MOVING THE AMERICAN ECONOMY

Federal Railroad Administration
Federal Track Safety Standards
Fact Sheet

Background on Federal Track Safety Standards

There are approximately 140,000 miles of track in America which require constant and vigilant inspection, maintenance, repair and replacement by railroads in order to keep freight and passenger trains moving safely. The wide range of conditions associated with, and inherent in, track infrastructure can lead to derailments if not properly and effectively managed.

Although the number of track-caused accidents has decreased over time, the Federal Railroad Administration (FRA) continues to encourage railroads to achieve further reductions. In 1978, there were 4,780 such accidents, compared to 1,052 in 2004, 1,081 in 2005, 1,064 in 2006, and 810 through November, 2007.

Responsibility of Railroads

Each railroad has the primary responsibility to ensure its own track meets or exceeds the standards prescribed in the FRA track safety regulations and to perform regular and routine track inspections. This includes establishing a track inspection and maintenance program, training its inspectors to identify non-compliant track conditions, making any necessary repairs, and maintaining accurate records of these actions.

Role of the FRA

The FRA's federal track safety standards generally focus on four main areas:

- Track Structure: Rails, crossties, track switches, tie plates, and rail fastening systems
- Track Geometry: Track gage, alignment, elevation, curvature, and track surface
- Road Bed: Drainage and vegetation (vegetation cannot obstruct signs and signals)
- Track Inspection: Frequency and quality of inspection, special inspections, and recordkeeping

The primary duty of FRA's 90 Federal track safety inspectors, along with 30 certified State inspectors, is to strategically monitor track conditions to determine whether a railroad is complying with federal safety standards. Effective federal investigation requires identification, evaluation, and accurate reporting of a railroad's track conditions and practices.

A railroad is subject to FRA enforcement actions, or possibly liable for civil penalties, if it fails to construct and/or maintain track to the appropriate standard, or if it operates trains in excess of the designated track speed.

FRA is continually prompting railroads to perform more thorough track inspections both by traditional visual means and increasingly through the use of new technologies. And, the FRA continues to drive track safety innovation through its research and development activities enabling railroads to undertake better preventive maintenance efforts.

Class of Track

FRA's track safety standards establish nine specific classes of track (Class 1 to Class 9), plus a category known as Excepted Track. The difference between each Class of Track is based on progressively more exacting standards for track structure, geometry, and inspection frequency.

Furthermore, each Class of Track has a corresponding maximum allowable operating speed for both freight and passenger trains. The higher the Class of Track, the greater the allowable track speed and the more stringent track safety standards apply.

Railroads determine the Class of Track to which each stretch of track belongs based upon business and operational considerations. Once the designation is made, FRA holds railroads accountable for maintaining the track to the corresponding standards for that particular class.

If through regular maintenance and inspection efforts a railroad discovers that a section of its track fails to meet the specified federal standard, the railroad is required to make appropriate repairs to maintain that Class of Track designation, or downgrade the track segment to a lower Class of Track to which the federal standard can be met.

Track Inspection Requirements

Under FRA regulations, each railroad has primary responsibility to ensure its own track meets or exceeds the federal safety standards. This includes railroad inspectors performing track inspections at specified minimum frequencies based on the Class of Track, the type of track, the annual gross tonnage operated over the track, and whether it carries passenger trains. Railroads are required to maintain accurate records of regular and ad hoc track inspections subject to review and audit by FRA federal inspectors at any time.

Class of Track	**Minimum Track Inspection Frequency**
Excepted Track	Weekly
Class 1,2, and 3 Mainline and Sidings	Weekly, or twice weekly if the track carries passenger trains or more than 10 million gross tons of traffic during the preceding year.
Class 1, 2 and 3 Not mainline or sidings	Monthly
Class 4 and 5	Twice Weekly
Class 6,7, and 8	Twice Weekly
Class 9	Three Times a Week

Establishing Track Speed

Track speed is determined by the Class of Track. Railroads can change the Class of Track (and thus increase or decrease the track speed) whenever it deems appropriate and without prior notification to, or approval by, the FRA. FRA's interest is in ensuring the railroad maintains the track to the appropriate federal safety standards for that Class of Track.

