EXHIBIT 3-S

Docket No. DCA-08-MR009

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

Safety Recommendation Letter to
Federal Railroad Administration, R-03-1, June 13, 2003

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: June 13, 2003

In reply refer to: R-03-1 and -2

Honorable Allan Rutter
Administrator
Federal Railroad Administration
1120 Vermont Avenue, N.W.
Washington, D.C. 20590

At 8:57 a.m., central daylight time, on May 28, 2002, an eastbound Burlington Northern Santa Fe (BNSF) coal train collided head on with a westbound BNSF intermodal train near Clarendon, Texas. Both trains had a crew of two, and all crewmembers jumped from their trains before the impact. The conductor and engineer of the coal train received critical injuries. The conductor of the intermodal train received minor injuries; the engineer of the intermodal train was fatally injured. The collision resulted in a subsequent fire that damaged or destroyed several of the locomotives and other railroad equipment. Damages exceeded $8 million.[1]

The National Transportation Safety Board determined that the probable cause of the May 28, 2002, collision at Clarendon, Texas, was (1) the coal train engineer's use of a cell phone during the time he should have been attending to the requirements of the track warrant his train was operating under and (2) the unexplained failure of the conductor to ensure that the engineer complied with the track warrant restrictions. Contributing to the accident was the absence of a positive train control system that would have automatically stopped the coal train before it exceeded its authorized limits.

The coal train, with 116 cars of coal and headed by lead locomotive BNSF 8876,[2] departed Amarillo at 7:40 a.m. The train operated eastward, entering track warrant control (TWC) territory several miles east of the yard area. Track warrant records indicate that the coal train received a track warrant to enter TWC territory at 7:47 a.m. The crew's first track warrant was quickly followed by a second track warrant, which was issued to the coal train at 7:49 a.m. The second track warrant was an "after-arrival" warrant, which stipulated that the coal train was to wait at Malden Siding for the arrival of a specified train before proceeding beyond that point. The coal train met the opposing westbound train at Malden Siding, as required. The meet took

[1] For more information, see National Transportation Safety Board, *Collision of Two Burlington Northern Santa Fe Freight Trains Near Clarendon, Texas, May 28, 2002*, Railroad Accident Report NTSB/RAR-03/01 (Washington, D.C.: NTSB, 2003).

[2] The *General Code of Operating Rules* uses the identification of the lead locomotive to formally identify a train for the purpose of issuing authority to occupy main tracks. The train identification also includes the train's direction. Thus, the official identification of the coal train on track warrants (see note below) was "Engine BNSF 8876 East."

place from about 8:30 until 8:35, after which, in accordance with its track warrant, the coal train proceeded toward the east end of Ashtola Siding.

As the coal train neared Ashtola, at 8:43 a.m., the final track warrant, Track Warrant 22, was issued. This was also an after-arrival track warrant that covered the coal train's movement between Ashtola Siding and Hedley Siding, about 25 miles away. This track warrant specified that the coal train was to hold short of the east end of Ashtola Siding until the arrival in the siding of a westbound intermodal train (Engine BNSF 4385 West). The track warrant would become effective at that point. At the time this warrant was issued, the coal train was approximately 3.2 miles from the point at which it was to stop and wait and was traveling, according to event recorder data, about 48 mph.

Investigators reviewed audiotapes and confirmed that communications between the dispatcher and the coal train crew were similar for both of the last two track warrants given to the coal train. The conductor accurately repeated the instructions for the last track warrant, including the stipulation that the track warrant was not in effect until after the arrival of BNSF 4385 West at the east siding switch at Ashtola.

Records indicated that about the time that the final track warrant was radioed to and read back by the conductor, the engineer placed a call on his cell phone. The engineer was still on this call about 4 minutes later as his train passed the east end of Ashtola Siding. The train should have stopped at this point to await the arrival of the intermodal train, in accordance with the train's track warrant. Event recorder data indicated that the train was traveling about 48 mph at that time.

Some minutes after the coal train passed the east end of the siding, the train's conductor saw and alerted the engineer to the oncoming train as the intermodal train rounded the curve ahead. At the point of the collision, the coal train had traveled for about 9 1/2 minutes and about 7.7 miles from the point where it should have waited for the arrival of the intermodal train.

Both the engineer and conductor said they could not remember anything about the track warrant. They could not, therefore, confirm that the engineer had a copy of the track warrant or, if the conductor did give a copy to the engineer, that it reflected the after-arrival instructions. (The track warrant could not be found after the operating cab was destroyed by the impact and fire.)

