

Log 2100



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: August 11, 1989

In reply refer to: A-89-83 through -90

Honorable James B. Busey
 Administrator
 Federal Aviation Administration
 Washington, D.C. 20591

On August 9, 1987, an operational error occurred at the New York Terminal Radar Approach Control (TRACON) that involved Trans World Airlines flight 843 (TW843), a Boeing 747, inbound to the John F. Kennedy (JFK) International Airport and Pan American World Airways flight 537 (PA537), a Boeing 727, inbound to the LaGuardia Airport. At the time of the incident, both flights were at their assigned altitudes of 3,000 feet mean sea level (msl). In-flight visibility was reported as 3 to 4 miles.

Prior to the incident, TW843 was issued vectors in preparation for the landing sequence at JFK. This flight was followed by another company flight, TW834, a Boeing 727 also inbound to JFK. The arrival controller issued a turn that he had intended for TW843; however, when the instruction was verbalized, he addressed the airplane as "TW834 Heavy."^{1/} As a result, the flightcrew of TW834 complied with the turn instruction. The flight for which the turn was intended (TW843) continued straight ahead and entered the airspace of an adjacent sector where a loss of standard separation occurred with PA537: the controller for TW843 and the controller for PA537 both issued instructions to climb from 3,000 to 4,000 feet. The flightcrew of PA537 reported to the LaGuardia arrival controller, "We went underneath him," and later said, "OK, looks like we were maybe 6[00] to 700 feet below him." Both flights were returned on course without further incident.

The controller who made the error said that he had confused the similar flight call signs and issued instructions to one flight that were actually intended for another. He had been employed by the Federal Aviation Administration (FAA) as a controller since 1958, working at Newark Tower for a "few months" and then as a radar approach controller at facilities associated with JFK Airport. He reported that this operational error was his first in 20 years.

^{1/}The Boeing 747 is categorized as a heavy jet, which is capable of takeoff weights of 300,000 pounds or more. During radio communications, flightcrews and air traffic controllers will add the word "heavy" after the company prefix and trip number. The word alerts controllers and pilots of other airplanes that additional separation requirements must be considered because of possible wake turbulence while airborne.

During the investigation, the FAA reported that it was conducting an internal study on the problem of duplicate flight call signs. In January 1988, the Safety Programs Division of the FAA Office of Aviation Safety completed the study, "Duplicate Flight Numbers at Major U.S. Airports." The study concluded that among the 12 airports examined, there were 951 occurrences of flights using the same number operating within 2 hours of each other. Of these occurrences, there were 310 flights using the same number within 30 minutes of each other. The study contained no recommendations, was limited to duplicate flight numbers, and did not address the issue of similar flight numbers.

The FAA handbook, "Facility Operation and Administration," instructs air traffic control facilities to contact the Air Transport Association (ATA) or, in the case of nonmembers, the operator directly, when duplicate, phonetically similar, or hard-to-distinguish flight call signs are used so that changes may be made. This handbook is written for supervisors and other facility administration personnel. Operational procedures for controllers are contained in handbook 7110.65E, "Air Traffic Control." That handbook, however, does not contain instructions for controllers concerning the reporting of duplicate or similar call signs.

Within a few minutes after this incident occurred, the same controller again confused two other flights, Clipper 568 (PA568) and Clipper 558 (PA558); however, the confusion did not result in a loss of separation. Facility supervisors and training department personnel, and regional personnel did not report the second instance of phonetically similar flight call signs to the ATA until after the Safety Board raised the issue with the FAA. The ATA was notified of this additional confusion of call signs about 3 weeks after it occurred.

The Safety Board believes that these events highlight the inadequate priority associated with the reporting of similar-sounding flight call signs. The incidents also illustrate the need for the FAA to develop software programs that will identify potentially confusing or duplicate call signs in both air route traffic control centers and terminal facilities. In the interim, handbook 7110.65, "Air Traffic Control," should be amended to instruct controllers to notify their supervisors when duplicate, phonetically similar, or hard-to-distinguish call signs are used.

