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National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: January 15, 1986

In reply refer to: A-86-7 through -12

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

At 1722 eastern daylight time on September 24, 1985, the captain of an Eastern Airlines Boeing 727 (B-727) rejected a takeoff on runway 36 at Washington National Airport (DCA) when he observed a Bell 206-L1 helicopter depart the north helicopter pad in a direction that would cross the B-727's projected takeoff path. The B-727 came to rest on the grass overrun off the end of runway 36, approximately 130 feet from the Potomac River. There was no damage to the aircraft or injuries to the passengers or crew during the rejected takeoff.

The National Transportation Safety Board's preliminary investigation of this incident disclosed that the B-727 was cleared for takeoff by the tower local controller while, about the same time, the Bell 206 was cleared for takeoff by another controller who was staffing the helicopter control position. The Bell 206 pilot, who had access to a Special Military Helicopter VFR Route Chart, had requested a departure via "Route 1 to Greenbelt."

The Bell 206 pilot interpreted the controller's subsequent takeoff clearance as authorization to proceed to the east by the most direct route to intersect "Route 1 to Greenbelt." The flightpath for this route crosses runway 36. During his takeoff, the pilot observed the Eastern B-727 on takeoff roll, and he also maneuvered to avoid crossing runway 36. He subsequently returned to the north helicopter pad without damage to the helicopter or injury to persons on board.

In a postincident interview, the helicopter controller stated that she normally would direct a pilot requesting this departure to proceed northwest to join Route 1 at the Memorial Bridge and that she thought she had issued these instructions to the Bell 206. A helicopter flying from the north helicopter pad to the northwest would not interfere or pass over airplanes departing runway 36. The recorded tower communication, however, showed that the controller transmitted the winds, altimeter, and takeoff clearance information without amplifying departure instructions. The helicopter controller stated that she had not coordinated the Bell 206 departure with the local controller because she expected the helicopter to depart northwest, causing no traffic conflict. Further, she stated that even without specific departure clearance instructions, she would have expected the departure helicopter to remain clear of runway 36. The tower cab supervisor, however, stated that he would assume that the helicopter would cross runway 36 during a "Route 1 to Greenbelt" departure unless given specific instructions to the contrary. The controller who worked ground control during the incident stated that although he would have given distinct departure instructions to the helicopter pilot, he would not have expected the helicopter to cross an active runway even without instruction.

The "Route 1 to Greenbelt" departure is not a standard routing published for use by civilian helicopter operators. The routing is, however, depicted on the Special Military Helicopter VFR Route Chart published by the U.S. Department of Defense (DOD). This DOD route chart is intended for use by military helicopters. However, DCA has letters of agreement with local helicopter users concerning procedures and operation to and from the airport and through the Washington terminal control area (TCA). These letters of agreement are with the local police, military, Federal Aviation Administration (FAA), and some civilian helicopter operators. They establish responsibilities and describe procedures for helicopter operations under the provisions of Special Visual Flight Rules clearances and for general operations within the Washington TCA. They also describe the use of various routes and altitudes published on the DOD Special Military Helicopter VFR Route Chart. Helicopter operators with letters of agreement with DCA are given copies of the Special Military Helicopter VFR Route Chart. Transient helicopter operators are not assumed to possess this chart, although some, including the helicopter pilot involved in this incident, have obtained copies.

Although the helicopter traffic arriving, departing, or overflying DCA represents only a small percentage of the total daily operational count, 1/ the circumstances of this incident exemplify safety issues regarding the general operation of helicopters at busy airports. Additionally, the investigation of the incident has prompted some specific concerns regarding the administration of the controller training program at the DCA facility.

The Safety Board found that at the time of the incident, all standard control tower positions were staffed with qualified personnel. Before the strike of the Professional Air Traffic Controllers Organization on August 3, 1981, the average number of controllers scheduled for work during a 1500-2300 shift at DCA ranged from 20 to 25. On September 24, 1985, there were 23 air traffic controllers scheduled to work the 1500-2300 shift during which the incident occurred. Two controllers scheduled to work were granted 8 hours of sick leave. One controller was approved for 8 hours of annual leave. Also, one controller worked from 1500-1900 and took 4 hours annual leave from 1900-2300, and one controller worked from 1800-2300 and took 3 hours annual leave from 1500-1800. In summary, at the time of the incident (1722) there were 19 controllers on duty including 10 full performance controllers (3 of whom were supervisors), 4 controllers certified through departure radar 2/, 3 certified through local control, 1 certified through ground control, and 1 controller certified at flight data and clearance delivery positions. Thus, of the 19 controllers on duty, only 2 were not qualified to work all positions in the tower cab. At the time of the incident, 3 controllers were on an authorized break from duty--all 3 were certified to work all tower cab positions.

