

Crew Resource Management

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Seven Skills

- Leadership
- Adaptability
- Assertiveness
- Communication
- Decision Making
- Mission Analysis
- Situational Awareness

Leadership

- Ability to direct and coordinate the activities of other crew members, and to encourage them to work together as a team

- Types of Leadership

1. Designated Leadership

- Responsible
- Makes final decisions
- Normal mode of Leadership

2. Functional Leadership

- Leadership by knowledge or expertise
- Occurs as need arises

- Responsibilities of Leadership
 - Crew performance
 - Direct actions
 - Ask for info and assistance

- Traits of an Effective Leader
 - Respected
 - Decisive
 - Delegates tasks
 - Provides feedback
 - Leads by example
 - Keeps crew informed
 - Open to suggestions
 - Builds team spirit
 - Directs and coordinates activities
 - Maintains professional atmosphere
 - Mission knowledge

Adaptability

- Ability to alter course of action when new information becomes available
- Situations requiring flexibility
 - Unbriefed situations
 - Emergencies
 - Crew incapacitation
 - Crew interactions

- Maintaining adaptability
 - Anticipate problems (Murphy)
 - Identify and acknowledge any change
 - Determine if a SOP or habitual response is appropriate
 - Offer alternative solutions
 - Provide and ask for assistance
 - Interact constructively with team

- Setting the tone for adaptability
 - Establish an open, professional atmosphere
 - Ensure the crew understands the mission

Assertiveness

- Willingness and readiness to actively participate, state and maintain a position
- Initiative and courage to act and adapt
- May exceed your comfort level. If so, speak up!
 - Comfort Level – The degree to which you feel comfortable with what is happening, while taking into account that flying a mission can be dangerous and demanding

- Barriers to assertiveness
 - Position of authority
 - Experience
 - Rank
 - Lack of confidence
 - Fear of reprisal

Communication

- Clear and accurate sending and receiving of information, instructions or commands
- Shared mental model
- Providing useful feedback

- Verbal
- Spoken
- Written
- Non-verbal

Process of Communication

1. Sender conveys ideas or information to receiver
2. Receiver takes in information
3. Receiver provides feedback

- **Sender's Responsibilities**
 - Communicate in appropriate mode
 - Verbal vs non-verbal
 - Convey information accurately, concisely and in standard formats
 - Provide information at appropriate time
 - Request verification or feedback
- **Receiver's Responsibility**
 - Actively listen
 - Active vs passive role
 - Take action as a result of communication
 - Respond to communications
 - Ask for clarification of unclear communication

- Barriers to Communication

- Noise

- Rank

- Technology

- Task overload

- Gender

- Attitudes

- Culture

- Language

Decision Making

- Ability to use logical and sound judgment to make decisions based on available information. This includes:
 - Assessing the situation
 - Verifying information
 - Identifying solutions
 - Anticipating consequences of decisions
 - Informing others of decision and rationale
 - Evaluating decisions

- Factors Which Promote Good Decision Making
 - Teamwork
 - Building time to make decision (Wind the clock)
 - Alert team members
 - Decision strategies
 - Experiences
 - Contingency plans

- Decision Making Strategy for Troubleshooting
 - Identify all of the symptoms
 - Make a hypothesis as to probable cause
 - Test your hypothesis
 - Consider appropriate remedies

- Barriers (and Mitigations) for Decision Making
 - Time
 - (Use SOPs, stop, hold, vector, divert)
 - Inaccurate or ambiguous information
 - Cross check or request more info
 - Pressure to perform
 - Evaluate rationale for decision
 - Rank difference
 - Use assertive behavior

- Decision Strategy for Risk Assessment

- Perceive

- PAVE

- People
 - Aircraft
 - enVironment
 - External Pressures

- Process

- CARE

- Consequences
 - Alternatives
 - Reality
 - External Pressures

- Perform

- TEAM

- Transfer
 - Eliminate
 - Accept
 - Mitigate

- Or Ask-Assess-Act

- Good decision making skills optimize risk management and minimize errors
- Poor decision making and faulty judgment is a leading cause of mishaps and mission failures.
- Define mission

Mission Analysis

- Ability to develop short term, long term and contingency plans
- Ability to coordinate, allocate and monitor system resources

- Phases of Mission Analysis
 - Premission/Preflight
 - Inflight
 - Postflight

- Preflight Mission Analysis
 - Planning
 - Preparation
 - Briefing
 - Professional
 - Focused
 - Assigns responsibilities
 - Interactive
 - Complete

- In-flight Mission Analysis
 - Short term planning
 - Monitoring mission progress
 - Identifying and reporting challenges or changes

- Post-Mission Analysis
 - Selective review of flight and events
 - Interactive
 - Timely

Situational Awareness

- Degree of accuracy by which one's perception of current environment mirrors system values

- Perception vs Reality
 - View of situation
 - Incoming information
 - Expectations and Biases
 - Incoming information vs expectations

- Factors that Reduce Situational Awareness
 - Insufficient communication or information
 - Fatigue
 - Stress
 - Task overload
 - Task underload
 - Groupthink
 - Goal completion
 - Degraded system operating conditions

Reference

- Human Factors Checklist: An Aircraft Accident Investigation Tool, Appendix B: Crew Resource Management

(Naval Postgraduate School, School of Aviation Safety, Ciavarelli & Sather, 2002)

<https://www.netc.navy.mil/nascweb/sas/files/hfchklst.pdf>

Thank you for your dedication to the continuous
improvement of aerospace safety

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