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# CABIN CREW SAFETY

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## Flight Attendants Who Work Alone Need Specialized Training at Regional Airlines

*Cabin-safety specialists in Australia and the United States have identified common issues that affect regional airline operations in which only one flight attendant works aboard an aircraft. Solo flight attendants have significant responsibilities in meeting passengers' expectations for service and in performing all cabin-safety duties during relatively short flights. Crew resource management training and increased support from ground personnel have been recommended to increase operational safety.*

FSF Editorial Staff

Several issues that affect flight attendants who work alone in regional airline operations<sup>1,2</sup> have been identified recently by cabin-safety specialists in Australia and the United States. Some regulations require an adequate number of aircraft crewmembers to direct safe evacuations of transport category aircraft during emergencies — even if some crewmembers become incapacitated.<sup>3</sup> Nevertheless, the consensus of several authors and organizations is that operation of aircraft with one flight attendant involves distinct challenges compared with the operation of aircraft requiring two or more flight attendants.

Work is under way in Australia to develop a “world best practice” and a training video for solo flight attendant (SFA) operations by focusing on recruitment, initial training, recurrent training, performance standards, work environment, workplace isolation, in-flight medical emergencies, and management of passengers who have special needs.<sup>4</sup>



The Single Flight Attendant Work Group (SFAWG) of the Asia/Pacific Cabin Safety Working Group — comprising representatives of regional airlines, air safety investigators and civil aviation authorities — has identified common issues by surveying flight attendants for regional airlines in Australia, Canada, New Zealand and South Africa. Although the SFAWG's work is in progress, preliminary findings and recommendations have been published, and Australia's Bureau of Air Safety Investigation (BASI) considered this work in developing the Regional Airline Safety Study Project Report.<sup>5</sup>

In its analysis of SFA issues, the BASI report said, “From the day they complete their training, the [solo] flight attendants work without the supervision of a more experienced flight attendant. Any in-flight cabin emergencies which occur, such as a medical emergency or a cabin fire, are dealt with by the

flight attendant, usually without assistance from the flight crew. Anything [solo flight attendants] fail to learn in training they are unlikely to learn on the job. Regional-airline flight attendants, therefore, have a special need for comprehensive standards of training.

“The need for flight attendants to call upon their safety training in an emergency situation is rare but often sudden, and may be life-threatening. Flight attendants, therefore, must be provided with the knowledge and skills to perform efficiently and effectively. It is imperative that they [be] practiced and familiar with all on-board emergency equipment and procedures to enable them to perform adequately in the event of an emergency.

“Airline management and airline training departments must recognize the special needs associated with solo flight attendant operations and provide a level of training which will adequately prepare those flight attendants to confidently and effectively handle in-flight emergencies. To promote an understanding of each other’s duties and responsibilities, and to enable effective communication and coordination in abnormal situations, joint flight crew-cabin crew resource management [CRM] training should be provided.”<sup>6</sup>

“The fact that more than one-quarter of the flight attendants felt that their initial safety training did not adequately prepare them for in-flight emergencies and that 54 percent of respondents commented on the need for more practical emergency training suggested that the initial training conducted by some airlines was inadequate.”<sup>7</sup>

## **Working Environment Presents Special Challenges to SFAs**

In the United States, Walter S. Coleman, president of the Regional Airline Association, said that among 124 regional airlines in 1997, the largest category of aircraft used by regional airlines — approximately 900 aircraft — had between 20 seats and 50 seats, and were operated with one flight attendant.<sup>8</sup> These operations typically had characteristics and safety requirements that differ from those of airlines that operate larger airplanes.

“The majority of regional aircraft park on ramps which are not connected to the [airport] terminal structure,” said Coleman. Thus, the following issues and procedures are common in this environment:

- “Ramps can be slippery,” said Coleman;
- “There are aircraft stairs to negotiate;
- “Other aircraft may be taxiing;
- “Other aircraft [propellers] may be turning;

- “[Under standard operating procedures (SOPs), a] customer service agent escorts [passengers] from the departure gates to the aircraft;
- “[SOPs determine] passenger movements if aircraft are taxiing in the [vicinity];
- “[SOPs require] propeller tie-downs before [the] entry door [is] opened on arrival;
- “[SOPs require] communication from outside ramp crew before entry doors are opened;
- “[SOPs require] flight attendant escort [of passengers] to the gate;
- “[SOPs define] prohibited areas, such as no [passengers] on the right-hand side of the aircraft and no [passengers] aft of the wing on forward-entry-door aircraft; [and,]
- “Most procedures have ramp crews bring the bags to a point convenient for the passenger but not at the cargo hold.” (SOPs vary, depending on the configuration of individual aircraft.)