1/ The traffic count for a busy day at DCA during June 1985 recorded 1,251 fixed-wing departures and landings as compared to 55 helicopter departures and landings. In addition to the 55 helicopter departures and landings there were 118 (81 military and 37 civil) helicopter "over flights" that transited the terminal area and were under tower control.

2/ The normal progression of training and certification (by position) at DCA tower is: flight data, clearance delivery, ground control, assistant local control, and local control. Controllers are trained for certification on radar positions only after qualifying for all tower positions. The normal progression of training and certification for radar positions is departure radar and then arrival radar.

At DCA, in addition to the supervisor positions, with the maximum number of positions staffed there are 6 control positions in the tower and 8 control positions in the Terminal Radar Approach Control Facility (TRACON). This maximum number is only filled during peak activity. At other times, positions are combined. At the time of the incident, 13 positions were staffed (the LC position was staffed by 2 controllers: a developmental controller and the supervisor administering on-the-job training) and two of the arrival radar positions in the TRACON were combined. Normally, at DCA, two supervisors are on duty in the TRACON and one in the tower cab. At the time of the incident, one of the TRACON supervisors was staffing an arrival radar position.

The local control position at DCA is responsible for the control of both fixed-wing and helicopter traffic during normal traffic activity. However, during peak traffic periods, the helicopter control position is activated and staffed by another certified local controller to reduce the workload of the local controller. At the time of the incident, the helicopter control position, with specific responsibilities for helicopter operations, was staffed by a developmental controller who was certified through the departure radar position. The tower cab supervisor was responsible for local control while he administered on-the-job-training (OJT) to a developmental controller working the LC position. The supervisor did not designate a controller-in-charge even though sufficient staff were available to assist in the tower.

The safety issue raised when a regular first-line supervisor is working a control position or is absent from his duties has been the subject of previous Safety Board recommendations addressed to the FAA. On October 14, 1981, during its special investigation of the air traffic control system in the United States, the Safety Board issued Safety Recommendation A-81-147, which recommended that the FAA:

Require that, at any time that a first-line supervisor is to work a control position in addition to performing supervisory duties, a procedure is in place at the facility through which qualified personnel are immediately available for assistance or coordination.

On May 12, 1983, as a result of its "Special Investigation Report--Followup Study of the United States Air Traffic Control System," the Safety Board issued Safety Recommendation A-83-38, which recommended that the FAA:

Institute air traffic control directives and procedures to require, when the assigned first-line supervisor is occupied working a control position, that there is appropriate and adequate direct supervision to ensure the detection and reporting of all controller errors or deviations, the detection and monitoring of fatigue and/or stress, and the control of each controller's workload.

On November 9, 1984, as a result of its investigation of an air traffic control operational error near Philipsburg, Pennsylvania, on May 9, 1984, in which four air carrier airplanes and one corporate jet were involved in four specific conflicts because the standard air traffic control separation criteria were compromised, the Safety Board issued Safety Recommendation A-84-117, which recommended that the FAA:

Issue a General Notice (GENOT) directing the management of all Air Traffic Control facilities to schedule auxiliary activity of supervisors so as to minimize interruption of their controller supervision function during periods of high traffic demands.

The FAA's initial response to these recommendations stated that it would make supervisors continuously available during high-volume traffic situations. More recently, on April 18, 1985, the FAA responded further that it would issue a GENOT to satisfy the Safety Board's concern "that more positive action is required by the FAA to assure that first-line supervision is available to monitor controller performance at peak times." Although in this incident, the Safety Board has not determined if the absence of direct supervision in the tower cab contributed to the operational error, the circumstances of this incident indicate that the FAA has not adequately emphasized the importance of having a supervisor or designated controller-in-charge whose sole function is to monitor controller performance. The Safety Board continues to believe that a supervisor who is busy working a control position cannot effectively and safely monitor controllers.

