Written Statement of
Grady C. Cothen, Jr.,
Deputy Associate Administrator
for Safety Standards and Program Development,
Federal Railroad Administration,
U.S. Department of Transportation
before
the Subcommittee on Railroads, Pipelines, and Hazardous Materials,
Committee on Transportation and Infrastructure,
U.S. House of Representatives

March 16, 2007

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Subcommittee Chairwoman Brown, Ranking Committee Member Shuster, Representative Gonzales, and other Members of the Committee, I am very pleased to be here in San Antonio today, on behalf of the Secretary of Transportation and the Administrator of the Federal Railroad Administration (FRA), to discuss the specific topic of this hearing, the "Role of Human Factors in Rail Accidents," as well as other issues that relate to some recent, fatal rail accidents in the San Antonio region and to highway-rail grade crossing accidents in the State. To start, I will briefly describe FRA's railroad safety program in general. Then, I will revisit subjects that FRA's Administrator Joe Boardman addressed, at least in part, in his testimony earlier this year before this Subcommittee: first, the status of implementation of the aspects of FRA's National Rail Safety Action Plan that relate to human factors and certain accidents in the State; and, second, the need for enactment of provisions in FRA's new rail safety bill that address the same issues. Finally, I will close with a focus on what is being done to remedy human-factor problems particularly in the San Antonio region.

I. FRA's Railroad Safety Program

FRA is the agency of the U.S. Department of Transportation (DOT) charged with carrying out the Federal railroad safety laws. These laws provide FRA, as the Secretary's delegate, with very broad authority over every area of railroad safety. In exercising that authority, the agency has issued and enforces a wide range of safety regulations covering a railroad network that employs more than 232,000 workers, moves more than 42 percent of all intercity freight, and provides passenger rail service to more than 500 million persons each year.

FRA's regulations address such topics as track, passenger equipment, locomotives, freight cars, power brakes, locomotive event recorders, signal and train control systems, maintenance of active warning devices at highway-rail grade crossings, accident reporting, alcohol and drug testing, protection of roadway workers, operating

rules and practices, locomotive engineer certification, positive train control, and use of train horns at grade crossings. FRA currently has active rulemaking projects on a number of important safety topics, many of which will be described later in this testimony. FRA also enforces the Hazardous Materials Regulations, promulgated by DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA), as they pertain to rail transportation.

FRA has an authorized inspection staff of about 400 persons nationwide, distributed across its eight regions. In addition, about 160 inspectors employed by the approximately 30 States that participate in FRA's State participation program also perform inspections for compliance with the Federal rail safety laws. Each inspector is an expert in one of five safety disciplines: Track; Signal and Train Control; Motive Power and Equipment; Operating Practices; or Hazardous Materials. FRA also has 18 full-time highway-rail grade crossing safety positions in the field. Every year FRA's inspectors conduct thousands of inspections, investigate more than 100 railroad accidents, investigate hundreds of complaints of specific alleged violations, develop recommendations for thousands of enforcement actions, and engage in a range of educational outreach activities on railroad safety issues, including educating the public about highway-rail grade crossing safety and the dangers of trespassing on railroad property.

FRA closely monitors the railroad industry's safety performance, and the agency uses the extensive data gathered to guide its accident prevention efforts. FRA strives to continually make better use of the wealth of available data to achieve the agency's strategic goals. FRA also sponsors collaborative research with the railroad industry to introduce innovative technologies to improve railroad safety. Finally, under the leadership of the U.S. Department of Homeland Security (DHS), FRA actively plays a supportive role in Federal efforts to secure the Nation's railroad transportation system.

II. The National Rail Safety Action Plan (Action Plan)

A. Genesis and Overview of the Action Plan

As detailed in the appendix to my testimony, the railroad industry's overall safety record has improved during recent decades, and most safety trends are moving in the right direction. However, significant train accidents continue to occur, and the train accident rate has not shown substantive improvement in recent years. Moreover, several major freight and passenger train accidents in 2004 and 2005 (such as those at Macdona, Texas;[1] Graniteville, South Carolina; and Glendale, California) raised specific concerns about railroad safety issues deserving government and industry attention.

[1] The National Transportation Safety Board determined that the probable cause of the Macdona collision was--

In May 2005, DOT and FRA announced the National Rail Safety Action Plan, a blueprint to comprehensively address critical safety issues facing the railroad industry with the following strategy:

- Target the most frequent, highest-risk causes of train accidents;
- Focus FRA's oversight and inspection resources on areas of greatest concern; and
- Accelerate research efforts that have the potential to mitigate the largest risks.

The causes of train accidents are generally grouped into five categories: human factors; track and structures; equipment; signal and train control; and miscellaneous. In the five years from 2001 through 2005, the great majority of train accidents resulted from human factor causes or track causes. Accordingly, human factors and track are the major target areas for improving the train accident rate. The Action Plan includes initiatives intended to--

- Reduce train accidents caused by human factors;
- Address fatigue;
- Improve track safety;
- Enhance hazardous materials safety and emergency preparedness;
- Strengthen FRA's safety compliance program; and
- Improve highway-rail grade crossing safety.

