U.S. House of Representatives
Committee on Transportation and Infrastructure
Washington, DC 20515

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May 4, 2007

SUMMARY OF SUBJECT MATTER

TO: Members of the Subcommittee on Railroad, Pipelines, and Hazardous Materials

FROM: Subcommittee on Railroads, Pipelines, and Hazardous Materials Staff

SUBJECT: Hearing on Rail Safety Legislation

PURPOSE OF HEARING

The Subcommittee on Railroads, Pipelines, and Hazardous Materials is scheduled to meet on Tuesday, May 8, 2007, at 2:00 p.m. to receive testimony on pending rail safety legislation.

BACKGROUND

The Federal Railroad Administration (FRA) administers the Federal rail safety program, which was last reauthorized in 1994; that authorization expired in 1998. Since the FRA was last reauthorized, the Subcommittee has held 22 hearings on rail safety.

On September 14, 1995, Subcommittee on Railroads held a hearing on the proposed expansion and renewal of rail safety user fees. On March 5 and 6, 1996, the Subcommittee held a hearing on rail safety oversight, focusing on human factors and grade crossing issues. On March 12, 1996, the Subcommittee held a hearing on equipment and FRA regulatory procedures. On March 27, 1996, the Subcommittee held a joint hearing with the Subcommittee on Technology of the Committee on Science on train control devices. On March 26, 1998, the Subcommittee held a hearing on reauthorization of the FRA, focusing on resource requirements, personnel, and budget issues. On April 1, 1998, the Subcommittee held a hearing on safety hardware issues. On April 29, 1998, the Subcommittee held a hearing on human factors issues. On May 20, 1998, the Subcommittee held a hearing on the FRA regulatory process. On July 18, 2000, the Subcommittee held a hearing on implementation of the FRA's grade crossing whistle ban law. On March 29, 2001, the Subcommittee held a hearing on railroad track safety issues. On June 6, 2002, the Subcommittee held a hearing on recent derailments and railroad safety. On June 10, 2003, the Subcommittee held a hearing on new technologies in railroad safety. On April 28, 2005, the Subcommittee held a hearing on new technologies in railroad safety and security. On July 21, 2005, the Subcommittee

held a hearing on railroad grade crossing safety issues. On June 13, 2006, the Subcommittee held a hearing on current issues in rail transportation of hazardous materials. On June 27, 2006, the Subcommittee held a hearing on current FRA safety initiatives. On July 25, 2006, the Subcommittee held a hearing on human factors issues in rail safety. On January 30 and 31, 2007, the Subcommittee held a hearing on reauthorization of the Federal rail safety program. On February 13, 2007, the Subcommittee held a hearing on fatigue. On March 16, 2007, the Subcommittee held a field hearing on the role of human factors in rail accidents.

PENDING LEGISLATION

On May 1, 2007, Chairman Oberstar and Chairwoman Brown introduced H.R. 2095, the Federal Railroad Safety Improvement Act of 2007. Congressmen Mica and Shuster have circulated a separate proposal for comment, entitled the Federal Railroad Safety Accountability and Improvement Act. On February 12, 2007, the Secretary of Transportation transmitted to Congress the Administration's FRA reauthorization proposal, entitled the Federal Railroad Safety Accountability and Improvement Act.

OVERVIEW OF RAIL SAFETY

In 2006, there were a total of 13,046 accidents and incidents involving railroads. This total is divided into three components: train accidents, including collisions and derailments; grade crossing accidents; and other incidents, which is defined as any event that caused a death, an injury, or an occupational illness to a railroad employee. Many fatalities in this category are to trespassers.

Since the FRA was last reauthorized, the total number of train accidents, including collisions and derailments, increased from 2,504 in 1994 to 3,325 in 2005. In 2006, the number of train accidents decreased to 2,835.

According to the FRA, the two leading causes of all train accidents are human factors and track defects. In 2006, 1,017 accidents were caused by human factors and 1,032 accidents were caused by track defects. It was the first time that track defects surpassed human factors as the top cause of all train accidents since 2001.

