



Log 2311-B

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: October 9, 1991

In reply refer to: A-91-103

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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 operated by United Airlines and Continental Airlines. 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.¹

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 at one of the motor/pump units also raised concerns about the safety oversight and inspection of fuel farm pumping operations.

Although regulations at 14 CFR Part 139.321 address fuel storage, fire protection, training, and inspection, subparagraph (h) exempts the

¹ 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.

certificate holder (the operator of the airport) from requiring Part 121 and Part 135 air carriers to comply with the requirements of Part 139.321. However, there are no equivalent regulations under Parts 121 and 135 to require air carriers to accomplish what is required under Part 139. The pertinent provisions under Part 121 and 135 appear to address refueling of aircraft only, and not inspection and maintenance of the fuel storage facilities. There also appears to be considerable confusion within the Federal Aviation Administration (FAA) as to which division within FAA has responsibility for inspecting fuel storage facilities on airport property. The FAA's Office of Airport Safety and Standards understands that it has responsibility for inspecting fuel storage facilities operated by fixed-base operators but questions its own legal authority to do so for fuel storage facilities operated by Part 121 and Part 135 carriers. The FAA's Office of Flight Standards Service has operated in a manner that suggests its responsibility is limited to the refueling of aircraft.

As a result of this fire, the investigation of which highlighted the deficiencies in the regulations, the FAA's Office of Airport Safety and Standards issued a policy memorandum that attempted to resolve the issue and clarify which organization within the FAA has responsibility for inspection and oversight of these fuel storage facilities on FAA-certificated airports. The Safety Board believes, however, that the appropriate course of action would be to clarify the exemption in paragraph (h) of Part 139.321. Further, the FAA should clarify which division within FAA has the responsibility for inspections of fuel storage facilities on airport property and assure that the inspection responsibility is consistent with regulatory authority.

Although the regulations are not clear as to which division within FAA has oversight with respect to inspections of fuel storage facilities on airport property, the FAA's Office of Airport Safety and Standards did conduct an annual certification inspection of Stapleton International Airport in June 1990. That inspection achieved the intended results, noting that the certificate holder (city/county of Denver) was not in compliance with Part 139.321 nor with requirements outlined in its Airport Certification Manual (ACM); specifically, the certificate holder failed (1) to maintain [adhere to] its fueling standards for protection against fire and explosion in storing and dispensing fuel on airport property, (2) to conduct quarterly inspections of fuel storage facilities, and (3) to maintain yearly training certification of fueling tenants. The failure of the certificate holder to conduct quarterly inspections of the fuel storage facilities and to comply with its ACM certificate represents an inadequate approach to fire safety and, thus, contributed to the cause of the accident. Also of concern to the Safety Board is the apparent lack of followup by the FAA to determine if the certificate holder had resolved the discrepancies noted during the annual certification inspection. Efforts are needed to determine if areas of noncompliance are, in practice, resolved by the certificate holder.

The investigation raised concern that the certificate holder was not allocating sufficient resources to perform thorough quarterly inspections of fuelers on airport property. Although the airport certificate holder inspector cannot be expected to detect all pumping equipment maintenance discrepancies, the Safety Board believes that the certificate holder's

inspector should have found that AMR Combs was not properly inspecting and maintaining its equipment. (AMR Combs operated and maintained United Airlines' portion of the fuel farm.) However, only one Denver fire department inspector had been assigned to conduct quarterly inspections of all fuelers at Stapleton International Airport and he had received only minimal training to conduct these inspections. The Safety Board has not ascertained if the same conditions exist at other airports. The Board believes, however, that the FAA, during the annual certification, should determine if the certificate holders are providing the necessary resources to perform thorough quarterly inspections of fuelers on airport property. Further, the Safety Board believes that training of certificate holder inspectors should be required, particularly because the FAA is relying on the self-inspections to certify that fuel handling is being done safely.

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 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.

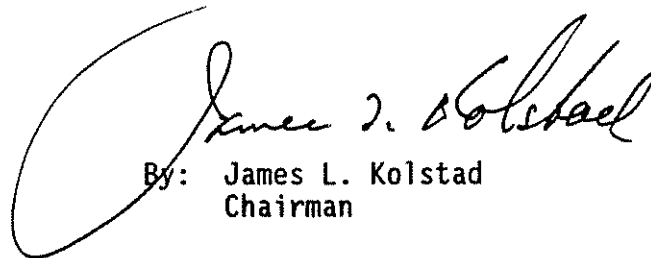
Therefore, as a result of its investigation of this accident, the National Transportation Safety Board recommends that the Airport Operators Council International, Inc. and the American Association of Airport Executives:

Inform your members of the circumstances of the fuel farm fire at Denver's Stapleton International Airport on November 25, 1990, and emphasize the importance of providing adequate resources for the inspection and maintenance of fuel tank farm facilities.
(Class II, Priority Action) (A-91-103)

Also, as a result of the investigation, the Safety Board issued recommendations to the Federal Aviation Administration, AMR Combs, and the National Fire Protection Association.

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 recommendation in this letter. Please refer to Safety Recommendation A-91-103 in your reply.

Chairman KOLSTAD, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in this recommendation.



By: James L. Kolstad
Chairman