U.S. Federal Aviation Regulations require specific crewmembers or qualified ground personnel to attend to passengers aboard aircraft and in ramp areas where there could be exposure to jet blast, moving propellers and similar hazards.<sup>9</sup>

Basic cabin duties, such as passenger safety briefings and equipment demonstrations, become more complex for SFAs unless such tasks are planned carefully and practiced adequately, said Coleman. Technology such as audio recordings of the briefings sometimes is used, but more often the briefings must be memorized so that the SFA can demonstrate how to use equipment.

SFAs also must ensure that there is no ambiguity concerning crewmember duties in the event of an emergency. Close coordination with the flight crew has the same critical importance as on larger aircraft. Rapidly identifying the emergency and the appropriate checklist ensure that the flight attendant’s emergency actions are prioritized and are completed effectively.

SFAs might have two advantages compared with two or more flight attendants on larger aircraft: clarity about the execution of cabin duties (because the SFA knows who will be coordinating and performing these duties) and opportunity to maintain direct voice communication with the relatively small group of passengers in the cabin, said Coleman.

“On regional aircraft, there is a high ratio of exits to passengers,” said Coleman. “On 19-seat to 50-seat regional aircraft, the ratio ranges between 13 [seats per exit] and seven

seats per exit, which places passengers very close to exits, regardless of where they are seated. ... One of the advantages [that] the regional fleet has ... is quick access to hundreds of airports in the United States.”

In addition to initial training and recurrent training in emergency procedures in relatively small classes, SFAs especially benefit from CRM training, which has been defined as the effective use of all available resources, including equipment, procedures and personnel, to achieve safe and efficient flight operations.

“Most of the [U.S. regional airlines] appear to train under a CRM program which combines cockpit [crew] and cabin crew,” said Coleman. While relevant to all air carrier environments, CRM training has been recommended as a high priority for operations with one flight attendant. A U.S. Federal Aviation Administration (FAA) advisory circular (AC)<sup>10</sup> in 1998 said that such training is especially important in clarifying expectations during an emergency.

“Cabin attendants are probably the most obvious of the groups other than pilots who may profit from CRM training,” said AC 120–51C. “Joint CRM training for pilots and flight attendants has already been proposed and adopted. One fruitful activity in joint training has been that each group learns of the other group’s training in shared issues. The joint training has revealed inconsistencies between training for one group and training on the same topic for another group. Examples of shared issues include delays, the use of personal electronic devices in the cabin, and evacuation and ditching. When inconsistencies are identified between the contents of pilots’ manuals and flight attendants’ manuals, or between widely held ideas or attitudes in those two populations, those inconsistencies are brought out into the open and often resolved. Other specific topics for joint training have been proposed, including: preflight briefings; postincident/accident procedures; sterile-cockpit procedures; notification procedures pretakeoff and prelanding; procedures for turbulence and other weather; security procedures; passenger-handling procedures; in-flight medical problems; and smoke/fire procedures.”

Coleman said that U.S. regional airlines also have recognized the following special considerations of SFA operations:

- “Once [regional airlines] release flight attendants [from training and initial operating experience] to operate on revenue flights, [SFAs] are on their own in the cabin;
- “When there is time to prepare for an emergency, such as an anticipated emergency evacuation, flight attendants may assign passenger assistants;

- “In medical emergencies, where the flight attendant may have to attend to a passenger, another passenger may be asked to communicate with the cockpit; [and,]
- “Passengers with special needs ... could require time for planning and duty allocation.”

Author and SFA trainer Lisa A. Kearns said in 1995 that working as a solo flight attendant occasionally might involve professional disagreements with the flight crew regarding interpretation or enforcement of SOPs. Procedures should be available to resolve these conflicts.

SOPs might include, for example, conditions in which the flight crew will contact a cabin-crew supervisor by radio or enable the SFA to speak with a cabin-crew supervisor, and a toll-free telephone number for SFA-to-base consultations on the ground.<sup>11</sup> A significant disparity typically exists in the greater average years of experience among flight crews and the fewer average years of experience among SFAs. Thus, clear SOPs for crew introductions, preflight briefings and resolution of disagreements can help to build harmonious in-flight relationships.

A 1994 study said, “Overall, the results of this analysis indicate that crewmembers prefer to have enough time to establish a smooth working relationship with one another. Their responses suggest that safety is enhanced through increased contact. ... Both flight attendants and pilots [in a survey] ranked setting the tone for crew communication as the most important element of a [preflight] briefing. Flight attendants ranked emergency procedures as a close second; however, pilots ranked weather as the second most important topic in a briefing.”<sup>12</sup>

SFAs also confront decisions that involve conflicts between meeting one passenger’s needs and performing duties that meet a safety obligation to all passengers, said the SFAWG. An example of such a conflict would be continuing to assist a passenger after landing — when other duties usually would be performed.

SFA self-reliance requires a commitment to self-protection because some critical cabin-safety duties could not be delegated to an untrained person if the flight attendant were injured. SFAs might have to choose, for example, between remaining seated with a seat belt and shoulder harness fastened during turbulent flight conditions or risking personal injury by assisting an ill passenger.