The investigation of these incidents also revealed deficiencies related to the visual acuity standards and the corrected vision requirements for controllers. The controller involved in the incidents stated that he had difficulty contacting the LaGuardia controller by dialing a three-digit indirect access code on the intraphone communication system in the facility. He had a problem obtaining the correct code and believed more time was required to make contact than was necessary. He said that before the recent change in codes, contact was made by pushing a single button. A list containing indirect access codes for New York TRACON was posted on the final vector position of the Kennedy area, about 3 feet from the controller. The list contained a breakdown of the indirect access codes for various positions within the five areas of the TRACON. The type size of the list was 11 characters per inch. The Safety Board believes this type size was adequate and should not have posed a problem for the controller unless his vision was not distinct at that distance.

A review of the controller's medical records disclosed that he held a second-class medical certificate dated February 26, 1987, with the limitation, "Holder shall possess correcting glasses for near vision while exercising the privileges of his airman certificate." Records indicated that the controller's uncorrected near vision was 20/70 at the time of the examination. Another examination in early 1988 indicated that his uncorrected near vision was 20/100. The controller said that his eyeglasses were in his shirt pocket at the time the incidents occurred. A subsequent review of the FAA medical standards for air traffic controllers revealed no requirement to wear corrective glasses for either near vision or distant vision while performing their duties as controllers.

The present visual acuity standards for air traffic controllers state that both distant and near vision of 20/20 must be demonstrated. If corrective lenses are required to meet this standard, refractive error limits apply in which the prescription of the correction is accounted for. Diopters of spherical equivalent and cylinder are specified. These standards are contained in "ATCS (Air Traffic Control Specialist) Medical Standards," extracted from the Office of Personnel Management Handbook X-118 dated August 21, 1988. However, the Safety Board's experience has been that these standards are not applied consistently among FAA regions.

An air traffic controller is generally not issued a medical certificate unless the controller is also a pilot. Even if the controller is a pilot, he is still subject to the more stringent visual acuity standards for controllers. The controller who is a pilot receives either a first-class or second-class medical certificate, depending on the type of flying that the controller is engaged in. The controller who confused the call signs was also a pilot and had a second-class medical certificate.

First-class and second-class medical certificates for pilots require an uncorrected distant vision of 20/20 or better in each eye, or at least 20/100 in each eye corrected to 20/20 or better. Both certificates stipulate that the holder wear corrective lenses for distance while exercising the privileges of the airman certificate. A first-class medical certificate requires a near vision of 20/40 at a distance of 18 inches with each eye, with or without corrective lenses. A second-class medical certificate requires only that near vision demonstrate enough accommodation to read "official" aeronautical maps. Neither class of medical certificate requires that the holder wear corrective lenses for near vision while exercising the privileges of the airman certificate, only that the holder must have such lenses in possession.

The standards presently used for visual acuity address only near vision, normally determined at a distance of 12-14 inches, and distant vision, normally determined at 20 feet. Controllers' duties, however, are often performed under conditions where objects at other distances must be identified clearly. A radar controller, for example, usually works at a visual range of 2 1/2 to 3 feet, the distance of the radar display and flight strips from the controller's eyes. The radar controller has little need for corrected distant vision at 20 feet. However, a controller in a control tower cab would have different vision requirements: distant vision for sighting aircraft, intermediate vision for viewing a radar display, and near vision for reading documents.

The Safety Board is concerned about the adequacy of the present visual acuity standards and the present requirements relating to wearing corrective lenses. Using the present standards and requirements, the following situation could easily occur: Assume a radar controller has an uncorrected distant and near vision of 20/20. As the controller ages, he begins to experience difficulty seeing small print at close range, such as newspaper print and numbers in a telephone book. An eye examination reveals a deficiency in near vision, and the controller is told he must get corrective lenses. His doctor prescribes corrective lenses for near vision (about 12-14 inches), and the controller passes the medical examination using the lenses. To perform most of his duties, however, he does not need the lenses because he looks at objects that are about an arm's length away--about 2 1/2 to 3 feet. As the controller grows older, objects at arm's length--which include his radar screen--begin to blur. The lenses he wears when reading material at close range do not help him see material at arm's length. He continues eligibility to control traffic by wearing his corrective lenses to pass the near-vision portion of the annual eye examination. To perform his duties, however, the controller needed lenses to correct intermediate vision rather than lenses to correct near vision.

