Testimony of Mark V. Rosenker, Chairman
National Transportation Safety Board
Before the
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Rail Safety Legislation
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Good afternoon Chairwoman Brown, Ranking Member Shuster, and Members of the Subcommittee. My name is Mark Rosenker, Chairman of the National Transportation Safety Board. Madame Chairwoman, I would like to take this opportunity to thank you, the Members of the Subcommittee, and staff for inviting the Safety Board to testify today on several rail safety issues that are being considered in proposed rail safety legislation and for your continued interest in furthering the safety of our Nation's railways.

The Safety Board is concerned about several rail safety issues that are being considered by this Subcommittee, including train crew fatigue; the lack of positive train control systems to prevent train collisions, overspeed derailments, and improper switch positions in non-signaled (dark) territory.

Train Crew Fatigue

I would like to begin with the decades long history of fatigue-caused railroad accidents that the Safety Board has investigated, the equally long history of safety recommendations that we have made to address the problem, and the frustration we share with the Federal Railroad Administration (FRA) -- regarding its lack of legislative authority -- to address the root causes of fatigue through scientifically based principles of workload and fatigue management.

We have investigated more than a dozen railroad accidents in which we believe train crew fatigue played a contributing role. The earliest railroad accident investigation in which the Board attributed the probable cause to fatigue was a collision between two freight trains at Wiggins, Colorado, in 1984. About a week later, two more freight trains collided near Newcastle, Wyoming. Again, the Board found that the probable cause was that the crew of the striking train had fallen asleep and had failed to comply with restrictive signals.

Since 1984, fatigue-related train accidents have continued, such as the collisions between two freight trains at Anding, Mississippi, in 2005 and at Macdona, Texas, in 2004. In Anding, the northbound train crew failed to comply with wayside signals requiring them to stop, and their train hit a southbound train head-on killing all four crewmembers. The Safety Board examined the work/rest cycles of the northbound train crews and found that both the engineer and conductor had worked about 11 ½ hours per night and had been sleeping about 5 ½ hours per night for the 3 days immediately before the accident. Both crewmembers typically worked 6

days a week, most often going on duty between 12:00 a.m. and 1:00 a.m., and were usually on duty for 11 to 12 hours. They were working their sixth consecutive day when the accident occurred in Anding. Getting a repeatedly insufficient amount of sleep on a regular basis can impair human performance and alertness, and the crewmembers' short sleep periods likely allowed them to develop a cumulative sleep loss or sleep debt.

In the Macdona accident investigation, the Safety Board found that both crewmembers did not obtain sufficient restorative rest before reporting for duty because of their ineffective use of off-duty time, and that the Union Pacific Railroad's train crew scheduling practices inverted the crewmembers' work/rest periods; both of which contributed to the accident. Work as a train crewmember entails an unpredictable job schedule that can make it difficult for employees to effectively balance their personal and work lives. We found that the unpredictability of Union Pacific train crewmembers' work schedules may have encouraged them to delay obtaining rest in the hope that they would not be called to work until later on the day of the accident.

Fatigue related accidents have occurred across all regions of the country. Every major railroad has had at least one fatigue-caused accident. Moreover, no type of railroad operation is immune from the effects of fatigue. Although the majority of fatigue accidents that we have investigated involve freight operations, our investigation case files contain fatigue accidents involving long-distance passenger trains, commuter trains, light rail operations, and even subway trains.

The work schedules of rail crewmembers permit repetitive 12-hour days that lead to cumulative fatigue or sleep debt. When the workers' commute, limbo time and family/personal responsibilities are factored into their daily schedules; the conditions for exceedingly long days that lead to acute fatigue are evident. The relatively short mandatory periods of time off currently in place do not afford the opportunity for fully restorative sleep.

Just as our accident history has identified the problem of fatigue in railroad accidents, the Safety Board's recommendation history has identified actions that we think could address the problem. In the past two decades, the Safety Board has issued 34 recommendations concerning railroad employee fatigue. The FRA received 8, the others have gone to rail carriers and operating unions. The Board has recommended that the railroad companies reduce the irregularity and unpredictability of crewmember's work/rest schedules and provide education and counseling to help them avoid sleep deprivation. And, we have asked all rail carriers to develop policies that would allow an employee to report off duty, without penalty, when they are impaired by lack of sleep.