Personal health and fitness for flight duty also have added significance for the flight attendant who works alone in the cabin.

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The position involves judging the safety risks of attempting to perform flight duties while feeling ill, for example.

Characteristics of aircraft operated with one flight attendant include cabins that are more restricted than those of larger aircraft, and operation at lower altitudes where turbulence is more likely. Some studies also have shown that most turbulence-related injuries occur during initial climb or descent for landing — flight phases where SFAs spend relatively more time because of multiple flights per day (up to nine legs per day on one airline, for example), said Kearns.<sup>13</sup>

To help reduce risk of turbulence-related injury, some regional airlines have SOPs that require flight crews to check the status of the flight attendant if unexpected turbulence occurs; passengers might not know how to communicate with the flight deck if the SFA were injured. Thus, SOPs require the flight crew to communicate periodically with the SFA and to investigate if there is no response.

Aboard the aircraft, SFAs typically work in constant view of the passengers, without a time or place to relax, said Kearns.

Adequate education regarding safety risks and regarding time available to prepare the cabin during in-flight emergencies — combined with prompt and complete notification by the flight crew — enables an SFA to take the appropriate actions (including appropriate passenger briefings) if an engine failure, landing gear failure or similar event occurs. SFAs in these situations cannot rely on the experience of a purser or the collective knowledge of other cabin crewmembers to respond appropriately, including the accurate communication of information to the flight crew.

“It has become increasingly vital that cabin crews [be] knowledgeable concerning aircraft systems and architecture,” said the 1994 study. “Valuable time can be wasted in the inaccurate transfer of information, especially when pilots cannot leave the flight deck to validate the accuracy of the information. ... The implications of an inadequate [understanding] of aircraft terminology and mechanical knowledge are potentially serious.”<sup>14</sup>

## **Emergency Evacuation Demonstrates Safety Role of Solo Flight Attendant**

In a 1995 accident near Carrollton, Georgia, United States, the U.S. National Transportation Safety Board (NTSB) said that a solo flight attendant aboard a turboprop aircraft evacuated passengers.<sup>15,16</sup>

NTSB said, “The Safety Board commends the exemplary manner in which the flight attendant briefed the passengers and handled the emergency. According to passengers, immediately following the loss of the propeller blade, the flight attendant checked with each passenger individually to make sure that they all understood how to assume the brace position, and she yelled instructions to the passengers up to the time of impact. After the crash, although she was seriously injured, she continued to assist the passengers by moving them away from the airplane and extinguishing flames on at least one passenger who was on fire. ... The flight attendant and several passengers said that they had to run through flames to escape from the cabin wreckage. The flight attendant received second-degree burns to her ankles and legs.”

The flight attendant, 37, was employed by the regional airline two years and six months before the accident with no previous experience as a flight attendant, and her most recent recurrent training on that type of aircraft was conducted seven months before the accident, said the report.

The NTSB’s report also included recommendations for improving the performance of a flight attendant and a flight crew under emergency conditions similar to those involved in this accident.

“The Safety Board recognizes that the flight crew in this accident was attempting to control the aircraft,” said the report. “However, the Safety Board is concerned that the flight attendant neither received nor sought information about the time remaining to prepare the cabin or brace for impact. The [cockpit voice recorder] transcript revealed that the flight crew informed her seven minutes before impact that they had experienced an engine

failure, that they had declared an emergency for return to [Atlanta Hartsfield International Airport (ATL)], and that they had advised her to brief the passengers. There were no further communications to the flight attendant.

“Specifically, the flight attendant was never told that the airplane would not be able to make ATL, and would instead be making an off-airport crash landing. The flight attendant stated that while preparing the cabin and passengers, she saw the treetops from a cabin window. She immediately returned to her jump seat and shouted her commands. A passenger commented that the flight attendant was barely in the brace position when the impact occurred. The Safety Board is concerned that the flight attendant and the flight crew did not discuss a brace signal and the time available to prepare the cabin, and that the flight crew did not announce a brace

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command on the public address system. Further, if the flight attendant had not had sufficient time to fasten her safety belt and shoulder harness, she might have received more serious or fatal injuries, and she might have been incapable of directing an evacuation.”

A 1996 BASI report said that joint CRM training could prepare flight crews to use an SFA effectively.<sup>17</sup>

The report said, “On 17 May 1996, a de Havilland Canada Dash 8 aircraft sustained a serious bird strike near Broome[, Australia]. Although the [flight] crew had received CRM training and utilized company engineers to assist with the problem-solving of the technical aspects, the flight attendant was not utilized to visually inspect the landing gear or to prepare the cabin for a non-normal landing. She was instructed that her assistance was not required. In addition, the flight attendant, who had not received CRM training, did not understand the contribution she could make to the crew’s handling of the occurrence. She remained seated throughout the occurrence.”

