Integrating Crew Resource Management Behaviors Into Risk and Resource Management

What is the weakest link in the aviation safety chain—the pilot or the technology? When aviation technology was in its infancy, the aircraft itself was the weakest link in the safety chain. However, as technology advanced, the pilot became the focal point of potential risk. Crew Resource Management (CRM) was developed to equip flight crews with "soft skills" necessary for managing both the flight deck environment and flying skills effectively.

The Federal Aviation Administration (FAA) has identified seven key CRM skills or observable behaviors critical for flight safety:

1. **Leadership/Followership:** Recognizing the appropriate time to lead and support the leader is essential. Effective leadership involves guiding the crew toward a common goal, while followership requires actively supporting the leader's decisions and directives.

2. **Situational Awareness:** This skill entails accurately perceiving and understanding the operational and environmental factors affecting the aircraft and its flight. It includes assessing the current situation, anticipating future developments, and recognizing necessary changes in time to act.

3. **Communication:** Clear, concise, and assertive communication among crew members, as well as with ATC, maintenance, and other support personnel, is crucial. This includes both verbal and non-verbal communication.

4. **Decision Making:** The process of diagnosing a situation and deciding on an appropriate course of action involves generating options, selecting a course of action, and evaluating the outcome.

5. **Team Building and Maintenance:** Creating and sustaining effective crew performance requires developing teamwork and cooperation, setting clear goals, and resolving conflicts.

6. **Workload Management:** Efficiently managing duties and responsibilities ensures that workload is balanced across the crew, prioritizing tasks and managing time effectively to prevent performance degradation.

7. **Problem Solving and Critical Thinking:** Identifying problems accurately, generating viable solutions, and choosing the best course of action requires logical analysis and critical thinking.

These CRM skills are fundamental to the FAA's strategy for improving flight safety by focusing on human factors that can lead to incidents and accidents. Effective CRM training enhances these skills through educational and practical exercises, preparing crew members to handle diverse situations during flight operations.
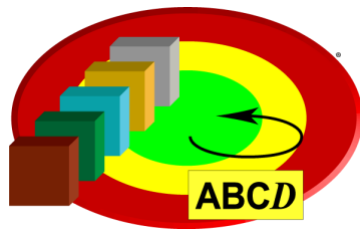
The Volant Risk and Resource Management (RRM) model advances CRM by integrating these CRM skills and behaviors into its framework using the ABC*D* process (a set of fundamental management skills) and Resources. This integration improves decision-making and safety in time-critical situations. RRM emphasizes managing both perceived and actual risks through a structured approach that incorporates human factors and technical skills.

1. **Leadership/Followership—Do and Debrief:** The italicized "*D*" in RRM's ABC*D* process stands for "Do and Debrief," promoting leadership through active involvement and continuous self-evaluation. RRM encourages open communication on the flight deck and mandates that risk decisions are made at the correct level, clarifying leadership roles when risk issues arise. Crew members are encouraged to take proactive roles in managing situations and providing feedback.

2. **Situational Awareness—Assess:** RRM emphasizes continuous situational awareness, particularly in the "Assess" phase of the ABC*D* process. Crew members are trained to identify and process critical information, aligning with CRM's focus on maintaining high situational awareness. RRM encourages the use of various Resources (Automation, External Resources, Briefings) to enhance and communicate risks, helping crews project future status. The Green-Yellow-Red target provides both a visual framework and a language for communicating the ever-changing risk state, enhancing situational awareness.

3. **Communication—Communicate Risks and Intentions:** The "C" in the ABCD process stands for "Communicate Risk and Intentions." This iterative step focuses on establishing a shared mental model among crew members, crucial for coordinated action. RRM provides various Resources (Briefings, Checklists, Procedures) to promote open communication and enable crews to create a shared mental model.

4. **Decision Making—Balance:** Decision-making is central to RRM, particularly in the "Balance" phase, where decisions are based on Policies, Procedures, and operational priorities. This mirrors CRM's emphasis on sound decision-making, ensuring that risks are anticipated, managed, and mitigated. The four principles of RRM provide a framework for making decisions in the face of both expected and unexpected risks.

5. **Team Building and Maintenance—Shared Mental Model:** RRM promotes team building and maintenance by emphasizing the shared mental model through good communication, supported by various Resources (Briefings, Policies, Procedures, Checklists). RRM acknowledges human factors within the operating context that increase risk and decrease performance, labeling them as Crew Factors. This open acknowledgment fosters a team environment for managing risks.

6. **Workload Management—Task Loading:** Effective distribution and management of tasks among the crew are essential to avoid overloading and maintain optimal performance. Resources (Knowledge, Skills, Automation, Technology) can assist when Task Loading increases risk and decreases performance. Balancing priorities is a vital part of the ABC*D* process, helping crews focus on critical tasks at the appropriate time. The Cone of Time aids in differentiating between tasks that are time-critical, time-sensitive, and not time-sensitive.

7. **Problem Solving and Critical Thinking—Four Principles:** The RRM model is built on four principles for managing risk, providing a framework for decision-making and critical thinking.
- Accept no unnecessary risk.
- Anticipate and manage risk by planning.
- Accept risk when benefits outweigh the cost.
- Make risk decisions at the right level.

Resources such as Knowledge, Policies, Checklists, and External Resources offer tools for gathering information and applying critical thinking to evolving situations. The Resiliency Arrow symbolizes the methodology for returning from a high-risk state (Red) to a low-risk state (Green) using Resources and the ABCD process.

A significant benefit of RRM is the ability to incorporate these behaviors into a measurable performance standard. Historically, the "soft skills" of CRM have been challenging to evaluate and quantify. RRM's granular approach connects these behaviors to a measurable performance standard, providing data for improving training programs.

By integrating CRM into the RRM model, crew members are empowered to manage risks and achieve safety, making them a robust link in the aviation safety chain.