Crew Resource Management

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Crew Resource Management

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Adapted by Kent Lewis
Signal Charlie
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)  
Thank you for your dedication to the continuous improvement of aerospace safety

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