

CRM & the Integration of Human Factors into SMS



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safe skies for all

Background

- Definitions
- Case Study
- CRM - Principles
- SMS – Principles
- CRM & SMS (HF & NTS)
- Assessing Effectiveness?
- Learning Points

Human Factors (HF)

- The minimisation of human error and its consequences by optimising the relationships within systems between people, activities and equipment

CAAP SMS-1(0)

Crew Resource Management (CRM)

- A team training and operational philosophy with the objective of ensuring the effective use of all available resources to achieve safe and efficient flight operations

CAAP SMS-1(0)

Non-Technical Skills (NTS)

- The mental, social, and personal-management abilities that complement the technical skills of workers and contribute to safe and effective performance in complex work systems
- Competencies include:
 - Decision-making & situational awareness
 - Workload management & stress management
 - Team communication

CAAP SMS-3(1)

Safety Management System (SMS)

- An organised (systematic) approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures

ICAO SMM Doc 9859

Case Study: Kegworth – 1989



Kegworth...

- Left engine/right engine?
- No smoke...
- No notice of vibration indications – known to be unreliable (no sim training on new type)
- No communication from cabin...
- Procedure review – radio distraction

- Engine failure following a fan blade upgrade to an existing engine – therefore, no in-flight testing carried out

Captain & Copilot Comments

- Captain – “we were the easy option – the cheap option if you wish. We made a mistake – we both made mistakes – but the question we want answered is **why we made those mistakes**”
- Copilot – “pilot error is a very neat term. What they’re saying is that the people who made it, manufactured it and carried out all the specifications - got it right, **but the 2 chaps at the front got it wrong**. Straight away it sweeps all the problems under the mat”

CRM Principles...?

“effective use of all available resources”

- Simulator?
- Communication?
- Distraction?
- Situational Awareness?

SMS Principles...?

“organised (systematic) approach to managing safety”

- Safety culture?
- Acceptable v unacceptable behaviour?
- Non punitive?
- Commercial pressure (pilot error)
- Focus on the why?

HF Common Ground between CRM and SMS

- Both involve People!
- However, focus needs to remain on the 'Why' not the 'Who' - trust
- Both require HF & NTS training & awareness
- Both should focus on 'outcomes'
- Both need to be 'tailor-made'...therefore, culturally specific and operationally specific

SMS & Integration of HF Principles

Are HF principles:

- Included in the risk management process?
- Included in the management of change?
- Included in design and procurement (systems, equipment)?
- Included in job and task design (procedures)?
- Included in the selection and training of safety critical personnel?

SMS & Integration of HF Principles (cont'd)

- Included as contributing factors during safety reporting and flight data analysis?
- Are HF contributing factors a part of the event/incident/accident internal investigation process?
- Are personnel aware of HF issues and how to report as contributing factors?

Integration of CRM/NTS Training?

UK CAA:

- An integrated approach with existing systems of safety management
- Key principles:
 - Acceptance of human performance limitations
 - Promotion of a 'just' safety culture
 - Establishment of a learning organisation

Assessing Effectiveness (SMS)

Evidence of absence is not absence of evidence...

Effectiveness is achieved when the organisation has defined its safety policy that clearly states its intentions, safety objectives and philosophies and there is visible evidence of safety leadership and management 'walking the talk' and leading by example

UK CAA

Assessing Effectiveness - CRM

1. NOTECHS:

- Cooperation
- Leadership & Managerial Skills
- Situational Awareness
- Decision Making Flin et al, 2003

2. Assessing NTS by training and checking (practice and feedback)

3. Organisation's review of the impact on safety data

SMS and HF & NTS (CRM) – Learning Points from Industry

- Communication!
- Culture – within groups!
- Relevant scenario based training – best!



QUESTIONS...