Today, given the purpose of the hearing, I will focus on only four of the Action Plan initiatives: reducing human factor accidents; addressing fatigue (which is, of course, a human factor); enhancing hazardous materials safety and emergency preparedness; and improving highway-rail grade crossing safety.

B. Implementation of Action Plan Initiatives to Reduce Human Factor Accidents, Address Fatigue, Enhance Hazardous Materials Safety and Emergency Preparedness, and Improve Highway-Rail Grade Crossing Safety

1. Reducing Train Accidents Caused by Human Factors

Union Pacific Railroad 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. 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 Union Pacific Railroad train crew scheduling practices, which inverted the crewmembers' work/rest periods. Contributing to the accident was the lack of a positive train control system in the accident location. Contributing to the severity of the accident was the puncture of a tank car and the subsequent release of poisonous liquefied chlorine gas.

NTSB No. RAR-06/03; NTIS No. PB2006-916303, Executive Summary.

Accidents caused by human factors constitute the largest category of train accidents, accounting for 37 percent of all train accidents in the five years from 2001 through 2005. As you will remember, FRA last testified on the full range of human factors before this Subcommittee in July 2006 and provided an update in January on the human factor initiatives pursuant to the Action Plan. Today, I will provide a further update on the Action Plan human factor initiatives.

a. Development of Rulemaking to Address Leading Causes of Human Factor Accidents

Some human factors are addressed squarely by FRA regulations. For example, FRA's regulations on alcohol and drug use by operating employees were the first such standards in American industry to incorporate chemical testing, and they have been very successful in reducing accidents resulting from the use of illicit substances. FRA also has regulations on locomotive engineer certification, and enforces the Federal hours of service restrictions, which are wholly governed by statute. However, FRA has been concerned that several of the leading causes of human factor accidents are not presently covered by any specific Federal rule, and these causes can have serious consequences.

In May 2005, FRA asked its Railroad Safety Advisory Committee (RSAC) to develop recommendations for a new human factors rule to address the leading causes of human factor accidents. This effort helped lead to FRA's issuance of a notice of proposed rulemaking (NPRM) in October 2006, to Federalize core railroad operating rules governing the handling of track switches, leaving cars in the clear, and shoving rail cars. *See* 71 FR 60371. Overall, the rule proposes to establish greater accountability on the part of railroad management for the administration of railroad programs of operational tests and inspections, and greater accountability on the part of railroad supervisors and employees for compliance with those operating rules that are responsible for approximately half of the train accidents related to human factors. FRA believes this will contribute positively to railroad safety, by emphasizing the importance of compliance with fundamental operating rules and providing FRA a more direct means of promoting compliance. The final rule is expected to be issued later this year.

The final rule is intended to supersede Emergency Order No. 24, which FRA issued in October 2005, in response to an increasing number of train accidents caused by hand-operated, main track switches in non-signaled territory being left in the wrong position and the potential for catastrophic accidents, such as the one in Graniteville, South Carolina, in January 2005, which resulted in nine deaths. The emergency order requires special handling of hand-operated main track switches in non-signaled territory, as well as instruction and testing of employees in railroad operating rules pertaining to such track switches, and is expected to remain in place until the final rule addressing the major causes of human factor accidents is promulgated and becomes effective.

b. *Launch of "Close Call" Pilot Research Project*

"Close calls" are unsafe events that do not result in a reportable accident but could have done so. FRA is working to better understand these phenomena. In March 2005, FRA completed an overarching Memorandum of Understanding (MOU) with railroad labor organizations and management to develop pilot programs to document the occurrence of close calls. In other industries, such as aviation, adoption of close-call reporting systems that shield the reporting employee from discipline (and the employer from punitive regulatory sanctions) has contributed to major reductions in accidents. In August 2005, FRA and DOT's Bureau of Transportation Statistics (BTS) entered into an MOU stipulating that BTS will act as a neutral party to receive the close-call reports and maintain the confidentiality of the person making the report. Four railroads have expressed interest in taking part in this project, and participating railroads will be expected to develop corrective actions to address the problems that may be revealed. Union Pacific Railroad Company (UP) has signed an Implementing MOU for its North Platte Service Unit to be the first site for this project. Data collection at UP began on February 1, 2007, and more than 40 reports have been received as of last week. Discussions are also underway with BNSF Railway Company (BNSF) and Canadian Pacific Railway for second and third sites for this project.

c. Development and Implementation of Promising Technologies to Improve Safety through Redundant Safety Systems

Technology can be a tremendous aid to safety, providing a safety net when human beings make a mistake or become incapacitated.

o Positive Train Control (PTC) Systems. PTC systems are capable of automatically preventing train collisions (with positive stop protection), preventing overspeed derailments, and protecting roadway workers within their authorities. Recognizing the safety benefits of PTC systems, as well as their potential to improve rail efficiency by safely increasing the capacity of high-density rail lines, FRA issued a final rule in 2005 entitled, "Performance Standards for Processor-Based Signal and Train Control Systems." *See* 49 CFR part 236. Earlier, FRA worked with Amtrak and other stakeholders to assist in the development of PTC systems in support of high-speed passenger rail. The results included the Advanced Civil Speed Enforcement System, which, combined with cab signals and automatic train control, safeguard operations up to 150 mph on the Northeast Corridor. In addition, the Incremental Train Control System was deployed on Amtrak's Michigan line and currently supports operations up to 95 mph (planned for 110 mph when validation and verification work is complete on the final system).

