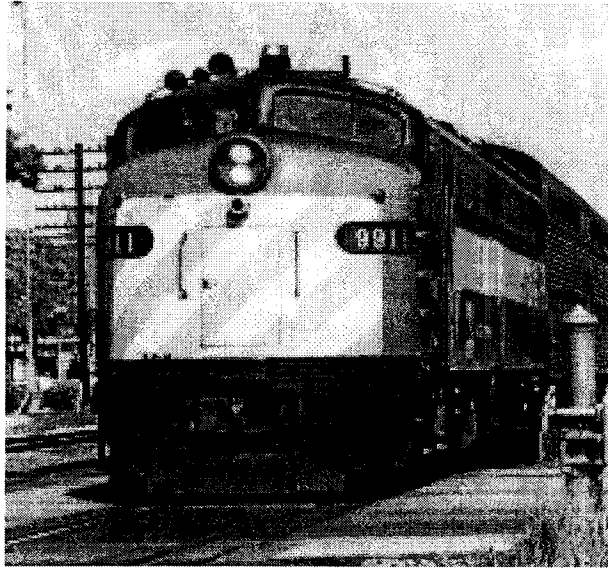


# The Federal Railroad Safety Program



100 Years of Safer Railroads

August, 1993

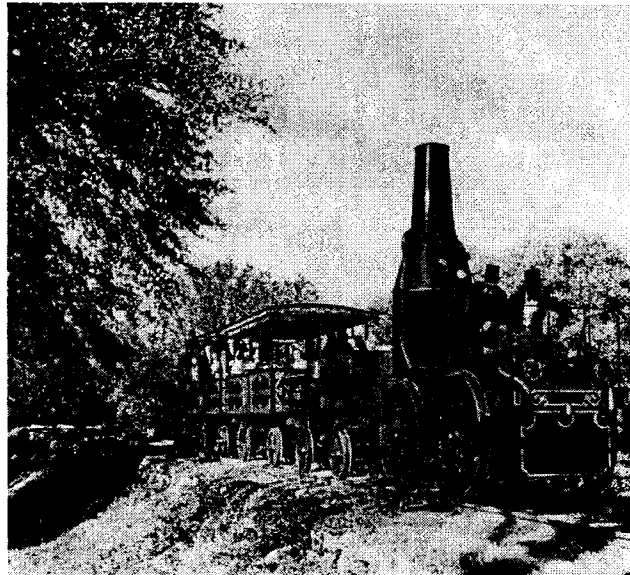
by

Charles W. McDonald

# RAILROAD SAFETY IN THE 1800'S

To really understand the full impact of railroad safety legislation in the United States during the past 100 years, it is necessary to take a look at the state of railroad safety in the 1800's. As industries go, railroading is a relatively late development of the industrial revolution. By the 1850's railroading had become an important factor in the economic fiber of America, although it would be some years before rail transportation became the dominant mode of moving people and goods. By the end of the American Civil War, the advantages in terms of both speed and cost of moving people and goods by rail were clear to all and the greatest period of railroad building in the history of the United States got underway. As the 1860's ended railroads were being built at a frantic pace, the continent had been spanned by steel rails, and the public was starting to demand something be done to improve the safety of railroad work and travel. During this period safety often took a back seat to profit and expansion. Bridges collapsed under the weight of trains that were rapidly becoming heavier and faster. Boilers exploded because of poor maintenance as well improper operation and inspection. Inadequate track maintenance led to derailments as well as other accidents. The training of employees was generally done by the method of "watch it done, do it, teach someone else to do it"..... not necessarily the best method of instruction. Employees worked long hours and often without sufficient rest between tours of duty.

Not surprisingly, the number of injuries and deaths among employees as well as passengers on America's railroads soared. As early as June 17, 1831 railroad accidents were on the front pages in newspapers in the United States. On that day the first person, who was also the first railroad worker to die in service, was killed when the South Carolina Railroad's (at that time this 135 mile line and the longest in the world) engine, the "Best Friend of Charleston's" boiler exploded killing the fireman



Replica of the "Best Friend of Charleston" - Southern Railway Photo

(according to contemporary reports, a result of the fireman holding the safety valve down because the sound of the safety valves lifting annoyed him.) From that date on, the number of deaths and injuries grew steadily in America. During the period 1850 to 1879 there were numerous wrecks, some of the most appalling were:

Norwalk, Connecticut - 6 May 1853 -- Train runs through open draw bridge -- 46 dead  
 Camp Hill, Pennsylvania - 17 July 1856 -- Head on collision -- 66 dead  
 Mishawaka, Indiana - 28 June 1859 -- Bridge collapse -- 41 people dead  
 Angola, New York - 18 December 1867 -- Derailment on bridge -- 42 dead  
 Ashtabula, Ohio - 29 December 1876 -- Bridge collapse -- 86 dead

These are only a few of the hundreds of wrecks that shocked the American public. Newspapers featured lurid headlines, and shocking (at least for the time) drawings and later

photographs. Cover stories, such as the example reproduced at right, frightened many Americans to the point they (often with some justification) refused to ride trains. Train wrecks became so numerous that railroad trade publications published box scores of "major" wrecks with the numbers dead and injured, as well as the accident statistics, listing the dead and wounded each year.