While investigators were given no explanations by the engineer for why he did not act on the after-arrival information, it is not likely that he would have forgotten about the meet with the intermodal train because only a minute or two would have elapsed from the time the warrant was issued until he would have had to begin preparing for it by beginning to slow his train. The only known departure from what must have been a routine conveyance of track warrant information between the conductor and the engineer was the engineer's placing of the cell phone call, which possibly produced a significant dual-task diversion of the engineer's attention during the time he would have been expected to read the track warrant. The cell phone call ended several minutes before the collision. During the several minutes after the cell phone call and before the collision, the coal train continued to travel eastward at timetable speed.

The engineer's cell phone use may have diverted enough attention from his track warrant reading that the after-arrival stipulation was seen but not actually comprehended. Because he could have looked at the track warrant again or checked with the conductor if he had any afterthoughts or uncertainties, it is likely that he proceeded beyond Ashtola with absolutely no knowledge of the oversight. The Safety Board concluded that the engineer's cell phone use likely distracted him to the extent that he did not take proper note of the after-arrival stipulation imposed by Track Warrant 22 and thus was unaware of the need to prepare to bring his train to a stop.

Cell phone use in controlled research situations has been shown to interfere with the perception process during the performance of operational tasks. The scientific understanding of this impairment is that visual perception is disrupted to the extent that a person does not implicitly attend to the information or physical cues available.[3] Such an impairment obviously has implications for operating train crews because use of a cell phone during train operations can call a crewmember's attention away from the task at hand. Moreover, a crewmember who is on a cell phone may miss information that is broadcast on the locomotive radio. Wayside defect detectors broadcast defect information and axle counts to the crews of passing trains. Similarly, train crews and other employees are required to inspect passing trains and report defects or the improper display of the rear marker. To improve safety, many railroads require that train crews announce their train's presence on the radio as they approach a meeting point in non-signaled territory and the indication of wayside signals in signaled territory. An employee who is using a cell phone may not hear or perceive such information.

When used by either the engineer or conductor, a cell phone may distract the other crewmember or terminate the normal interaction between the two. Perhaps one employee may wish to ask a question or offer a reminder but chooses to not disturb the employee who is using the phone. An incoming phone call may be a significant distraction to a person who is engaged in a critical task at that particular moment.

It is conceivable that both the conductor and the engineer could be on their cell phones at the same time. In this case, neither employee is fully concentrating on the safe operation of the train. In other situations, particularly in passenger operations, an engineer may be alone in the cab. In this case, the sole occupant of the locomotive may be impaired by the demands of a cell phone call. In the Clarendon accident, as noted previously, the engineer placed a cell phone call and continued the conversation during the time he should have been preparing his train to stop, providing convincing evidence that cell phone use by train operating crews can interfere with crewmember attention and communications and can therefore degrade the safety of train operations.

Both the *General Code of Operating Rules* and BNSF operating instructions restrict the use of cell phones by operating employees. The BNSF instructions prohibit locomotive engineers from using cell phones/laptop computers while operating a locomotive. Federal regulations

[3] Strayer, D.L., Drews, F.A., and Johnston, W.A. Cell Phone-Induced Failures of Visual Attention during Simulated Driving, *Journal of Experimental Psychology: Applied.* Vol. 9, No. 1, 2003: pp. 23-32. The term "inattentional blindness" was given by earlier researchers to findings where persons were unable to perceive certain controlled presentations in the visual field that they would have seen if they had been attentive to them. Mack, A. and Rock, I., *Inattentional Blindness.* Cambridge, MA: The MIT Press, 1998. pp. 13-15, 227-250.

contained in 49 *Code of Federal Regulations* Part 220 do not prohibit an engineer from using a cell phone while at the controls of a moving locomotive. As noted, however, the use of a cell phone by an engineer at the controls of a moving locomotive will likely dilute the engineer's full awareness and attention, which are required for safe operation. The BNSF recognizes this risk and has acted accordingly by amending its operating rules. Other railroads, however, have not. To improve safety, the Safety Board believes that the FRA should promulgate new or amended regulations that will control the use of cellular telephones and similar wireless communication devices by railroad operating employees while on duty so that such use does not affect operational safety.

After the Clarendon collision, the BNSF issued instructions requiring that a train be stopped at the location where another train is to be met before the crew is given a track warrant that contains an after-arrival stipulation. This restriction eliminates instances in which a train has a track warrant that instructs the crew to proceed or to keep proceeding, but to remember to stop the train before passing a specific point within the territory. A disoriented or distracted crew may not stop at the designated location.