The controller assigned to the helicopter control position was employed by the FAA as a pre-developmental controller in 1978 and was assigned to the DCA tower to receive OJT as a developmental controller in December 1979. She was certified on all tower cab positions by August 1981 when she left employment with the FAA. She rejoined the FAA in March 1983 and resumed duties as a controller in the DCA tower cab. By July 1983, she was recertified on all control positions in the tower cab but, as of September 1985, she had not achieved status as a full performance level controller because she had not qualified in the approach radar positions in the TRACON.

The Safety Board believes that the lack of consensus among controllers regarding helicopter control procedures, as well as deficiencies demonstrated by the controller in this incident--that is, the imprecise departure clearance instruction issued to the Bell 206 pilot and the lack of coordination with the local controller--illustrates shortcomings in the DCA controller training program as well as lack of standard procedures. The Safety Board believes that classroom training and OJT at DCA did not consistently give adequate attention to the requirements to coordinate and issue specific departure or arrival clearances regarding helicopter operations. These observed deficiencies may be due to inadequate subject matter content in the current training program, to weakness in the evaluation standards for controller performance, or to problems associated with the implementation and administration of the training and evaluation program for controllers. The Safety Board believes that similar problems in controller training and evaluation programs may exist at other major airports. Recommendations to address these problems are expected to follow the completion of a Safety Board special investigation of runway incursions.

The investigation of this incident also disclosed apparent irregularities in the administration of controller training which the Safety Board believes need to be addressed without delay. According to FAA Order 3120.4F, tower facility managers are required to conduct "tape-talks" and over-the-shoulder (OTS) evaluations ^{3/} to evaluate controller proficiency at least semiannually. The requirements and monitoring of these proficiency and training sessions are controlled by the FAA's Technical Appraisal Program. Before the incident of September 24, 1985, the helicopter controller's last tape-talk evaluation occurred while she was at the local controller position, and it was conducted from 1249 to 1327 eastern standard time on January 24, 1985, 8 months before the incident. The tape-talk was supervised by the helicopter controller's regular first-line supervisor, and the only written comments on the evaluations were "no deficiencies." The helicopter controller's training and proficiency record indicated that since February 1984, all OTS evaluations were conducted at the local control positions.

^{3/} "Tape-talks" are sessions between a controller and first-line supervisor in which the supervisor critiques a period of controlling activities recorded on audio tape. Over-the-shoulder evaluations are conducted during actual controlling activities.

The most recent OTS evaluation was given on January 25, 1985, 8 months before the incident. Information supplied in the training record did not indicate whether helicopter control was combined with the local control position at the time of the last OTS evaluation.

FAA Order 3120.4F states that only ATC specialists who have completed an FAA-approved training instructor course shall administer OJT. The helicopter controller in this incident completed FAA OJT Instructor Course 05561, a 16-hour course taught at the DCA facility on April 8, 1983, less than a month after having been reinstated at the facility on March 14, 1983.

The order also states that each OJT instructor must be evaluated as to training performance at least semiannually by a designee of the facility manager. According to the helicopter controller's training and proficiency record, she was last given an OTS evaluation of OJT by her first-line supervisor on February 29, 1984, 1 year 7 months before the incident. But according to the position sign-on logs (FAA Form 7230-10) for September 24, 1985, the helicopter controller had given OJT to a developmental controller on the local control position earlier during the day of the incident. The Safety Board is concerned that this controller was qualified by the FAA to give OJT even though neither her proficiency in OJT ability nor in the position being trained had been evaluated in the previous 6 months. As a result of these findings, the Safety Board believes that the FAA must review the Technical Appraisal Program administered at DCA and correct noted deficiencies regarding both the substance and administration of the program.

Another concern illustrated in this incident involves the lack of procedures for helicopter operation in and out of DCA and possibly other major airports throughout the National Airspace System. With regard to DCA, no standardized aeronautical charts have been published for civilian helicopter pilots to use in making visual approaches or departures. The only chart available showing helicopter low-level routes through the DCA area was the Special Military Helicopter VFR Route Chart published by the DOD. This chart was designed for military helicopter pilots to use around the Washington, D. C., metropolitan area, including operations to and from the Pentagon Army Heliport. It showed specific arrival and departure route descriptions for Pentagon operations, but it did not depict similar information for DCA. The special military routes were not defined by navigation aids, but used familiar landmarks such as rivers, bridges, and major highways. Although the chart had limited distribution and was intended for military use, through letters of agreement with the DCA tower it also was made available to some civilian helicopter operators. The tower controllers were reportedly made familiar with the helicopter routes on this military chart, and with the letters of agreement with operators, in the controller training program. However, the controllers should have been made aware that only those operators authorized should be issued clearances for routing depicted on the military chart and that only those operators could be expected to be familiar with that routing.