HUMAN FACTORS

Human factors are responsible for nearly 40 percent of all train accidents, and the FRA reports that fatigue plays a role in approximately one out of four of those accidents. The National Transportation Safety Board's (NTSB) in-depth investigations of accidents have also demonstrated that fatigue is a major factor in transportation accidents. In fact, fatigue has been on the NTSB's Most Wanted list of safety improvements since its inception in 1990. In the late 1980s, following a series of fatigue-related accidents, the NTSB issued three recommendations to the U.S. Department of Transportation (DOT) addressing needed research, education, and revisions to hours-of-service regulations. Between 1989 and 1999, the NTSB issued more than 70 additional recommendations to the DOT, States, industry, and industry associations to reduce the incidence of fatigue-related accidents.

In 1999, the NTSB published a report evaluating the efforts of the DOT to address operator fatigue. According to the NTSB, in response to the three recommendations issued in 1989, the DOT and the modal administrations "acted and responded positively to those addressing research and education; little action, however, has occurred with respect to revising the hours-of-service regulations."

Hours-of-service regulations specify the length of on-duty and off-duty time for operators in transportation. The current hours-of-service regulations vary from mode to mode, and according to the NTSB, "the current railroad hours-of-service laws permit, and many railroad carriers require, the most burdensome fatigue-inducing work schedule of any federally-regulated transportation mode in this country."

According to the NTSB, a commercial airline pilot can work up to 100 hours per month; shipboard personnel, at sea, can work up to 240 hours per month; and a truck driver can be on-duty up to 260 hours per month. Meanwhile, train crews can operate a train up to 432 hours per month. That equates to more than 14 hours a day for each of those 30 days.

The NTSB has recommended on numerous occasions that the FRA establish within two years scientifically based hours-of-service regulations that set limits on hours-of-service, provide predictable work and rest schedules, and consider circadian rhythms and human sleep and rest requirements. However, the FRA is the only modal administration within the DOT whose hours-of-service standards are mandated by Congressional statute and, therefore, may not be adjusted or modified by administrative procedures.

The Hours of Service Act was first enacted in 1907; it was substantially amended in 1969, and amended again in 1976 and 1988. The Act governs maximum time on-duty for all persons engaged in or connected with a movement of a train, including locomotive engineers, conductors, signalmen, and dispatchers. Maintenance-of-way workers (who maintain and repair tracks and other structures), Carmen (who repair and inspect railroad cars), other shop crafts, and contractors who perform signal duties are not covered by the Act and thus have no limits on hours-of-service.

Under current law, train operating crews and railroad signalmen can work 12 consecutive hours with 10 hours of rest. However, if they work less than 12 hours by even one minute, then they are only required to get eight hours of rest. This means that an individual can begin a shift on Monday at 8:00 a.m. and be called for a shift on Tuesday at 4:00 a.m., and a shift on Wednesday at midnight. According to the FRA, this kind of "backward-rotating shift" may continue for weeks, and can wreak havoc on an employee's circadian rhythm, the biological cycle that governs sleeping patterns.

Train dispatchers are under a different hours-of-service regime. Under current law, dispatchers can work a total of nine hours in a 24-hour period in a tower, office, or station that has two or more shifts in a 24-hour period, or a total of 12 hours in a 24-hour period where employed in a one-shift office.

There are two exceptions to these work periods. During emergencies, all of these employees may be required to work up to an additional four hours, for a total of 16 hours of train operating crews and railroad signalmen, and a total of 13 to 16 hours for train dispatchers (limited to three days per week for dispatchers). In addition, signalmen may be called for one or more "trouble calls"

to deal with wayside signal problems or malfunctioning warning devices at grade crossings. Trouble calls can add up to four hours on top of the 12-hour on-duty limit.

