

CREW RESOURCE MANAGEMENT (CRM)

HUMAN FACTORS

FIXED WING AERO MEDICAL ENVIRONMENT

INTRODUCTION - John Corcoran

- Airline Transport Pilot Licence
 - 14,000 flight hours
 - 2,500 hours - corporate jet
 - 5,000 hours aero medical operations
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- European Aviation Safety Agency (EASA) accredited CRM Instructor – Human Factors - Facilitator



**100 years of manned flight
Wilbur and Orville Wright
17th December 1903 - 17th December 2003**



**Hey Orville, they've rostered you for a
Crew Resource Management Human Factors Course**

Crew Resource Management (CRM)

Definition

Consists of all the knowledge, skills and roles used to most effectively direct, control and co-ordinate all available resources towards and safe and efficient operation

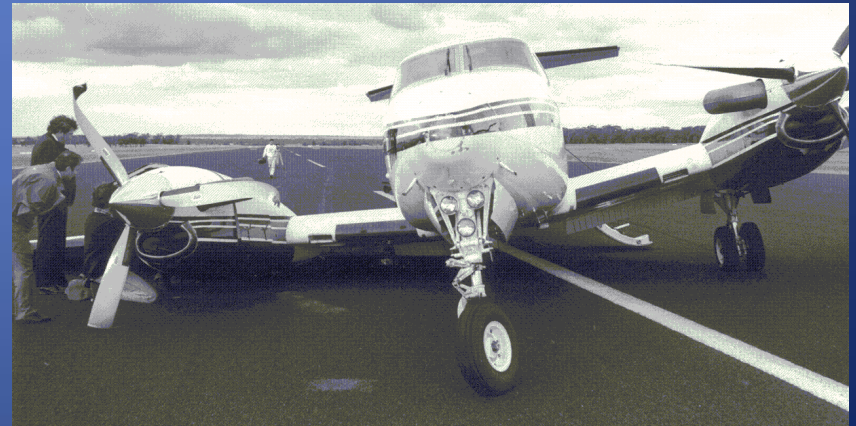
Human Factors - Definition

Human factors is all about recognising and accepting the limits of human performance. We all have certain capabilities and limitations. Human factors must be considered and factored when designing and or operating any complex system – i.e. aeroplanes

Aero Medical CRM – how important?



Aircraft Accidents



Aero Medical CRM - how important?



Aircraft Accidents



Asiana Airlines

Flight 214 – Boeing 777

San Francisco International Airport

06 July 2013



United Parcel Service - UPS Flight 1354 - Airbus A300F4 Birmingham Airport – Alabama - USA 14 August 2013



History

- CRM first introduced in the mid 1970's
- The British CAA mandated CRM training in 1993
- The USA FAA mandated CRM training in 1996
- The FAA mandated (Air Taxi) CRM Training on 23 March 2013

History - Australia

- Australian Airlines introduced Aircrew Team Management (ATM) for pilots only in 1985
- Ansett Australia introduced CRM training (including Cabin Crew) in 1996
- The Australian CASA mandate CRM for Regular Public Transport operations

CRM for Cabin Crew

- Early CRM training focused on 'pilot error' only!
- Several major airline accidents during the 80's and 90' highlighted the need to involve cabin crew in CRM training

British Midlands B737 – near Kegworth, UK - 8 January 1989



Overview

- Flight crew mistakenly shut down the right engine after a fan blade failure in the left engine!
- Captains P.A. reported trouble with the right engine!

Captains P.A.

“Ladies and gentlemen, we have had some problems with the right hand engine and are shutting it down. We will be landing at East Midlands in approximately 10 minutes”

Communication

- Cabin crew had an opportunity to pass on information to the flight crew that fire and smoke was coming out of the left engine!
- Cabin crew did not come forward to report that it was the left engine, not the right, which was emitting sparks and smoke!