For the railroad worker in the last quarter of the 19<sup>th</sup> Century, railroading was a hazardous job indeed. The "link and pin" coupler was the prevalent method of coupling

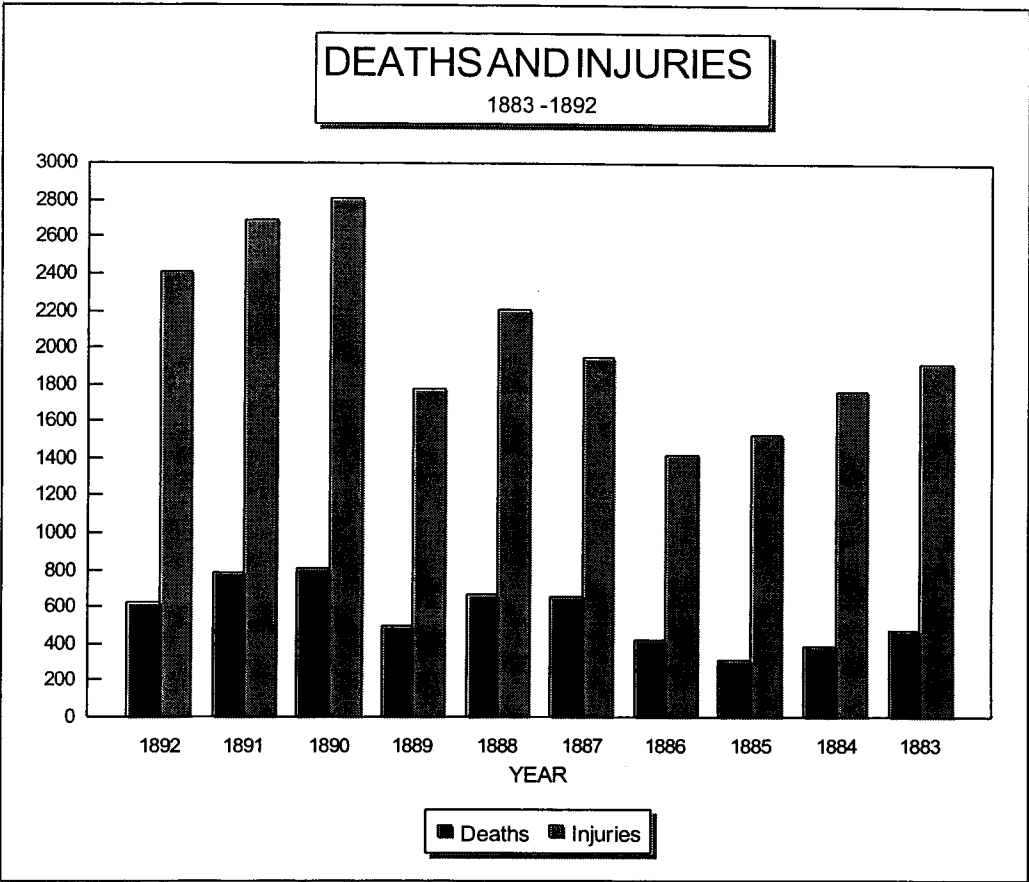
railroad cars, and required the coupling of cars be done manually. To make things worse, many cars had nonstandard coupling systems, hand holds were the exception rather than the rule and braking was done by manually operating the hand brakes from the top of moving cars. The only form of power brake (if there were any brakes at all, many engines had no power brake equipment at all) was on the engine.

By 1870 the public outcry for some sort of government action to improve safety on the railroads was mounting. As early as 1871 a resolution by Senator Sumner was introduced into the Congress demanding a government investigation to find methods to reduce the loss of life on the railroads. Some of the data for the 1870's, 1880's and 1890's is conflicting due in large measure to the lack of standardization in reporting because the Accident Reports Act would not be enacted until 1910; however there is sufficient data to draw a clear picture of the carnage during this period caused by the lack of adequate safety equipment and policies.

### Railroad Deaths and Injuries 1882 - 1892\*

YEAR	KILLED	INJURED	KILLED PER MILLION TRAIN MILES
1892	627	2,407	.98
1891	790	2,685	.95
1890	806	2,812	1.015
1889	492	1,772	.681
1888	667	2,204	.968
1887	656	1,946	1.018
1886	416	1,419	.73
1885	307	1,530	.548
1884	389	1,760	.718
1883	473	1,910	.879
<b>TOTAL</b>	5,623	20,445	.8424

\*Source: *Railroad Gazette*; 8 Feb. 1883.