In addition, local or state governments cannot establish their own train speed limits over highway-rail grade crossings or through urban settings unless they can meet an extremely high

legal standard. That is, federal preemption exists unless it can be demonstrated that a more stringent speed restriction is necessary to eliminate or reduce a local safety or security hazard; that such local or state provision is not incompatible with a Federal law, regulation, or order; and that it does not unreasonably burden interstate commerce.

Furthermore, the safest train is one that maintains a steady speed, and locally established speed limits would result in hundreds of individual speed restrictions along a train's route. This would not only cause train delays, but it could actually increase the chance of a derailment as every time a train must slow down and then increase speed, "buff" and "draft" forces (those generated when individual freight cars are compressed together or stretched out along a train's length) are introduced. This increases the chance of derailment along with the potential risk of injury to train crews, the traveling public, and those living and working in surrounding communities.

Class of Track	Maximum Allowable Speed for Freight Trains	Maximum Allowable Speed for Passenger Trains
Excepted Track	10 mph	N/A
Class 1	10 mph	15 mph
Class 2	25 mph	30 mph
Class 3	40 mph	60 mph
Class 4	60 mph	80 mph
Class 5	80 mph	90 mph
Class 6	N/A	110 mph
Class 7	N/A	125 mph
Class 8	N/A	150 mph
Class 9	N/A	200 mph

Track Inspection Technology

Prior to the mid-1970's, track inspection was primarily performed visually. Since then, the development of measurement technologies fitted on moving equipment has greatly increased the accuracy and speed of inspections, and has been a major contributing factor in the decline of track-caused derailments.

Railroads initially developed Gage Restraint Measuring Systems (GRMS) to assess the ability of their track to maintain proper gage (the distance between two rails). To advance the science of automated track inspections even further, FRA developed its own Automated Track Inspection Program (ATIP) outfitted with custom-made vehicles equipped with state-of-the-art technology to help identify track flaws that could lead to train derailments. FRA now has five such cars in service that will inspect approximately 100,000 miles of track each year. In January 2008, the ATIP reached the milestone of surpassing its one millionth mile of track inspected.

The ATIP cars are primarily used on high-volume traffic density rail lines that carry the majority of hazardous materials transported by rail, as well as passenger trains. They are also used to quickly respond and evaluate routes where the integrity of track is suspected or known to be substandard. The ATIP cars use a variety of technologies to measure track geometry characteristics. The measurements are recorded in real-time and at operating speed. The precise location of problem areas are noted using global positioning system (GPS) technology and shared immediately with the railroad so appropriate corrective actions can be taken. FRA's

newest ATIP car also video records every 50 feet of track bed, which are analyzed by track inspectors and the railroad.

The nation's Class I, or largest railroads all operate similar cars while regional and short line railroads sometimes arrange to have such cars inspect their track under contract. In addition, some railroads have installed Vehicle Track Interaction devices in locomotives to measure high impacts, which instantly alert track maintenance personnel of abnormalities and potential problems areas. Similarly, Visible Joint Bar Detection Systems use a high-speed camera placed on a service truck to scan for broken joint bars. In addition, FRA operates a high rail car with a Joint Bar Inspection System to spot cracks in continuous welded rail.

Technological advances currently being tested include a more refined high-speed photo inspection system that will take a high-resolution picture of the joint bars, and use pattern-recognition software to automatically detect cracks which are difficult to see. A laser vision system is being tested that will scan the track and track bed for anomalies, and ground penetrating radar shows promise to inspect track bed and soil conditions. Driven by FRA research, the industry will soon initiate ultrasound and laser testing of rails to detect internal flaws, fatigue and minute cracks.

Track Speed and Highway-Rail Grade Crossings

The potential danger of a train –vehicle collision present at a highway-rail grade crossing is a separate issue from train speeds. The physical properties of a train moving at almost any reasonable operating speed generally, if not inevitably, prevent it from stopping in time to avoid hitting an object on the tracks. In more than 37 percent of collisions between trains and motor vehicles at public grade crossings, the train was operating at less than 20 mph.

In addition, there is little evidence that wholesale reductions in train speeds will reduce the risk that such grade crossing collisions will occur. Decades of experience and research have shown that prevention of grade crossing incidents is more effectively achieved through the use of roadway warning signage, active warning devices such as flashing lights and gates, and strict observance by motorists of applicable traffic safety restrictions, precautions and laws.

For more information on Federal Track Safety Standards, see 49 CFR Part 213.
For more information on the FRA Automated Track Inspection Program, visit
http://atip.fra.dot.gov/

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