  * In January 2007, FRA approved operational use of the first PTC system intended for general use, BNSF's Electronic Train Management System.

The rail industry is actively advancing the implementation of PTC technology as other railroads—among them, UP, Norfolk Southern Railway Company, CSX Transportation, Inc. (CSX), and the Alaska Railroad—are all making significant strides to develop PTC systems. The Association of American Railroads (AAR) will play a critical role in finalizing interoperability requirements for these technologies.

o Switch Point Monitoring System and Other Systems. There are steps that can be taken short of PTC to reduce risk in non-signalized territory while PTC systems are deployed. In November 2005, FRA partnered with BNSF through a $1 million Switch Point Monitoring System pilot project. The main objective of the project is to develop a low-cost system that electronically monitors for, and reports, a misaligned switch on main line track located in dark (non-signaled) territory. The project involves the installation of wireless communication devices at 49 switches along a 174-mile section of non-signaled BNSF track between Tulsa and Avard, Oklahoma. Train dispatchers at an operations center in Fort Worth, Texas, are monitoring the devices to detect when the hand-operated switches are set in the wrong position. If a switch is misaligned, the dispatcher directs a train to slow down or stop until railroad crews in the field confirm it is safe to proceed. Along with the human factors rulemaking, this new switch monitoring system may prevent future train accidents such as the one at Graniteville, which resulted from an improperly lined main track switch in non-signaled territory.

  * BNSF is also demonstrating rail integrity circuits, which can detect broken rails and alert the dispatcher much in the same way as the switch point monitoring technology. Both of these technologies are "forward-compatible" with PTC, meaning that they can be integrated into PTC as it is deployed on the subject territories.

o Electronically Controlled Pneumatic (ECP) Brakes. In 2005, 14 percent of human-factor accidents on main track involved improper train handling or misuse of the automatic braking system. A significant number of these events might have been avoided if locomotive engineers were given a more suitable air brake system to use as a tool. During the 1990s, the AAR led an industry effort to develop ECP brakes, which use an electronic train line to command brake applications and releases. ECP brakes apply uniformly and virtually instantaneously throughout the train, provide health-status information on the condition of brakes on each car, respond to commands for graduated releases, and entirely avoid runaway accidents caused by depletion of train-line air pressure. ECP brakes shorten stopping distances on the order of 40 to 60 percent, depending on train length and route conditions. In turn, shortened stopping distances mean that some accidents that occur today might be avoided entirely and that the severity of those that do occur in the future might be reduced. (I would hasten to add that our ongoing

safety analysis confirms that most grade crossing accidents, in particular, could not be prevented by ECP brakes, because motorist actions become manifest only seconds before the collision.)

* FRA commissioned a study released last year that identified and quantified significant business benefits that could be realized with this technology through greater operational efficiencies and suggested a migration plan that would start with unit train operations, logically focused initially on the Powder River Basin coal service. Since then, FRA has been working with the AAR, railroads, vendors, and the coal sector to generate momentum toward implementation of this cost-saving and, potentially, life-saving technology. In this regard, ECP brakes are one of the key features of FRA's Advanced Concept Train, a research-and-development prototype train specially designed and equipped with other improvements that is helping to demonstrate the potential of these new technologies across the Nation. FRA is also planning to develop a revised set of requirements for train air brakes that are more suitable for this new technology, by issuing a notice of proposed rulemaking sometime in the near future. Until a final rule is issued amending the train air brake requirements, we remain ready to review and respond to requests for relief from railroads interested in proceeding with ECP technology, and are currently reviewing such a request.

d. Safety-Related Training for Employees

Obviously, training is another important component of any human-factors effort. Just last week, FRA convened the final meeting of a joint labor-management-FRA group that has reviewed standards for training operators of remote control locomotives and has identified the need for more precise qualification standards, conditions for learning, and documentation of proficiency.

2. Addressing Fatigue

Fatigue has long been a fact of life for many railroad operating employees, given their long and often unpredictable work hours and fluctuating schedules. Train crews may legally work an enormous number of hours in a week, month, or year. While commuter train crews often have some predictability in their work schedules, crews of freight trains rarely do. The long hours, irregular work/rest cycles, and lack of regular days off, combined, have a very deleterious effect on employee alertness. Railroads are necessarily 24-hour businesses, and the effects of "circadian rhythms" challenge the alertness of even well-rested employees, particularly in the early morning hours. The hours of service law, originally enacted in 1907 and last substantially amended in 1969, sets certain maximum on-duty periods (generally 12 hours for operating employees) and minimum off-duty periods (generally 8 hours, or if the employee has worked 12

consecutive hours, a 10-hour off-duty period is required). However, the limitations in that law, although ordinarily observed, do not seem adequate to effectively control fatigue.