The American public viewed these grim statistics with growing shock and alarm. Through the 1880's the demand for safety legislation grew as the casualties mounted. During this period the railroads generally opposed all regulatory legislation, for the most part on the grounds of cost and the anticipated negative impact on operational efficiency.

It was also during this period the railroad labor unions began to develop and grow. Originally formed, in part, to provide a measure of security and support to injured railroad workers and to aid the families of those killed or disabled, the unions rapidly expanded into other areas. As might be expected, the unions strongly supported safety legislation. To this date the various railroad unions are generally the leading supporters of stronger regulation and enforcement.

As the statistics associated with the injury and death of railroad employees were studied, it became clear there were several areas that were particularly dangerous for railroaders. The following table illustrates the leading causes of death and injury to railroaders during the five years prior to the passage of the first Safety Appliance Act in 1893.

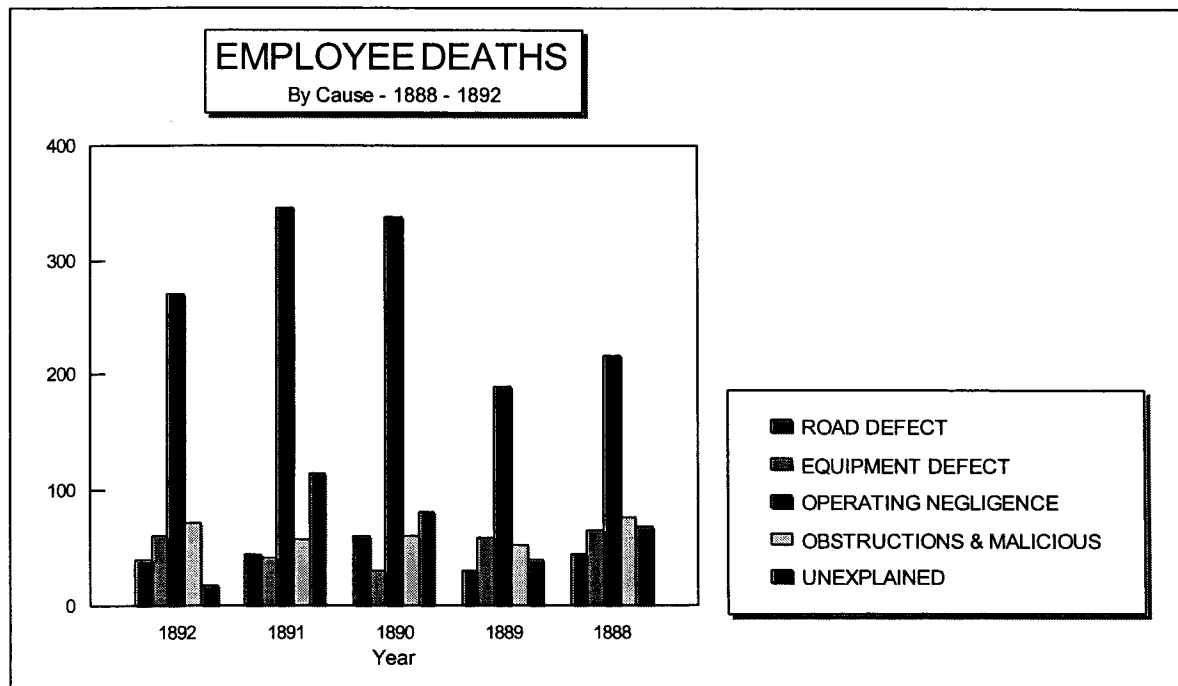
## RAILROAD EMPLOYEE INJURIES & DEATHS \* 1888 - 1892

CAUSE OF DEATH	1892	1891	1890	1889	1888
ROAD DEFECT	39/103	45/101	61/126	30/81	45/153
EQUIPMENT DEFECT	61/93	42/65	30/77	58/24	65/35
OPERATING NEGLIGENCE**	271/718	345/930	337/959	189/595	217/573
OBSTRUCTIONS & MALICIOUS	72/177	57/114	60/165	53/120	77/163
UNEXPLAINED	17/113	61/188	81/192	40/119	69/117
<b>TOTALS</b>	<b>460/1,204</b>	<b>603/1398</b>	<b>569/1,519</b>	<b>370/939</b>	<b>473/1041</b>

NUMBERS LISTED ARE DEATHS / INJURIES

\*Only Railroad workers - Excludes passengers

\*\* This figure seems questionable with regard to the cause of the accident. Since there was no uniform reporting and investigation of accidents, it is not possible to calculate the accuracy of this classification



While it is clear from the above data that the methods and standards for the reporting of railroad accidents were unsatisfactory, it is also clear that railroading was a VERY dangerous vocation. In fact, railroading was second only to coal mining in loss of life during this period.


