NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C. 20594

Safety Recommendation

Date: November 30, 1993

In Reply Refer To: R-93-18 through -22

R-94-5A

Mr. A. R. Carpenter
President and Chief Executive Officer
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On July 31, 1991, National Railroad Passenger Corporation (Amtrak) train 82, Silver Star, was en route from Tampa, Florida, to New York, New York. The train consisted of 2 diesel-electric locomotives, 3 baggage cars, and 15 passenger cars.

At 5:01 a.m., its last six passenger cars derailed at milepost S329.6 on CSX Transportation Inc. (CSXT) track in Lugoff, South Carolina. The accident occurred near the E.I. DuPont May plant on a single main track that has a parallel auxiliary track, which is known as the DuPont siding. The derailment occurred at the Orlon crossover switch that connects the main track and the auxiliary track. The derailed passenger cars collided with the first of nine hopper cars that were stored at the siding.

Six operating crewmembers, 16 on-board service crewmembers, and 407 passengers were on the train. Twelve on-board service crewmembers and 53 passengers sustained minor injuries, 12 passengers sustained serious injuries, and 8 passengers sustained fatal injuries.[1]

[1]For more detailed information, read Railroad Accident Report--*Derailment and Subsequent Collision of Amtrak Train 82 with Rail Cars on DuPont Siding of CSX Transportation Inc. at Lugoff, South Carolina, on July 31, 1991* (NTSB/RAR-93/02).

When the National Transportation Safety Board inspected the switch after the accident, the numerous deficiencies found in the switch indicated that the inspections and maintenance were inadequate. Further inspection of the switch stand revealed that more shims were in place on the north side of the switch stand than on the south side. The combination of extra shim packs that were used within the switch stand mechanism indicated excessive adjustment requirements for the switch stand. The need for additional shims to adjust the switch points, by the use of cut plate shims behind the switch point clips and switch stand, indicated a pattern of more than normal wear or damage to the switch and switch stand. The additional shims between the switch point and switch point clip were evidence of a quick-fix switch maintenance procedure because the switch is not designed for adjustment in that area.

No documentation emerged during the accident investigation that the switch had been improperly run through by a train before the accident or damaged when the quick-fix repair was made. However, the switch crank, the safety plate, and the extra shims in the switch stand mechanism and on the switch point clips indicate that the switch had required and received maintenance as a result of either damage or excessive wear. Despite the extensive maintenance, Safety Board investigators after the accident discovered a broken and corroded cross pin, excess ballast that fouled the connecting rod, and cross level deficiencies on the main track at the switch.

In the weeks before the accident, the switch had undergone several visual inspections. The inspectors, who included the roadmaster, a track inspector, and the signal supervisor, had independently inspected the switch. None of these switch inspections noted the broken cross pin, the cross level deficiencies, or a nail used instead of a cotter pin. Although the inspectors knew about the excess ballast, they did not remove it. The inspectors could have and should have seen the switch deficiencies during a normal inspection and, with appropriate action, could have prevented the accident.

The Safety Board investigators found that the CSXT inspection process lacked an adequate documentation procedure. The CSXT track inspectors were not required by the CSXT or the Federal Railroad Administration (FRA) to have detailed documentation for each switch that was inspected during monthly inspections. The lack of adequate inspection documentation could have contributed to the failure to detect and correct the problems with the switch. Without adequate records on each switch inspection performed, the CSXT inspectors cannot verify whether an inspection has been made, and an inspector can overlook a developing problem.

The Safety Board determined during the investigation of this accident that the inspections on the Hamlet Subdivision were cursory, did not conform to existing procedures, and were not properly documented. Therefore, the Safety Board believes that the CSXT should review and revise, as necessary, existing practices to ensure that track supervisors review their subordinates' track inspections and that switch inspections are adequately documented.

Although the roadmaster, the track inspector, and the trackman were sufficiently trained and experienced to do the inspections and maintenance, the condition of the switch indicated that

the CSXT and FRA procedures had not been followed. If the switch had been inspected and maintained to comply with the CSXT and FRA requirements, such as the requirement that the connecting rod must be securely fastened, the worn, broken, fouled, and missing parts would have been noted and corrected, and the accident would probably not have occurred. These deficiencies indicate that the maintenance and inspection practices of the CSXT on this roadmaster's territory before the accident were inadequate and ineffective. The roadmaster and the track inspectors stated that they were not doing the track and switch inspections as required because the track surface repairs and other maintenance needs that they found during the day did not allow them enough time to do that work and to complete the required inspection schedule.

The testimony of the roadmaster and track inspector indicated that the inspectors on the Hamlet Subdivision had insufficient time to properly inspect the track and to perform other duties. They testified that they had 25 to 30 switches to examine each day. According to the roadmaster, a switch can be inspected in 10 to 15 minutes if no repairs are needed. The chief engineer of the CSXT track department confirmed the roadmaster's statement that it can take 10 to 15 minutes for a switch inspection, and he added that under certain circumstances, it could take up to 20 minutes. Consequently, inspecting an average of 27.5 switches a day and spending an average of 12.5 minutes on each, an inspector would require 5 hours 44 minutes daily for switch inspection (travel time not included). An inspector also has about 35 miles of track to inspect each day, which requires 2 hours 20 minutes if he drives a hi-rail vehicle at 15 mph. A 15-mph speed is appropriate for main track inspection in the Lugoff area according to the FRA regional track inspector. However, the 2 hours 20 minutes does not allow for slowing to 5 mph, as the Code of Federal Regulations requires, when a vehicle crosses switches and track or highway crossings.