The laws, rules, and regulations governing this aspect of transportation safety in the railroad industry fail to address the problem. The Railroad Hours of Service Act allows railroad operating employees to work 11 hours 59 minutes, and after only 8 hours off duty return back to work. An employee who works the full 12 hours, just one more minute, would get 10 hours off duty before being allowed to return to work. And, under the current law these employees are permitted to repeat that arduous work-rest cycle an unlimited number of times. The Railroad Hours of Service Act does not take into account either rotating work schedules or the accumulated hours spent working in limbo time, which can be substantial--adding additional

hours to the workday. The Railroad Hours of Service Act also does not take into account the significant effects of the human circadian rhythm upon a crewmember's level of alertness.

The Macdona accident again prompted the Safety Board to issue new recommendations to FRA: R-06-14 to require railroads to use scientifically based principles when assigning work schedules, and R-06-15 to establish requirements that limit train crewmembers limbo time.

FRA's October 24, 2006 response to the Board on these recent recommendations again stated that FRA lacks rulemaking authority over duty hours. This precludes the FRA from making use of almost a century of rigorous scientific research on the issue of sleep-wake cycles and fatigue-induced performance failures to try to reduce fatigue-related accidents. The FRA response letter further stated " the FRA supports efforts to address the fatigue experienced by railroad operating employees, and acknowledges that the existing hours-of-service is not designed to address the causes of fatigue." The FRA has subsequently sought legislative authority to enact hours-of- service regulations.

The Board strongly believes that the FRA needs authority to regulate crewmember work scheduling practices and work limits, and the Safety Board supports statutory change that would provide the FRA that authority.

Proposals being considered for rail safety legislation this year include elements that address certain aspects of employee fatigue: at least 10 hours of undisturbed off-duty time with no contact during the period; at least 24 consecutive hours of rest in a 7-day consecutive work period; at least 48 hours off-duty after 7 consecutive 8-hour workdays; and eliminating limbo time or requiring an additional 4 hours of undisturbed off-duty time when limbo time exceeds an hour. The Safety Board believes that a comprehensive fatigue management program is needed that considers scientifically based principles when assigning work schedules, including factors that influence acute and cumulative fatigue, the body's ability to adjust to rotating schedules, and the responsibility of employees to get sufficient and timely sleep during off-duty periods. Although some of these elements may have a positive effect on improving training crews' adequate rest, without a comprehensive program, the Safety Board does not believe that train crew fatigue will be adequately addressed. We further believe that the best means to achieve this result is through regulations promulgated by the FRA that can be modified as industry conditions evolve.

Positive Train Control

Technological solutions, such as positive train control systems, have great potential to reduce the number of serious train accidents by providing safety redundant systems to protect against human performance failures. As a consequence, positive train control has been on the Safety Board's list of Most Wanted transportation safety improvements for 17 years.

In the past 10 years, the Safety Board has investigated 52 rail accidents, including 4 transit accidents, where the installation of a positive train control system would likely have prevented the accident. These include 5 accidents in 2005: Graniteville, South Carolina; Anding, Mississippi; Shepherd, Texas; Chicago, Illinois; and Texarkana, Arkansas.

The objective of positive train control is to prevent train collisions and over-speed accidents by requiring automatic control systems to override mistakes by human operators. This issue was highlighted in 2002 when a freight train and a commuter train collided head-on in Placentia, California, a high-speed corridor where commuter and intercity passenger trains operate. As a result of the Placentia accident, the Safety Board reiterated Safety Recommendation R-01-6 to the FRA to facilitate actions necessary for development and implementation of positive train control systems that include collision avoidance, and require 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. The FRA published a final rule in the Federal Register titled "Standards for Development and Use of Processor-Based Signal and Train Control Systems," which became effective on June 6, 2005. As a result of FRA's responsiveness, Safety Recommendation R-01-6 is classified "Open—Acceptable Response."

