

Running Head: CRM Leadership Development Practice: Developing a Model

An Introduction to the Team Leadership Development Practice of Crew Resource Management
in the Airline Industry and the Findings of a Qualitative Study to Develop a Practitioners' Model

Christin M. Capriglione, Scott R. Homan Ph.D., and Michael W. Suckow

Purdue University

Scott Robert Homan Ph.D.
Purdue University
151 S. Grant Street Office 440
West Lafayette, IN 47906-3572
(765) 494 – 5613
srhoman@purdue.edu

Christin Capriglione
13844 Jefferson Park Dr. Apt. 12303
Herndon, VA 20171
703-793-0670
christin_c@alumni.purdue.edu

Michael W. Suckow
Purdue University
1413 Aviation Technology
West Lafayette, IN 47906-3572
(765) 496-6375
msuckow@purdue.edu

Abstract

The team leadership development practice known as Crew Resource Management (CRM) has been in existence for twenty-five years, however, one piece still seems to be missing in spite of the past twenty-five years of research, changes, innovations, and improvements—a practical model for how CRM is developed and implemented and what issues are important to professional CRM practitioners for this implementation. For the purposes of this study, the researcher conducted interviews with professionals in the field of CRM in order to obtain their inputs and viewpoints. The result is a practitioners' model of Crew Resource Management practice which displays the ideas and concepts that are seen as necessary to CRM by the experts who regularly apply it. The model indicates communication as the central idea in Crew Resource Management and relates it to other related themes including situation awareness, understanding individual personality traits and characteristics, the capabilities of the group above those of the individual, CRM for all workgroups involved in flight operations, and error reporting without fear of retribution.

Introduction

The concept of Crew Resource Management (CRM) was first introduced in 1979 through a workshop sponsored by the National Aeronautics and Space Administration (NASA) entitled *Resource Management on the Flightdeck* (Helmreich, Merritt, & Wilhelm, 1999). In response to a number of accidents caused by human failures and pilot error rather than mechanical malfunctions, the aviation industry sought a way to increase the leadership ability of pilots to increase safety and avoid accidents. NASA's then termed Cockpit Resource Management seemed to be the mechanism to accomplish this goal.

Since its inception, Crew Resource Management has developed through several generations of changes and refinements. Current CRM is the fifth generation, which not only focuses on using resources to avert accidents after errors occur, but also to manage and prevent errors from occurring at all. Research also continues to be performed in this area, specifically in the areas of program evaluation and new program implementation. Program evaluation efforts attempt to develop tools to determine the level of success of Crew Resource Management training programs. New program implementation involves adapting and applying CRM concepts to other organizational environments, particularly other high-risk industries.

According to The Royal Aeronautical Society of Great Britain (2003), "Crew Resource Management (CRM) has now been in existence for over two decades but confusion still exists within the aviation industry and elsewhere as to precisely what the term implies" (p. 1). In spite of the past twenty-five years of research, changes, innovations, and improvements, however, one piece still seems to be missing—a practical model for how CRM is developed and implemented by the industry and what issues are important to professional CRM practitioners for this implementation. Furthermore, the guidelines provided by the Federal Aviation Administration

which has mandated CRM practice are rather vague and subjective, so each participating organization may use a different definition and model for developing its CRM training programs. Therefore, the problem of this study was that Crew Resource Management is a poorly defined training program for which no standard model exists. The purpose of this study was to discern the commonalities in Crew Resource Management training among aviation organizations and industry professionals in order to document the practitioners' viewpoints and develop a standardized, practical model for executing CRM training based on current industry priorities and practices which incorporates the desired knowledge, skills, and abilities and the central conceptual training ideas.

Literature Review

Crew Resource Management (CRM) is defined by the Federal Aviation Administration (FAA) as “the effective use of all available resources: human resources, hardware, and information” (FAA, 2004, p. 2) for safe flight operation.

