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Airline Pilots' Perceptions of and Experiences in Crew Resource Management (CRM) Training

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ABSTRACT

We surveyed over 30,000 airline pilots to assess their perceptions of and experiences in their professional training. In this paper, we describe their responses to a series of questions that focus on Crew Resource Management (CRM) training. The results suggest that most pilots are satisfied with their CRM training and find it useful. However, the respondents indicated that training programs which integrate CRM principles throughout the entire curriculum are substantially more useful than stand-alone CRM training courses.

INTRODUCTION

Over the years, the Federal Aviation Administration (FAA) and the airline community have made tremendous strides in increasing flight safety through improved pilot training. For example, innovative training strategies such as Crew Resource Management (CRM) training have been incorporated into pilot training programs with noticeable payoffs.

Unfortunately, few studies have compared the relative strengths and weaknesses of CRM training programs across multiple airlines. Therefore, we administered a survey to a large, representative sample of U.S. commercial airline pilots. The survey was designed to answer several questions:

- To what extent are pilots satisfied with their training (i.e., affective reactions)?
- To what extent do pilots find their training useful (i.e., utility reactions)?
- What are pilots' opinions about various training issues?

The survey was administered to over 30,000 airline pilots from 24 of the 30 largest U.S. passenger carriers, making it the largest training evaluation conducted to date.

CREW RESOURCE MANAGEMENT TRAINING

For over 20 years, Crew Resource Management (CRM) training has been used to reduce the impact and severity of human error on the flight deck. Unfortunately, few large-scale studies have examined the effectiveness of CRM training programs.

THE NEED FOR CRM TRAINING

Given the precision and reliability of modern aircraft technology, mechanical causes of accidents are extremely rare. A substantial proportion of aviation-related accidents are due to pilot error (Boeing Commercial Airplane Group, 1994; National Transportation Safety Board, 1994). To reduce the incidence of pilot error, aviation professionals have traditionally focused on improving pilots' technical skills and safety-related attitudes.

However, the co-occurrence of several accidents during the late 1970's caused aviation professionals to re-examine their selective emphasis on the skills and attitudes of individual pilots. For example, in 1978, United Air Lines flight 173 crashed near Portland as a result of total fuel exhaustion. Subsequent analyses of the cockpit voice recorder suggested that the crew were unable to effectively communicate with one another (National Transportation Safety Board, 1979). Given an alarming pattern of similar findings across several such accidents, the Federal Aviation Administration recommended that all carriers implement Crew Resource Management (CRM) training programs (Federal Aviation Administration, 1993).

THE HISTORY OF CRM TRAINING

The underlying purpose of CRM training is to provide trainees with the knowledge and skills to effectively manage all available resources, whether they are human-, hardware-, or information-based (Federal Aviation Administration, 1993). Over the years, CRM training has undergone a number of transformations (Helmreich, Merritt, & Wilhelm, 1999).

The first generation of CRM training programs was designed to raise pilots' awareness of human factors issues on the flight deck. For example, early CRM programs focused on how to recognize one's own leadership style, such as authoritarianism or lack of assertiveness (Helmreich, Merritt, & Wilhelm, 1999). These early programs focused on general CRM

principles, rather than providing training in specific CRM skills (e.g., situational monitoring, conflict management, decision-making). As a result, attempts to evaluate CRM performance have frequently met with resistance from line pilots who do not believe that CRM skills can be assessed with the same degree of precision as "stick-and-rudder" skills.

More recent CRM training programs routinely provide training in specific CRM skills, and integrate CRM principles throughout the entire training curriculum. Many have also included specific behavioral markers for assessing crewmembers' CRM performance (Flin & Martin, 2001; Seamster, Boehm-Davis, Holt, & Schultz, 1998). These changes in CRM training are most clearly demonstrated in the Advanced Qualification Program (AQP; Federal Aviation Administration, 1998).

AQP is a voluntary alternative to traditional pilot training under 14 CFR Part 121. Following an instructional systems development (ISD) approach, AQP development begins with a comprehensive task analysis of the technical and CRM requirements associated with each aircraft. The results of these task analyses are then used to develop AQP training programs from the ground up (Birnbach & Longridge, 1993). Several unique features of AQP training include:

- the integration of CRM concepts throughout the training curriculum;
- the requirement for pilots to demonstrate proficiency on technical and CRM skills in Line Operational Evaluation (LOE) scenarios prior to certification;
- the requirement that CRM evaluation focus on specific, observable behaviors that were derived from the task analysis, and;
- the requirement that check airmen receive special training in evaluating pilots' CRM skills.