# ARTIFICIAL LIMBS

CRIPPLES RESTORED TO THEIR USEFULNESS

— BY THE USE OF —

## Artificial Limbs with India-Rubber Hands and Feet

JAMES PATENT




Over thirty years' experience in the treatment of every class of amputation, deficiency or deformity, with the most successful results, has gained the confidence of the profession and popularity among the crippled. The rubber hands and feet dispense with complicated articulations, produce every requisite movement for good, natural, easy and graceful use of the member, with little increased durability. Also with help their knees act freely, and enable them to attend their vocations without restriction. Arms restore the appearance and assist greatly in the performance of labor.

Illustrated pamphlet of 16 pages, containing valuable information, sent free to those giving addresses descriptive of their cases, U. S. Government Blank License. Surgeons, as well as disabled soldiers and invalids persons, should have a copy of the pamphlet. We desire to call special attention of railroad officials who are purchasing artificial limbs for their employees. The simplicity of these limbs render them of special importance to railroad men.

Invalid and Rolling Chairs and Crutches to meet any demand.

**A. A. STARBUCK, 609 Broadway, New York.**



Advertisements such as this one offered artificial limbs to injured railroaders. In a period of history when statistically one out of every nine trainmen could expect to be injured annually, the trade in artificial arms and legs boomed.

In today's society with its safety conscious atmosphere, it's difficult to imagine a time when makers of artificial limbs directed their advertising toward the workers of a specific industry. Such was the case just over 100 years ago prior to the passage of the first Safety Appliance Act. A measure of just how common injury (or death) was in the 1890's can be gained by considering the fact, the experience of trainmen was frequently judged by how many fingers the worker had (or more specifically didn't have.....an experienced brakeman or switcher with all his fingers was not the rule as it is today.) To get an idea of how dangerous railroading was in the last century it's necessary to review some accident figures. In 1893, at the time the Safety Appliance Act was passed, one in 28 railroad workers was injured during the course of the year and one in 320 killed. For trainmen alone the odds were even worse..... one in nine was injured and one in every 115 killed.<sup>1</sup> Injuries incurred while coupling cars represented 44% of the total casualties.<sup>2</sup>

## LEGISLATION

By the mid 1880's a number of states had passed laws to regulate railroads, including safety legislation. As might be expected the requirements of the various state

<sup>1</sup>Interstate Commerce Commission Activities: 1887 - 1937; Interstate Commerce Commission: Washington D. C. 1937.

<sup>2</sup>Ibid.

statutes were conflicting and difficult for the railroads to implement. As a result state governments as well as some segments of the railroad industry began to urge Federal legislation to provide a workable set of standards. The railroad industry recognized the disadvantage of state by state regulation. The Master Car Builders' Association, as a result began studies to develop standards for coupling and to address related issues. By 1891 almost everyone involved in the issue agreed action was needed.

## **THE FIRST SAFETY APPLIANCE ACT (1893)**

*Railway Age Magazine* of 3 March 1893, reported on page 170 the passage on 2 March 1893, of the first Safety Appliance Act as follows:

"The Lind railway safety appliance bill which has been so long and hotly contested in Congress, has finally passed both branches [*of the Congress*], the House having on Monday agreed to the Senate amendments by a vote of 181 to 85. The bill provides that after Jan. 1, 1898, every locomotive engine used in moving interstate traffic must have a power driving wheel brake and appliances for operating the train-brake system, and that every train must have a sufficient number of cars so equipped with power or train brakes that the engineer on the locomotive drawing the train can control it without requiring brakemen to use the common hand brake.

It is provided also that after the same date it shall be unlawful to use any cars not equipped with couplers coupling automatically by compact [sic] and which can be uncoupled without the necessity of men going between the ends of the cars. The importance of this will be better appreciated when it is known that the number of persons killed or injured yearly on American roads while coupling or uncoupling cars is over 7,000. Within three months after the passage of the act the American Railway Association is authorized to designate to the Interstate Commerce Commission the standard height of drawbars for freight cars and fix also the maximum variation from standard height. If the association does not act by July 1, 1894, then the commission must determine a standard and after July 1, 1895, no car loaded or unloaded can be used which does not comply with this standard.

Any violation of this act is punishable by a fine of \$100.00 for each and every offense and it is also provided that:



*Any employee who may be injured by any locomotive, car or train in use contrary to the provisions of this act shall not be deemed thereby to have assumed the risk thereby occasioned, although continuing in the employment of such carrier after the unlawful use of such locomotive, car or train has been brought to his knowledge.<sup>3</sup>*

This rather minor bit of coverage seems remarkable for a law that would prove so significant in so many ways, especially in light of the intense and prolonged struggle that had been waged in the Congress over this bill. While the law started out fairly quietly, much more comment and discussion would follow.

The first Safety Appliance Act <sup>4</sup>was a major first step towards improving the working conditions of the railroad employee, as well as making railroad travel safer for the general public. The implementation of the act faced difficulties from the outset. Though the act required implementation by 1 July 1895, it would be 1 August 1900, before the act was fully implemented. This law gave the Interstate Commerce Commission (ICC) the option of extending the implementation date upon request from the parties involved. Requests were made and granted by the ICC delaying full implementation until 1900, seven years after the enactment of the Lind Bill. It took 30 years after the beginning of the movement for railway safety laws, for this landmark piece of legislation to be implemented even in part.

