

R-411

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: May 28, 1982

Forwarded to:

Mr. A. G. Dustin
President, Chief Executive Officer,
and Chief Operating Officer
Boston & Maine Corporation
Iron Horse Park
North Billerica, Massachusetts 01862

SAFETY RECOMMENDATION(S)

R-82-26 through -32

About 4:15 p.m. on August 11, 1981, Boston & Maine Corporation (B&M) freight train Extra 1731 East and Massachusetts Bay Transportation Authority westbound commuter train No. 570 collided head-on on the former B&M tracks near Prides Crossing, Beverly, Massachusetts. The train dispatcher allowed Extra 1731 East, a yard switcher, to enter onto the main track because he understood that a coworker would instruct the train to clear the main track for westbound No. 570. The coworker did not have the same understanding about the train's routing as the dispatcher, and Extra 1731 East was allowed to proceed eastward on the same track on which No. 570 had been authorized to proceed westward. The engineer of No. 570 and two trainmen and an unauthorized passenger on Extra 1731 East were killed. The engineer and foreman of Extra 1731 East, and the conductor, the trainman, and 28 passengers on No. 570 were injured. Damage was estimated at \$1,683,200. 1/

Neither Bulletin Order B1-420 nor the B&M operating rules required the operators at train order offices at Congress Street in Beverly or at Manchester, Massachusetts, to report the passing times of trains past their offices to each other or to the train director at Salem (Massachusetts) Tower. However, they were required by rule 222 to report this passing time information to the dispatcher. They were not required to determine if the block between their respective offices was clear of trains, or request or dedicate the block exclusively to a train. Under the bulletin order and operating rules, the responsibility rested solely with the dispatcher to move all trains under his or her jurisdiction, to insure that the block was clear between Congress Street and Manchester, and to insure that there were no opposing trains in conflict. The Form D-R train order assigned to the dispatcher the responsibility of determining that there were no conflicting trains in the area in which right was conferred by the order to a train which otherwise had no right.

There was considerable conflict in the testimony of the train dispatcher, the train director, and the train order office operators at Congress Street and Manchester concerning train arrivals, train departures, and the placement of a blocking device. The operator at Manchester said that he reported the arrival and departure times of No. 570 on his own initiative. Yet, 2 minutes after the train departed, the dispatcher called Manchester seeking to locate No. 570 in an attempt to stop the train. This discrepancy in the testimony of the operator and the dispatcher is inconsequential. It is simply a matter of whether the operator did or did not promptly report No. 570's arrival and departure

1/ For more detailed information read Railroad Accident Report—"Head-on Collision of Boston & Maine Corporation Extra 1731 East and Massachusetts Bay Transportation Authority Train No. 570, Beverly, Massachusetts, August 11, 1981" (NTSB-RAR-82-1).

times as he said, or whether the dispatcher failed to receive these times or just failed to record them. It is evident that the dispatcher did not record the arrival and departure times because the times were later recorded by his relief dispatcher.

There is evidence that the dispatcher and train director at Salem Tower did not reach a mutual understanding in their conversation. Their testimony agrees up to the point that the dispatcher told the train director to have Extra 1731 East get clear at Beverly Gulf Siding. Either the train director failed to hear the dispatcher, the train director forgot to relay this information to Extra 1731 East, or the dispatcher did not verbalize direct instructions to the train director. According to rule 733, the dispatcher was charged with the responsibility of being certain that his instructions were clearly given and understood. The dispatcher did not check to make certain that his instructions had been understood.

When the engineer of Extra 1731 East, while at Congress Street, told the train director that, "They are letting us go," the train director could have understood that "they" included the dispatcher. However, when the dispatcher told him that Extra 1731 East had a "may go," he did not question the previously discussed possibility of the freight train's getting in the clear at Beverly Gulf Siding or Beverly Yard. From his testimony, it appears that the dispatcher was talking about authority for the freight train to pass the train order signal at Congress Street so that it could get clear at Beverly Gulf Siding. Also, according to his testimony, he believed that the blocking device that had been required by track car permit No. 123 was in place at Beverly Junction Interlocking, and the train director could not and would not allow Extra 1731 East to pass that point without his permission. This series of events indicates a failure on the part of the dispatcher and train director to understand each other's intent. There also appears to have been either a failure on the part of the first-shift dispatcher to call Salem Tower and have the train director apply a blocking device at Beverly Junction Interlocking, or the train director failed to apply the blocking device when he was directed to do so. During the time of the transfer to his successor, the first-shift dispatcher may have intended to call Salem Tower to have a blocking device applied as required but overlooked completion of the task.