THE EFFECTIVENESS OF CRM TRAINING

Most attempts to validate the effectiveness of CRM training have focused on assessing the trainees' reactions to their CRM training. A small number of studies have also assessed trainees' learning (e.g., changes in attitudes towards CRM or knowledge about CRM principles) at the end of training. In general, CRM training has been found to produce positive reactions and enhanced learning. Unfortunately, many of these studies are based on extremely small samples, trainees from a single airline, anecdotal data, or weak evaluation designs (Salas, Burke, Bowers, & Wilson, 2001).

Because AQP training is now being implemented at a large number of carriers, we felt that there was a unique opportunity to identify the strengths and weaknesses of different approaches to CRM training (Part 121, SVT, AQP), the results of which could be used to improve all CRM training programs.

In the sections below, we describe the results of a large-scale survey of pilots' perceptions of and experiences in their training. In particular, we focus on their responses to a series of questions concerning Crew Resource Management (CRM) training. This project was a unique opportunity to conduct a scientifically rigorous, large-scale comparison of CRM training programs across multiple airlines. Nevertheless, we recognize that participants' reactions to training are only one measure of a training program's effectiveness.

SURVEY DEVELOPMENT

Survey development involved a number of critical steps, including: document review, focus groups, item development, and pre-testing.

DOCUMENT REVIEW

We extracted a list of preliminary variables from documents that describe AQP, SVT, and Part 121 pilot training (see, for example, Federal Aviation Administration, 1998). This information was supplemented by a review of the aviation psychology, training, and human factors research literatures, which yielded a number of relevant articles on aviation training (see, for example, Birnbach & Longridge, 1993) and training evaluation (see, for example, Alliger, et al., 1997; Kraiger, Ford, & Salas, 1993). We also reviewed a series of surveys that had been conducted among general aviation and commercial airline pilots.

FOCUS GROUPS

Focus groups were conducted with airline pilots to develop a better understanding of CRM training. Several important issues arose during the focus groups that directly contributed to finalizing the list of outcome and content variables. For example, because some airlines refer to their CRM training as "Command/Leadership/Resource Management (C/L/R)" training or "Human Factors" training, the participants felt it was important to include this terminology.

We also established a Technical Advisory Board (TAB) to provide oversight for the project, to review and approve all deliverables, and to assist with coordinating important project activities. The TAB members included representatives from: the Federal Aviation Administration (FAA), the Air Transport Association (ATA), the Air Line Pilots Association (ALPA), the Allied Pilots Association (APA), and the Independent Association of Continental Pilots (IACP). It was the general consensus of the TAB that pilots might not know which training program – Part 121, SVT, or AQP – they are currently trained under. Therefore, a procedure was established that involved identifying each pilot's airline and the fleet/series assignment. This information was later matched to FAA databases to determine the training program under which each pilot was trained.

DRAFT SURVEY MATERIALS

Survey items were written to target each of the content variables included on the final variable list. The first draft was distributed to the TAB in early May 2000 for review and comment. Based on their feedback, a revised draft was submitted to TAB members in early June 2000, which was then formatted for pre-testing.

Because the survey would be distributed to 24 different U.S. airlines and 3 distinct pilot unions, a decision was made to tailor the cover letter to each union. Therefore, comments from the TAB members were incorporated separately into their respective cover letters. Each cover letter appeared on union letterhead, was signed by the union president, and was personally addressed to the pilot receiving the survey. Each formatted cover letter was pre-tested with pilots from the appropriate union.

We also decided to include a postcard follow-up. Previous research suggests that a follow-up postcard can significantly enhance response rates (Yammarino et al., 1991). Draft postcards were prepared and submitted to TAB members for review and comment. The postcards were pre-tested with the other survey materials.

PRE-TESTS

The best way to identify problems with a survey is to pre-test all of the survey questions and procedures prior to their actual administration in the field (Rea & Parker, 1997). This allows potential problems to be detected and avoided. Four separate pre-tests were conducted.