The 1999 BASI report said, “As solo flight attendants, the only other crewmembers they can approach for advice during emergencies are the pilots. Therefore, effective communication and teamwork between the flight crew and cabin crew [have] a special significance on regional-airline aircraft. Past experience has shown that CRM training promotes communication and teamwork, particularly when pilots and flight attendants train together. Thirty-nine percent of flight attendants answered that they had received CRM training, and 80 percent of those had completed joint training with pilots. The fact that a significant proportion of pilots and flight attendants had not completed CRM training indicated that a safety deficiency existed in this area. However, as the majority of flight attendants reported that their CRM training was done in conjunction with pilots, the value of joint training was being recognized.”<sup>18</sup>

### **SFAs, Pilots Describe Diverse Range of Difficulties in Surveys**

The 1999 BASI report contained the following comments from flight attendants and pilots at regional airlines; they were asked to give their opinions about safety issues, including SFA issues:

- “The fact that we operate as a [solo] flight attendant can be difficult in some situations. I feel confident to handle

aircraft emergencies on my own, but I know from experience that it is very difficult for one flight attendant to handle an emergency and continue to carry out normal safety procedures. In several cases where one passenger requires all your attention, it becomes very difficult to manage. (Flight attendant, respondent 092)”;<sup>19</sup>

- “Most pilots come from single-pilot backgrounds so we have an inherent ‘do it myself’ approach to situations. We need training and simulation to rely on and be confident of each other’s abilities. The captain-first officer distinction needs to be diluted so more of a team approach exists to most crews. The flight attendant is often left out of the situational loop. More attention needs to be given to including them, and they need to seek more information. (Pilot, respondent 421)”;<sup>20</sup>

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- “The person teaching the course should demonstrate ... the correct way in which a flight attendant should evacuate an aircraft, not let a trainee figure it out ... from the book and become confused. (Flight attendant, respondent 469)”;<sup>21</sup>
- “I really do feel that my (safety) training was inadequate. It is a big responsibility when you work on your own. (Flight attendant, respondent 464)”;<sup>22</sup>
- “Training itself should be run by professionals, unfortunately it is not [run by professionals] in our company. (Flight attendant, respondent 492)”;<sup>23</sup>
- “We need to have training flight attendants that are trained how to train. (Flight attendant, respondent 509)”;<sup>24</sup>
- “Specific, less rushed (safety training), more qualified trainers.” (Flight attendant, respondent 627)”;<sup>25</sup>
- “[We should] use all of the emergency equipment in a hands-on situation and part of our emergency training, i.e., fire extinguishers, [personal breathing equipment (PBE)], parachute flares, day and night flares, etc. I also think we should train in the simulator with the pilots. The more scenarios, hands-on training with equipment, the easier it is to remember how to use them, rather than from the manual (Flight attendant, respondent 034)”;<sup>26</sup> [and,]
- “More hands-on experience. During our emergency procedures, only two or three went through ‘walking through cabin preparing for emergency landing’ — not all of us. (Flight attendant, respondent 071)”;<sup>27</sup>

## Australian Group Identifies Issues for Continuing Study

Some SFAs believe that they do not receive enough practical experience in emergency procedures or in the use of emergency equipment, according to the SFAWG's preliminary findings<sup>28</sup> and the 1999 BASI report.<sup>29</sup> The SFAWG said that the relatively limited resources of some regional airlines represented in the surveys might be a factor; nevertheless, the following recommendations were made to enhance safety:

- Workplace-isolation issues — such as absence of crew interaction prior to commencing line duties, extended separation from other flight attendants and personal security of SFAs in isolated airport areas — should be considered in developing briefings, regular meetings and special working relationships (such as assigning a seasoned SFA to function as a mentor to an inexperienced SFA);
- Training requirements should be specified in detail, especially for in-flight emergencies without direct support or backup from other flight attendants;
- Training specifications should include familiarization flights on the flight deck and in the cabin, ramp-safety orientation, joint flight deck-cabin emergency-procedures training, CRM training for flight attendants, use of personal flotation devices, proficiency in swimming, and certification in cardiopulmonary resuscitation (CPR) and first aid;
- The limitations of operating without dedicated staff for training should be recognized. Without such staff, significant training responsibilities and assessment responsibilities could exceed the capabilities of personnel who also have operational duties as SFAs;
- Outside organizations and departments should be used when adequate cabin trainers cannot be provided by flight operations personnel;
- Check flight attendants should have specific training and should conduct checks using well-defined SOPs. Regular evaluations should include recurrent training and additional training when deficiencies are identified;
- Medical standards should be used to determine each SFA's fitness to fly as the only cabin crewmember. After

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***First aid techniques, CPR techniques and in-flight medical equipment should be specially adapted for use by an SFA, who is limited to the relatively confined space of a typical aircraft, or who might encounter multiple in-flight medical emergencies on the same flight.***

