



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

06/20/95

Subject: CREW RESOURCE MANAGEMENT
TRAINING

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1. PURPOSE. This change transmits Appendix 3, Appropriate CRM Training Topics -- (FAR Parts 121 and 135 Operators). This appendix is being added because accident investigations conducted by the National Transportation Safety Board have revealed that many accidents are caused by crewmembers who may not have been knowledgeable of and/or properly trained in Crew Resource Management.

The Change number and date of the added material are carried at the top of the page. Pages having no changes retain the same heading information.

2. PRINCIPAL CHANGES. Appendix 3 has been added and a reference to Appendix 3 was inserted on page 10 of the advisory circular.

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* APPENDIX 3. APPROPRIATE CRM TRAINING TOPICS --
(FAR PARTS 121 AND 135 OPERATORS)

1. BACKGROUND INFORMATION.

a. Research findings suggest that CRM training can result in significant improvements in flightcrew performance. CRM is seen as an effective approach to reducing flight errors and increasing aviation safety.

b. Accident investigations conducted by the National Transportation Safety Board (NTSB) reveal that many accidents are caused by crewmembers who may not have been knowledgeable of and/or properly trained in CRM.

2. TRAINING TOPICS, PRINCIPLES, AND TECHNIQUES. CRM training is recommended which includes the curriculum topics described in paragraph 11 of the advisory circular and the topics, principles, and techniques which follow:

a. Theory and practice in using communication, decisionmaking, and team building techniques and skills.

b. Theory and practice in using proper supervision techniques, i.e., captains working with first officers.

c. Theory and practice in selecting and using interventions needed to correct flying errors made by either pilot, especially during critical phases of flight. These interventions may include, but not be limited to, communication, assertion, decisionmaking, risk assessment, and situational awareness skills.

d. During Line Operational Simulation training, information, and practice of nonflying pilot functions, i.e., monitoring and challenging pilot functions, and monitoring and challenging errors made by other crewmembers for flight engineers, first officers, and captains. Training will alert flightcrews of hazards caused by tactical decision errors which are actually errors of omission. Practice in monitoring and challenging errors, especially during taxi operations, should be included. These skills are important to minimize procedural errors which may occur as a result of inadequately performed checklists.

e. Training for check airmen in methods which can be used to enhance the monitoring and challenging functions of both captains and first officers.

f. Training for new first officers in performing the nonflying pilot role to establish a positive attitude toward monitoring and challenging errors made by the flying pilot.

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APPENDIX 3. APPROPRIATE CRM TRAINING TOPICS --
(FAR PARTS 121 AND 135 OPERATORS) (Continued)

g. Training for captains in giving and receiving challenges of errors.

h. Factual information about the detrimental effects of fatigue and strategies for avoiding and countering its effects.

3. APPROPRIATE TRAINING INTERVENTIONS.

a. The most effective CRM training involves active participation of all crewmembers. LOFT sessions give each crewmember opportunities to practice CRM skills through interactions with other crewmembers. If the training is videotaped, feedback based on crewmembers' actual behavior, during the LOFT, provides valuable documentation for the LOFT debrief.

b. CRM training can be presented using a combination of the following training interventions:

- (1) Operator in-house courses.
- (2) Training center courses.
- (3) Special Purpose Operational Training.
- (4) LOFT sessions.
- (5) Computer Based Training courses.

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(5) It is important to recognize that classroom instruction alone does not fundamentally alter crewmember attitudes over the long term. The indoctrination/awareness training should be regarded as a necessary first step towards effective crew performance training.

b. Recurrent Practice and Feedback.

(1) CRM training should be included as a regular part of the recurrent training requirement. Recurrent CRM training should include refresher practice and feedback exercises such as LOFT with taped feedback; or a suitable substitute such as role-playing in a flight training device and taped feedback. It is recommended that these recurrent CRM exercises take place with a full crew, each member operating in his or her normal crew position. A complete crew will always be scheduled, and every attempt will be made to maintain crew integrity. Recurrent training LOFT which includes CRM should be conducted with current linecrews, and preferably not with instructors or check airmen as stand-ins.

(2) Recurrent training and feedback allows participants to practice newly improved skills in communication and interpersonal relationships and to receive feedback on their effectiveness. Feedback has its greatest impact when it comes from self-critique and from peers, together with guidance from a facilitator with special training in assessment and debriefing techniques.

(3) Effective feedback refers to the coordination concepts identified in Indoctrination/Awareness training and relates to specific behaviors. Practice and feedback are best accomplished through the use of simulators or training devices and videotape. Taped feedback, with the guidance of a facilitator, is particularly effective because it allows participants to view themselves from a third person perspective. This view is especially compelling in that strengths and weaknesses are captured on tape and vividly displayed. Stop action, replay, and slow motion are some of the playback features available during debriefing. Attitudes and behaviors are easily seen, and appropriate adjustments are often self-evident.

c. Continuing Reinforcement.

(1) No matter how effective each curriculum segment is (the classroom, the role-playing exercises, the LOFT, or the feedback), one-time exposures are simply not sufficient. The attitudes and norms that contribute to ineffective crew coordination have developed over a crewmember's lifetime. It is

unrealistic to expect a short training program to reverse years of habits. To be maximally effective, CRM should be embedded in every stage of training, and CRM concepts should be stressed in line operations as well.

(2) CRM should become an inseparable part of the organization's culture.

(3) There is a common tendency to think of CRM as training only for the managers and captains. This notion misses the essence of the CRM training mission: the prevention of crew-related accidents. CRM training works best in the context of the entire crew. Training exercises are most effective if all crewmembers work together and learn together. In the past, much of the flightcrew training has been segmented by crew position. This segmentation has been effective for meeting certain training needs such as seat dependent technical training and upgrade training, but segmentation is not appropriate for CRM training.

(4) Reinforcement can be accomplished in many areas. Training such as joint cabin and cockpit crew training in security can deal with many human factors issues. Joint training with aircraft dispatchers, maintenance personnel, and gate agents can also reinforce CRM concepts.

11. SUGGESTED CURRICULUM TOPICS. The topics outlined below have been included in many current CRM programs. Specific content of training and organization of topics should reflect an organization's unique culture and specific needs. Appendix 1 offers a set of behavioral markers fitting subtopics within each topic cluster. These markers may be helpful in curriculum * development and in LOFT design. Appendix 3 gives additional CRM * training topics.

a. Communications Processes and Decision Behavior. This topic includes internal and external influences on interpersonal communications. External factors include communication barriers such as rank, age, gender, and organizational culture. Internal factors include listening skills and decisionmaking skills, conflict resolution techniques, and the use of appropriate assertiveness and advocacy. More specific subtopics include the following:

(1) Briefings. Training in addressing both operational and interpersonal issues, and training in establishing open communications.

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