NTSB National Transportation Safety Board

Office of Railroad, Pipeline and Hazardous Materials Investigations

Bob Chipkevich

February 22, 2007

Open Safety Recommendations - FRA

- Positive Train Control - 1
- Track Safety - 9
- Fatigue - 2
- Operations - 7
- Drugs, Alcohol, and Medical Conditions - 8
- Crashworthiness and Passenger Safety - 8
- Tank Cars - 7
- Grade Crossings - 1
- Passenger and Crew Accountability System - 1
- Train Crew Safety - 1

NTSB

Positive Train Control

- **R-01-6** 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.

NTSB

Track Safety

- **R-02-5** Require railroads to conduct ultrasonic or other appropriate inspections to ensure that rail used to replace defective segments of existing rail is free from internal defects.

- **R-04-1** Require all railroads with continuous welded rail track to include procedures (in the programs that are filed with FRA) that prescribe on-the-ground visual inspections and nondestructive testing techniques for identifying cracks in rail joint bars before they grow.

- **R-04-2** Establish a program to periodically review continuous welded rail joint bar inspection data from railroads and FRA track inspectors and, when determined necessary, require railroads to increase the frequency or improve the methods of inspection of joint bars.

- **R-04-3** Instruct FRA track inspectors to obtain copies of the most recent continuous welded rail programs of the railroads that fall within the inspectors' areas of responsibility and require that inspectors use those programs when conducting track inspections.

- **R-05-1** Require in 49 CFR Part 213, Track Safety Standards, that rail cracks originating from bond wire attachments be identified as rail defects and that information be collected on the methods and locations of those attachments.

NTSB

Track Safety

- **R-05-2** Require in 49 CFR Part 225, Guide for Preparing Accident/Incident Reports, that derailments caused by rail cracks originating from bond wire attachments be reported with a specific cause code and that information on the methods and locations of those attachments be provided in the accident narrative.

- **R-05-5** Emphasize to your track inspectors the importance of enforcing a railroad's continuous welded rail program as a part of the Federal Track Safety Standards, and verify that inspectors are documenting noncompliance with the railroad's program.

- **R-06-7** Require railroads to implement for all power-assisted switch machines, regardless of location, a formal commissioning procedure and a formal maintenance program that includes records of inspections, tests, maintenance, and repairs.

- **R-06-19** Extend to all classes of track safety standards for concrete crossties that address at a minimum the following: limits for rail seat abrasion, concrete crosstie pad wear limits, missing or broken rail fasteners, loss of appropriate toeload pressure, improper fastener configurations, and excessive lateral rail movement.

Fatigue

- **R-06-14** 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.

- **R-06-15** Establish requirements that limit train crewmember limbo time to address fatigue.

NTSB

Operations

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

- **R-05-9** Develop guidelines for locomotive engineer simulator training programs that go beyond developing basic skills and teach strategies for effectively managing multiple concurrent tasks and atypical situations.

- **R-05-10** Require train crews to call out all signal indications over the radio, including clear signals, at all locations that are not equipped with automatic cab signals with enforcement or a positive train control system.

- **R-05-14** 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 daylight and in darkness.

NTSB

Operations

- **R-05-15** 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-05-16** 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-06-10** Prohibit the use of after-arrival track warrants for train movements in dark (non-signaled) territory not equipped with a positive train control system.

Drugs, Alcohol, and Medical Conditions

- **R-00-1** Establish, with assistance from experts on the effects of pharmacological agents on human performance and alertness, procedures or criteria by which train operating crewmembers who medically require substances not on the U.S. DOT list of approved medications may be allowed, when appropriate, to use those medications when performing their duties.

- **R-00-2** Develop, then periodically publish, an easy-to-understand source of information for train operating crewmembers on the hazards of using specific medications when performing their duties.

- **R-00-3** Establish and implement an educational program targeting train operating crewmembers that, at a minimum, ensures that all crewmembers are aware of the source of information described in R-00-2 regarding the hazards of using specific medications when performing their duties.

- **R-00-4** Establish, in coordination with DOT, FMCSA, FTA, and Coast Guard, comprehensive toxicological testing requirements for an appropriate sample of fatal highway, railroad, transit, and marine accidents to ensure the identification of the role played by common prescription and over-the-counter medications. Review and analyze the results of such testing at intervals not to exceed every 5 years.

NTSB

Drugs, Alcohol, and Medical Conditions

- **R-01-17** Modify 49 CFR 219.201(b) as necessary to ensure that the exemption from mandatory postaccident drug and alcohol testing for those involved in highway-rail grade crossing accidents does not apply to any railroad signal, maintenance, and other employees whose actions at or near a grade crossing involved in an accident may have contributed to the occurrence or severity of the accident.

- **R-02-24** Develop a standard medical examination form that includes questions regarding sleep problems and require that the form be used, pursuant to 49 CFR Part 240, to determine the medical fitness of locomotive engineers; the form should also be available for use to determine the medical fitness of other employees in safety-sensitive positions.