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a critical incident, some SOPs take the SFA off the line until a debriefing occurs and counseling needs, if any, have been met;

- First aid techniques, CPR techniques and in-flight medical equipment should be specially adapted for use by an SFA, who is limited to the relatively confined space of a typical aircraft, or who might encounter multiple in-flight medical emergencies on the same flight;
  - Flight crewmembers who work with SFAs should maintain advanced first aid certification;
  - Ground-based medical advice should be considered to extend the capabilities and limited resources of the aircraft crew;
  - Appropriate flight-time limitations and duty-time limitations, and rest opportunities, should be established for SFAs to prevent safety risks associated with fatigue and sleepiness;
  - Records of operational incidents should be maintained and reviewed periodically for continual improvement of procedures and training; and,
  - The latest research on turbulence — adapted specifically to aircraft types used in regional airline operations — should be used to improve recognition of hazardous conditions, to enhance crew communication and to prevent injury to SFAs.
- The SFAWG said that reports from SFAs also indicate that the following situations can cause significant problems:
- Accommodating multiple passengers who have special needs on one flight — that is, disabled persons, unaccompanied minors and passengers who have difficulty traveling because of a health condition — requires SOPs that designate other personnel to relieve SFAs or otherwise assist SFAs during normal operations and emergencies. SOPs also should limit the number of such passengers on any flight that has only one flight attendant;
  - Duties that exceed those defined for SFAs should be limited. Examples are loading and unloading baggage, loading and unloading catering, and boarding disabled passengers. Ground-support staff also must understand fully the role, responsibilities and duty limitations of SFAs; and,

- SOPs should empower specific ground personnel, flight crewmembers and SFAs with authority and complete operator support to prevent the boarding of violent, abusive, unruly or intoxicated passengers.

## Australian Report Suggests Safety Improvements to Regional Airlines

The 1999 BASI report contained numerous recommendations about regional-airline operations and safety improvement when using SFAs.

The report said, “[Solo flight attendants at regional airlines,] after they complete their training, usually work without the direct supervision of a more experienced flight attendant. Any in-flight cabin emergencies, such as a passenger collapsing or a cabin fire, had to be dealt with by the sole flight attendant.”<sup>30</sup>

“The [BASI] survey results showed that flight attendants, as a group, had considerably less experience in the industry than other members of the regional airline industry. The majority of flight attendants had three years or less experience. Those figures indicated either a high turnover of staff, a rapid expansion of the industry or both. The high proportion of relatively inexperienced flight attendants would suggest that an emphasis should be placed on training and supervision.”<sup>31</sup>

The researchers found anecdotal information about a significant variation in the quality of mandatory flight attendant training among regional airlines. As a result, BASI recommended a standardized syllabus with greater detail than the typical syllabus.

The report said that BASI has identified current regulations regarding flight attendant safety training and the amount of practical training for flight attendants in emergency procedures as a safety deficiency.<sup>32</sup>

The report said that safety incidents involving the control of passenger behavior on airport ramps were most frequently cited by flight attendants for regional airlines.

“Incidents included passengers walking near turning propellers, passengers being blown over by propeller or jet blast, and passengers smoking on the [ramp],” said the report. “Passenger control on the [ramp] was frequently identified as a safety problem by pilots, flight attendants, maintenance staff and ground staff. Given the potential for a serious incident, passenger control on the [ramp] was considered a safety deficiency.”

The BASI report included the following findings and recommendations:

- “[The Civil Aviation Safety Authority of Australia] should approve and monitor airline training programs on a regular basis, recognizing the special needs associated with solo flight attendant operations and those operations which carry fare-paying passengers without a flight attendant;
- “[BASI] recommends that management and training departments of regional airline operators ensure that flight attendant emergency-training programs include joint flight crew-cabin crew training in the principles and practice of [CRM];
- “The present regulations on the safety training required for flight attendants are minimal and lacking in detail;
- “The safety training conducted for flight attendants provides insufficient practice in emergency procedures and use of emergency equipment;
- “The current procedures for preventing passengers from bringing excessive amounts of cabin baggage onto regional-airline aircraft are inadequate;
- “Procedures for preventing intoxicated passengers from boarding aircraft in some regional airlines are inadequate; [and,]
- “Current procedures at some locations for controlling passengers on the [ramp] are exposing passengers to unacceptable risks from turning propellers, taxiing aircraft and moving vehicles.”

Respondents to BASI surveys recommended the following improvements:

- “More practical training in aircraft evacuations, with a preference for conducting practice evacuations from cabin simulators;
- “More practical training in handling in-flight emergencies, for example, by using emergency equipment such as fire extinguishers and [PBE];
- “More practical first-aid training, such as in [CPR];
- “More training in emergency handling by the whole crew; [and,]
- “A longer initial training course.”

