

Log 8311A



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

Date: October 9, 1991

In reply refer to: A-91-101 and -102

Mr. Robert Anderson  
President  
AMR Combs  
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About 0915 mountain standard time, on Sunday, November 25, 1990, a fire erupted at a fuel storage and dispensing facility about 1.8 miles from the main terminal of Stapleton International Airport at Denver, Colorado. The facility, referred to as a fuel farm, was owned by United Airlines and Continental Airlines. United Airlines' portion of the fuel farm was operated and maintained by AMR Combs. From the time firefighting efforts were initiated immediately after the fire erupted until the fire was extinguished, a total of 634 firefighters, 47 fire units, and 4 contract personnel expended 56 million gallons of water and 28,000 gallons of foam concentrate. The fire burned for about 48 hours. Of the 5,185,000 gallons of fuel stored in tanks at the farm before the fire, about 3 million gallons were either consumed by the fire or lost as a result of leakage from the tanks. Total damage was estimated by United Airlines to have been between \$15 and \$20 million. No injuries or fatalities occurred as a result of the fire.<sup>1</sup>

United Airlines' flight operations were disrupted because of the lack of fuel to prepare aircraft for flight. Airport facilities, other than the fuel farm, were not affected by the fire. The duration and intensity of the fire, however, raised concerns about the ability of airport and local firefighters to respond to a fuel fire of this magnitude. The origin of the fire also raised concerns about the safety oversight and inspection of fuel farm pumping operations.

The nature of the failure of motor/pump unit 3 over a period of time raises questions about the adequacy of daily inspections conducted by AMR Combs' fuel farm employees and about the concern of AMR Combs' management for adequate inspections and maintenance. According to training manuals furnished by AMR Combs, the pumping equipment was to have been checked daily and at the beginning of each day. The entries on the daily inspection sheet

<sup>1</sup> National Transportation Safety Board. 1991. Fuel farm fire at Denver's Stapleton International Airport, Denver, Colorado, November 25, 1990. Aviation Accident Report NTSB/AAR-91/07. Washington, D.C.

for the month of November indicate that the pumps were checked daily and were recorded as being satisfactory. The daily inspection forms for the equipment were signed off by the night shift employee, and interviews confirmed that he was performing the inspections. The night shift was the time of lightest fuel demand at the ramp, and little, if any, fueling was done after 2200. Consequently, unless the night shift employee inspected the motor/pump units early in the shift, most of the pumps would have been inspected when they were not operating. Further, it is not likely that all six motor/pump units would be operating during the night shift. Because, according to maintenance staff, inspection of the equipment relied heavily on feeling vibrations and listening for unusual noises in the equipment, only very obvious discrepancies with these pumps could be noted when the equipment is not operating.

The night shift employee had worked at the fuel farm for less than 1 month. Further, his testimony indicates that he had been given no guidance or training by management regarding equipment inspections and that he might not have been able to detect a problem with the equipment if one existed. Inspection of the equipment during nighttime when the equipment was not operating and by an inexperienced and untrained employee could account for the fact that the deteriorating condition of motor/pump unit 3 went undetected. Moreover, the fact that the night shift employee had initialed before the fire the daily inspection sheet for November 26, 1990 (the day after the fire), indicates that the inspections were not conducted properly, if at all, and that the employee may have been merely satisfying paperwork requirements.

According to information received later during the investigation from the fuel farm manager, the equipment was to be inspected during each shift and the formal signoff on the status of the pumping equipment was performed during the night shift. It is difficult to understand how the deteriorating condition of motor/pump unit 3 could have gone undetected if the equipment was inspected during each shift by more experienced personnel and when the equipment was likely to be operating. The Safety Board concludes that adequate inspections were not being performed and that management failed to train and guide its employees in the inspection and maintenance of its fuel pumping equipment and that this failure caused the accident. The Safety Board believes that pumping equipment at fuel storage facilities on airports should receive detailed inspections when the equipment is operating and also when the equipment is not operating and that these detailed inspections should occur daily. Information received by the Safety Board 9 months after the fire indicates that AMR Combs' management has taken no steps to improve its inspection of pumping equipment.

Therefore, as a result of its investigation of this accident, the National Transportation Safety Board recommends that AMR Combs:

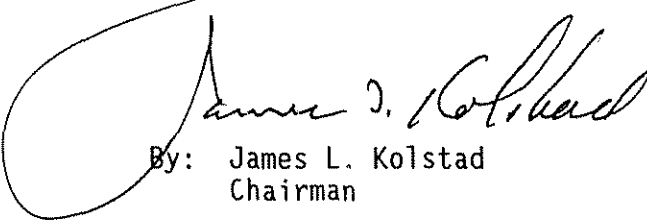
Revise procedures for inspecting airport fuel farm pumping equipment to assure that equipment is inspected daily when the equipment is operating and also when it is not operating.  
(Class II, Priority Action) (A-91-101)

Provide initial and recurrent training on detailed inspections of airport fuel farm pumping equipment to all fuel farm employees.  
(Class II, Priority Action) (A-91-102)

Also, as a result of the investigation, the Safety Board issued recommendations to the Federal Aviation Administration, the National Fire Protection Association, the Airport Operators Council International, Inc., and the American Association of Airport Executives.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "...to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations A-91-101 and -102 in your reply.

Chairman KOLSTAD, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in these recommendations.



By: James L. Kolstad  
Chairman