In this accident, had the crew not received their final track warrant, they might have stopped at the limit of their previous warrant; that is, at the east end of Ashtola. The engineer may have heard the radio transmission of at least the beginning of the final track warrant and mistakenly determined that, since he had a track warrant, he did not have to be concerned about stopping in the next several miles. The timing of the engineer's initiation of the final phone call clearly suggests that he did not believe he had to stop at Ashtola. The Safety Board concluded that the issuance, to moving trains, of track warrants containing after-arrival provisions creates an unacceptable and unnecessary risk of a head-on train collision. Although most of the major railroads, including the BNSF since this accident, have adopted their own special instructions that eliminate or restrict the use of after-arrival track warrants, the Safety Board is concerned that other railroads may not recognize the risk inherent in this form of train control. The Safety Board therefore believes that the FRA should restrict the issuance of track warrant authority that contains an after-arrival requirement to trains that have stopped at the location at which they will meet the opposing train.

Technology does exist to automatically enforce the operating parameters of trains and thus prevent train collisions. Over the past 3 decades, the Safety Board has investigated a long list of train collisions that could have been prevented through the use of a positive train control system[4] that incorporated collision avoidance. The Safety Board has addressed this issue through the issuance of a series of safety recommendations. In fact, positive train control has been on the Safety Board's list of "Most Wanted" transportation safety improvements since 1990. The most recent safety recommendation relating to positive train control was issued as a result of the Board's investigation of a 1999 fatal train collision in Bryan, Ohio:

> R-01-6
> Facilitate actions necessary for development and implementation of positive train control systems including collision-avoidance components, and require

[4] Various names have been given to these types of systems, but one component of all true positive train control systems is a system designed to prevent train collisions.

implementation of positive train control systems on main line tracks, establishing priority requirements for high-risk corridors such as those where commuter and intercity passenger railroads operate.

Based on a March 27, 2002, letter in which the FRA outlined steps it had taken toward "achieving the proper atmosphere in the rail industry to allow for the development and implementation of [positive train control]," the Safety Board classified Safety Recommendation R-01-6 "Open—Acceptable Response."

In answer to an April 17, 2003, letter from the Safety Board asking for an update on actions regarding this safety recommendation, the FRA responded, in a May 5, 2003, letter, that it was "doing everything within its power to prepare the way for [positive train control] and encourage its rapid deployment." In the meantime, the majority of railroad operations occur in territory without any automatic means of preventing train collisions.

The BNSF is developing a system of train separation that would prevent trains from operating beyond the limits of track warrant authority. BNSF's train collision avoidance system is designed as an "overlay system" that enforces the track warrant limits or signal indications and the operating rules that are in place. The system is designed to inform the engineer of conditions that require him to act. If the engineer does not take the proper actions, the system will automatically stop the train. The BNSF plans to begin a pilot collision avoidance program for trains in the summer of 2003 on about 100 miles of track in western Illinois.

The BNSF system will use such information as train position (provided by the global positioning system), switch position (provided by switch sensors), signal indication, locomotive speed and control inputs, and track authority as given by the train dispatcher. This information will be combined with a train and track database to enforce operating parameters. The system will be designed to prevent the overrun of track authority in both signaled and track warrant territory. In addition to the absolute limits of track authority, the system will be able to enforce track speed and permanent and temporary speed restrictions. The Safety Board concluded that had a positive train control system with collision avoidance capabilities been in place and operational on the Red River Valley Subdivision at the time of the accident, the collision probably would not have occurred.

Based on its investigation of this accident, the National Transportation Safety Board makes the following safety recommendations to the Federal Railroad Administration:

Promulgate new or amended regulations that will control the use of cellular telephones and similar wireless communication devices by railroad operating employees while on duty so that such use does not affect operational safety. (R-03-1)

In territory not equipped with a positive train control system, restrict the issuance of track warrant authority that contains an after-arrival requirement to trains that have stopped at the location at which they will meet the opposing train. (R-03-2)

The Safety Board also issued a safety recommendations to the General Code of Operating Rules Committee. Please refer to Safety Recommendations R-03-1 and -2 in your reply. If you need additional information, you may call (202) 314-6177.

Chairman ENGLEMAN, Vice Chairman ROSENKER, and Members GOGLIA, CARMODY, and HEALING concurred in these recommendations.

Original Signed

By: Ellen G. Engleman
Chairman