## Training Targets Special Needs of Solo Flight Attendant Operations

Cabin-safety specialists in several countries prize the attitudes, behaviors, abilities and skills found among effective SFAs.

They said that an airline’s new-hire selection process should include focus on these characteristics.

For example, Kearns said that the desired personality is “assertive but not aggressive” and SFAs “have to be self-reliant, able to work alone, able to take command and able to maintain a position of authority when challenged.”<sup>33</sup>

The practical reality of recruiting cabin personnel outside major airline-hub cities of the United States, however, is that candidates might not have any prior experience that prepares them directly to be an SFA.

“Some of our students have never flown in an airplane before, and most have never seen or flown in our types of aircraft ... observation flights are the one time our new hires will get to watch how another flight attendant works under real conditions before those students begin the initial operation experience,” said Kearns.<sup>34</sup>

Nevertheless, efforts are continuing to identify desirable characteristics and to develop standardized methods of recruiting, screening and selecting the most qualified candidates. Some cabin-safety specialists have recommended that senior flight attendants — ideally those involved in safety training and/or conducting proficiency checks — participate in the screening process.<sup>35</sup>

In addition to customer-service skills, pleasant demeanor and ability to work harmoniously with others, one airline looked for “immediate leadership ability, confidence, self-motivation, a conscience, critical thinking skills and the ability to learn quickly and adapt,” said Kearns.<sup>36</sup> Tests that demonstrate ability to make careful decisions under pressure sometimes have been used in screening candidates.

Training programs for SFAs assume that there will be “no supervision, no trained backup, no guidance and no support,” she said. One goal is to enable an SFA to handle every aspect of each situation based on training, CRM and well-designed checklists and manuals.

“We perform the [evacuation] drill by having the flight attendant sit in [the] jump seat on an actual airplane; we simulate the [accident] by making loud banging noises in the cabin — during which our flight attendant must respond properly, get into [the] brace position and yell the proper commands,” said Kearns. “When the banging stops, the flight attendant knows the aircraft has come to a complete stop, [the flight attendant] must change [the] commands, get out of [the] jump seat, switch on the emergency lights, assess the exits, [and] open both rear exits while yelling the proper commands — or if the exits are unusable, lock the door,

change the commands and redirect the evacuation. And we require each student to do all this while blindfolded ... this is our simple attempt to simulate visual conditions in a total blackout.”

Kearns said that the following techniques have been effective in SFA training:

- Emphasis on hands-on training with all equipment;
- Role-playing exercises conducted in an aircraft with other trainees acting as passengers;
- Sufficient simulated pressure on trainees to induce mistakes and faulty judgments in a controlled environment;
- Development of self-reliance by encouraging independent problem solving and working alone in class;
- Constructive critiques of the trainees’ performance by peers and instructors;
- A high degree of consistency and structure to review course content thoroughly;
- Testing each SFA trainee with the assumption that rote memorization is inadequate and that failure to learn a skill, understand vital information or internalize a procedure could cause loss of life under the stress of an emergency;
- Drills that familiarize SFAs with managing multiple exit doors, including authoritative verbal commands and body language to communicate with passengers and to command rapid passenger compliance; and,
- Training on the “sterile-cockpit” rule<sup>37</sup> in U.S. airline operations, and emphasis on appropriate actions when this rule is effective.

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For example, FAA’s sterile-cockpit rule prohibits nonessential duties or activities for all crewmembers during a critical phase of flight. Critical phases of flight include all ground operations involving taxi, takeoff and landing, and all other flight operations conducted below 10,000 feet mean sea level, except cruise flight.

SOPs and training should guide a flight attendant’s decision to interrupt the sterile cockpit for an emergency or a safety-related problem that could endanger passengers, crewmembers or the aircraft. The following guidelines, adapted



from several airlines, have been used as practical examples of when a sterile-cockpit interruption might be appropriate:

- Fire, burning odor or smoke in the cabin;
- Medical emergency;
- Unusual noise or vibration;
- Auxiliary power unit torching;
- Fuel or other fluid leakages;
- Exit door ajar or unable to be armed or disarmed;
- Extreme temperature change;
- Evidence of deicing problems;
- Suspicious unclaimed bag or package;
- Cart stowage problem; and,
- Any other condition that seems abnormal or that a flight attendant believes the flight crew should know in the interest of safety.

In summary, the work of SFAs involves two complex factors: face-to-face contact with groups of people in close quarters of the cabin, and relative isolation from other crewmembers throughout the duty period. The SFA's safety role in the aircraft can be subject to misunderstanding among some passengers, who might be familiar only with the service aspects of aircraft that have several flight attendants. Nevertheless, passengers will expect an SFA to perform just as well as a multiperson cabin crew in an emergency.