Then there is "limbo time," a term used to describe the period of time when a train operating crew's hours-of-service has expired, but the crew has not yet arrived at their point of final release; meaning, the off-duty location or terminal point where they can go home or obtain food and lodging at an away from home terminal. Limbo time also accrues for train operating crews whose trains are stopped on a line of track, frequently due to the expiration of their 12-hour on-duty time limit, before they reach their destination terminal (point of final release). Limbo time accrues for the time the train is stopped until the crew arrives at the final release point, and includes time spent in transportation to their final release point, as well as time spent waiting for transportation to pick them up from their train.

During limbo-time, crewmembers are required to stay awake, alert, and able to respond to any situation and follow the railroad's operating rules. Although time spent in limbo is classified under current law as neither on-duty nor off-duty time, it may be paid time for the crew, and any required minimum rest period does not begin until the limbo period ends, limbo time can and has kept railroad operating crews effectively on-duty for well over 12 hours and, in the case of the Union Pacific engineer involved in the 2004 Macdona, Texas accident, 22 hours (12 hours on-duty and 10 hours of limbo time).

When it comes to time available for rest, train crewmembers are generally called for service approximately two to three hours before their report for duty time. So, if a train crewmember is called to return to duty at the completion of his or her statutory off-duty period, then the duration of uninterrupted off-duty time available for sleep could be as little as five or six hours. However, since the required eight or ten hours of off-duty time includes commuting, leisure, and personal time, the duration of any period available for sleep could be less than that.

THE MACDONA ACCIDENT

On June 28, 2004, a westbound Union Pacific (UP) freight train traveling on the same main line track as an eastbound BNSF freight train struck the midpoint of the 123-car BNSF train as it was leaving the main line to enter a parallel siding. The accident occurred at the west end of the rail siding at Macdona, Texas, on the UP's San Antonio Service Unit. The collision derailed the four locomotive units and the first 19 cars of the UP train as well as 17 cars of the BNSF train. As a result of the derailment, the 16th car of the UP train, a pressure tank car loaded with liquefied chlorine, was ruptured. Chlorine escaping from the punctured car immediately vaporized into a cloud of chlorine gas that engulfed the accident area to a radius of at least 700 feet. Three persons, including the conductor of the UP train and two local residents, died as a result of chlorine gas inhalation. The UP train engineer, 23 civilians, and six emergency responders were treated for respiratory distress and other injuries. Damages to the rolling stock, track, and signal equipment were estimated at $5.7 million, with environmental cleanup costs estimated at $150,000.

The NTSB determined that the probable cause of the collision was UP train crew fatigue that resulted in the failure of the engineer and conductor to appropriately respond to wayside signals governing the movement of their train. An NTSB review of the UP engineer's work schedule revealed that his time on-duty in the days leading up to the accident ranged from nine hours to more

than 18 hours. Eleven of his work days were longer than 14 hours, with one day totaling 16 hours and eight minutes on-duty, another day totaling 18 hours and 34 minutes on-duty, and another day totaling 22 hours on-duty (12 hours on-duty and 10 hours of limbo time).

Contributing to the crewmembers' fatigue was their failure to obtain sufficient restorative rest prior to reporting for duty because of their ineffective use of off-duty time and UP's train crew scheduling practices, which inverted the crewmembers' work/rest periods. A review of the UP conductor's work schedule showed that in the 10 days prior to the accident he had four days off followed by six consecutive work days leading up to the day of the accident. His duty times for the six work days would have allowed him to continue the nighttime sleep pattern that he had adhered to during the preceding four days off, but the conductor's call for the accident trip shortly after midnight inverted the work/sleep cycle he had developed over the previous 10 days. According to the NTSB, "such a disruption would be expected to produce severe effects for sleepiness and performance."

The NTSB concluded, "The minimum rest periods prescribed by Federal regulations do not take into account either rotating work schedules or the accumulated hours spent working and in limbo time, both of which can affect the ability of an employee to obtain full rest and recuperation between job assignments." The NTSB recommended, among other things, that the FRA require railroads to use scientifically based principles when assigning work schedules for train crewmembers, which consider factors that impact sleep needs, to reduce the effects of fatigue and establish requirements that limit train crewmember limbo time to address fatigue.