According to the dispatcher's testimony, when he prepared to issue a train order to No. 570 at Manchester, he believed that the required blocking device was in place on the switch at Beverly Junction Interlocking leading to the Gloucester Branch, and that Extra 1731 East was clear of the main track in Beverly Gulf Siding. However, the dispatcher should not have made the train order complete that authorized No. 570 to operate to Congress Street on the eastward track until he had confirmed that Extra 1731 East had cleared. He apparently did not check on the blocking device when he came on duty or when he issued the train order to No. 570 because his transfer record indicated that his predecessor had ordered the device applied and he had been told verbally that the device was in place. Although he could be expected to accept with confidence the information passed to him in transfer from the first-shift dispatcher, it would have been prudent for him to have checked and verified the status of the blocking device since he was depending on the blocking device to protect No. 570. As the operating rules are written, it is the dispatcher's responsibility to determine that there are no conflicting moves in the block for which a train has been given right by train order. He did not check at any time to insure that Extra 1731 East was in the clear or that the blocking device was in its proper place.

The B&M could have distributed the operational responsibility for insuring a clear block for No. 570 and similar trains by assigning the operators at Congress Street and Manchester more responsibility for that operation. Management could have required that the operators report trains to each other when they passed their respective offices. Thus,

if the operator at Congress Street had reported the passage of Extra 1731 East to the operator at Manchester, the operator at Manchester would have known that there was a conflict for No. 570. Also, the operator at Manchester could have been required to obtain the block between Congress Street and Manchester for the exclusive use of No. 570, which is a procedure followed under manual block rules. This would have insured that one train or the other would have had to wait until the block was clear.

The practice of the dispatcher's regarding the receiving and recording of train passing times in violation of the operating rules left the dispatcher operating much of the time without knowing the location of his trains. If the dispatcher had received the passing time of Extra 1731 East past Beverly Junction promptly, he would have known the train's location and that he could not allow No. 570 to leave Manchester when it did. Since there had been discussions between the dispatcher and the train director about Extra 1731 East, the train director would have provided a vital check if, in conformance with the rules, he had promptly reported Extra 1731 East's passing at Beverly Junction. The Safety Board believes that the absence of these simple procedures, and the failure of supervisors to enforce the rule requiring a prompt reporting and recording of the time of trains past reporting points, eliminated some of the safety backup measures available for the operation. Also, these procedures would have provided the dispatcher assistance in carrying out the responsibilities of his job.

Additional backup safety measures could have been provided if a common dispatcher's telephone circuit had been available to all train order offices. On most railroad properties, the dispatcher's telephone circuit is amplified through a speaker which is usually on. Operators, for whatever reason, tend to listen to the activity over the dispatcher's telephone to keep abreast of train movements, especially in offices where work is slow. If the operator at Congress Street had known, and she might have heard it over the dispatcher's telephone circuit, that No. 570 was leaving Manchester after Extra 1731 East had been cleared to proceed east to Manchester, she could have alerted the dispatcher or train director to the conflict.

Another unavailable backup feature was that train orders issued to one office were not available to other offices which were not addressed. Had they been, another source for detecting conflicting moves might have been alerted. Finally, the sharing of telephones by the operators at Congress Street and Manchester with the drawtenders presented a hazard of potential delays in communicating vital information in a timely manner.

While the Form J holding order is an effective instrument to control train movements as a protective measure, it is only available to the operator at the location to which it is addressed. Similarly, a blocking device is effective to restrict train movements at a given point only if it is used as prescribed by rules and if it performs its design function. However, there is no backup system or crosscheck on the B&M to insure that the blocking device is, in fact, in its proper place. According to the operating rules, the dispatcher orders an operator to apply a blocking device. The rules are explicit about how blocking devices are to be regarded relative to train movement and how they can be removed. The notation entry in the dispatcher's train order book does not specify where a blocking device is applied, although a record is maintained of its application and removal adjacent to the train order or track car permit that generated a requirement for it. These entries should be specific as to where the blocking device is applied, the number of the switch or signal lever to which the blocking device is applied, and by whom it was applied. A more positive means of applying a blocking device would be by a train order or similar directive.