“We teach our flight attendants not to rely on any help from the [flight deck] — to use the passengers in limited ways to assist, [and] to be trained and ready to take charge of whatever [they] face in the [cabin],” said Kearns. “[SFAs] must have a conscience and the personal integrity to follow every rule and procedure on every flight, to keep up their knowledge on their own outside of class, and to understand that we are trusting them — alone — with the lives of 50 human beings.”<sup>38</sup>◆

## Notes and References

1. In the United States, Federal Aviation Regulations (FARs) Part 121 specifies the number of flight attendants that must be used by domestic, flag and supplemental air carriers and commercial operators of large aircraft. Since Jan. 19, 1996, U.S. commuter operators conducting scheduled passenger-carrying operations in airplanes that have passenger-seating configurations of 10 seats to

30 seats (excluding any crewmember seat) and those conducting scheduled passenger-carrying operations in turbojet airplanes (regardless of seating capacity) have been required to conduct operations under FARs Part 121. FARs Part 121.391 said, “(a) Each certificate holder shall provide at least the following flight attendants on each passenger-carrying airplane used: (1) For airplanes having a maximum payload capacity of more than 7,500 pounds [3,402 kilograms] and having a seating capacity of more than nine but less than 51 passengers — one flight attendant. (2) For airplanes having a maximum payload capacity of 7,500 pounds or less and having a seating capacity of more than 19 but less than 51 passengers — one flight attendant. (3) For airplanes having a seating capacity of more than 50 but less than 101 passengers — two flight attendants. (4) For airplanes having a seating capacity of more than 100 passengers — two flight attendants plus one additional flight attendant for each unit (or part of a unit) of 50 passenger seats above a seating capacity of 100 passengers.” The U.S. Federal Aviation Administration (FAA) uses the term “commuter operator” to include all scheduled passenger-carrying operations conducted in airplanes with seating capacities of 20 seats to 60 seats. The term “regional,” which is used by industry to refer to short-haul, passenger-carrying, scheduled operations conducted under FARs Part 121 or Part 135, generally is not used by the FAA.

2. In Australia, the Bureau of Air Safety Investigation (BASI) said that current regulations do not define a regional airline, but the following definition was adopted for BASI's recent study of the regional-airline industry: a regular public-transport operation using low-capacity aircraft to transport persons or cargo for hire or reward in accordance with fixed schedules; low-capacity aircraft are aircraft other than those that have a maximum seating capacity greater than 38 seats or a maximum payload greater than 4,200 kilograms (9,259 pounds). BASI said, “Aircraft carrying between 20 and 36 passengers are required to carry one flight attendant [Australian Civil Aviation Orders 20.16.3]. As that capacity aircraft is commonly operated by regional airlines, most flight attendants employed in the regional-airline industry operate as solo flight attendants.” BASI. Regional Airline Safety Study Project Report. Canberra, Australia: Department of Transport and Regional Services, May 1999, 29.

3. For example, FARs Part 121.397 said, “(a) Each certificate holder shall, for each type and model of airplane, assign to each category of required crewmember, as appropriate, the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The certificate holder shall show those functions are realistic, can be practically accomplished, and will meet any reasonably anticipated

emergency including the possible incapacitation of individual crewmembers or their inability to reach the passenger cabin because of shifting cargo in combination cargo-passenger airplanes. (b) The certificate holder shall describe in its manual the functions of each category of required crewmembers under paragraph (a) of this section.