In each pre-test, participants reviewed the cover letter, postcard, and survey instrument and were asked to independently complete the survey. A short focus group followed to identify any problems with the cover letter and the survey. Changes were made to the survey based on the focus group comments. These primarily involved minor editorial and formatting changes to the survey instrument.

SAMPLE SELECTION

For the purposes of this survey, we restricted the commercial airline pilot population to only those pilots who are currently employed by the 30 largest U.S. passenger carriers. These carriers were selected because they contain a substantial percentage of the best trained and most experienced air carrier pilots in the U.S. economy. Despite our efforts to contact the top 30 carriers and solicit their participation in the survey, we were unsuccessful at enlisting the participation of six airlines. Therefore, the final population for the survey consisted of 24 U.S. airlines, accounting for nearly 95% of the U.S. commercial market.

SAMPLE SIZE

We decided to use a very large sample – 30,752 airline pilots – for this survey. This figure represents 50% the airline pilots employed at the 24 largest U.S. carriers. Large samples have a number of advantages over smaller ones. For example, large samples are associated with small levels of sampling error and therefore produce more accurate statistical tests (Rea & Parker, 1997).

SAMPLING STRATEGY

After exploring a number of possible alternatives, we decided to use union membership lists as our sampling frame. These lists included the most up-to-date information on pilots' names, mailing addresses, carrier affiliation, aircraft fleet and series, and seat position. We used stratified random sampling to select a sample of 50% of the pilots at 24 of the 30 largest air carriers. This technique produces a sample that is highly representative of the population (Fowler, 1993). To draw the sample, we sorted each database by carrier, fleet, series, and seat position. Next, we randomly chose a starting point in the database and then selected every other pilot.

SURVEY ADMINISTRATION

The survey was mailed during the last week of October 2000. When administering the survey, we utilized several strategies to bolster the probability of achieving as high of a response rate as possible. These included:

- publishing an article in each union's newsletter to pre-notify pilots of the upcoming survey;
- including a personalized cover letter in each participant's survey materials;
- ensuring the anonymity of all participants;
- limiting the survey to four pages in length; and
- mailing a follow-up postcard to all participants.

SURVEY DISTRIBUTION

Approximately 31,000 copies of the survey were printed for distribution. Personalized cover letters, postcards, and outgoing and return envelopes were also printed. Each outgoing envelope was clearly marked "AIRLINE PILOT TRAINING SURVEY." Approximately one week after the survey was mailed, a postcard was sent to participants thanking them for their participation and reminding them, if they had not done so, to complete the survey and return it. As part of the survey distribution process, we established a toll-free telephone number for questions from pilots.

SURVEY RETURNS

Most of the surveys were returned between November 2000 through February 2001. In total, 11,709 surveys were completed and returned.

DATA CLEANING

Prior to conducting any statistical analyses, we performed a series of data screening and checking

procedures to ensure the quality of the data (Tabachnick & Fidell, 1996).

GENERAL QUALITY CONTROL MEASURES

Of the 30,732 surveys that were mailed, 11,709 were completed and returned. An additional 246 surveys were returned undeliverable. This yielded an effective response rate of 38.4%. To ensure that the survey results were not systematically biased, we first filtered out respondents who were either not currently employed as commercial airline pilots, or whose pattern of responding raised serious questions regarding the veracity of their responses. Four criteria were established:

Age

Federal regulations stipulate a mandatory retirement age for all commercial airline pilots. Therefore, we filtered the 96 respondents who exceeded the maximum age for their current seat position. Specifically, we filtered out Captains and First Officers who were over 60 years old and Flight Engineers who were over 65 years old.

Year of Employment

One of the survey questions asked the respondents to indicate the date that they began employment at their current airline. We then filtered the 17 respondents whose year of employment was either highly unlikely or which would make them too old for commercial licensure (e.g., 1956).

Extensive Missing Data

Certain response patterns tend to suggest general carelessness when responding which could bias the survey results. Therefore, we calculated the amount of missing data per respondent (items marked "Not Applicable" were not included in this calculation), and filtered the 36 respondents with greater than 10% missing data.