We are pleased to note that today, several railroads are moving to develop positive train control systems. For example, in January of this year, the FRA approved a BNSF Railway project for its Electronic Train Management System (ETMS), an overlay technology that augments an existing train control method. The ETMS system includes an in-cab electronic display screen that will first warn of a problem and then automatically engage the train's braking system if the locomotive engineer fails to act appropriately. The FRA action allows BNSF to implement ETMS on 35 specific freight lines in 17 states.

The Union Pacific Railroad (UP) is working on a communication-based train control system pilot project that will enforce stop signals, dark territory authority limits, and speed restrictions. Field tests are scheduled to be conducted on two test beds and will cover about 333 miles of track. UP began installing test equipment on locomotives in September 2006.

Although we are encouraged with progress underway by some railroads, we note that positive train control systems are needed on railroad systems across the entire United States. The Safety Board believes that positive train control systems should be required.

Improperly Positioned Switches

One of the most serious hazardous materials train accidents in recent years occurred in Graniteville, South Carolina, on January 6, 2005, after a Norfolk Southern Railway Company freight train, while traveling 47 mph, encountered an improperly positioned switch that diverted the train from the main line onto an industry track, where it struck an unoccupied parked train. The track through Graniteville was non-signaled (dark) territory. Nine people died as a result of chlorine gas inhalation after a tank car was punctured during the accident.

The investigation found that the improperly lined switch had most recently been used by the crew of a local train about 8 hours before the accident. The crew had lined the switch for an industry track in order to place two cars at a local plant and then park their train. No crewmember remembered relining the switch for the main line before they boarded a taxi and returned to the terminal. The Safety Board concluded that the local train crew failed to reline the

main line switch for one or more of the following reasons: (1) the task of relining the switch was functionally isolated from other tasks the crew was performing, (2) the crewmembers were rushing to complete their work and secure their train before reaching their hours-of-service limits, (3) the crew had achieved their main objective of switching cars and were focused on the next task of securing their equipment and going off duty, and (4) the switch was not visible to the crew as they worked, leaving them without a visual reminder to reline the switch.

On September 15, 2005, a UP train entered a siding in Shepherd, Texas, at approximately 37 mph and struck a parked train, killing one crewmember. There were no wayside signals to govern the train movements or protect the train from an interruption in the continuity of the track, such as an open switch. Consequently, strict compliance with the operating rules was necessary to protect one train from another. The probable cause of this accident was the failure of a previous crew to return a main track switch to the normal position after they had secured the train on the siding and departed the area.

The Safety Board was concerned as early as 1974 about the issue of train speeds in areas not under a form of centralized traffic control. As a result of its investigation of an accident in Cotulla, Texas, involving a misaligned switch in non-signaled territory, the Board recommended that the FRA determine and assess the current risks of train accidents involving misaligned switches, collisions, broken rail, and other route obstructions on main track where automatic block signal systems do not exist, and to promulgate regulations that detail the major risks and controls assumed, set guidelines for safe operations below the maximum operating speed, and assign responsibility to the carrier for safe operations. Because the FRA's actions did not satisfy the Safety Board's intent that new regulations specify circumstances that were required when trains operated below the allowable maximum speed, Safety Recommendation R-74-26 was classified "Closed—Unacceptable Action."

Measures beyond additional operating rules, forms, or penalties are needed to ensure that accidents, such as the one in Graniteville, South Carolina, do not recur. On December 12, 2005, the Safety Board issued Safety Recommendation R-05-14 to the FRA to require that, along main lines in non-signaled territory, railroads install an automatically activated device, independent of the switch banner, that will, visually or electronically, compellingly capture the attention of employees involved with switch operations and clearly convey the status of the switch both in day and in darkness. In a letter dated June 30, 2006, the FRA acknowledged that additional actions are needed to protect the safety of trains in dark territory and that over time, positive train control will serve this function. However, it noted concern that any system that requires power at the switch location will involve significant costs simply because of the number of switches involved. The letter advises that the FRA has initiated a project to evaluate a system that it believes will be able to detect and report switch point gapping for switches on main line tracks located within dark territories as an alternate action.