History of CRM

In 1979, the National Aeronautics and Space Administration (NASA) introduced the concept of Crew Resource Management—then called Cockpit Resource Management—through a workshop entitled *Resource Management on the Flightdeck* (Helmreich et al, 1999). This development was the result of an increased awareness of leadership failures of humans teams in the causes underlying airline accidents. Specifically, a series of catastrophic accidents in the 1970's, including the 1977 runway collision of two Boeing 747's in Tenerife, implicated flight crew errors rather than mechanical failures as causal factors (Flin et al, 2002). “Many of the air carriers represented at this meeting left it committed to developing new training programs to enhance the interpersonal aspects of flight operations” (Helmreich et al, 1999, p. 19).

Since its introduction, CRM has evolved through five generations of application. The first generation was begun following the NASA workshop; the first comprehensive program was initiated in 1981 by United Airlines (Helmreich et al, 1999). The first generation of CRM focused on interpersonal skills. Programs employed general management training techniques, utilizing a seminar style with tools such as managerial style assessments, including Blake and Mouton's Managerial Grid model, and psychological testing (Helmreich et al, 1999). "They advocated general strategies of interpersonal behavior without providing clear definitions of appropriate behavior in the cockpit" (Helmreich et al, 1999, p. 2).

The second generation emerged in the mid-to-late 1980's. NASA held a second CRM workshop in 1986 (Helmreich et al, 1999) where various aviation organizations gathered to report their progress and insights into the practice of CRM. The emphasis shifted from a mere focus on interpersonal skills training in generation one to highlight group dynamics and team orientation in the cockpit in generation two. Topics addressed in the second generation included team building, briefing strategies, situational awareness, stress management, decision-making, and breaking the error chain. In this generation, practitioners also suggested that Crew Resource Management would cease to be a separate training module and become integrated with all aspects of flight training. Of particular note is that with this shift in focus, a name change from Cockpit to Crew Resource Management also occurred (Helmreich et al, 1999). Still, many training exercises used to illustrate concepts continued to be unrelated to aviation, and pilots criticized CRM as a lot of "psycho-babble" (Helmreich, 1999, p. 3). Generation two CRM programs also continued to define the flight crew as only the pilots in the cockpit.

The third generation, which started in the early 1990's, broadened the scope of CRM. Third generation CRM extended the definition of flight crew to include flight attendants,

dispatchers, and maintenance personnel for the purposes of CRM training. Specific training programs for the trainers who taught and evaluated CRM skills also emerged here (Helmreich et al, 1999).

Training programs began to consider the big picture ideas in the aviation industry, and topics for instruction included consideration of organizational culture and its effects, recognition and assessment of human factors issues, the issues and hazards of flightdeck automation, and leadership particularly for new captains. “At the same time, efforts began to integrate CRM with technical training and to focus on specific skills and behaviors that pilots could use to function more effectively” (Helmreich et al, 1999, p. 3). The criticism of generation three CRM was that the variety of new ideas was diluting the originally intended focus of CRM, which was to reduce human error (Helmreich et al, 1999).

Fourth generation CRM developed as a means to instill adaptability and allow individual organizations to tailor training programs to their specific cultures and needs. Tailored CRM training programs also corresponded with the introduction of the Advanced Qualification Program (AQP) by the Federal Aviation Administration (FAA), which was developed for the same purpose—to allow individual carriers to develop tailored training programs to address all training areas in an organization. CRM behaviors were added to checklists in an effort to ensure that the basics of CRM are practiced, particularly in “non-standard situations” (Helmreich et al, 1999, p. 3). The fourth generation of CRM posed the idea that CRM had finally ceased to be a separate training module and that the industry had finally succeeded in completely integrating CRM into all aspects of flight training as was suggested in generation two (Helmreich et al, 1999).

CRM is currently considered to be in its fifth generation of practice. Broadly, generation five CRM is considered to be a combination of ideas from the previous four generations. The fifth generation of CRM makes a marked return to the original focus of CRM, which was to reduce human error, and extends it one more step to the management of human error. Within fifth generation CRM, current research suggests a variety of initiatives to improve the practice of CRM and facilitate a proactive approach to error management.