Aberrant Response Patterns

Other response patterns tend to suggest that certain respondents were not carefully reading the survey items. This could also bias the survey results. Therefore, we identified and filtered the 605 respondents who "straight-lined" the entire survey (e.g., individuals who responded to all items as "Strongly Agree").

A total of 738 respondents were filtered during this stage (16 respondents were filtered out for more than one reason). This represents approximately 6.3% of the total respondent pool. To check for possible bias, we compared the filtered respondents to the remaining respondents along a series of demographic variables: age, employing airline, number of flight hours, union affiliation, fleet and series assignment, seat position, and training program. We found no meaningful differences between the two groups.

ADDITIONAL QUALITY CONTROL MEASURES

During the second stage of the filtering process, we filtered out those respondents whose training program could not be accurately identified. Two criteria were established:

Insufficient Information

We filtered out the 504 respondents who failed to provide sufficient information that would allow us to accurately identify their training program. The necessary information typically included their employing airline, fleet and series assignment, training curriculum, and date of most recent training event.

Transitions within Training Programs

Even with all the necessary information, it was sometimes impossible to determine which type of training each respondent received. This typically occurred when the respondent's most recent training coincided with a change in the training program itself (e.g., when the training program formally transitioned from Part 121 to SVT). We then filtered out the 301 respondents whose training programs transitioned during the survey's administration. A total of 805 respondents were filtered during this stage. This represents an additional 6.9% of the total respondent pool.

RESPONDENT REPRESENTATIVENESS

In total, the filters resulted in a total of 10,166 usable responses for the remaining analyses. This represents approximately 86.8% of the total respondent pool. In order to assess the representativeness of the respondents vis-à-vis the intended population, we compared the sample proportion to the usable response proportion. If these two values are approximately equal, the usable respondents can be considered representative of the population of pilots. However, if large differences are observed, this would indicate that the results are biased and would require response weighting to offset this bias (Henry, 1990; Lee, Forthofer, & Lorimer, 1989).

The differences between the sample and usable response proportions were generally less than 1 percent, and never exceeded four percent. These differences are extremely small and could easily have occurred by chance. As a result, it was not necessary to weight the survey results prior to conducting subsequent analyses (Henry, 1990; Lee et al., 1989).

CREW POSITION

The surveys were completed by a roughly equal number of Captains (49.2%) and First Officers (45.6%). Substantially fewer were completed by Flight Engineers (5.2%). The relatively small number of responses from Flight Engineers is not unexpected, given that many carriers are phasing out their older, three-crewmember aircraft.

NUMBER OF FLIGHT HOURS

The respondents included both highly seasoned veterans and relative novices. A sizeable number reported that they had logged over 14,000 hours in all commercial and military aircraft (25.9%). However, most reported having logged between 2,000 and 14,000 hours (72.8%). A handful reported having flown fewer than 2,000 hours (1.3%).

MOST RECENT TRAINING

Because this survey was mailed to such a diverse population, we needed some type of "anchor" for pilots to use when responding to the survey items. We decided that the pilots' most recent training event should serve as this anchor. Therefore, we asked the pilots to describe their most recent training event and to consider this event when responding to many of the survey questions.

Roughly equal numbers of pilots were trained under AQP (42.0%) and Part 121 (41.8%). Substantially fewer pilots were trained under the SVT (16.3%).

The majority of the respondents reported that they most recently received recurrent qualification training (66.5%). Substantially fewer received initial qualification (6.5%), re-qualification after losing their qualification (1.5%), transition training from one fleet to another (15.8%), or upgrade training – to a different seat position (9.7%).

When they responded to the survey, relatively few pilots were currently enrolled in training (3.3%). Many had received their most recent training between one to six months earlier (64.4%). Substantially fewer had received their training more than six months earlier (32.4%). During their most recent training event, a substantial majority of respondents participated in CRM training (95.2%).

SURVEY RESULTS

For ease of presentation, we collapsed the five-point response scale – Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, and Strongly Disagree – into a three-point scale – Agree, Neither Agree nor Disagree, Disagree. Differences between AQP and Part 121 that exceeded 5% for the new response category of "Agree" were considered practically meaningful.

DESCRIPTIVE STATISTICS

Survey items 51-53 focused on the pilots' personal experiences in CRM training. The respondents were instructed to answer these questions only if they received CRM training during their most recent training.