The crewmembers of a train that has been given a right between designated points by train order are relying on the fact that the block is clear and that an absolute hold is in effect at the extreme end of the block in which their right is conferred. Two additional actions that would provide a measure of safety backup would be to provide the train operating by train order against the current of traffic a copy of the restricting order in effect at the exit end of the block covered by the right order, and, as a minimum, providing the operator at the restricted entrance to the block a copy of the right order. If opposing trains were delivered a copy of the right order, added protection would be provided. The B&M Director of Rules indicated that even if Extra 1731 East had gotten clear at Beverly Gulf Siding, that train should have gotten a copy of the order given to No. 570. The B&M rules say this delivery will be made if or when practicable. The Safety Board believes that if the operator at Congress Street or the train director at Salem Tower had been given copies of the right order on which authority No. 570 left Manchester, the accident probably would have been avoided since each would have known the movements of both the trains.

Bulletin Order B1-420 did not specify that a holding order was necessary at Beverly Junction, even though the Director of Rules gave it an after-the-fact interpretation to that effect. In comparison, the bulletin order was specific about the form of train order to be used and other details. The operating rules say that prescribed forms will be used, but the prescribed forms are not identified. The B&M Director of Rules pointed out that a blocking device should be applied to the signal "and" switch control levers. If this is the interpretation that the B&M chooses to place upon that rule, the phrase in the rulebook should be changed to read "switch and" instead of "switch or." "Or" definitely provides for a choice and the blocking device was applied on either or both at the discretion of the dispatcher and/or operator.

The application of the operating rules as understood by those persons responsible for the operation of trains under the provisions of Bulletin Order B1-420 was too restrictive in the sense of sharing related developments and procedures. The instructions affecting the movement of a train at one location were not shared and disseminated to other offices on the route over which the train/trains would move. Therefore, the safety backup that could have been available, whether provided purposefully or that is inherent in the communication network, was lost.

The Safety Board discussed the potential problems that could result from unclear and inexplicit operating rules in its special study "Signals and Operating Rules as Causal Factors in Train Accidents" issued on February 7, 1972. 2/ The fallibility of blocking devices was discussed in a Safety Board report of an accident on the tracks of the Consolidated Rail Corporation at Dobbs Ferry, New York, in 1980. 3/

Extra 1731 East and No. 570 each had the freight road radio channel as a common communication frequency, but neither engineer made an attempt to contact the other. While the engineer of No. 570 had no reason to suspect the presence of another train, the engineer of Extra 1731 East had received an approach signal at signal G-209 and he was on the scheduled time of No. 570. During the company hearing held regarding this accident, it was evident in a discussion of the various radio channels used by the B&M that train employees generally did not know that the two trains could have communicated with one another, and they did not seem to know about the compatibility of the several radio channels when they were referred to by channel designation such as channel 1 or channel 2.

2/ Report No. NTSB-RSS-71-3.

3/ Railroad Accident Report—"Head-End Collision of Amtrak Passenger Train No. 74 and Conrail Train OPSE-7, Dobbs Ferry, New York, November 7, 1980" (NTSB-RAR-81-4).

As a result of its investigation of this accident, the National Transportation Safety Board recommends that the Boston & Maine Corporation:

Develop and implement a system that will ensure that blocking devices are promptly and properly applied. (Class II, Priority Action) (R-82-26)

Enforce Boston & Maine Corporation operating rule 222 that requires operators to promptly report and the dispatcher to promptly record train passing times at locations where passing reports are required. (Class II, Priority Action) (R-82-27)

Provide a dispatcher telephone system common to all train order offices. (Class II, Priority Action) (R-82-28)


Revise the operating rule concerning Form J Holding Orders so that the rule specifically requires applying a blocking device to both the switch and the signal levers. (Class II, Priority Action) (R-82-29)

When it becomes necessary to divert a train from its normal route, require the dispatcher to inform all employees who will handle the diverted train of the planned move and further require that the operators handling a diverted train report the train's passing times to each other. (Class II, Priority Action) (R-82-30)

Require that Bulletin Orders issued to govern train operations in special circumstances specifically describe the mode of operation and cite the applicable operating rules. (Class II, Priority Action) (R-82-31)

Uniformly identify the radio channels used by Boston & Maine Corporation employees on a systemwide basis so that employees know which channels trains, mobile units, and manned base stations may use to communicate with each other. (Class II, Priority Action) (R-82-32)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations. McADAMS, Member, did not participate.


By Jim Burnett
Chairman