A major theme emerging out of CRM research is the need for evaluation of the effectiveness of CRM as a training program. Salas et al suggest that, “Although systematic training evaluation is not an easy task, it is the only way to ensure that training programs are having the desired effect and are a worthwhile investment for the organization” (Salas et al, 2001, p. 643). A second major pursuit is the application and implementation of CRM training in alternate industry environments including air traffic control (Smith-Jentsch et al., 2001), the Merchant Navy (Flin et al., 2002), the nuclear power industry (Flin et al., 2002), aviation maintenance (Robertson, 2001), the offshore oil industry (Flin & O’Connor, 2001), medicine including anesthesiology (Davies, 2001), and Naval aviation (Oser et al., 2001).

Current Issues in CRM

Through the past twenty-five years of research and application in Crew Resource Management, however, authors continue to discuss problematic issues that exist in its practice. According to The Royal Aeronautical Society of Great Britain (2003), “Crew Resource Management (CRM) has now been in existence for over two decades but confusion still exists within the aviation industry and elsewhere as to precisely what the term implies” (p. 1). Furthermore, “CRM training would be considerably enhanced if a satisfactory and universally

agreed set of behavioral standards could be developed” (The Royal Aeronautical Society, 2003, p. 7).

Despite CRM’s long history, there remains a lack of consistency within the aviation industry with regard to its definitions, training content, and method of delivery. [Federal Aviation Regulation] FAR Part 121 states the general operating requirements for domestic, flag, and supplemental operations and contains the general requirements for CRM training. However, it leaves the methods for CRM curriculum design and development, as well as for evaluation, ambiguous. Aviation leaders hoped that the diverse, complex, and systemic nature of CRM errors could be reduced with simple solutions. The appeal of personality/small group dynamics approaches to solving CRM problems caused many government officials and industry executives to be receptive to major investments in CRM training. They wanted to be able to *re-engineer the flight crews* without having to *re-engineer major elements* of the systems.

In the absence of “a clear definition and goal of CRM training” (Komich, 1996, p. 541), and in light of the aforementioned lack of consistency and consensus in the industry regarding CRM and its practice, it was the intent of this study to develop a model for Crew Resource Management training based on current practice and industry input which incorporates the desired knowledge, skills, and abilities with the most effective conceptual training tools in order to provide the standard and clarity that is lacking. One other researcher is currently creating a model of common industry practices in CRM that identifies specific topic areas and instructional methods (Beneigh et al, 2003). This study, however, attempted to move beyond the instructional surface to discern commonalities in the practitioners’ viewpoints in order to develop a practical, conceptual model of CRM.

Methodology of the Study

The study was qualitative in nature, using interviewing as the primary means of data gathering. The researcher chose to use a qualitative methodology in order to obtain specific opinions from the participants, which could not be as easily obtained through a quantitative tool such as a survey. The qualitative approach allowed the researcher to obtain complete thoughts from the participants in order to compose a clearer picture of the practitioners' viewpoints of Crew Resource Management.

Sample Selection and Data Collection

Five subject matter experts (SME's) in Crew Resource Management were purposefully selected to participate in the interview process. The reason for choosing such a small number of participants is justified by the qualitative research method itself. "What would be a 'bias' in statistical sampling, and therefore a weakness, becomes intended focus in qualitative sampling, and therefore a strength. The logic and power of purposeful sampling lie in selecting *information-rich cases* for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term purposeful sampling. Studying information-rich cases yields insights and in-depth understanding rather than empirical generalizations" (Patton, 2002, p. 230). The criteria for selection as a subject matter expert was multiple years of experience teaching and/or developing Crew Resource Management training as well as multiple years of experience as a professional in the commercial aviation industry.

Each subject matter expert participated in a one-hour interview during which the interviewer asked a series of standardized primary questions and a variety of unformalized secondary questions. After conducting each interview, the researcher transcribed each interview in preparation for qualitative analysis. Using the interview transcripts, the researcher then

categorized the information using two pieces of software—Microsoft Excel® and ATLAS.ti® 5.0 Demo. The researcher then discerned those concepts that were common results from multiple interviews. Those common results were used to develop an initial practical model suitable for future validation by a larger population. The primary deliverable of this study is a CRM model that emphasizes the primary elements of Crew Resource Management according to the practitioners' viewpoints. These elements may be actual or ideal depending on the particular participant, but there is consensus regarding the necessity of these elements.