The NTSB also stated that it "remains concerned about the safety of railroad operations where backup systems are not available to intervene when, as in this accident, a train crew operates a train improperly or fails to comply with wayside signals. Board accident investigations over the past three decades have shown that the most effective way to prevent train-to-train collisions is through the use of a positive train control (PTC) system that will automatically assume some control of a train when the train crew does not comply with signal indications."

Over the years, the NTSB has issued a series of recommendations on PTC. In fact, PTC has remained on the Board's Most Wanted Transportation Safety Improvements list since 1990. The NTSB concluded that the Macdona, Texas, accident is "another in a long series of railroad accidents that could have been prevented had there been a PTC system in place at the accident location."

TRACK SAFETY

In 2006, defective track was the leading cause of all train accidents. Prior to that, it was either the leading or second leading cause of all train accidents. A series of recent high-profile accidents have called into question the adequacy of track safety regulations, the railroads' track inspection and maintenance programs, and the FRA's oversight of those programs.

- On March 12, 2007, a CSX train derailed in Oneida, New York. The cause was defective track. It was one of a series of accidents in Upstate New York, and the FRA launched a rail inspection project to check 1,300 miles of CSX track across New York State for flaws that might lead to a train derailment. On April 18, the FRA announced that it had found 78

track defects and one serious violation during the audit. FRA's ongoing review of rail safety in New York has now been expanded to other railroads.

- On April 3, 2005, a westbound Amtrak train derailed on BNSF's tracks in Home Valley, Washington. Thirty passengers sustained minor injuries; 14 of those people were taken to local hospitals. Track and equipment damages, in addition to clearing costs associated with the accident, totaled about $854,000. The NTSB determined that the cause of the accident was BNSF's inadequate response to multiple reports of rough track conditions that were subsequently attributed to excessive concrete crosstie abrasion, which allowed the outer rail to rotate outward and create a wide gage track condition. Contributing to the accident was the FRA's failure to provide adequate track safety standards for concrete crossties.

- On April 6, 2004, an Amtrak train derailed on Canadian National-owned and maintained track near Flora, Mississippi. The entire train derailed, including one locomotive, one baggage car, and eight passenger cars. The derailment resulted in one fatality, three serious injuries, and 43 minor injuries. The equipment costs associated with the accident totaled about $7 million. In its Railroad Accident Report, the NTSB determined that the probable cause of the accident was "the failure of the Canadian National Railway Company to properly maintain and inspect its track, resulting in rail shift and the subsequent derailment of the train, and the Federal Railroad Administration's ineffective oversight to ensure proper maintenance of the track by the railroad."

- On October 16, 2004, a Union Pacific (UP) freight train derailed three locomotives and 11 cars near Pico Rivera, California. Small amounts of hazardous materials were released from the transported cargo. There were no injuries to area residents, the train crew, or the emergency response personnel. UP estimated the monetary damage at $2.7 million. In its Railroad Accident Brief, the NTSB determined "that the probable cause of the derailment was the failure of a pair of insulated joint bars due to fatigue cracking. Contributing to the accident was the lack of an adequate on-the-ground inspection program for identifying cracks in rail joint bars before they grow to critical size."

- On January 18, 2002, a Canadian Pacific freight train derailed 31 of its 112 cars near Minot, North Dakota. Five tank cars carrying anhydrous ammonia, a liquefied compressed gas, catastrophically ruptured, and a vapor plume covered the derailment site and surrounding area. About 11,600 people that occupied the area were affected by the vapor plume. One resident was fatally injured, and 60 to 65 residents of the neighborhood nearest the derailment site were rescued. As a result of the accident, 11 people sustained serious injuries, and 322 people, including the two train crew members, sustained major injuries. Damages exceeded $2 million, and more than $8 million has been spent in environmental remediation.