The stated purpose of the first Safety Appliance Act (the Lind Bill) can be summarized as *"To promote the safety of travelers and employees on the railroads."* (This definition of the intent of the law would prove important later, when it would be an important consideration in court decisions on the new law). This goal was to be accomplished by empowering the ICC to enforce requiring the following statutory requirements:

- a. That all locomotives be equipped with power driving-wheel brakes and appliances for operating the train-braked system.
- b. That all trains have a sufficient number of power-braked cars so that the engineer could control the speed of the train without the use of hand brakes.
- c. That all cars be equipped with automatic couplers.
- d. That all cars be equipped with grab irons or handholds.

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<sup>3</sup>The Car Coupler Bill Passed, *The Railway Age And Northwestern Railroader*, March 3, 1893, 170.

<sup>4</sup> 45 U.S.C. 1-7, March 2, 1893

e That all power brake cars in a train have the brakes in use and operation (the intent of this provision was to force the use and maintenance of braked cars.) The 1893 act applied only to locomotives and cars actually engaged in interstate commerce.

f. In addition the ICC was authorized to set standards and enforce standards for freight car coupling appliances.<sup>5</sup>

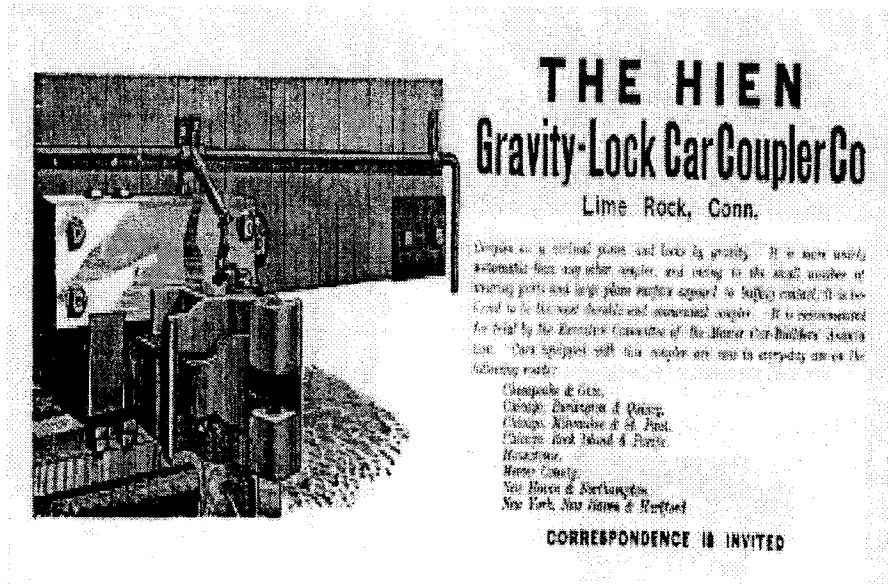
## THE SECOND SAFETY APPLIANCE ACT (1903)

It became apparent in fairly short order that there were loopholes in the new law. The principal difficulty involved the issue of what usage of rolling stock constituted "interstate commerce."

Enforcement of

the law was difficult with the large number of railroads that operated entirely within the borders of a state, but nonetheless interchanged cars with railroads operating across state borders. The second Safety Appliance Act<sup>6</sup> passed in 1903:

- a. Made the first Safety Appliance act applicable to all vehicles operating over highways of interstate commerce within the scope of the Safety Appliance Act.
- b. Established a requirement that 50% of the total cars in a train have power brakes.
- c. Granted the Interstate Commerce Commission authority to increase the percentage of braked cars required if it were deemed necessary to do so.<sup>7</sup>



Contemporary advertisement for an automatic coupling device

<sup>5</sup> The ICC set standards by administrative order on June 6, 1893 using the standard proposed by the American Railway Association. This standard was modified in 1910.

<sup>6</sup> 45 U.S.C. 8-10; 1903

<sup>7</sup> This was done by the Interstate Commerce Commission in 1905 (75%) and in 1910 (85%). This requirement has the practical effect now that virtually all cars are equipped with power brakes and of requiring brakes to be operative (with a few exceptions.)

It will come as no surprise to most it would take the Federal Courts many cases to more firmly establish the actual scope of the law's application. As early as 1904, in the case of the *United States v. Geddes*,<sup>8</sup> the court system continued to define what constituted "interstate commerce." It would take years and many court actions to more or less firmly establish what constituted "interstate commerce" but in general most common carrier railroads, as well as industrial railroads that interchanged cars with common carrier railroads came under the regulation of the act.