Although the Bell 206 pilot was not officially authorized by letter of agreement to use the military "Route 1 to Greenbelt," he and other operators apparently obtained and used the chart. The pilot confirmed that he referred to it when requesting his departure clearance. Since the helicopter controller had not been trained to question the pilot's authorization to use, or his familiarity with, the "Route 1 to Greenbelt" routing, she issued the departure clearance as requested.

As a result of the September 24 incident, on September 26, 1985, the manager of the DCA tower published a memorandum to all personnel regarding helicopter operations, which stated that effective immediately, only military helicopters and helicopters with letters of agreement with the DCA tower were to use the Special Military Helicopter VFR Route Chart, and that for all other helicopters, "specific progressive clearances delineating routes and altitudes necessary to separate them from other traffic will be issued." The Safety Board believes this procedure change was a necessary immediate improvement, but it does not completely solve the problem at the DCA Tower. The Safety Board believes that the FAA, in conjunction with civilian and military helicopter users, should design and publish a special helicopter route map for use in the Washington metropolitan area. This map should include standardized arrival/departure route descriptions for operations at DCA. Standardized routing would reduce the helicopter controller workload and minimize the potential for misunderstood and ambiguous communications.

Although this letter addresses the Washington National incident in particular, the Safety Board believes that the problems involved have implications on a national scale. During the Rotorcraft Master Plan Workshop of the National Airspace Review (NAR), the Helicopter Association International (HAI) requested that standard published helicopter route maps and procedures be made available to all helicopter pilots. The Safety Board endorses the HAI concerns, and believes that the FAA should study the feasibility of establishing published procedures and routes for helicopter visual flight rules operations at major airports throughout the National Airspace System.

The Safety Board is aware that the DCA tower has taken measures to improve standard procedures with respect to helicopter control. However, the Safety Board is concerned that these measures are not sufficient to prevent another such incident from occurring. Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Establish standardized departure/arrival routes for helicopter traffic arriving and departing Washington National Airport. (Class II, Priority Action) (A-86-7)

Design, publish, and require the use of a chart depicting visual flight rules helicopter routes for civilian and military helicopter operations throughout the Washington, D.C. metropolitan area, which would include the standardized departure and arrival routes to and from Washington National Airport. The chart should include graphic and narrative descriptions of the selected routes. (Class II, Priority Action) (A-86-8)

Study the feasibility of establishing standard visual flight rules helicopter routes and arrival and departure procedures at major airports throughout the National Airspace System. (Class III, Longer-Term Action) (A-86-9)

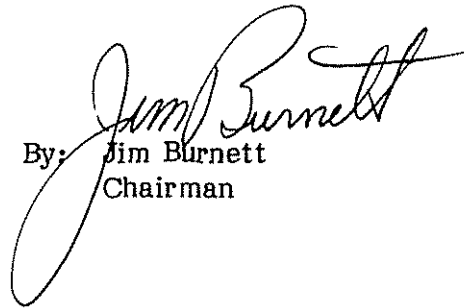
Require the inclusion of visual flight rules helicopter control procedures, in using standard routes, in both classroom and on-the-job training of local controllers. (Class II, Priority Action) (A-86-10)

Examine the administration of the Technical Appraisal Program at Washington National Airport tower to confirm compliance with all directives pertaining to Air Traffic Control Specialist Proficiency Requirements. (Class II, Priority Action) (A-86-11)

Require that on-the-job training at specified control positions be given only by controllers who are qualified instructors and who have current (in the last 6 months) performance evaluations of on-the-job training ability and current (in the last 6 months) performance evaluations at the specified control position. (Class II, Priority Action) (A-86-12)

In addition, the Safety board reiterates and urges expeditious implementation of Safety Recommendation A-83-38 issued to the FAA on May 12, 1983.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, Member, concurred in these recommendations.

By:  Jim Burnett
Chairman