Human Error – Red Flags

- Decision making
- Authority gradient
- Teamwork and synergy
- Appropriate assertion
- Communication
- Situational awareness



Human Error – Aero Medical

Error-free operations involving humans do not exist!

- Error **Prevention** measures are designed to limit error occurrence
- Error **Containment** measures are designed to limit the adverse consequences of those errors that still occur

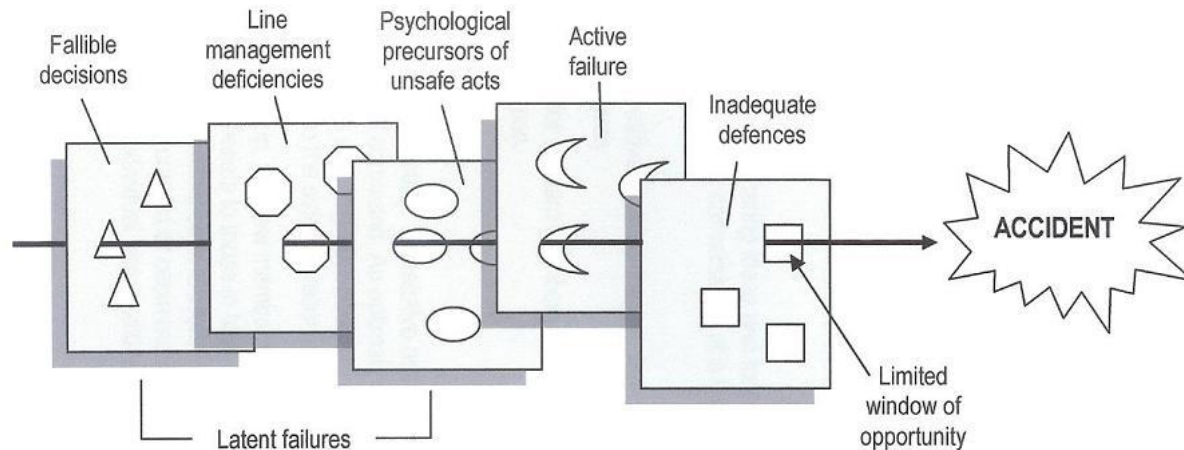
Error Prevention

Model of an Aircraft Accident

1.2.3 Model of an aircraft accident

THE REASON MODEL

Organisational Error Chain (from Reason 1990)

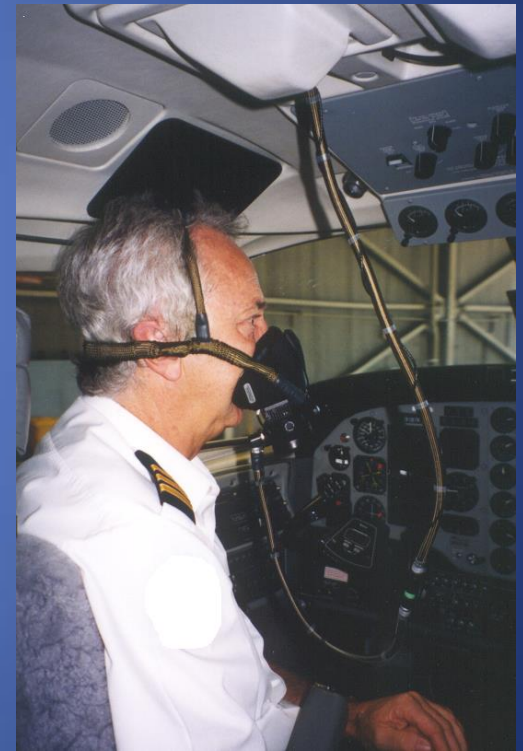


CRM - Aero Medical Error Prevention Measures

- Targeted Personnel Selection
- Training and Revalidation
- Line Checking
- Incident Reporting Systems
- Standard Operating Procedures
- Rules and Regulations



Training and Revalidation



Line Checking



Incident Reporting Systems



Standard Operating Procedures



Rules and Regulations



Further Recommendations

Sterile Flight Deck Procedures

Interruptions for Security, Safety, SOP reasons only!