Credibility of the Study

One means of adding credibility to a qualitative study is to collect and analyze data concurrently (Morse et al., 2002). In this study, the researcher initially analyzed and categorized the responses from each separate interview directly after it was conducted and transcribed.

A second way to lend credibility is to obtain an appropriate sample. According to Morse et al. (2002), an appropriate sample consists of “participants who best represent or have knowledge of the research topic” (p. 12). In this study, the researcher applied this concept by gathering information from five established experts in the field of Crew Resource Management and its instruction and development.

A third way to ensure credibility is “to create an account of method and data which can stand independently so that another trained researcher could analyse the same data in the same way and come to essentially the same conclusions” (Mays & Pope, 1995, p. 110). Along these lines, the researcher created a written transcript of each interview conducted in order to provide a record of the data that was collected.

Findings

After completion of the interviews, the researcher categorized the responses into six categories; topics for instruction, instructional methods, sources of program development and update information, CRM improvements, value of CRM, and overall common themes among participants.

Topics for Instruction

Within each interview the researcher inquired about the topics that are taught within CRM training programs. Documentation of those topics included by the practitioners in CRM programs allows the researcher to compare industry CRM practice with the topics suggested in the FAA Advisory Circular. Topics indicated by a majority of the participants were teams/teamwork, communication, leadership, situational awareness, command/authority, workload distribution/management, and the power of the group greater than that of the individuals. Of these topics, all are consistent with those outlined by the FAA Advisory Circular except two—command/authority and the power of the group.

Instructional Methods

The second area of categorization is instructional methods employed to instruct the selected topics of a CRM program. The participants did not identify specific methods to instruct specific topics, however, there was a degree of consensus regarding the most frequently used methods. Methods indicated by a majority of the participants included examples including scenarios, cases, accidents, and incidents; participation including discussion, exercises, games, and role-playing; lecture; briefings and debriefings; and video.

Sources of Program Development and Update Information

The third category of information collected through the interviews was the sources of information used by the practitioners to develop new CRM programs and update existing

programs. Sources for new developments and updated information identified by a majority of the participants included industry seminars and conferences, industry organizations, crew feedback about training and accidents, and incidents.

CRM Improvements

Various questions were asked of the participants to determine the improvements they would make to traditional CRM to make it more valuable for their operations. The main improvement suggested by the participants for improvement of CRM programs involved time devoted to CRM training, specifically longer courses and more frequent conducting of courses.

Value of CRM

Although Crew Resource Management is mandated by the FAA for use in many aviation operations, the researcher desired to ascertain whether there is value in CRM training beyond the mandate. Some of the participants agreed that quantifying the value of CRM is a difficult task. Participant five inquired, "If you don't have any accidents for a period of time, does that mean your CRM was great or does that mean you were lucky? It's a very hard thing to measure directly so you have to measure empirically by...what's not happening." Personal experiences, however, dictated to them that there is value in using CRM even if it is difficult to measure. Participant five further stated that "I have seen it work in my cockpit and work positively. And I have flown in cockpits where it wasn't working and things were getting ugly. And so I can see a direct benefit to that." Participant two also supports that position: "I really found the value of it, have used it myself, and it certainly helped me get through some situations that I, most probably, would not have gotten through as well as I did. And the results were more favorable by using the skills that I learned with CRM."

Common Themes Among Participants

Though important, on a broad scale, the interview responses show that the environment in which the training occurs is more pertinent to good CRM practice in the aviation industry than the specific topics and methods of instruction used in the programs. This idea is supported by the common themes that emerged from the combined interview transcripts.

Communication surfaced as the central idea in Crew Resource Management. The FAA Advisory Circular emphasizes a number of different ideas for consideration in CRM, but the information from this study indicates that communication is the primary focus of the professionals that employ CRM on a regular basis. Participant five stated this idea as follows: “The core of that would be the communications process, the breakdown of communications, the tools to repair the communications process. And that’s probably the core part of the [CRM] curriculum—the actual process of communication, what breaks down, and then how to attempt to fix that.” Furthermore, communication is referenced not merely as a topic for instruction, but also as a central theme and necessary consideration when using CRM in the cockpit. Participant four stated, “Crew Resource Management is really developing good communication skills with people.” Participant three gave further support to this idea: “It’s all about interpersonal communication...you can’t fly a cockpit anymore without good communication.” Additionally, participant five stated that, “Communication has to be essential in the cockpit—good communication flow between the crewmembers.”