FRA's Administrator testified in some detail about fatigue at the Subcommittee's hearing on this subject last month. As a result, I will not take up the Subcommittee's time on this issue at today's hearing, except for covering FRA's hours of service reform legislation, later in my testimony, and mentioning sleep disorders now. The National Transportation Board has emphasized the role of sleep disorders in transportation accidents, and FRA recognizes that providing fatigue management information alone may not be sufficient. In October 2004, FRA published a safety advisory in the Federal Register, urging railroads to address sleep disorders through progressive company policies. This past September, FRA's Railroad Safety Advisory Committee adopted a task to develop recommendations on medical standards for safety-critical railroad employees. Management of sleep disorders is among the important elements of that effort, which is now well underway.

3. Improving Hazardous Materials Safety and Emergency Response Capability

The railroad industry's record on transporting hazardous material (hazmat) is very good. The industry transports nearly two million shipments of hazmat annually, ordinarily without incident. However, the Macdona accident in 2004 and the Graniteville accident in 2005, which together involved 12 deaths as the result of chlorine releases, demonstrate the potential for catastrophic consequences from train accidents. The agency is actively engaged in a variety of activities intended to reduce the likelihood that a tank car may be breached if an accident does occur, complementing our effort to reduce the likelihood of train accidents. Realizing that we cannot prevent all accidents, FRA has developed initiatives to ensure that emergency responders will be fully prepared to minimize the loss of life and damage when an accident or release does occur.

It is important to emphasize that these safety initiatives are in addition to, and complement efforts by, FRA, DHS and its Transportation Security Administration (TSA), and PHMSA to provide for the security of hazmat transported by rail. A major component of this effort has been PHMSA's March 2003 regulation requiring each shipper and carrier of significant quantities (placardable amounts) of hazmat to adopt and comply with a security plan. *See* 49 CFR § 172.800 *et seq*. Last December, in consultation with FRA and TSA, PHMSA published an NPRM to revise current requirements for the security of hazmat transported by rail, with particular focus on toxic inhalation hazard materials, such as chlorine and anhydrous ammonia. *See* 71 FR 76833. This proposal would require consideration of both safety and security in evaluating routing of hazardous materials and the mitigation of hazards on the routes selected. PHMSA and FRA held two public meetings, one on February 1, in Washington, D.C., and the second on February 9, in Dallas, Texas, to obtain oral comments on the proposed requirements, with a view to issuing a final rule. The comment period closed on

February 20, and PHMSA and FRA are in the process of reviewing all of the comments received and anticipate issuing a final rule by the end of the calendar year.

The safety and security of hazmat transported by rail are often intertwined, and I would be glad to provide the Subcommittee with additional information concerning the many security initiatives in this area.

a. Enhancements to Emergency Response Readiness

Emergency responders presently have access to a wide variety of information regarding hazmat transported by rail. Railroads and hazmat shippers are currently subject to the hazard-communication requirements of the Hazardous Materials Regulations. In addition, these industries work through the American Chemistry Council's Transcaer® (Transportation Community Awareness and Emergency Response) program to familiarize local emergency responders with railroad equipment and product characteristics. PHMSA publishes the Emergency Response Guidebook, with the intention that it may be found in virtually every fire and police vehicle in the United States.

In March 2005, with FRA encouragement, the AAR amended its Recommended Operating Practices for Transportation of Hazardous Materials (now Circular No. OT-55-I) to expressly state that local emergency responders, upon written request, will be provided with a list ranking the top 25 hazardous materials transported by rail through their communities. This is an important step to allow emergency responders to plan for, and better focus their training on, the type of rail-related hazmat incident that they could potentially encounter.

In July 2005, again with FRA encouragement, CSX and CHEMTREC (the chemical industry's 24-hour resource center for emergency responders) entered into an agreement to conduct a pilot project to see if key information about hazmat transported by rail could be more quickly and accurately provided to first responders in the crucial first minutes of an accident or incident. The project is designed so that if an actual hazmat rail accident or incident occurs, CHEMTREC watchstanders, who interact with emergency response personnel, will have immediate access to CSX computer files regarding the specific train, including the type of hazmat being carried and its exact position in the train consist. CSX has advised that there has been sufficient use of the current system to begin evaluating the project, and that is scheduled to being early this year. FRA is also working through the AAR to encourage the other major railroads to participate in a similar project.

Finally, another pilot project is underway to evaluate the use of Railinc Corporation's Freightscope, a program that provides equipment search capabilities for hazmat shipments. The system was installed at CHEMTREC in December 2006, and it has the potential to more rapidly provide information about hazmat shipments on

shortline and regional railroads to CHEMTREC watchstanders to improve information availability and reduce delays in emergency response. The pilot project is scheduled to last a year, and includes various tests to determine the system's effectiveness. Two tests have already been conducted with good results.

b. Improvements in Tank Car Integrity through Research and Development

Before the August 2005 enactment of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, FRA had initiated tank car structural integrity research stemming from the circumstances of the 2002 derailment in Minot, North Dakota, which involved the release of anhydrous ammonia from tank cars punctured during the derailment. Current research being conducted for FRA at Southwest Research Institute in San Antonio involves a three-step process to assess the effects of various types of train accidents (e.g., a derailment or collision) on a tank car. The first phase is the development of a physics-based model to analyze the kinematics of rail cars in a derailment. The second phase is the development of a valid dynamic structural analysis model; and the third phase is an assessment of the damage created by a puncture and entails the application of fracture mechanics testing and analysis methods. DOT's Volpe National Transportation Systems Center (Volpe Center), part of the Research and Innovative Technology Administration (RITA), is doing the modeling work now, and FRA will dovetail this ongoing research with the requirements of the statute. FRA, in conjunction with PHMSA, hopes to develop new hazardous material tank car safety standards in 2008.