As shown in Table 1, the majority of respondents indicated that their most recent training integrated CRM principles throughout the entire curriculum (55.8%). Substantially fewer indicated that they had received CRM training as a separate module (22.0%) or that their training involved both integrated CRM as well as a separate CRM course (12.1%). A small but sizeable percentage of pilots reported having received no formal CRM training (10.1%).

Table 1. Item 2f, "Please indicate what type of CRM training you received."

	Training Program			
	121	SVT	AQP	Total
Separate Course	32.7%	25.0%	11.1%	22.0%
Integrated Throughout	46.5%	50.9%	65.8%	55.8%
Both	9.3%	12.0%	11.5%	12.1%
None other than LOFT	11.4%	12.1%	11.5%	10.1%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 9676.

It is interesting to note that 11.5% of AQP trained pilots reported receiving no CRM training other than LOFT. These results are somewhat puzzling, because one of the tenets of AQP is that CRM should be integrated throughout the training curriculum. These results may suggest that a small but sizeable number of pilots are confused regarding what exactly the term "CRM" entails. Alternatively, the results may suggest that there is substantial variability among AQP programs regarding the extent to which CRM principles are integrated throughout training.

DIFFERENCES BETWEEN AQP AND PART 121

Survey items 50-53 all showed greater than a 5% difference between pilots trained under AQP compared to pilots trained under Part 121. For each item, these results favored AQP training. Item 50, which concerns the usefulness of performance feedback during CRM training, revealed the largest difference between pilots trained under AQP and Part 121. Item 52, which concerns the clarity of CRM training objectives, revealed the smallest difference. Tables 2-5 present the results for items 50-53, respectively.

Table 2. Item 50, "CRM training provided useful feedback about my performance."

	Training Program			
	121	SVT	AQP	Total
Disagree	22.7%	18.5%	12.0%	17.5%
Neither Agree nor Disagree	25.3%	23.6%	21.7%	23.5%
Agree	52.1%	57.9%	66.3%	59.1%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 8,811.

Table 3. Item 51, "CRM training covered important issues in current line operations."

	Training Program			
	121	SVT	AQP	Total
Disagree	15.8%	12.8%	10.8%	13.2%
Neither Agree nor Disagree	18.0%	18.2%	17.1%	17.7%
Agree	66.2%	68.9%	72.1%	69.1%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 8,933**.**

Table 4. Item 52, "The objectives of CRM training were clear."

	Training Program			
	121	SVT	AQP	Total
Disagree	14.2%	11.9%	9.9%	12.0%
Neither Agree nor Disagree	19.4%	18.4%	18.4%	18.8%
Agree	66.4%	69.7%	71.8%	69.2%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 8,931.

Table 5. Item 53, "CRM training prepared me to fly the line."

	Training Program			
	121	SVT	AQP	Total
Disagree	20.6%	15.5%	14.0%	17.0%
Neither Agree nor Disagree	27.1%	26.9%	24.3%	25.9%
Agree	52.3%	57.6%	61.7%	57.1%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 8,901.

Two additional items (items 70-71) focused on pilots' opinions about various training issues. The respondents were instructed to answer these questions regardless of whether or not they received CRM training during their most recent training. Tables 6-7 present the results for items 70-71, respectively.

Item 70 focused on the importance of CRM in the pilot training curriculum. This item is important because human error has been identified as a major cause of accidents (Boeing Commercial Airplane Group, 1998), and CRM training has been designed to address the role of human factors issues on the flight deck. A substantial majority of pilots recognize the value of CRM. Regardless of their training program, most pilots indicated that CRM is an important topic to include in training (86.2%). Few remained neutral on the topic (8.3%) or disagreed outright (5.5%).

Table 6. Item 70, "CRM is an important topic to include in training."

	Training Program			
	121	SVT	AQP	Total
Disagree	4.9%	7.7%	5.4%	5.5%
Neither Agree nor Disagree	7.0%	11.0%	8.5%	8.3%
Agree	88.1%	81.3%	86.2%	86.2%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 10,155.

Item 71 focused on the extent to which CRM principles should be integrated throughout the training curriculum. Regardless of their training program, most pilots indicated that CRM should be integrated throughout the total training curriculum (82.6%). Again, few remained neutral on the topic (10.3%) or disagreed outright (7.1%).