Connected to communication is the idea of situational awareness. Participant responses indicated that awareness is also a necessary component of successful flight operations. Participant three indicated this in the following manner, “Situational awareness is really the important piece there. Not sitting there thinking about what’s going to hurt you all the time, but

you're just trying to be proactive in reducing and preventing accidents and incidents. Just being more aware all the time of your surroundings and what's out there.”

Not only is awareness necessary in itself, but using good communication to convey one's awareness to the other crewmembers is also vital. Participant one supports this idea in saying that, “Where the CRM aids that leader [of the cockpit] is through the communication to keep his or her situational awareness at its highest level.” Furthermore, participant four relates awareness to communication by stating that, “It all revolves around communication, knowing what's in your surroundings and being able to convey that to others.” Participant one agrees: “If everybody communicates well, and they're at the same [awareness] level, then you've reduced the potential for surprises in and out of the cockpit around the airplane.”

A third common theme that is connected to awareness and communication is the theme of understanding the people aspects of flight operations. Understanding personality traits and characteristics and being able to communicate in light of those traits was indicated to be an important concept. Interviewee responses supported the idea that good leadership practice involves being aware of crewmembers' personality types, characteristics, and moods. Participant one said that, “Knowing that a person fell into one of those [personality type] categories technically should allow another person who's not in that category to understand what those character traits are and to be able to work with them better.” Participant four also lent support to this idea of understanding the traits of one's fellow crewmembers: “It's...important that they're aware. You've got your Hitler style or your ‘everybody likes the guy’, too nice of a guy—the captain that really doesn't exercise his authority at all to the one that's my way or the highway. A person needs to be aware of where they fall in that broad category and how to deal with it.” Furthermore, according to participant five, “we can also teach the other crewmembers the

warning signs to recognize when somebody's breaking down in that process—they're not communicating effectively.”

The leadership potential of CRM to influence behavioral change is connected to the necessity of understanding people. Participant one stated, “Unless someone's in long-term counseling it's pretty tough to change anybody, especially as they get older. But, if you can make them recognize who they are and they can probably better recognize who they work with, it could also have a contributing increase to safety.” The response of participant five supports this idea further: “That type of thing's built in your early years and it's hard to be trainable, but recognition of the weaknesses is a benefit.”

The aforementioned ideas—communication, situational awareness, and understanding individual characteristics and personality traits combine to provide the crew with the ability to function better as a group than any one individual could operate by himself/herself. The importance of the power of group leadership being greater than any one individual's is specifically emphasized by the respondents as well. Participant one indicated that, “The brainpower in the cockpit, if you add it both together, could be far greater than the sum of one and one. You actually gain more by having two people working there together than you do by having two individuals working as individuals.” Furthermore, Participant five suggested that the problems occur when “the communications stopped, where the interpersonal relationship broke down and there was no longer an effective crew on board that airplane but two or three individuals doing their own things.”

The ideas mentioned above are not only important for the pilots in the cockpit as a group, but responses indicated that CRM training should be implemented for all groups involved with the flight process.

Understanding the CRM Practitioners' Model

On a broad scale, the interview responses show that the environment in which the training occurs is more pertinent to good CRM practice in the aviation industry than the specific topics and methods of instruction used in the programs. The original expectation of the researcher was to develop a model that indicated topics for instruction and related them to specific instructional methods; however, the participants' responses conveyed a model of greater depth of concepts than simply instructional topics and methods. In light of this idea, the following model is a representation of the previous common themes in Crew Resource Management that portrays the researcher's interpretation of the practitioners' viewpoints and values.