In addition to focusing on strengthening the structural integrity of the tank car to reduce the probability that a collision will result in release of a hazardous commodity, the project is also evaluating technology such as pushback couplers, energy absorbers, and anti-climbing devices designed to prevent a train derailment in the first place. We are currently consulting with railroads, shippers, and car manufacturers and have solicited public comments in this initiative.

To further these efforts, FRA just signed a Memorandum of Cooperation with Dow Chemical Company, UP, and the Union Tank Car Company to participate in their Next Generation Rail Tank Car Project. The agreement provides for extensive information-sharing and cooperation between ongoing FRA and industry research programs to improve the safety of rail shipments of hazardous commodities, such as toxic inhalation hazards and high-risk gases and liquids.

Finally, in September 2006, FRA awarded $200,000 to test sample tank car panels with various coatings to determine their ability to prevent penetration from small arms fire, as well as their ability to self-seal and, thereby, mitigate the severity of any incident. FRA developed the project in coordination with the AAR and DHS, which came up with the idea of applying to tank cars a protective coating like that used to enhance the armor protection of military vehicles in Iraq.

4. Fostering Further Improvements in Highway-Rail Grade Crossing Safety

Deaths in highway-rail grade crossing accidents are the second-leading category of fatalities associated with railroading. (Trespasser fatalities are the leading category.) The number of grade crossing deaths has declined substantially and steadily in recent years. However, the growth in rail and motor vehicle traffic continues to present challenges.

a. Issuance of Safety Advisory 2005-03

In May 2005, FRA issued this safety advisory, which describes the respective roles of the Federal and State governments and of the railroads in grade crossing safety. It also specifically reminds railroads of their responsibilities to report properly to FRA any accident involving a grade crossing signal failure; to maintain records relating to credible reports of grade crossing warning system malfunctions; to preserve the data from all locomotive-mounted recording devices following grade crossing accidents; and to cooperate fully with local law enforcement authorities during their investigations of such accidents. FRA is also committed to providing technical assistance to local authorities in the investigation of crossing accidents where information or expertise within FRA control is required to complete the investigation. FRA has extensively distributed this advisory through national law enforcement organizations and through contacts with local agencies.

b. Development of State-Specific Grade Crossing Safety Action Plans

In June 2004, DOT and FRA issued an "Action Plan for Highway-Rail Crossing Safety and Trespass Prevention" that sets forth a series of initiatives in the areas of engineering, education, and enforcement to reduce and prevent highway-rail grade crossing accidents. As one of these initiatives, FRA began working with the State of Louisiana in March 2005 to develop its own action plan for grade crossing safety, to address high numbers of grade crossing accidents and deaths at the State level. The action plan focuses on reducing collisions between trains and motor vehicles at grade crossings where multiple collisions have occurred. After a cooperative effort between the Louisiana Department of Transportation and Development, Federal Highway Administration, FRA, and other stakeholders, the State approved the action plan in April 2006. FRA is encouraging other States with high numbers of grade crossing accidents and deaths to do the same, and we are in preliminary discussions with the Texas Department of Transportation regarding preparation of a State action plan.

c. Focus on Pedestrian Safety

In addition, FRA will work with the grade crossing safety community to determine appropriate responses to pedestrian fatalities at grade crossings. Early in 2006, the Transportation Research Board devoted an entire session of its annual meeting to

pedestrian grade crossing safety issues in order to capture information on how to improve safety in this area. By this spring, FRA will publish a compilation of information on existing pedestrian safety devices currently being used in the Nation so that those making decisions on methods to improve pedestrian safety may have resource material available.

d. Inquiry on Safety of Private Grade Crossings

In June 2006, FRA initiated an inquiry into the safety of private grade crossings. Approximately 10 percent of grade crossing collisions occur at privately-owned crossings. However, there is little governmental safety oversight of these crossings, at either the State or Federal level. As a result, in cooperation with appropriate State agencies, FRA has been soliciting oral statements at a series of public meetings throughout the Nation on issues related to the safety of private grade crossings, including current practices concerning responsibilities for safety at these crossings, the adequacy of warning devices at the crossings, and the relative merits of a more uniform approach to improving safety at private crossings. The next and final meeting will be held in Syracuse, New York, on April 26. FRA has also opened a public docket on these issues, so that interested parties may submit written comments for public review and consideration. The statements made and comments received will help inform decisions on what action needs to be taken to address the safety of private grade crossings.

II. FRA'S NEW RAIL SAFETY BILL AND ITS MAJOR PROVISIONS THAT DIRECTLY ADDRESS THE ISSUES OF THIS HEARING

The Bush Administration's rail safety reauthorization bill**,** the Federal Railroad Safety Accountability and Improvement Act, which was transmitted to Congress last month, would reauthorize appropriations for FRA to carry out its rail safety mission for four years and proposes a number of other measures that would significantly advance rail safety. I will describe some major provisions of that legislation that bear on fatigue and human factors generally, on grade crossing safety, and on hazardous materials safety.