In the example cited, the controller had a normal aging condition called presbyopia. The condition, more fully described in medical literature, occurs with the loss of elasticity of the lens of the eye. It causes defective accommodation and inability to focus properly for near vision. As one ages, vision at middle distances may become blurry, and finally even objects at a distance may also be blurred. The Safety Board believes that the visual acuity standards should be tailored for the specific distance ranges dictated by the tasks to be performed and that controllers should be examined for all applicable ranges.

The Safety Board also believes that all corrections required to demonstrate 20/20 vision at all applicable distances should be present in the same pair of corrective lenses. A controller cannot perform duties safely while changing, adding, or removing various corrective lenses, or while not wearing a necessary correction. Because nearly all controllers wear headsets, and some of them have their headsets clipped to the frame of their eyeglasses, removal and replacement of corrective lenses may offer a frequent distraction to the task at hand. Any visual correction should be accomplished in a manner that eliminates the need to change, add, or remove various corrective lenses while performing air traffic control duties.

The Safety Board also sees little value in requiring that visual acuity be corrected without also requiring that the correction be worn. Therefore, the Safety Board believes that standards for air traffic controllers should require the controller to wear the corrective lenses prescribed for the distance ranges dictated by the tasks to be performed.

Normally, the air traffic control facility in which the controller is employed receives either a printed list of controllers who have passed medical examinations or a form for each controller indicating that the controller has received and passed a medical examination. The form states whether or not a controller had to wear corrective lenses to meet the visual acuity standards during the examination. The form is generally kept with the controller's

training records. The Safety Board believes that first-line supervisors should be made aware on a continuing basis of controllers required to wear corrective lenses.

The visual acuity standards for pilots were not part of the investigation of the August 9, 1987, incident. The Safety Board notes, however, that the need for visual acuity at different ranges is applicable for pilots as well as for controllers. The Safety Board also notes that the corrected near vision demonstrated must be 20/40 for a pilot's first-class medical certificate but 20/20 for an air traffic controller. The Safety Board believes that the FAA should review the present visual acuity standards for pilot medical certificates to determine whether they should be revised.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Develop software programs to identify duplicate and similar flight call signs that are in simultaneous use or are likely to be in simultaneous use in an individual sector or normally-combined sectors of both en route and terminal facilities. (Class II, Priority Action) (A-89-83)

Amend handbook 7110.65, "Air Traffic Control," to require controllers to notify supervisors when duplicate, phonetically similar, or potentially confusing flight call signs occur simultaneously on the same voice communication frequency. (Class II, Priority Action) (A-89-84)

Issue a General Notice (GENOT) directing that all air traffic control supervisory personnel review the procedures contained in the Facility Operation and Administration handbook, 7210.3I, regarding the reporting of duplicate, phonetically similar, or hard-to-distinguish flight call signs. The GENOT should also emphasize the importance of and assign a higher priority to the reporting of all known instances. (Class II, Priority Action) (A-89-85)

Revise visual acuity standards for air traffic controllers to include testing at specific distance ranges dictated by the tasks to be performed. (Class II, Priority Action)(A-89-86)

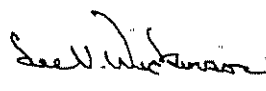
Require that any visual correction for an air traffic controller be accomplished in a manner that eliminates the need to change, add, or remove various corrective lenses while performing air traffic control duties. (Class II, Priority action)(A-89-87)

Require a controller to wear visual corrective lenses for specific distance ranges dictated by the tasks performed if visual corrective lenses are used to meet the standards for medical certification. (Class II, Priority Action)(A-89-88)

Establish recurrent procedures to notify first-line supervisors which controllers under their supervision are required to wear corrective lenses during the performance of air traffic control duties. (Class II, Priority Action)(A-89-89)

Review present visual acuity standards for pilot medical certificates, especially those for the first-class medical certificate, to determine whether regulations pertaining to the following areas should be revised or added: acuity for near vision; examination at intermediate-distance range; correction in a manner that would eliminate the need to change, add, or remove various lenses while exercising the privileges of the airman certificate; and the wearing of corrective lenses while exercising the privileges of the airman certificate. (Class II, Priority Action)(A-89-90)

KOLSTAD, Acting Chairman, BURNETT, LAUBER, NALL, and DICKINSON, Members, concurred in these recommendations.

For 
By: James L. Kolstad
Acting Chairman