Table 7. Item 71, "CRM training should be integrated throughout the total training curriculum."

	Training Program			
	121	SVT	AQP	Total
Disagree	6.9%	9.3%	6.5%	7.1%
Neither Agree nor Disagree	9.2%	14.1%	9.9%	10.3%
Agree	83.8%	76.6%	83.6%	82.6%
TOTAL	100.0%	100.0%	100.0%	100.0%

Note: The number of usable responses for this question was 10,145.

Survey items 50-53, which focused on pilots' experiences in their training, clearly showed an advantage of CRM training conducted under AQP. By way of comparison, survey items 70-71, which focused on pilots' opinions about CRM training, showed no discernable differences between AQP and Part 121 pilots.

TESTS FOR GROUP DIFFERENCES

In this section, we describe the procedures that we used to test for between-group differences on CRM Training. Specifically, we tested for differences between training programs (i.e., AQP, SVT, Part 121), training curricula (i.e., recurrent training vs. initial/other), seat positions (i.e., Captains vs. First Officers), and CRM training type (refer to Table 1).

We started by conducting a factor analysis of survey items 50-53. The results suggested that a single factor could explain approximately 75% of the total item variance. Moreover, all items loaded .84 or higher on this factor. We then conducted a reliability analysis of the 4 items. The results suggested that the reliability was high (α=.89). Combined, the results suggest that it was appropriate to average all 4 items to form a single scale.

Tests for group differences yielded significant effects for training program and seat position, $F_{(2,8959)}$=53.59, p. < .001 and $F_{(1,8480)}$=65.02, p. < .001. The mean scores for Part 121, SVT, and AQP were 3.54, 3.63, and 3.76, respectively, while the mean scores for Captains and First Officers were 3.57 and 3.72, respectively. The results for training curricula were not statistically significant ($F_{(1,8721)}$=.64, n.s.). The mean scores for Initial Qualification/Other and Recurrent Qualification were 3.64 and 3.65.

Although statistically significant effects for training program and seat position were identified, none of the mean differences exceeds our .5 scale point criterion for practical significance. Therefore, the extent to which the results for these analyses are meaningful is questionable.

However, when taken in combination with the item-level percentages, it appears that pilots in AQP find their CRM training more useful than pilots in Part 121. This result may be a function of the fact that CRM training is more likely to be integrated throughout AQP training than in Part 121.

Our analyses showed a significant effect for the type of CRM training that was offered (i.e., CRM taught as a separate course, CRM integrated throughout training, CRM taught both as a separate course and integrated throughout training), $F_{(2,8639)}$=254.43, p. < .001. The mean scores for separate, integrated, and both separate/integrated were 3.28, 3.75, and 3.83, respectively. Although the mean differences between CRM taught as a separate course and the integrated and both options appear small (ranging between .47 and .53), the difference between taught as a separate course and both does exceed our .5 scale point criterion and the difference between taught as a separate course and integrated nearly meets our criterion. Therefore, we would consider these differences to have practical implications for how CRM training should be conducted.

CONCLUSION

The results suggest that most pilots – regardless of whether they were trained under AQP, SVT, or Part 121 – are satisfied with their CRM training and find it useful. However, AQP pilots did rate their CRM training as more useful that Part 121 pilots. Finally, the results suggest that training programs which integrate CRM principles throughout the entire curriculum are perceived more favorably than stand-alone CRM training courses.

We remind the reader that in comparison to Part 121 training, AQP training programs are more likely to include:

- the integration of CRM concepts throughout the training curriculum;
- the requirement for pilots to demonstrate proficiency on technical and CRM skills in Line Operational Evaluation (LOE) scenarios prior to certification;
- the requirement that CRM evaluation focus on specific, observable behaviors that were derived from the task analysis, and;
- the requirement that check airmen receive special training in evaluating pilots' CRM skills.

We believe that these characteristics resulted in the higher ratings for AQP. However, because trainee reactions are only one measure of training's effectiveness, we refrain from making recommendations for practice. We feel that policy-related issues are best left to other groups that have more experience in this area. Nevertheless, we hope that these constituencies

will consider the survey results when updating their CRM training programs.

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