In order to enhance the accountability of railroads for their own safety, the bill would authorize appropriations for the addition of a safety risk reduction program to FRA's current safety activities. Since rail-related accidents, injuries, and deaths are already at low levels, FRA needs to supplement its traditional behavior-based and design-specification-based regulations with a robust safety risk reduction program to drive down those key measures of risk at a reasonable cost. In the safety context, a risk reduction program is intended to make sure that the systems by which railroads operate and maintain their properties are adequate to meet safety objectives. This approach focuses on both entire systems and management-level decisions, and it improves these systems by eliminating or minimizing processes that cause, or tend to allow, employees to make mistakes that lead to accidents, injuries, or deaths.

To implement this new program, FRA will need to acquire new skills and adapt to

new ways of thinking. FRA will also put greater emphasis on developing models of how railroads can systematically evaluate safety risks, in order to hold railroads more accountable for improving the safety of their own operations, including implementing plans to eliminate or reduce the chance for workers to make mistakes that can lead to accidents or near accidents. To encourage railroads to produce thorough, as opposed to superficial, risk analyses, a companion provision in the bill bars public disclosure by FRA of records required under the safety risk reduction program, except for Federal law enforcement purposes. Also in order to encourage thorough risk analyses by railroads, the provision forbids discovery by private litigants in civil litigation for damages of any information compiled or collected under the program, and forbids admission into evidence of same information in civil litigation by private parties for damages.

To help improve the alertness of railroad operating personnel, the bill would permit FRA, as the Secretary's delegate, to replace the hours of service laws (49 U.S.C. chapter 211) with scientifically based regulations, after first seeking consensus recommendations from the agency's Railroad Safety Advisory Committee. The hours of service laws, first enacted in 1907 and currently delegated to FRA to administer, contain no substantive rulemaking authority over duty hours. FRA's lack of regulatory authority over duty hours, unique to FRA among all the safety regulatory agencies in the Department, precludes FRA from making use of almost a century of scientific learning on the issue of sleep-wake cycles and fatigue-induced performance failures. FRA's general safety rulemaking power under chapter 201 of title 49 would provide ample authority to deal with the entire subject of maximum work periods and minimum rest periods in light of current research on those subjects; however, the hours of service laws effectively bar such a rational regulatory initiative because the chapter 201 authority may be used only to supplement the pre-1970 railroad safety statutes, not to supplant them. Where the hours of service laws set a rigid requirement, e.g., maximum on-duty and minimum off-duty periods for train crews, a regulation could not lawfully vary from them. FRA would refrain from adopting new requirements relating to fatigue if the agency determines that voluntary activities are adequately addressing topics of concern, and the agency would be authorized to allow a railroad to comply with an approved fatigue management plan as an alternative to compliance with the usual regulatory regimen. The regulations would be subject to review under the Congressional Review Act (5 U.S.C. 801) as the sole and exclusive means of review.

In addition to taking important steps to combat operating employee fatigue, the bill seeks to prevent highway-rail grade crossing collisions, which cause more than a third of all rail-related deaths each year. To make crossings safer, the bill proposes two major provisions. One measure would improve the Department's National Crossing Inventory (Inventory), a large, online database containing vital safety information on the identification, location, physical characteristics, and other salient features of at-grade and grade-separated highway-rail crossings nationwide. FRA is the custodian of the National Crossing Inventory. Currently, reporting to the Inventory by both States and railroads is voluntary; some information is missing, and some is very outdated. The bill would require initial reports on all previously unreported crossings and periodic updates on all

crossings, so that each crossing can be accurately ranked according to its relative risk. These improved rankings will assist States in identifying which of the crossings are the most hazardous and in channeling Federal safety improvement funds to the most hazardous crossings first and will help the Department and the transportation research community to identify the most promising strategies for further reducing largely preventable traffic collisions and casualties at crossings. A second provision of the bill would encourage the development and use of new safety technology at highway-rail grade crossings by establishing a Federal policy to support the development of new crossing safety technology and providing relief from tort liability for an accident at a crossing based upon selection of that technology if the Secretary has approved the use of the technology and if the technology has been installed at the crossing in accordance with the conditions set by the Secretary.

Finally, another provision would expand FRA's existing disqualification authority to reach individuals who are unfit for safety-sensitive service in the railroad industry because of a violation of the Hazardous Materials Regulations related to transporting hazardous material by rail. Currently, FRA may disqualify an individual only for a violation of the rail safety laws or regulations, not the Hazardous Materials Regulations, even though violation of the Hazardous Materials Regulations may involve a greater accident risk or consequence (in the event of an accident)..

In summary, enactment of the Federal Railroad Safety Accountability and Improvement Act would promote safety in five main ways: by allowing FRA (1) to launch a safety risk reduction program that will make railroads more accountable for their safety performance; (2) to issue scientifically sound rules on hours of service that will reduce the fatigue of safety-critical employees; (3) to get vital, up-to-date data on all highway-rail crossings; (4) to foster the development of new crossing-safety technology; and (5) to disqualify railroad personnel from safety-sensitive service based on their violation of the Hazardous Materials Regulations.