A CSXT inspector needs 8 hours 4 minutes each day to inspect switches and track (5 hours 44 minutes and 2 hours 20 minutes, respectively). This time expenditure allows no time for other necessary activities, such as travelling to and from inspection areas, clearing the track for trains, or normal maintenance and repair. Because an inspector must engage in these other activities, the time he can spend on inspections would be depleted accordingly. The roadmaster has an additional important and time-consuming responsibility, checking the quality of the inspections done by the track inspector and the trackman.

The roadmaster reported that he worked 10- or 11-hour days to complete his duties. Even working these hours, he could not complete the 50 percent of inspections for which he was responsible. The reports for the 3 months before the accident showed that he had done only 4 (7 percent) of the 55 recorded track inspections. His inability to do half of the inspections increased the number that the track inspector and the trackman had to do. The roadmaster stated that although the assigned manpower for his territory had been reduced by half, the time for inspections remained adequate. According to the CSXT, automation and mechanization of the work have compensated for the reduction in the work force.

Initially, the track inspector stated that he had adequate time to fulfill his inspection requirements and that he could meet the requirements if he did not have anything else to do. He

noted, however, that often he had something else to do, such as tamping, track surface smoothing, or other duties that were unknown when he began an inspection trip. Thus, he qualified his earlier statement and said that taking care of maintenance and other duties did not leave him enough time to get his inspections done and that this had been the situation for about 3 or 4 years. He attributed the situation to the elimination of some positions and the reassignment of personnel. He also reported that he did not do a detailed inspection each time he inspected a switch but that the monthly inspections were more detailed and thorough. He added that as long as the switch threw well and the points fitted up, he did not generally check everything. The track inspector's statements that he did not have sufficient time to adequately do his work and that during his inspections, he checked only whether the switch points fitted properly indicate a definite need for an evaluation of his work schedule.

At 5:12 a.m., the CSXT dispatcher telephoned the Kershaw County emergency medical services (KCEMS) and said, "All we know is we've derailed right out of Lugoff headed toward Camden with a bunch of cars turned over and people hurt." When asked for a phone number where he could be reached, the CSXT dispatcher gave the wrong number. The KCEMS then called the Kershaw County sheriff's dispatcher (KCSD) for help in locating the accident site. After attempting to contact the CSXT dispatcher, the KCSD sent two deputies at 5:18 a.m.[2] to search for the train. At 5:23 a.m., the KCSD called the KCEMS and said that she had received a call that the train was at the Lugoff crossover. Had the emergency response telephone list been current, the CSXT dispatcher would have called the KCSD, which is the primary communications link, instead of the KCEMS. Therefore, the Safety Board believes that the CSXT should maintain an up-to-date emergency response telephone list.

The train engineer radioed the Cayce yardmaster that the accident location was the "crossover at Lugoff" at "the lead into the DuPont plant at Lugoff," and the CSXT dispatcher monitored the communication. However, the CSXT dispatcher used the same term "crossover" when he talked to the emergency response agencies. "Crossover" is railroad jargon for a track structure composed of two or more turnouts that permits the continuous travel of cars from one track to another, but the emergency responders understood the term as a road crossing. After the deputy sheriff was notified, he searched the three Lugoff road crossings instead of proceeding directly to the Lugoff crossover, which added to the confusion and delay. The CSXT should not use railroad jargon when giving directions on accident locations to law enforcement and emergency responders. The Safety Board believes that terminology should be used that can be readily understood by local emergency personnel when advising them of train locations after an accident.

The main objective of postaccident toxicological testing is to determine whether drugs or alcohol was responsible for or contributed to the cause of an accident; to make such a determination, blood and urine specimens must be taken soon after an accident. The time required for the traincrew to perform their postaccident duties was short. About 1 1/2 hours after

[2]All times that refer to the actions of the KCSD are estimated.

the accident around 6:30 a.m., the incident commander for the emergency medical services reported that he had sufficient emergency personnel on scene to relieve the traincrew of emergency medical duties. However, the CSXT did not prepare for the specimen collection until 5 hours after the accident and had not completed taking the specimens until 8 hours 29 minutes after the accident.

The CSXT should emphasize in its written postaccident toxicological testing guidelines and in its training of company officials, the critical need to obtain postaccident toxicological specimens as soon as possible. The specimen collection process should have taken less time than the 8 hours 29 minutes that was required. Immediately after an accident, the CSXT should designate a railroad representative who has the single task of ensuring that postaccident toxicological specimen collection is completed. The Safety Board believes that the CSXT should revise its postaccident drug and alcohol testing procedures to ensure timely specimen collection.

Therefore, the National Transportation Safety Board recommends that CSX Transportation Inc.:

> Review and revise, as necessary, existing practices to ensure that track supervisors review their subordinates' track inspections and that switch inspections are adequately documented. (Class II, Priority Action) (R-93-18)
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> Review and revise, as necessary, manpower schedules for track and switch inspections to ensure that the track and switch standards of the Federal Railroad Administration and the CSX Transportation Inc. can be met. (Class II, Priority Action) (R-93-19)
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> Maintain an up-to-date emergency response telephone list. (Class II, Priority Action) (R-93-20)
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> Instruct dispatchers on the use of terminology that can be readily understood by local emergency personnel when advising them of train locations after an accident. (Class II, Priority Action) (R-93-21)
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> Revise postaccident drug and alcohol testing procedures to ensure timely specimen collection. (Class II, Priority Action) (R-93-22)

Also, the Safety Board issued Safety Recommendation R-93-23 to the National Railroad Passenger Corporation.

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 action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations R-93-18 through -22 in your reply. If you need additional information, you may call (202) 382-6840.

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

By: Carl W. Vogt
Chairman