## **THE THIRD SAFETY APPLIANCE ACT (1910)**

This act<sup>9</sup>, passed on 14 April 1910, strengthened the provisions of the 1893 and 1903 acts. In addition, it added the requirement for additional safety appliances on cars and engines such as, ladders, sill steps and hand brakes. The law also empowered the Interstate Commerce Commission to establish standards for the location, number, dimensions and method of application of these safety appliances.<sup>10</sup>

The act excepted certain classes of cars from this regulation, including:

- a. Four-wheel and eight-wheel standard logging cars, where the height of the coupler did not exceed 25 inches.
- b. Locomotives used in hauling such trains when used exclusively for the transportation of logs.
- c. Cars used on street railways.
- e. In addition, with some limitations cars with defective safety appliances may be moved, without violating the law, from the point of discovery of the defect to the nearest facility with the capability to effect repairs of the defective car.

## **IMPACT OF THE SAFETY APPLIANCE ACTS THROUGH 1908**

The impact of these laws was rapid and dramatic. In 1893, 310 trainmen were killed and 8,753 injured in accidents involving coupling and uncoupling of cars according to the *Railway Age Gazette*.<sup>11</sup> By 1908 these numbers had fallen to 198 dead and 3,116 injured. The *Railway Age Gazette* speculates the reason for the drop in deaths and in

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<sup>8</sup>*U. S. v Geddes*, 131 F. 452, 65 C.Ca. 320, 6th Cir. 1904.

<sup>9</sup>45 U.S.C. 11-16; 1910

<sup>10</sup>The Interstate Commerce Commission did this by an administrative order on 13 October 1910. This was later replaced by an administrative order on 13 March 1911.

<sup>11</sup>"Lives and Limbs Saved by Automatic Couplers", *Railway Age Gazette*, March 11, 1910, p525.

injuries was not more dramatic was because of better reporting of accidents.<sup>12</sup> In any case, while the number of trainmen grew by more than a third during the period 1893 through 1908, deaths fell about a third. The following chart shows graphically the impact of the first and second Safety Appliance Acts on the well being of trainmen.

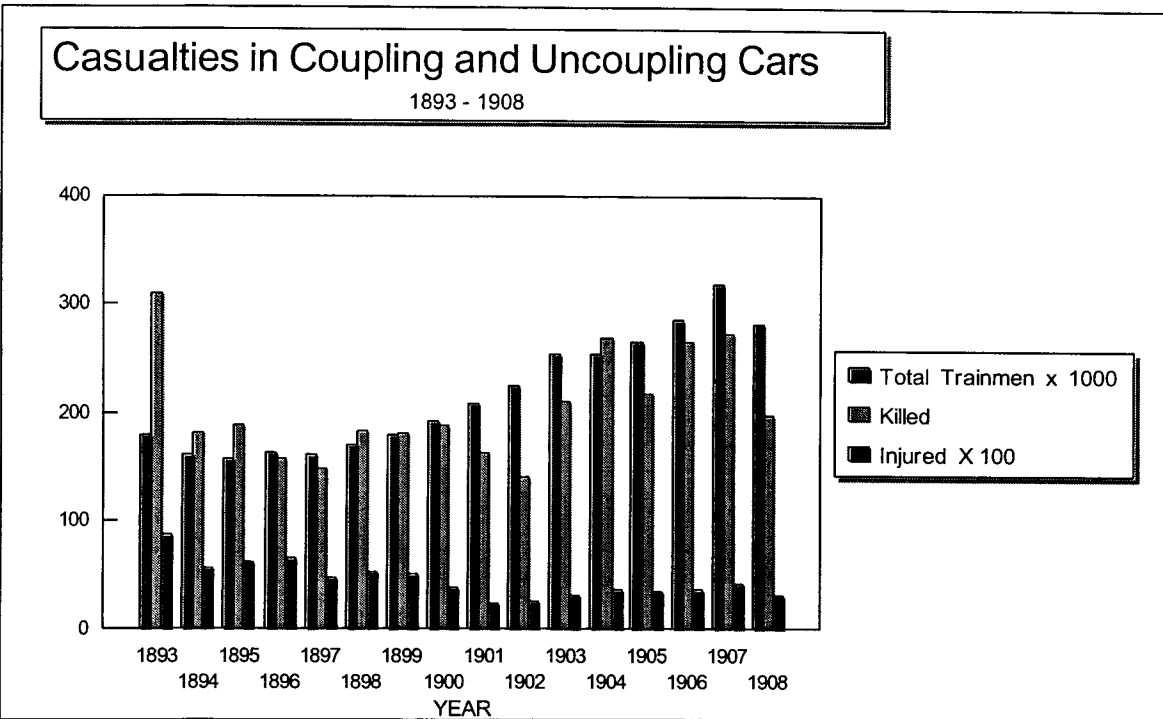
CASUALTIES IN COUPLING AND UNCOUPLING CARS<sup>13</sup>

YEAR	NO. TRAINMEN EMPLOYED	KILLED	INJURED
1893	179,636	310	8,753
1894	160,033	181	5,539
1895	157,731	189	6077
1896	162,876	157	6,457
1897	161,397	147	4,698
1898	170,708	182	5,290
1899	178,851	180	5,055
1900	191,198	188	3,803
1901	209,043	163	2,377
1902	225,422	141	2,457
1903	253,660	211	3,023
1904	253,834	269	3,506
1905	265,175	217	3,316
1906	285,556	266	3,590
1907	317,808	272	4,062
1908	281,645	198	3,116

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<sup>12</sup>Ibid., 9.

