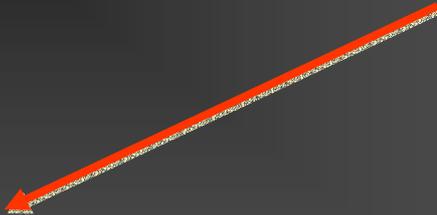




**Safety Issues
in
Ground & Maintenance
Operations**

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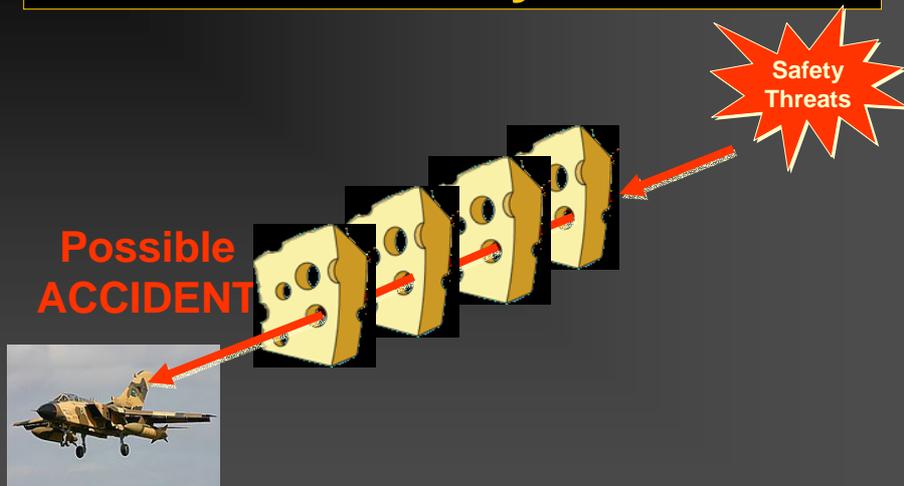
Flight operations vs. safety threats



Safety barriers



Holes in safety barriers



Outline

- **WHAT** are the human errors in maintenance?
- **WHY** do humans make errors in maintenance?
- **HOW** can we minimize human errors in maintenance?

What are the human errors?



Types of Errors (action based)

1. **Error of omission:**
Not performing an action
--simply just didn't do it
2. **Error of commission:**
wrong action
3. **Extraneous error:**
Performing an additional
wrong action



Types of human errors (time based)



Active Error:
Action with immediate
effects

Latent Error:
Action with delayed
effects

Top 8 maintenance errors

1. Incorrect installation of components
2. The fitting of wrong parts
3. Electrical wiring discrepancies (including cross connections)
4. Loose objects (tools, etc.....) left in aircraft
5. Inadequate lubrication
6. Cowlings, access panels and fairings not secured
7. Fuel/oil caps and refuel panels not secured
8. Landing gear ground lock pins not removed before departures

Why do humans make errors?



Causes of Human Factor Error “Dupont’s Dirty Dozen”

- 1) Lack of Communication
- 2) Lack of assertiveness
- 3) Complacency
- 4) Distraction
- 5) Lack of Teamwork
- 6) Fatigue
- 7) Lack of Resources
- 8) Pressure
- 9) Lack of knowledge
- 10) Stress
- 11) Lack of Awareness
- 12) Norms

Lack of awareness



Norms

- Positive norms have an overall positive effect on the organization.

Example:

Checking all “B” nuts by hand after the job is done

- Negative norms have a negative effect on the organization and have the potential to cause errors.

Negative norms : Ignoring a final walk-around before each flight



How can we minimize human errors in maintenance?



HFACS-Maintenance Extension

COMMAND CLIMATE

SUPERVISION

PRECONDITIONS

UNSAFE ACTS

Maintenance Error Decision Aid (MEDA)

- MEDA is a process that is used to investigate the causes of maintenance error.