- Door closed
- Cycle Seat Belt Sign – (10,000 feet)



- Prepare Cabin PA – (10,000 feet)
- Seat Belt Sign Off after landing

Further Recommendations

No Contact Period

- Beginning of the take-off roll to 'gear up'
- Landing gear down to stopped on the runway or taxiing clear of the runway



Further Recommendations
Aero Medical Crew Member
SILENT REVIEW - OLDABC

- Operation of Exits
- Location of Equipment
- Drills
- Able Bodied Passengers
- Brace Posture
- Commands



Further Recommendations

CRM - Aero Medical

Human Error **Prevention** Measures

- CRM – Human Factors - joint training sessions for Aero Medical flight and cabin crew members
- Subject material to capture the requirements of (European) Joint Aviation Requirements – JAR-OPS – CRM syllabus
- Syllabus tailored to Operator specific Aero Medical Operations

Automation and CRM



Automation - Definition

“The act or process of converting the controlling of a machine to a more automatic system, such as computer or electronic controls”



Frequent problems with Automation

- In the late 1990's the FAA conducted a study evaluating flight crew – flight deck interfaces
- The study looked beyond Human Error as to the cause of accidents/incidents and evaluated the automation side of aircraft

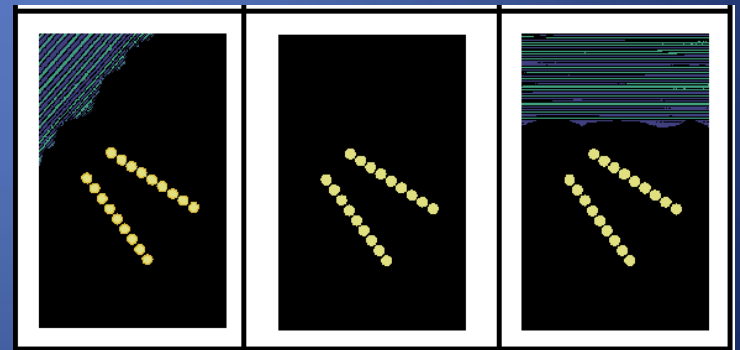
Problems

- Lack on monitoring
- Incorrect programming
- Distraction during programming
- Mismanagement / confusion



Problems

- Automation may demand attention
- Automation behaviour may be unexpected and/or unexplained
- Crew members become overconfident in handling automation
- Failure assessment may be difficult



“Big Ticket” – Problem!



SITUATION AWARENESS MAY BE REDUCED

- Reliance on automation may reduce pilots' awareness of the present and projected state of the aircraft and its environment, possibly resulting in incorrect decisions and actions

LOSS OF SITUATION AWARENESS

CONTROLLED FLIGHT INTO TERRAIN – CFIT

- King Air B200C Aeromedical – Mount Gambier, South Australia, 10 December 2001
- King Air B200C Aeromedical – Coffs Harbour, New South Wales, 15 May 2003



CRM – Human Factors – Aero Medical

Recommended Subject Material

- **Human error**
- **Teamwork and synergy**
- **Authority gradient**
- **Situational awareness**
- **Red flags**
- **Appropriate assertion**



CRM – Human Factors – Aero Medical

Recommended Subject Material

- Hazardous attitudes
- Stress/fatigue awareness
- Communication
- Decision making
- Priorities of flight



CRM – Human Factors – Aero Medical

At the end of the day CRM is all about staying safe. The ultimate aim of CRM is to allow human factors to be integrated into your safety culture as a professional Aero Medical Crew Member

You simply cannot afford to be the cause of a serious aircraft accident !

QUESTIONS?



Useful CRM Information



CAPTAIN MARTIN BOMILEY

JUST A ROUTINE OPERATION

CRM – HUMAN FACTORS

THANK YOU?