  In its Railroad Accident Report, the NTSB determined that the probable cause of the derailment was "an ineffective Canadian Pacific Railway inspection and maintenance program that did not identify and replace cracked joint bars before they completely fractured and led to the breaking of the rail at the joint." The NTSB also found that the FRA's requirements regarding rail joint bars in CWR were ineffective and that the FRA's oversight of Canadian Pacific's CWR program was ineffective, because the FRA neither reviewed the

CWR program nor ensured that its track inspectors had copies of the CWR programs to determine if the railroad was in compliance with it.

- On March 17, 2001, a westbound Amtrak train traveling on BNSF tracks derailed near Nodaway, Iowa. As a result of the derailment, 78 people were injured, including one fatal injury. The NTSB determined that the probable cause of the derailment of the Amtrak train was the failure of the rail beneath the train, due to undetected internal defects. BNSF had failed to inspect the rail that it used to replace a defective rail. The replacement rail was also defective. According to the NTSB, contributing to the accident was the BNSF's lack of a comprehensive method for ensuring that replacement rail is free from internal defects.

GRADE CROSSING SAFETY

There are 243,016 grade crossings in the United States, of which 149,628 or 62 percent are public crossings. Of these public crossings, 63,387 or 42 percent have automatic warning devices.

Since the FRA was reauthorized in 1994, significant progress has been made in reducing collisions and fatalities at grade crossings. From 1994 to 2006, total train miles traveled in the United States increased from 655 million miles to 810 million miles, and the total miles traveled by motor vehicle increased from 2.3 trillion miles to 2.9 trillion miles. During the same period, collisions at the nation's grade crossings have decreased from 4,979 in 1994 to 2,908 in 2006. Fatalities have also decreased from 615 in 1994 to 366 in 2006, and injuries have decreased from 1,961 to 1,006 during the same period.

The Department of Transportation's (DOT) Inspector General reports that this significant decrease was attributable to the Department addressing much of the "low-hanging fruit," that is, working with the states and railroads to close grade crossings, install automatic gates and flashing lights at public crossings with a high probability for collisions, and educate the public about crossing safety. The Department also made progress in implementing safety initiatives included in its 1994 Grade Crossing Safety Action Plan.

A look at more recent statistics, however, show that the sharp decline in grade crossing statistics has leveled-off. From 2002 to 2005, collisions, fatalities, and injuries have both increased and decreased, but on average have remained around 3,000 collisions in recent years. The number of fatalities has remained around 350, and the number of injuries has remained around 1,030. This "leveling-off" combined with the upward trend in train and highway traffic show that more needs to be done to improve grade crossing safety.

Of course, the adequacy of the FRA's grade crossing safety program is dependent on information it receives from the railroads. In July 2004, a series of *New York Times* articles alleged problems with railroad accident reporting, investigations at grade crossings, and several other safety issues. Chairman Oberstar, Chairwoman Brown, and former Senator Ernest Hollings sent a letter to the DOT Inspector General requesting an audit of the FRA's activities to oversee safety on the nation's highway-rail grade crossings.

The Inspector General found that railroads failed to report 21 percent of reportable crossing collisions to the National Response Center (NRC). Railroads are required to report crossing

collisions involving fatalities and/or multiple injuries to passengers or train crew members, and fatalities to motorists or pedestrians involved in grade crossing collisions to the NRC. Reports are to be made within two hours after the accidents, according to FRA and NTSB regulations. Immediate reporting allows the Federal Government to decide whether or not to conduct an investigation shortly after a crossing collision has occurred. The DOT Inspector General's analysis showed that 115, or 21 percent, of 543 reportable grade crossing collisions that occurred between May 1, 2003 and December 31, 2004 were not reported to the NRC. Although the 115 unreported crossing collisions, which resulted in 116 fatalities, were reported to the FRA within 30 to 60 days after the collision, as required, that was too late to allow Federal authorities to promptly decide whether or not to conduct an investigation. In July 2004, the FRA began reconciling its database with the NRC to identify unreported accidents, and in March 2005 began issuing findings of violations to railroads failing to follow reporting requirements.

