



NATIONAL TRANSPORTATION SAFETY BOARD

**Office of Aviation Safety
Washington, D.C. 20594**

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Attachment 7: CRM PowerPoint

OPERATIONAL FACTORS

DCA17FA109



Crew Resource Management

WHAT IS CRM?

- Effective utilization of all available resources, liveware-hardware-software, to achieve safe & efficient flight operations
 - Liveware – flight crew, ATC, dispatch, maintenance, marshalers, loaders, etc.
 - Hardware – aircraft, emergency equipment
 - Software – manuals, documents, charts

WHY?

- CRM is good for error management
 - Reduces the human factors from the equation to aircraft accidents by implementing error countermeasures
- Three lines of defense
 - Avoid error using appropriate procedures & behaviors
 - Catch & trap error before becoming consequential
 - Mitigate error consequences

CRM SKILLS

- Effective communication
- Teambuilding
- Attitude & Performance
- Decision-making
- Situational awareness
- Workload management
- Stress management
- Error management

CRM SKILLS

- CRM skills are integrated with technical flying skills
 - Motor control – system/aircraft control, hazard recognition
 - Procedural activities – flight, emergency, ATC
 - Knowledge – SOP, FAR, ATC, WX, Aircraft Systems

EFFECTIVE COMMUNICATION

- Effective communication is considered as the most important skill for good CRM
 - When what you wanted to say was accurately said & heard
 - When you hear accurately what was intended to be said
- Barriers to communication
 - Mindsets
 - Lack of confidence
 - Anger/frustration
 - Effort to “save face”
 - Biased judgement
 - Emotional blocks
 - Habits of Interrupting
 - Status differences
 - Distractions
 - Daydreaming
 - Tunneled focus due to fear
 - Over certainty/confidence

COMMUNICATION TECHNIQUE

- Verify & Clarify
 - ATC – Climb to 5000
 - PNF – Climb to 5000
 - PF – We’re cleared to 5000, right?
 - PNF – Correct, 5000
- Assertive Behavior
 - Ability to state freely what you believe without being disrespectful or demeaning
 - 5 Step method to being assertive
 - Opening – address by name
 - State concern – “I feel _____ “
 - State problem – Clearly define the problem
 - Offer solution – At least one possible solution
 - Obtain agreement – “What do you think?”

COMMUNICATION TECHNIQUE

- Resolving Conflict
 - Avoiding
 - No desire to meet any needs at that time
 - Accommodating
 - Desire to meet other's needs at the expense of their own
 - Competing
 - Desire to meet own needs at the expense of the other's
 - Compromising
 - Meet partial needs of crewmembers
 - Collaborating
 - Desire to meet both crewmembers needs
- Crews who communicate more tend to perform better

TEAMBUILDING

- Teambuilding and maintenance are fostered by the Captain, but is not solely dependent upon the Captain
 - Elevate crew's team spirit
 - Look for commonalities
 - Accept differences in background/beliefs
 - Encourage participation in decision-making
 - Provide and ask for objective critique and feedback
 - Coordinate crew performance
 - Assign PF & PNF
 - Prioritize & distribute flying & non-flying tasks
 - Monitor & assess performance
 - Regulate & direct information
 - Communicate all pertinent flight information
 - Verify that all communications are accurately stated and received
 - Communicate all planned deviations from SOP's & obtain agreement

ATTITUDE AND PERFORMANCE

- The Five Hazardous Attitudes
 - Anti-authority
 - No one tells me what to do
 - Impulsiveness
 - Doing without thinking
 - Invulnerability
 - It won't happen to me
 - Macho
 - I can do anything
 - Resignation
 - What's the use

DECISION-MAKING

- Decision-making is the final responsibility of the Captain
 - Captains should consult all available resources and aids
- Five step process
 - RETAIN control of the aircraft
 - DEFINE the problem
 - REVIEW short-term objectives
 - EVALUATE alternatives
 - DECIDE on a course of action

SITUATIONAL AWARENESS

- Situational Awareness is knowing what is going on around you at all times
 - Aircraft attitude, altitude, position, speed
 - Fuel, time, & terrain constraints
 - Weather
 - Systems state
- Signs of diminishing situational awareness
 - Failure to meet targets
 - Departure from SOP's
 - Violating minimums, regulations, or limitations
 - No one flying the aircraft, or monitoring flight parameters
 - Ambiguity, confusion, uncertainty, uncomfortable gut feeling
 - Fixation or preoccupation
 - Incomplete communications, confused speech, or no response to inquiries

SITUATIONAL AWARENESS

- To increase other's situational awareness, use advocacy
 - State position
 - Suggest solutions
 - Be persistent & focused
 - Listen carefully
- To increase your own situational awareness, use inquiry
 - Decide what & how to ask
 - Ask clear, concise questions
 - Relate concerns accurately
 - Draw conclusions from the information
 - Keep an open mind to unlock mindsets

WORKLOAD MANAGEMENT

- When workload exceeds pilot capacity the potential for accidents increases
- Ways to defend against task overload
 - Preparation
 - Early & thorough briefings & missed approach planning
 - Structure the internal pace
 - Share duties, prioritize tasks
 - Decrease the external pace
 - Ask for delaying vectors or a hold
 - Vigilance
 - Never assume anything
 - Avoid complacency
 - As soon as you think something won't hurt you – It will
 - Avoid distractions

STRESS MANAGEMENT

- Techniques for Stress Management
 - Discussions among the crew
 - Optimistic self-talk
 - Constant cross check
 - Relax, deep breath
 - Play “what if?” game
 - Rehearse, plan, review
 - Get adequate rest
 - Exercise/eat nutritionally

ERROR MANAGEMENT

- Error management is when all the essential skills come together to prevent mishaps
 - Avoid Error
 - Use appropriate procedures and behaviors
 - Catch & Trap Error
 - Notice the error before it becomes consequential
 - Mitigate Error Consequences
 - If an error does happen, don't let more errors happen because of it



END