<sup>13</sup>Ibid., 9.



While the exact impact of the Safety Appliance Acts may be somewhat clouded by the way in which data was collected, it is clear many lives were saved by these laws, and many injuries prevented as well.

In 1908, the United States Supreme Court issued a ruling that had a major impact on the way the various railroad safety acts were applied to the railroads and their workers. Historically, the common law doctrine of "reasonable care" applied to the conditions in the work place. In the simplest of terms, this doctrine allowed an employer to defend itself in legal action if it could show it had exercised "reasonable care" in the way its equipment was maintained. In its review of a lower court ruling in the case of *St. Louis, Iron Mountain & Southern Railway Co. v. Taylor*, the United States Supreme Court set aside the doctrine of reasonable care.<sup>14</sup> This ruling supported the general intent of the legislation, that being to promote safety in the operation of the nation's railroad system.

From the outset, the Interstate Commerce Commission has approached the implementation of these regulations in a spirit of cooperation with the railroads. From the date of the passage of the first Safety Appliance Act in 1893, the ICC and later the Department of Transportation have had great success in working with the regulated industry on a basis of cooperation, rather than on a confrontational basis. This will be discussed later, but it is worth noting here, this approach is unusual, if not unique in the realm of government regulation.

<sup>14</sup>*St. Louis, Iron Mountain & Southern Railway Co. v. Taylor*, 210 U. S. 281, 28 S. Ct. 616, (1902).

## THE HOURS OF SERVICE ACT (1907)

Concurrently with the efforts to secure the passage and implementation of the Safety Appliance Acts, efforts were under way to improve the safety of railroad passengers and workers by limiting the number of hours an employee was legally allowed to work during a given period of time. Prior to the enactment of Hours of Service Act<sup>15</sup>, railroad workers were permitted and in many cases required (especially during harvest and other seasonal movements of traffic) to work extremely long hours. Not surprisingly, employees working very long hours were more likely to be involved in accidents. This situation resulted in many accidents involving the death and injury of passengers, railway men and bystanders. In addition, these long hours resulted in a large number of injuries and a heavy loss of property to both the railroads and the shippers of goods.

In 1903 President Theodore Roosevelt addressed the issue of hours of service on railroads in America in a message to the Congress. The question of safe working hours was again addressed in Presidential messages to the United States Congress in 1904 and 1905 when the President urged limits on the hours of service by railroaders. As early as 1904 the Interstate Commerce Commission annual report identified the working of long hours as a major cause of railroad accidents in the United States. Again in 1905 the ICC annual report noted the impact of working excessive hours in railroad accidents.

Between 1903 and 1907 the pressure on the Congress to enact legislation to limit the hours of service mounted. This legislation was opposed by railroads in the United States principally on the basis of cost. The railroads argued limits on hours of service were unnecessary and would be extremely expensive to implement. In addition, they maintained limits on hours of service would not only be costly to implement, but would have a negative impact on service to the customers, especially during the critical harvest season as well as during other periods of peak demand for transportation. Despite these arguments public opinion generally favored controls on the amount of time railroad employees were permitted to work.

As a result of many years of effort by various reform groups, labor unions and political organizations, the United States Congress passed the Hours of Service Act on March 4, 1907. The Hours of Service Law covered two major groups of employees:

- a. Those engaged in, or connected with, the movement of trains.
- b. Those who by the use of telegraph or telephone transmit or receive orders affecting train movements.

The Hours of Service Law as originally adopted in 1907 restricted workers in train service from working for more than 16 consecutive hours or more than a total of 16 hours during any 24 hour period. The act also established a minimum of 10 consecutive hours of rest after an employee has been on duty for 16 consecutive hours. Further, the law

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<sup>15</sup>45 U.S.C. 61 et. seq.

required a minimum of eight hours off duty when an employee had worked an aggregate 16 hours in a 24 hour period. With regard to employees in category "b" above (e.g., dispatchers, operators and telegraphers), the 1907 law recognized two sub-classifications. Those sub-classes were:

- a. Employees who work at a continuously operated office.
- b. Employees who work at offices operated during daylight hours only.

Workers in the first sub-class were permitted to be on duty nine hours during a 24 hour period. Those employed in the second class were allowed to work 13 hours during a single 24 hour period.<sup>16</sup>

As previously noted, it is always difficult to gauge the impact of one law or regulation on the general level of safety within the railroad industry. While accident statistics are an indicator of the impact of such legislation, it is difficult to quantify the exact success of the law, since the number of deaths and injuries that would have occurred without the law is unknown. Nonetheless, a look at the number of deaths and injuries to employees, as well as to members of the public, casts some light on the results of this legislation.