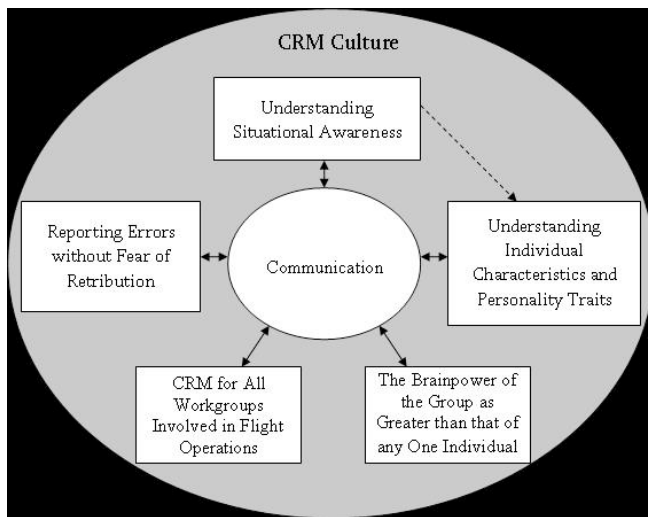


Figure 1. The CRM Practitioners' Model.

Communication

As was previously mentioned, communication on various levels is the central idea of the practitioners' model for Crew Resource Management. Communication is a theme unto itself

according to the professionals; however, it is also an element in several other themes. The connection between communication and five other themes is represented by the central location of communication in the model and delineated further in the following sections related to the five surrounding concepts.

Situational Awareness

The first connection indicated by this model is that of communication to situational awareness. Situational awareness is an important concept in itself as indicated by interview responses, but it is also important in relation to effective crew communication. Crew members must be able to communicate their individual awareness levels to the other individuals with whom they are operating. A third relationship between communication and situational awareness is crewmembers' ability to become aware of breakdowns in the communication process as they occur in order to respond accordingly. In sum, individual situational awareness is important to increasing safety in flight operations, but using effective communication to convey one's own awareness to other members of the crew further increases this safety level by allowing all crewmembers to be at the highest possible awareness level.

Understanding Individual Characteristics and Personality Traits

The next connection indicated by this model is that of communication and situational awareness to understanding individual characteristics and personality traits of other crewmembers in order to facilitate more effective operations. The results indicated that an understanding of individuals' personality traits and characteristics and being able to communicate in light of those traits is an important concept. Understanding the personality traits and characteristics of fellow crewmembers assists pilots in determining approaches to

communication and operational practices in the cockpit to facilitate better crew coordination and more effective operations.

Group Brainpower Greater than Individual Brainpower

The third connection indicated by this model is that of communication and the idea that crewmembers are more effective as a group than as individuals. Good communication facilitates the entire crew's ability to act cohesively and gain greater effectiveness than would result from each crewmember acting on his/her own individual brainpower. For this idea to be effective, however, all individuals must contribute to the whole body of crew knowledge through communication and contribution of ideas and information to aid the operational process. Communication heightens the synergy of the crew as a whole and allows the group to display capabilities greater than the sum of the individual parts separate abilities.

CRM for all Flight Operations Workgroups

The fourth connection portrayed by this model brings the remaining workgroups in the flight environment into the CRM picture and emphasizes their role in the communication process. The pilots in the cockpit are not operating in isolation. Multiple other groups within an organization, including flight attendants, dispatchers, mechanics, and crew schedulers, also work to make the pilots' portion of flight operations possible. All these groups are part of the communication process that allows for safe and successful flight operations.

CRM training for all workgroups also aids communication by assisting them in understanding the others' characteristics and perspectives. As pilots need to understand the characteristics and personality traits of other pilots, multiple workgroups need to understand these things in each other as well. Also, improving communication among workgroups decreases the opportunities for misunderstanding and unnecessary action. In sum, all the

workgroups related to flight operations are important links in the communication chain. Even if communication among the pilots is effective, if communication to the other groups involved fails, the complete effectiveness of flight operations remains uncertain.