III. Concerns in the San Antonio Region

FRA recognizes the special circumstances that prompted the Subcommittee to hold this hearing in San Antonio. Beginning in late 2003, UP experienced several serious accidents in south Texas, including the collision at Macdona on June 28, 2004, which resulted in the release of chlorine gas and the death of a railroad employee and two local residents. Although simple explanations are always inadequate to fully describe the many factors that result in specific events, we believe that several of the respective accident investigations did reveal the influence of a severe rail service crisis. During that period, UP was impacted by short staffing and congested facilities as a result of unanticipated traffic demand during a period of sustained employee attrition. This resulted in long hours and difficult working conditions, as everyone concerned worked to get on top of the situation.

Since that time, numerous public and private actions have been taken to restore safe and fluid operations. UP has continued aggressive hiring of agreement employees, particularly in the transportation department, and has enhanced facilities, so that basic switching operations can be accomplished more readily, and thus with greater safety. Both of these actions have reduced stress and fatigue that adversely affect safety performance.

As a result of Macdona and other accidents, FRA entered into safety compliance agreements with UP on November 12 and December 2, 2004, addressing three geographical UP service units of concern (the San Antonio, Houston, and Livonia Service Units). The agreements required UP to re-instruct all of the testing managers in these service units on the railroad's program of operational tests and inspections. Thereafter, UP was to formulate monthly plans and conduct operational tests and inspections in order to improve its employees' compliance with the railroad's operating rules. Subsequent FRA inspection of UP's entire southern region indicated that the railroad was making progress implementing the requirements of the agreements. On its own initiative, the railroad extended elements of the agreements to the balance of its system to strengthen management oversight of its program of operational tests. In part as a result of these compliance agreements between the railroad and FRA, the railroad has revitalized the management of its program of operational tests and restored rules compliance to more acceptable levels. The railroad has also strengthened its cadre of experienced supervisors.

Here in San Antonio, FRA is assisting the railroad and its employees in implementing "peer-to-peer" observations that endeavor to build a positive safety culture through grass-roots-level leadership. Since mid-2004 FRA's Research and Development Office (R&D) has been providing funding and evaluation support for a peer-to-peer accident-prevention program on the UP Southern Region in Texas. This innovative demonstration program is designed to prevent train accidents and incidents similar to those described earlier and to evaluate the safety impact of this approach for its potential effectiveness and application to other work practices in the railroad industry. This program grew out of private efforts that began in early 2004, when UP management and local labor unions initiated a collaborative safety effort called Cab Red Zone (CRZ). The UP's CRZ effort focuses attention on improving in-cab safety practices, such as proper radio communications, calling signals, and maintaining vigilance. In May 2004, FRA R&D funded a consultant, Behavioral Sciences Technology, Inc., to develop an objective behavior-based safety and continuous improvement process to support CRZ safety, which became known as C.A.B., or Changing At-risk Behaviors. Its focus is to clarify, enable, and encourage safe in-cab behaviors related to CRZ. Since then, a similar pilot program using the same peer-to-peer observation process, called Safety Through Employees Exercising Leadership (S.T.E.E.L.), has been implemented in Livonia, Louisiana, to help reduce the risks of accidents in switching operations.

Key driving forces of both the C.A.B. and S.T.E.E.L. accident-prevention process include peer-to-peer observations with immediate non-confrontational feedback, and

strong labor-management relations that include a barrier-removal and corrective-action process. This risk reduction approach emphasizes the systematic collection, analysis, and objective reporting of risk exposure, followed by barrier removal and corrective actions to reduce the probability of personal injury, collisions, or other accidents. It complements existing FRA audits, rules, and other compliance-based oversight and enforcement activities. It is preventive in that it seeks to find and reduce risks before they can lead to accidents and incidents. It also includes extensive training in safety leadership for supervisors, managers, and senior safety leaders in both union and management ranks.

Currently, both the C.A.B. and S.T.E.E.L. demonstration projects at UP are still in the implementation phase. An evaluation plan has been developed to evaluate the overall impact on safety, safety climate, and the overall culture of this accident-prevention process, and its potential benefit and application to the railroad industry. Early evaluation results suggest a significant decrease in at-risk behaviors associated with the risk of collisions since beginning the C.A.B. process. Over the last 13 months, the proportion of observed at-risk behaviors, for example, has been cut about in half. This decrease has been found in both the behavioral data collected by workers and in the operations field testing conducted by management concerning CRZ-related practices. Local management at the site also reported a 60-percent decrease in locomotive engineer de-certifications associated with the same type of CRZ at-risk behaviors. In addition, the October 4th edition of UPOnline, an online newsletter produced by UP, reported human factor derailments in the San Antonio Service Unit down 25 percent from this time last year and personal injuries down by 18 percent. While these reports have not been corroborated statistically with the FRA's evaluation team, it is promising that a number of safety outcomes are showing positive improvement.

