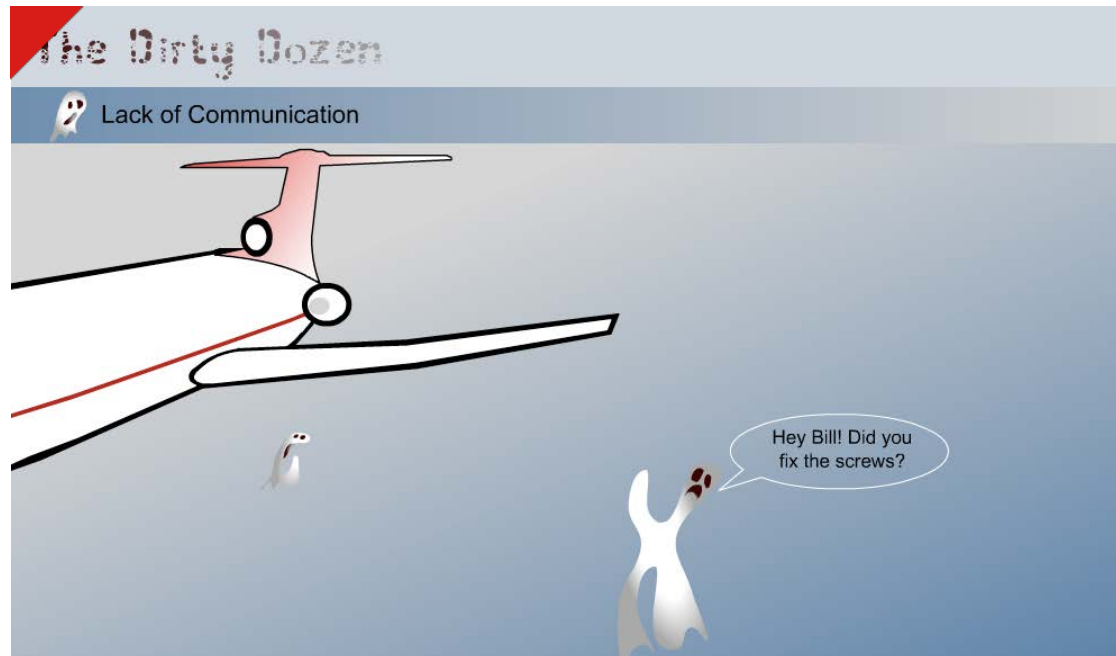


The 12 Most Common Causes for Human Errors



- Eliminate these causes and you have conquered most human errors
- Talk about each of these
- What are the causes in your company?
- What are the corrective actions?