Error Reporting Without Fear of Retribution

The fifth and final connection demonstrated by this model is between communication and the idea that it is necessary for pilots to be able to communicate their errors, mistakes, and failures without fear or retribution or punitive action. Participant one stated that, “What is a problem is, presenting information, realizing that we all want to learn from mistakes and to get people to admit to those mistakes without fear or retribution, knowing that their contribution may keep somebody else from being as uncomfortable as they were when they made the mistake.” The bottom line is that open communication by those making the errors could provide great improvement to the safety of the aviation industry as a whole. New methods to prevent errors cannot be developed nor sources of errors found if those persons making the errors are hiding them. As has been indicated by Helmreich et al (1999), “Underlying the fifth generation of CRM is the premise that human error is ubiquitous and inevitable—and a valuable source of information. If error is inevitable, CRM can be seen as a set of error countermeasures with three lines of defense. The first, naturally, is the avoidance of error. The second is trapping incipient errors before they are committed. The third and last is mitigating the consequences of those errors which occur and are not trapped” (p. 7). If error is “a valuable source of information” (Helmreich et al, 1999, p. 7), then the industry must find a way to gain access to this information. As the practitioners suggest, it is desirable to have a system that allows pilots to report their errors without fear of punishment in the interest of benefiting the entire aviation industry.

Culture

Communication and the elements connected to it are ultimately encompassed within the concept of CRM as an organizational and industry culture. CRM should not be merely a training module, but a way of operating—a way of doing things on an organizational and industry level. The challenge that still exists for some practitioners, though, is to develop this culture, because, as Participant four states, “they’re getting the structure of ‘hey be aware of this,’ ‘listen to yourself,’ ‘learn how to relax.’ They’re getting the bullet points, on all the factors that build around CRM but once they got it, it’s taking that out of the class, into the practice.”

Conclusions

As the interview responses indicated, communication on its various levels is the central important idea in the practice of Crew Resource Management from the practitioners’ viewpoints. Communication is important in conveying individual awareness levels to the entire crew in order to assist all crewmembers in maintaining the maximum awareness level. When communicating, it is important to understand the character and personality traits of those with whom one is working in order to communicate most effectively. Good communication facilitates the entire crew’s ability to act cohesively and gain greater effectiveness than would result from each crewmember acting on his/her own individual brainpower. Furthermore, the chain of communication exceeds the boundaries of the cockpit to include all workgroups involved in flight operations including flight attendants, maintenance personnel, dispatchers, and crew schedulers. Finally, in order to gain meaningful information to prevent errors and improve CRM programs to further increase safety, pilots need a system by which they can report errors without fear of retribution. The question that emerges from this idea of communication as the central idea is whether this conception of CRM by the practitioners accomplishes the goals of CRM that

have been asserted by the researchers—to avoid error, to trap “incipient errors before they are committed” (Helmreich et al, 1999, p. 7), and to mitigate “the consequences of those errors which occur and are not trapped” (Helmreich et al, 1999, p. 7).

The second question that arises is whether CRM is currently a culture in the aviation industry. While Participant three said that CRM is a culture in his organization, Participant two indicated that CRM will eventually become a culture at some time in the future as it ceases to be a program separate from other training. His statement indicates that CRM has not become a culture yet, and is supported by the claim from Participant four that the challenge is getting people to take CRM knowledge out of the classroom and into everyday practice.

In relation to the FAA Advisory Circular (AC), the results of this study were consistent with information provided in that document. Suggested topics for CRM instruction and methods to provide that instruction are consistent with the topics and methods that were indicated by the study participants. Common topics included teams/teamwork, communication, leadership, situational awareness, workload distribution/management, conflict resolution/management, planning, stress/stress management, decision-making, briefing/debriefing, vigilance, automation, self-evaluation, crew climate, inquiry, advocacy, and interrelationships in the cockpit. Common instructional methods included examples including scenarios, cases, accidents, and incidents; participation including discussion, exercises, games, and role-playing; lecture; briefings and debriefings; and video.

The AC also emphasizes the idea that pilots must work as a team rather than as individuals to be most effective. According to the AC, “CRM is training that requires the active participation of all crewmembers. It provides an opportunity for individuals and crews to examine their own behavior, and to make decisions on how to improve cockpit teamwork” (FAA, 2004, p. 6). This idea is

supported by this study by the aforementioned idea that “the brainpower in the cockpit, if you add it both together, could be far greater than the sum of one and one. You actually gain more by having two people working there together than you do by having two individuals working as individuals.”

Finally, the results of this study are consistent with the AC in their indication of the importance of CRM for all workgroups involved in flight operations.

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