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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: March 14, 1988

In reply refer to: A-88-29 through -31

Honorable T. Allan McArtor
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On May 1, 1987, about 1548, eastern standard time, a Midwest Packaging Materials Company Cessna-340A, N8716K, and a Rosie O'Grady's of Orlando, Inc., North American SNJ-4 N711SQ, collided in midair about 3,000 feet over Orlando, Florida. The Cessna-340A was level at 3,000 feet operating under instrument flight rules on radar vectors to runway 18R at Orlando International Airport (MCO). The SNJ-4 was in a descent to 1,500 feet and had completed a turn direct to Orlando Executive Airport (ORL) when the airplanes collided. The accident occurred 7 miles northwest of ORL in the outer area of MCO airport radar service area in visual meteorological conditions. Both airplanes were in contact with and were being radar vectored by the Orlando approach control. The Cessna-340A pilot, two passengers, and the SNJ-4 pilot were fatally injured. Both airplanes were destroyed by the collision, ground impact, and postimpact fire. A mobile home was also substantially damaged. 1/

There were three air traffic specialists providing air traffic services to both airplanes: the West controller, the North controller, and the Final controller. Using the interphone, the West controller attempted to coordinate a lower altitude for the SNJ-4 by calling the North controller, who was busy talking to other aircraft. The West controller then called the Final controller and requested and received approval to descend SNJ-4 to 2,500 feet. An analysis of the actions of the West controller indicated that he failed to perform required coordination responsibilities. The West controller should have coordinated the use of the North controller's airspace below 6,000 feet, and he should have forwarded to the North controller both the heading he (West) had assigned the SNJ-4 and the lower altitude (2,500 feet) the Final controller had approved. Further, because the West controller initially descended SNJ-4 to only 4,000 feet, based on another aircraft's descent to 3,000 feet, the National Transportation Safety Board believes that the West controller was aware of a potential conflict, and he should have informed the North controller that he (West) was using vertical separation.

1/ For more detailed, information read Aircraft Accident Report--"Midair Collision of Cessna-340A, N8716K, and North American SNJ-4, N711SQ, Orlando, Florida, May 1, 1987" (NTSB/AAR-88/02).

The West controller may have hurried to complete the communications transfer on SNJ-4 in order to return to the impending coordination of another aircraft with Tampa approach control. If this was the case, he should have asked for assistance from his supervisor. Since the West controller did not coordinate with the North controller, the North controller was led to believe that SNJ-4 was at or descending to 6,000 feet on a northwesterly track at the time SNJ-4 reported to the North controller on his frequency. Therefore, the Safety Board believes that this coordination breakdown was the precipitating event that led to this accident.

In reviewing the Federal Aviation Administration (FAA) handbooks and Orlando Terminal Radar Approach Control (TRACON) procedures, the Safety Board determined that there were no radio procedures to compensate for deficiencies in controller coordination, such as those that occurred in this case. If SNJ-4 had advised the North controller on initial contact that he was descending to 4,000 feet and was turning toward the Orlando VOR, it is unlikely that the North controller would have issued SNJ-4 a clearance to descend to 1,500 feet. There are presently no procedures whereby pilots provide controllers such information. In view of the fact that on occasion controllers will make such coordination errors, the Safety Board believes that as a good operating practice, pilots should advise controllers of their intended final altitude and other clearance limits.

A replication of the alphanumeric generated by the Automated Radar Terminal Systems (ARTS) IIIA computer program was performed. The retrack program approximated the visual display that would have been presented to the controllers on their radarscopes. The data tag of SNJ-4 coasted continually for 10 radar sweeps (about 46 seconds) before dropping off the radar screen and going into the tab list. In other Safety Board investigations of operational errors 2/ and near-midair collisions, the Safety Board has found similar errors in maintaining target identification. For example, there have been cases of coasting data tags that resulted in misidentification of radar targets and a lack of traffic situation awareness by controllers. (Coast occurs when a track fails to correlate with a beacon target.) The Safety Board believes that these instances, as well as the circumstances of this accident, indicate a lack of proper radar identification techniques, a failure to maintain target identification, and an over-reliance on automation on the part of controllers. These findings also suggest the lack of adequate traffic scan and search techniques by controllers. The Safety Board is concerned that controllers may have a tendency to control on the basis of the aircraft target data tag and not the aircraft itself. Further, the Safety Board believes that controllers should be required to discontinue radar separation procedures and to revert to nonradar separation procedures when a coasting data tag exceeds a specific number of radar sweeps (for example, continually coasting for more than four radar sweeps). If such a procedure had been used, this accident and other operational errors by controllers could have been avoided.

Further, the Safety Board notes that current FAA training at the Radar Training Facility and at field facilities does not include scenarios or simulations demonstrating target identification/reidentification resulting from coasting data tags whose associated targets are close to one another. The Safety Board believes that the FAA should include specifically these scenarios in its controller training curricula.

2/ May 29, 1987, Cocoa Intersection, 12 nmi southwest of Chicago O'Hare; August 8, 1987, Wheeling, Illinois, 1 nmi south of Palwaukee Airport.

Controllers must maintain constant vigilance over the aircraft they direct. When information is presented to them that is not consistent with what they believe is occurring, assumptions, such as occurred in this case, may not be appropriate. Even though the circumstances of this accident involved a tracking compromise resulting from a unique extended beacon code overlap, coasting in general is common because of problems such as poor or nonexistent beacon returns and ghosts or reflections. However, just as the professionally trained flightcrews must act on each warning signal as appropriate and consider each signal valid until demonstrated otherwise, controllers must consider each discrepancy, nuance, or other inconsistent information that prevents them from maintaining positive identity, ensured separation, and positive target and flight information as a potential threat to safety. Controllers must be aggressive in their search to determine authenticity of those "alerts" and act to resolve them. Therefore, air traffic control procedures and directives should be established and enforced to require controllers to do so.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Recommend that pilots, on initial contact, advise controllers of their altitude preceded by the word "level," "climbing," or "descending" and provide the present vacating altitude, if applicable, and final altitude. Also, when on other than published routes, pilots should include their present navigational position on initial contact with each air traffic controller (e.g., direct VOR, heading 240, turning right to heading 330, etc.). (Class II, Priority Action) (A-88-29)
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> Establish specific coasting parameters whereby controllers must discontinue using radar separation procedures and reidentify targets. (Class II, Priority Action) (A-88-30)
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> Issue an Air Traffic Service Bulletin to reemphasize Air Traffic Control Handbook 7110.65E, Chapter 5, Section 15, Paragraph 5-211, Responsibility. Further, develop lesson plans and associated training exercises to be administered at the Radar Training Facility in Oklahoma City, Oklahoma, and in facility development and annual refresher training demonstrating target identification/reidentification situations resulting from coasting data tags whose associated targets are in close proximity to one another. (Class II, Priority Action) (A-88-31)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, NALL, and KOLSTAD, Members, concurred in these recommendations.

By: Jim Burnett
Chairman