Dirty Dozen — Lack of Communication



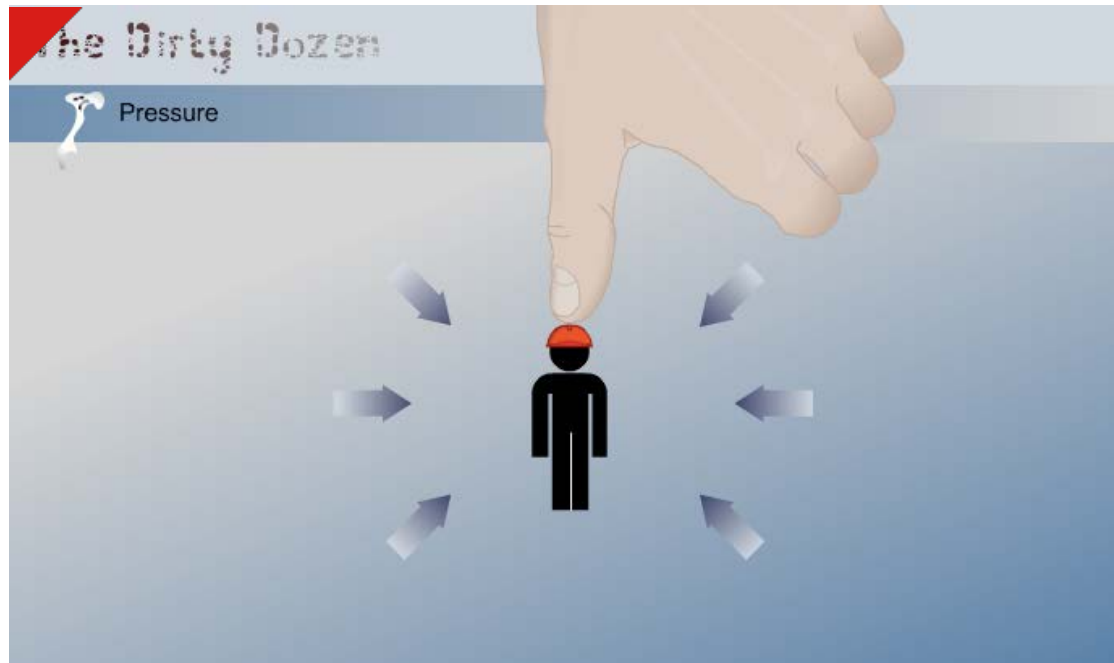
Dirty Dozen — Lack of Teamwork



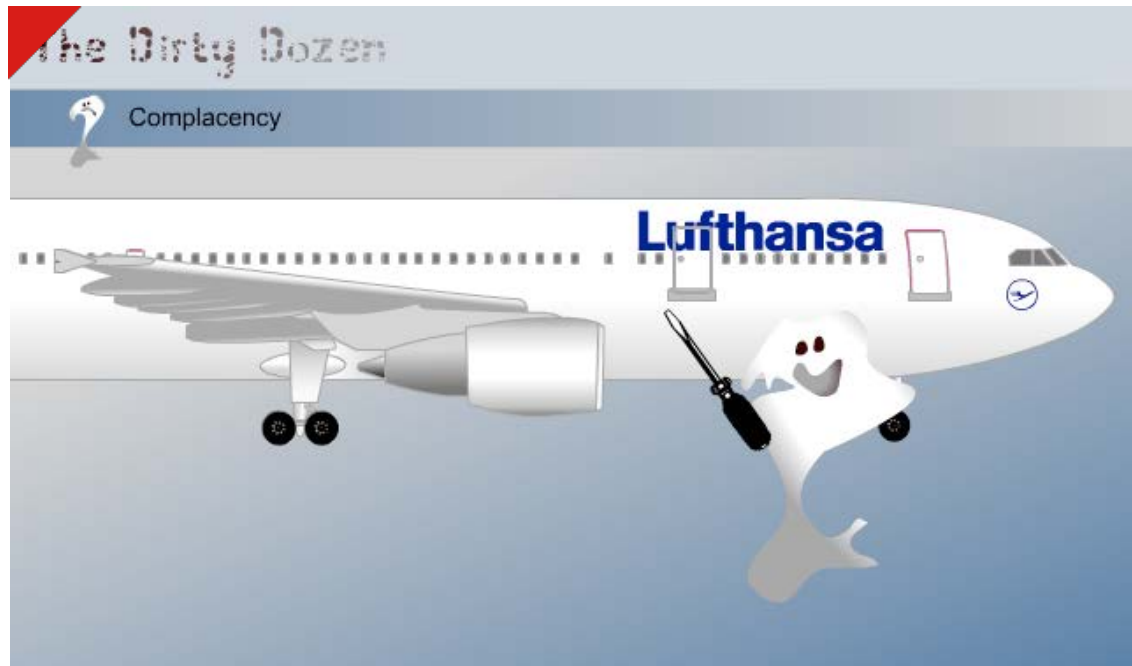
Dirty Dozen — Norms



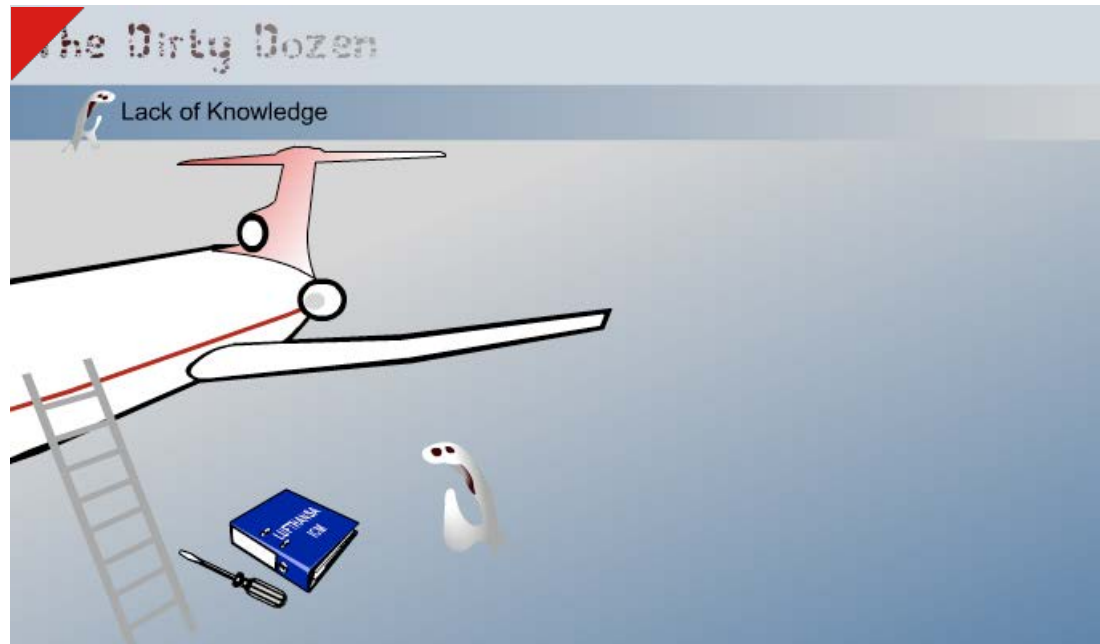
Dirty Dozen — Pressure



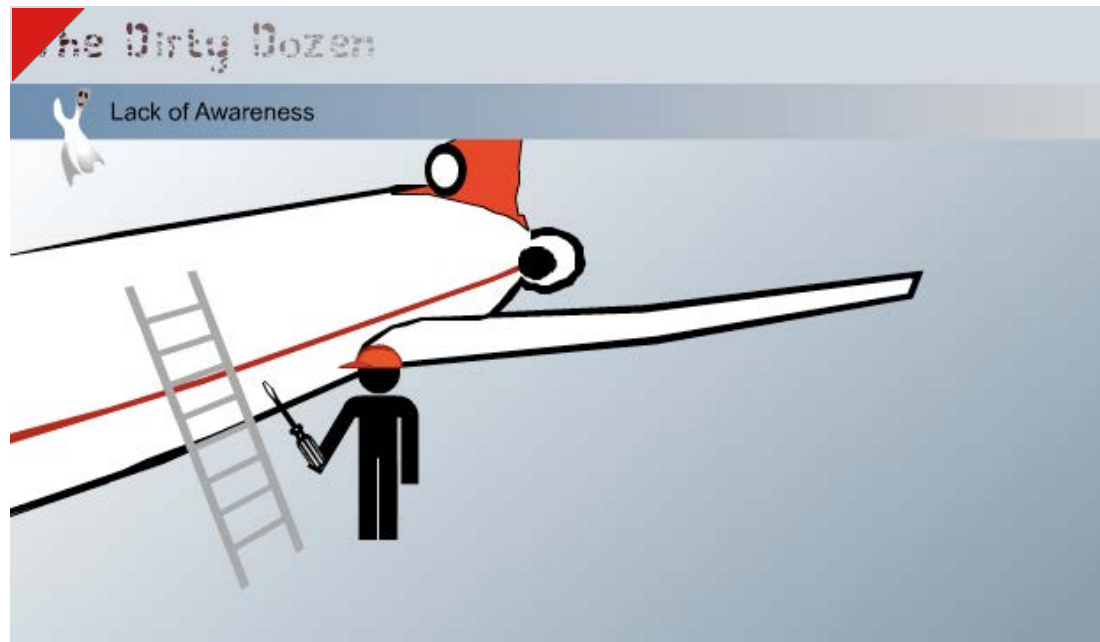
Dirty Dozen — Complacency



Dirty Dozen — Lack of Knowledge



Dirty Dozen — Lack of Awareness



Dirty Dozen — Lack of Resources