Despite strong efforts by all concerned, we continue to experience some mishaps, and each one is magnified in public perception because of the increased appreciation for potential consequences gained from prior accidents. For instance, on October 17, 2006, UP experienced a significant derailment in the San Antonio area that resulted in damage to two residences. This accident resulted from use of excessive dynamic braking. Dynamic braking uses traction motors, which would normally take electrical energy and rotate the locomotive axles, to generate electricity that is used to slow the train. The electric current is then dissipated as heat in resistor banks. In order to prevent the build up of excessive compressive ("buff") forces within the train, railroads limit the number of axles of dynamic brakes that are permitted to be operative, and FRA requires that locomotive engineers be advised of how much dynamic braking effort they have. In the case of this accident, neither requirement was met. The locomotive consist was improperly set up at Ft. Worth, and neither the crew at the time of the accident nor the two prior crews noted the problem. FRA is processing recommendations for civil penalty assessments to drive home the point that compliance is not optional. UP has instituted procedures to highlight available dynamic brake axles on it train consists, and checks have been made to determine that information and actual brake status match up. We will continue to monitor this issue, among many that can affect the safety of train operations.

IV. Looking Ahead

FRA is very aware that risk attends transportation functions today, as it has in the past. Together with participating States, including the Texas Department of Transportation, we work with railroads and labor organizations every day to drive down risk and add layers of protection. In the field of human factors, we should take courage from the fact that every day railroad workers perform hundreds of thousands of tasks safely; and systems are designed, as much as possible, to mitigate occasional but highly consequential failures. New technologies are coming on line that will help to provide additional safety nets, and other steps we are taking at the National level will contribute to safer operations here in San Antonio. Building on our strengths, we can look to better days ahead.

APPENDIX

The Railroad Industry's Safety Record

The railroad industry's overall safety record is very positive, and most safety trends are moving in the right direction. While not even a single death or injury is acceptable, progress is continually being made in the effort to improve railroad safety. This improvement is demonstrated by an analysis of the Federal Railroad Administration's (FRA) database of railroad reports of accidents and incidents that have occurred over the nearly three decades from 1978 through 2006. See 49 CFR part 225. (The worst year for rail safety in recent decades was 1978, and 2006 is the last complete year for which preliminary data are available.) Between 1978 and 2006, the total number of rail-related accidents and incidents has fallen from 90,653 to 12,833, an all-time low representing a decline of 86 percent. Between 1978 and 2006, total rail-related fatalities have declined from 1,646 to 915, a reduction of 44 percent. From 1978 to 2006, total employee cases (fatal and nonfatal) have dropped from 65,193 to 5,035, the record low; this represents a decline of 92 percent. In the same period, total employee deaths have fallen from 122 in 1978 to 16 in 2006, a decrease of 87 percent.

Contributing to this generally improving safety record has been a 74-percent decline in train accidents since 1978 (a total of 2,834 train accidents in 2006, compared to 10,991 in 1978), even though rail traffic has increased. (Total train-miles were up by 8.5 percent from 1978 to 2006.) In addition, the year 2006 saw only 28 train accidents out of the 2,834 reported in which a hazardous material was released, with a total of only 69 hazardous material cars releasing some amount of product, despite about 1.7 million movements of hazardous materials by rail.

In other words, over the last almost three decades, the number and rate of train accidents, total deaths arising from rail operations, employee fatalities and injuries, and hazardous materials releases all have fallen dramatically. In most categories, these improvements have been most rapid in the 1980s, and tapered off in the late 1990s. Causes of the improvements have included a much more profitable economic climate for freight railroads following deregulation in 1980 under the Staggers Act (which led to substantially greater investment in plant and equipment), enhanced safety awareness and safety program implementation on the part of railroads and their employees, and FRA's safety monitoring and standard setting (most of FRA's safety rules were issued during this period). In addition, rail remains an extremely safe mode of transportation for passengers. Since 1978, more than 11.2 billion passengers have traveled by rail, based on reports filed with FRA each month. The number of rail passengers has steadily increased over the years, and since 2000 has averaged more than 500 million per year. Although 12 passengers died in train collisions and derailments in 2005, none did in 2006. On a passenger-mile basis, with an average about 15.5 billion passenger-miles per year since the year 2000, rail travel is about as safe as scheduled airlines and intercity bus transportation and is far safer than private motor vehicle travel. Rail passenger accidents–while always to be avoided–have a very high passenger survival rate.

As indicated previously, not all of the major safety indicators are positive. Grade crossing and rail trespasser incidents continue to cause a large proportion of the deaths associated with railroading. Grade crossing and rail trespassing deaths accounted for 97 percent of the 915 total rail-related deaths in 2006. In recent years, rail trespasser deaths have replaced grade crossing fatalities as the largest category of rail-related deaths. In 2006, 530 persons died while on railroad property without authorization, and 362 persons lost their lives in grade crossing accidents. Further, significant train accidents continue to occur, and the train accident rate per million train-miles has not declined at an acceptable pace in recent years. It actually rose slightly in 2003 and 2004 (to 4.05 and 4.38, respectively) compared to that in 2002 (3.76), although it dropped in 2005 (to 4.08) and 2006 (to 3.47). As stated in the main testimony, the causes of train accidents are generally grouped into five categories: human factors; track and structures; equipment; signal and train control; and miscellaneous. The great majority of train accidents are caused by human factors and track. In recent years, most of the serious events involving train collisions or derailments resulting in release of hazardous material, or harm to rail passengers, have resulted from human factor or track causes. Accordingly, the National Rail Safety Action Plan makes human factors and track the major target areas for improving the train accident rate.