4. Martin, Julie. "Single Flight Attendant Operations." In *Proceedings of the 15th Annual International Aircraft Cabin Safety Symposium and Technical Conference*. Torrance, California, United States: Southern California Safety Institute, 1998, 42–50.
5. Martin, Julie. Electronic mail communication with Rosenkrans, Wayne. Alexandria, Virginia, United States, 27 July 1999. Flight Safety Foundation, Alexandria, Virginia.
6. BASI, 1999, 87.
7. BASI, 1999, 82.
8. Coleman, Walter S. "Regional Airline Passenger Safety from Gate to Gate." In *Proceedings of the 14th Annual International Aircraft Cabin Safety Symposium and Technical Conference*. Torrance, California: Southern California Safety Institute, 1997, 26–30. Coleman is president of the Regional Airline Association (RAA) in the United States. RAA data for 1998 showed the following aircraft among the 12 types with the largest representation in RAA operators' fleets: Saab 340 series (35–37 passenger seats), 272 airplanes; Embraer EMB-120 Brasilia series (24–30 passengers), 203 airplanes; Bombardier Dash 8 (DHC-8) series 100/200 (37–39 passenger seats), 159 airplanes; and Aerospatiale ATR 42 (42–50 passenger seats), 79 airplanes.
9. FARs Part 121.393 said, "At stops where passengers remain on board, the certificate holder must meet the following requirements: ... (b) On each airplane for which flight attendants are required by [FARs Part] 121.391(a), but the number of flight attendants remaining on board is fewer than required by [FARs Part] 121.391(a), the certificate holder must meet the following requirements: (1) the certificate holder shall ensure that: (i) The airplane engines are shut down; (ii) At least one floor-level exit remains open to provide for the deplaning of passengers; and (iii) the number of flight attendants on board is at least half the number required by [FARs Part] 121.391(a), rounded down to the next lower number in the case of fractions, but never fewer than one. (2) The certificate holder may substitute for the required flight attendants other persons qualified in the emergency evacuation procedures for that aircraft as required in [FARs Part] 121.417, if these persons are identified to the passengers. (3) If only one flight attendant or other qualified person is on board during a stop, that flight attendant shall be located in accordance with the certificate holder's FAA-approved operating procedures. If more than one flight attendant or other qualified person is on board, the flight attendants or other qualified persons shall be spaced throughout the cabin to provide the most effective assistance for the evacuation in case of an emergency."
10. FAA. *Crew Resource Management Training*. Advisory Circular No. 120–51C. October 30, 1998.
11. Kearns, Lisa A. "Alone in the Crowd: Single Flight Attendant Aircraft Training and Operational Challenges." In *Proceedings of the 12th Annual International Aircraft Cabin Safety Symposium and Technical Conference*. Torrance, California: Southern California Safety Institute, 1995, 272–290.
12. Chute, Rebecca D.; Wiener, Earl L. In "Cockpit/Cabin Communication: A Tale of Two Cultures." In *Proceedings of the 11th Annual International Aircraft Cabin Safety Symposium and Technical Conference*. Torrance, California: Southern California Safety Institute, 1994, 49.
13. Kearns, 285.
14. Chute and Wiener, 53.
15. U.S. National Transportation Safety Board (NTSB). *Aircraft Accident Report: In-Flight Loss of Propeller Blade Forced Landing, and Collision with Terrain. Atlantic Southeast Airlines, Inc., Flight 529, Embraer EMB-120RT, N256AS. Carrollton, Georgia*. August 21, 1995. NTSB/AAR-96/06.
16. The NTSB report said that a left-engine propeller blade fractured while the aircraft was climbing through 18,100 feet. The airplane then struck terrain during an emergency landing near Carrollton, Georgia, United States. The flight was a scheduled passenger flight from Atlanta Hartsfield International Airport, Atlanta, Georgia, to Gulfport, Mississippi, United States, carrying 26 passengers, two pilots and one flight attendant, operating under instrument flight rules and FARs Part 135. The report said, "The flight crew then advised [air traffic control] that they were unable to maintain altitude and were vectored toward West Georgia Regional Airport, Carrollton, Georgia. The airplane continued its descent and was destroyed by ground impact forces and a postcrash fire. The captain and four passengers sustained fatal injuries. Three other passengers died of injuries in the following 30 days. The first officer, the flight attendant and 11 passengers sustained serious injuries; the remaining eight

passengers sustained minor injuries. ... [NTSB determined] that the probable cause of the accident was the in-flight fatigue fracture and separation of a propeller blade resulting in distortion of the left engine nacelle, causing excessive drag, loss of wing lift, and reduced directional control of the airplane. The fracture was caused by a fatigue crack from multiple corrosion pits that were not discovered by Hamilton Standard because of inadequate and ineffective corporate inspection and repair techniques, training, documentation, and communications. Contributing to the accident was Hamilton Standard's and the [FAA's] failure to require recurrent on-wing ultrasonic inspections for the affected propellers. Contributing to the severity of the accident was the overcast cloud ceiling at the accident site."

17. BASI. *Investigation Report No. 9601590, De Havilland Canada Dash 8 VH-JSI Broome, Western Australia, 17 May 1996*. Canberra, Australia: Department of Transport. Also see Flight Safety Foundation. "Bird Strike during de Havilland Dash 8's Approach Disables Left-engine Instruments, Brakes and Nose-wheel Steering." *Accident Prevention*. August 1998.
18. BASI, 1999, 32.
19. BASI, 1999, 84
20. BASI, 1999, 32.
21. BASI, 1999, 85.
22. BASI, 1999, 84.
23. BASI, 1999, 85.
24. BASI, 1999, 85.
25. BASI, 1999, 85.
26. BASI, 1999, 84.
27. BASI, 1999, 85.
28. Martin, 1998, 45.
29. BASI, 1999, 30.
30. BASI, 1999, 29.
31. BASI, 1999, 6-7.
32. BASI, 1999, 30.
33. Kearns, 276.
34. Kearns, 280.
35. Martin, 45.
36. Kearns, 276.
37. FARs 121.542(b) and 135.100(b) said that no flight crewmember shall perform "any duties during a critical phase of flight except those duties required for the safe operation of the aircraft." Critical phases of flight include "all ground operations including taxi, takeoff and landing, and all other flight operations conducted below 10,000 feet, except cruise flight." Nonessential communications between cabin crews and flight crews are prohibited during a critical phase of flight.
38. Kearns, 284, 281.

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