Dirty Dozen — Distraction



Dirty Dozen — Lack of Assertiveness



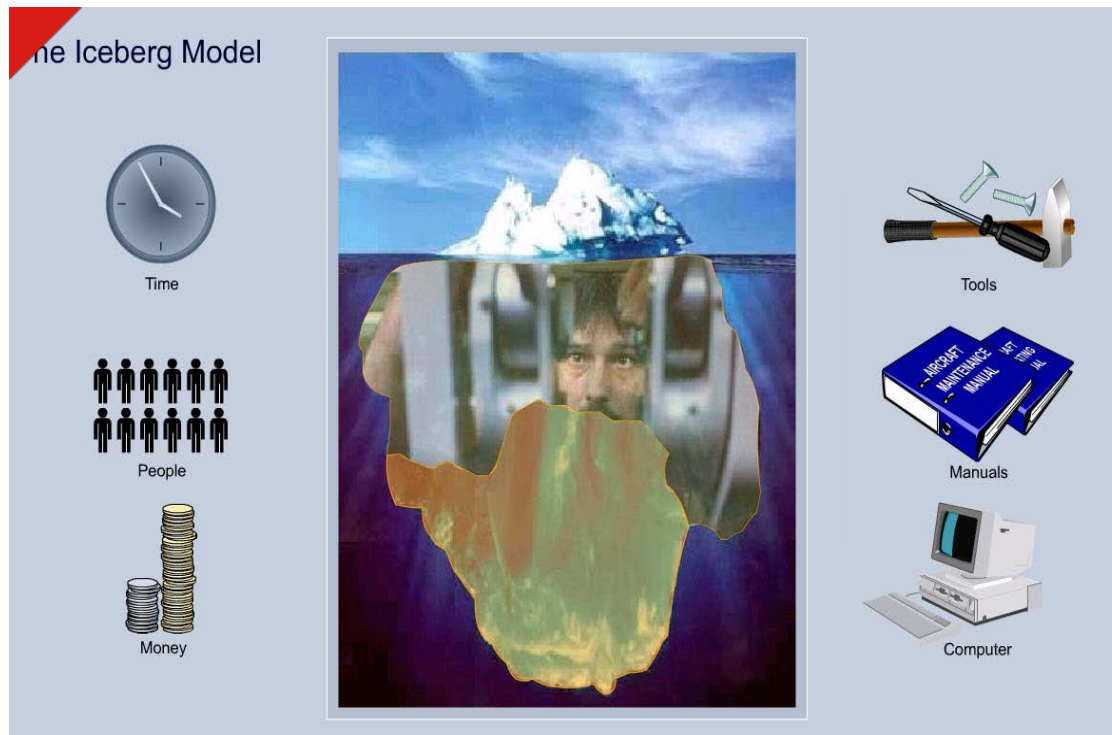
Dirty Dozen — Fatigue



Dirty Dozen — Stress



Iceberg Model



Event Investigation — MEDA



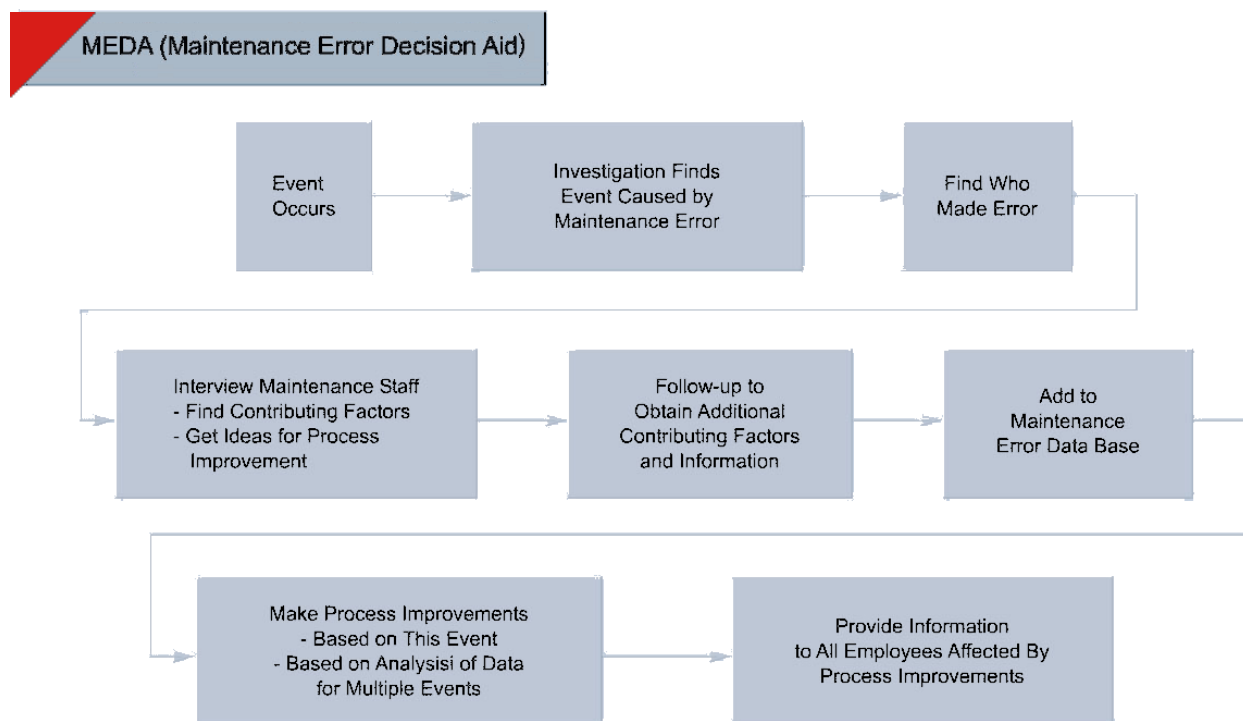
- Boeing's event investigation system
- Used by 500 airlines worldwide
- Finds the contributing factors

Performance Shaping Factors



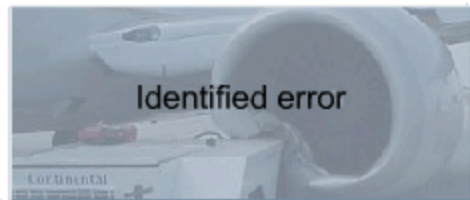
Anything that can increase or decrease the likelihood of human error.

MEDA Process



MEDA Corrective Actions

MEDA (Maintenance Error Decision Aid)



Noise



- Exposure to noise is cumulative
- People cannot adapt to high noise levels
- Noise interferes with communication
- OSHA requires hearing protection above 85 dbA
- Ear protection devices can also interfere with communication
- Noise increases the rate of errors