- **R-02-25** Require that any medical condition that could incapacitate, or seriously impair the performance of, an employee in a safety-sensitive position be reported to the railroad in a timely manner.

- **R-02-26** Require that, when a railroad becomes aware that an employee in a safety-sensitive position has a potentially incapacitating or performance-impairing medical condition, the railroad prohibit that employee from performing any safety-sensitive duties until the railroad's designated physician determines that the employee can continue to work safely in a safety-sensitive position.

NTSB

Crashworthiness and Passenger Safety

- **R-97-15** Require all passenger cars to have either removable windows, kick panels, or other suitable means for emergency exiting through the interior and exterior passageway doors where the door could impede passengers exiting in an emergency and take appropriate emergency measures to ensure corrective action until these measures are incorporated into minimum passenger car safety standards.

- **R-97-17** Require all passenger cars to contain reliable emergency lighting fixtures that are each fitted with a self-contained independent power source and incorporate the requirements into minimum passenger car safety standards.

- **R-98-56** Include in the passenger car safety standards a requirement for positive seat securement systems to provide against the disengagement and undesired rotation of seats in all new passenger cars purchased after January 1, 2000, and require the incorporation of such a system into existing passenger cars when they are scheduled for overhaul.

NTSB

Crashworthiness and Passenger Safety

- **R-03-21** Revise the language of 49 CFR 238.113(a)(1) to reflect that appropriate exterior instructional signage describing the emergency removal procedure be required at emergency windows on all levels of a multiple-level passenger railcar.

- **R-06-24** Immediately require all rail passenger car seat backs be secured to the seat assembly.

- **R-06-25** Revise the language in 49 CFR 238.233 to define seat to include all components of the seat assembly, such as seat cushions and seat backs, that could become dislodged when subjected to accelerations specified in that section.

- **R-06-26** Require all rail passenger car seat assemblies to be dynamically tested to withstand the accelerations specified in 49 CFR 238.233, and require both upward and downward vertical acceleration tests.

- **R-06-27** Establish crashworthiness standards for passenger car body floor structure systems.

NTSB

Tank Cars

- **R-89-48** Assist and cooperate with RSPA in amending 49 CFR Part 179 to require that closure fittings on hazardous materials rail tanks be designed to maintain their integrity in accidents that are typically survivable by the rail tank.

- **R-92-22** Develop and promulgate, with RSPA, requirements for the periodic testing and inspection of rail tank cars that help to ensure the detection of cracks before they propagate to critical length by establishing inspection intervals that are based on the defect size detectable by the inspection method used, the stress level, and the crack propagation characteristics of the structural component (requirements based on a damage-tolerance approach).

- **R-01-2** Evaluate, with the assistance of RSPA, AAR, and RPI, the deterioration of pressure relief devices through normal service and then develop inspection criteria to ensure that the pressure relief devices remain functional between regular inspection intervals. Incorporate these inspection criteria into the U.S DOT hazardous materials regulations.

NTSB

Tank Cars

- **R-04-4** Conduct a comprehensive analysis to determine the impact resistance of the steels in the shells of pressure tank cars constructed before 1989. At a minimum, the safety analysis should include the results of dynamic fracture toughness tests and/or the results of nondestructive testing techniques that provide information on material ductility and fracture toughness. The data should come from samples of steel from the tank shells from original manufacturing or from a statistically representative sampling of the shells of the pre-1989 pressure tank car fleet.

- **R-04-5** Based on the results of the FRA's comprehensive analysis to determine the impact resistance of the steels in the shells of pressure tank cars constructed before 1989, as addressed in R-04-4, establish a program to rank those cars according to their risk of catastrophic fracture and separation and implement measures to eliminate or mitigate this risk. This ranking should take into consideration operating temperatures, pressures, and maximum train speeds.

- **R-04-6** Validate the predictive model the FRA is developing to quantify the maximum dynamic forces acting on railroad tank cars under accident conditions.

- **R-04-7** Develop and implement tank car design-specific fracture toughness standards, such as a minimum average Charpy value, for steels and other materials of construction for pressure tank cars used for the transportation of DOT class 2 hazardous materials, including those in "low temperature" service. The performance criteria must apply to the material orientation with the minimum impact resistance and take into account the entire range of operating temperatures of the tank car.

NTSB

Grade Crossings

- **R-02-1** For all railroads that install new or upgraded grade crossing warning systems that include crossing gates and that are equipped with event recorders, require that the information captured by those event recorders include the position of the deployed gates.

NTSB

Passenger and Crew Accountability System

- **R-03-12** In cooperation with TSA, develop and implement an accurate passenger and crew accountability system for all long-distance, overnight, and reserved passenger trains that will immediately provide an accurate count and identity of the people on board the train in case of emergency at any time during the trip.

NTSB

Train Crew Safety

- **R-05-17** Determine the most effective methods of providing emergency escape breathing apparatus for all crewmembers on freight trains carrying hazardous materials that would pose an inhalation hazard in the event of unintentional release, and then require railroads to provide these breathing apparatus to their crewmembers along with appropriate training.

NTSB

NTSB