The Safety Board also recommended that the FRA require railroads, in non-signaled territory and in the absence of switch position indicator lights or other automated systems that provide train crews with advance notice of switch positions, to operate those trains at speeds that will allow them to be safely stopped in advance of misaligned switches (R-05-15). In its June 30, 2006, letter, the FRA states that it does not believe the recommendation is feasible for

operational and economic reasons and may also increase the risk of derailments. The FRA hastened to add that there are undoubtedly certain situations where requiring trains to approach switches prepared to stop would be practical and an appropriate safety response and that railroads should consider this option as they conduct risk assessments of their hazardous materials routes. However, the FRA states that it is not aware of any means to describe how this strategy could be applied in a safe and cost-effective manner. The FRA requested that the Safety Board classify the safety recommendation as "Closed—Reconsidered."

Finally, the Safety Board believes that modeling accident forces and applying fracture toughness standards, as recommended in the Minot, North Dakota, accident report, will improve the crashworthiness of tank cars transporting hazardous materials. However, because of the time that it will take to design and construct improved tank cars, the Board believes that the most expedient and effective means to reduce the public risk from the release of highly poisonous gases in train accidents is for railroads to implement operational measures that will minimize the vulnerability of tank cars transporting these products. For example, in Graniteville, the chlorine tank car that was punctured was in the ninth position of 42 freight cars in the train; the front 16 freight cars derailed. In Macdona, the punctured chlorine tank car was in the 16th position of 74 freight cars in the train; the front 19 cars in this train derailed. Following the Graniteville accident, the Board recommended that the FRA require railroads to implement operating measures, such as positioning tank cars toward the rear of trains and reducing speeds through populated areas to minimize impact forces from accidents and reduce the vulnerability of tank cars transporting chlorine, anhydrous ammonia, and other liquefied gases designated as poisonous by inhalation (R-05-16). In its response of October 24, 2006, the FRA stated that it believes that placing toxic inhalation hazard cars at the rear of a train would do little to protect them from damage and that slowing trains could have a negative impact on operations. However it would continue to examine the issue.

Rail Passenger Disaster Family Assistance

A proposal for Rail Passenger Disaster Family Assistance mirrors the Aviation Disaster Family Assistance Act of 1996, which makes the Board responsible for coordinating assistance to families after major aviation accidents. The Aviation Disaster Family Assistance Act has been tremendously successful, the "gold standard" in family assistance. This has been because of the Board's commitment to assisting victims and their family members, the significant cooperation and support of the aviation industry, and support of all of our federal partners and the non-profit community. We believe this proposed legislation would be beneficial to victims and their families, providing the needed coordination and support following a rail disaster.

However, the Board has two concerns regarding this proposed legislation. The first is clarification of the Board's responsibilities to victims in accidents where the Board is not launching an investigative team. If we are required to provide information about the accident investigation we have to be in a position to have timely access to that information. Second, this legislation would present a significant demand for additional resources. This would include staff to assist rail carriers in their preparedness efforts and to handle the accident launch responsibilities. Currently the Office of Transportation Disaster Assistance has a staff of four. A major aviation accident is challenging for such a small team. With the addition of rail

responsibilities and the possibility of a rail accident and aviation accident occurring simultaneously, it would be necessary to have additional staff handle all of the demands.

Finally, the Safety Board also recognizes that proposed rail safety legislation addresses several safety issues previously addressed in safety recommendations issued by the Board. These issues include requirements for toll-free numbers at grade crossings so that malfunctions of signals, crossing gates, or disabled vehicles can be reported; to require ultrasonic or other appropriate inspection of rail used to replace removed defective rail; to develop and implement regulations for all classes of track for concrete ties; and to provide emergency breathing apparatus for all crewmembers on freight trains carrying hazardous materials that would pose an inhalation hazard in the event of an unintentional release.

Madame Chairwoman, that completes my statement, and I will be happy to respond to questions at the appropriate time.