The Inspector General also found that the Federal Government investigated only a small number of grade crossing collisions and needs to collect and analyze independent information on all crossing collisions. From 2000 through 2004, FRA investigated 47 of 376, or 13 percent, of the most serious crossing collisions that occurred — those resulting in three or more fatalities and/or severe injuries. No Federal investigations were conducted for the remaining 329 crossing collisions. Those collisions resulted in 159 fatalities and 1,024 injuries. FRA officials stated that the National Transportation Safety Board (NTSB) is the lead Federal agency responsible for investigating railroad accidents, not FRA. However, the NTSB tends to investigate only high-profile grade crossing collisions. For example, from 2000 though 2004, the NTSB conducted seven grade crossing collision investigations. Consequently, the Federal Government did not independently investigate most crossing collisions, but rather received information concerning the causes of collisions almost exclusively from the railroads.

The railroads' grade crossing accident reports attributed over 90 percent of the collisions that occurred from 2000 through 2004 to motorists, but FRA did not conduct its own investigations to verify the causes. Independently collecting and analyzing information about grade crossing collisions would substantially improve the FRA's ability to determine the causes of grade crossing collisions and better target collisions that should be investigated further. The collection and analysis of this information is especially important given the limited resources of the FRA's inspection staff. Nationwide, 55 of 421 FRA inspectors are assigned to inspect the 63,387 warning signal systems at grade crossings.

The low-level of FRA inspectors combined with the extensiveness of the U.S. railroad system limits the FRA's ability to investigate each accident or incident and inspect each railroad and mile of track. In 2004, the Federal Aviation Administration (FAA) conducted on-site investigations of 1,392, or 93 percent, of the 1,484 general aviation accidents that the FAA had responsibility for investigating in 2004. Unlike the FRA, however, the FAA has an Office of Accident Investigations staffed with 8 full-time investigators whose mission is to detect unsafe conditions and trends and to coordinate the process for corrective actions. In addition, the FAA uses personnel from other disciplines to conduct investigations, including 2,989 inspectors from its Office of Aviation Safety.

The Inspector General also found that the FRA investigated few accidents (it investigates two-tenths of one percent of all railroad operations, according to the Government Accountability Office) and recommended few findings of violations for critical safety defects identified through inspections. From 2002 through 2004, for example, FRA inspectors identified 7,490 critical safety

defects out of 69,405 total safety defects related to automated grade crossing warning signals. Yet, FRA recommended only 347 critical defects, or about 5 percent, for findings of violations that carry a fine. According to the Inspector General, the FRA's policy of inspectors using their discretion in deciding whether to recommend a violation has resulted in a small number of critical defects recommended for violations. Furthermore, after violations are determined, Federal law allows the FRA to negotiate-down the amount of civil penalties proposed, resulting in the collection of lower penalties, despite the many critical safety defects found. According to the Inspector General, on average, the FRA settles fines with the railroad at about 60 cents on the dollar.

Since the release of the Inspector General report, the FRA has taken a number of actions to improve railroad reporting, investigate the information that is reported, and issue higher penalties for grade crossing violations. The Inspector General has tracked the FRA's progress in this area, and is expected to testify on any further developments in this area. The Inspector General is also expected to discuss a second grade crossing audit, which is scheduled to be released prior to the hearing.

WITNESSES

The Honorable Joseph Boardman
Administrator
Federal Railroad Administration

The Honorable Mark Rosenker
Chairman
National Transportation Safety Board

Mr. Kurt W. Hyde
Assistant Inspector General for Surface and Maritime Programs
Office of Inspector General
U.S. Department of Transportation

Mr. Edward Wytkind
President
Transportation Trades Department, AFL-CIO

Mr. John Tolman
Vice President and National Legislative Representative
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Mr. James Brunkenhoefer
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Mr. Dan Pickett
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Mr. Edward Hamberger
President and Chief Executive Officer
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Managing Director, Federal Affairs
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