Managing Human Factors Risk

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Overview

What is Risk Management?
How do we manage risk in Flight Operations?
Safety Culture
Management Recognition Tools
Operational Mitigation Tools
Training/Feedback
Safety is *No* Accident

So in a safety critical business...........

...........how do we manage the risks?
Effective Risk Management

- Organisation
- Procedures/Technical
- Training
- Data
Layered Defences

Safety Threats

Flying Ops
Layered Defences

Safety Culture

SOPs

Technical

Training

Safety Threats

Flying Ops
Layered Defences

Erosion

Safety Threats

Flying Ops
Layered Defences

Erosion

Safety Threats

Flying Ops
Layered Defences

Erosion

Safety Threats

Flying Ops
Layered Defences

Erosion

Safety Threats

Flying Ops
Layered Defences Ineffective

Possible ACCIDENT

Safety Threats
Organisation – Key Ingredients

Strong Safety Culture

No Blame

Open Reporting
Procedures

Designed around TEM

Easily Understood

Consistently Applied

Acknowledge what experts do
Training

Blend of Technical and Human Factors

HF Common Language

Trainer Skills

Operational Rigour
Data

Air Safety Reports (MOR)

SESMA (FDR Data)

Incident Analysis (CTA)

Risk Assessment (RAT)
Potential Accident Types

- CFIT
- Collision – Mid-Air/Ground
- Loss of Control - Tech / Non Tech
- Runway Excursion
- Fire / Smoke / Fumes
- Security
Near miss example

Normal Touchdown zone (X) with planned roll out

Actual Touchdown (X) and rollout

35 knots fast

Approx 80 knots passing normal turnoff
Incident Analysis

HUMAN FACTORS
Mindset (Training)
Overload (SA)
Tunnel vision (SA)
Confidence (Training)
Incident debrief methodology

Traditional
- *analytical questioning supported by data*
  - (FDR/weather reports/ATC etc)
- *informs what happened and how*
- *Investigators to establish causal factors*

Cognitive Task Analysis
- *informs individual/crew understanding of SOPs, custom and practice (work-arounds), what happened, how it happened and why the crew did what they did*
- *better informs causal factors and remedies*
CTA Process – 3 Stages

1. Timeline with Key Events established beforehand

Q: What is the crew understanding of the procedure?

What actually happened?

2. Custom and Practice (e.g. commonly seen workarounds/time saving on the line?)

3. Incident Timeline

Timeline will contain relevant phases, decisions, procedures, checklists, etc.

Follow up areas

What actually happened?
CTA Output

Use output to:

Review/modify procedures
Review/modify training
Develop expertise
CTA Example – Taxi Incident

Summary: Aircraft attempted to taxi without flap and with personnel under aircraft

Approx Timeline

NORMAL PROCEDURE
- Start Procedure
- Push Back Procedure
- After Start Check List
- Taxi Clearance/Taxi

CUSTOM & PRACTICE
- Potential Distractions
- Time Pressure?
- Lack of Rigour?
- Time Pressure?

INCIDENT
- System warning
- Completed
- Not actioned
- No Flap & Personnel still under aircraft
CTA Taxi Incident Outcome

Output from taxi incident CTA used to:

- Change 2 SOP’s based on Crew feedback
- SESMA event for taxy no flap
- Check Ride feedback item introduced
- Develop generic distraction management training module for Sim Checks (all fleets)
Risk Assessment Tool (RAT)

What does it do?

.............and how does it do it?

Example
Aircraft does not land gear up

“AND” Relationship

Gear is selected down

Gear system operates successfully
Gear is selected down

Pilots are prompted to select the gear down

Pilots remembers to select the gear down

“OR” Relationship
**RAT Example**

- **Aircraft does not land gear up**
  - **Gear is selected down**
  - **Pilot remembers to select the gear down**
    - **Procedural selection as part of SOP's**
      - **Crew monitoring and checklist discipline**
        - **Horn prompt tied to flap/throttle**
          - **GPWS gear mode**
            - **Hydraulic pressure is available**
              - **Control system sequences correctly**
  - **Normal System works correctly**
  - **Alternate system works correctly**
  - **Gear system operates successfully**
- **Pilot is prompted to select the gear down**
  - **Pilot remembers to select the gear down**
In this case, the previous slide shows that the probability of an aircraft landing with the gear up is approximately once in 100 million flights.
Summary

Risk Management – closing thoughts………..

Tools

CTA - Cognitive Task Analysis
RAT – Risk Assessment Tool

Key points

1. Thinking of Safety in a different way
2. Never relax your effort - you are always cutting the grass!
Questions?