## RAILROAD RELATED DEATHS 1907 - 1916

**FIGURES ARE FOR KILLED / INJURED**

YEAR	PASSENGERS KILLED/INJURED	EMPLOYEES KILLED INJURED
1907	610 / 13,041	4,534 / 87,644
1908	381 / 11,556	3,405 / 82,487
1909	253 / 10,311	2,610 / 75,006
1910	314 / 12,451	3,382 / 95,671*
1911	299 / 12,042	3,602 / 126,039
1912	283 / 14,938	3,635 / 142,442
1913	350 / 15,130	3,715 / 171,417
1914	232 / 13,887	3,259 / 165,212
1915	199 / 10,914	2,152 / 138,092
1916	239 / 7,488	2,687 / 160,663
<b>TOTAL</b>	<b>3,160 / 127,758</b>	<b>33,001 / 1,244,673</b>

\* The Accident Reports Act became effective 6 July 1910.

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<sup>16</sup>The law provided exceptions for emergency situations, such the operation of wreckers, relief trains, or other emergency service. In addition, it allowed for exceptions in the event of unavoidable accident, injuries and "Acts of God."

As noted, the general improvements in the level of railroad safety are affected not just by the Hours of Service Act, but also by the ongoing evolution of the Safety Appliance Act during the same period. In addition, while the raw statistics would seem to indicate the improvements were only moderately effective, it is necessary to remember the number of passenger miles were on the rise and freight traffic was increasing as well, particularly from 1914 on as the United States business sector expanded and boomed in reaction to the increased demand for food, medical supplies and general war materials by the European powers engaged in the First World War. Further, the Accident Reports Act clearly affected the employee injury portion of the accident statistics. While death and injury to passengers was always fairly accurately documented, employee injuries (most likely those judged to be of a "minor" nature) were not well recorded prior to the implementation of the Accident Reports Act in July 1910.

## THE ACCIDENT REPORTS ACT (1910)

Shortly after the passage of the first Safety Appliance Act, it became clear there was a need to have a way to develop statistics to measure the effectiveness of the act. As early as March 1901 the Congress had enacted a requirement for railroads engaged in interstate commerce to report accidents to the ICC.<sup>17</sup> The 1901 act did not provide the commission with much authority and was not sufficiently specific to meet the growing reporting needs arising from new legislation. The Interstate Commerce Commission recommended legislation to the United States Congress that would provide for uniform reporting of accidents involving death, injury or loss of property involved in interstate commerce. This bill also had the goal of preempting state legislation in this area. The provisions of the act were developed in cooperation with the railroads. Although the railroad industry in general was not in favor of reporting requirements, they did desire a standardized system of accident reporting rather than being forced to attempt to deal with a patch work of state laws on the subject. On May 6, 1910, the Congress enacted the Accident Reports Act of 1910. The law became effective 60 days later.

The new law imposed a duty upon the railroads to *"report under oath, all collisions, derailments, or other accidents resulting in injury to persons, equipment or roadbed arising from the operation of such railroad under such rules and regulations as may be prescribed by the said commission, which report shall state the nature and causes thereof and the circumstances connected therewith."*<sup>18</sup> The law made failure to comply with its provisions a misdemeanor, punishable by a fine of up to \$100.00 per offense (a lot of money for the time.) The act also rescinded the requirement to report accidents in the railroad's annual financial report to the commission, as well as repealing another law, "An Act requiring common carriers engaged in interstate commerce to make full reports of all accidents to the Interstate Commerce Commission." Another significant portion of the law, (section three,) gave the ICC the authority to investigate *"all collisions, derailments or other accidents resulting in serious injury to person or to the property of a*

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<sup>17</sup>This law was repealed by the Accident Reports Act, section six of 1910

<sup>18</sup>The Accident Reports Act of 1910, section one.



*railroad occurring on the line of any common carrier engaged in interstate or foreign commerce by railroad.*"<sup>19</sup> Section three further gave the Commission the authority to *"investigate such collisions, derailments or other accidents aforesaid and all the attending facts, conditions, and circumstances and for that purpose may subpoena witnesses, administer oaths, take testimony and require the production of books, papers, orders, memoranda, exhibits and other evidence and shall be provided by said carriers with all reasonable facilities."*<sup>20</sup>

The act went on to direct the Interstate Commerce Commission to prescribe the method and form for making reports of accidents covered under the act to common carrier railroads. One important section of the act provided a clear definition of "interstate commerce." The law also defined interstate commerce as used in the act: *"as all transportation from any State or Territory or the District of Columbia to any other State or Territory or the District of Columbia."*<sup>21</sup>

The Interstate Commerce Commission had required railroads to include accident reports in their annual reports to the commission. As previously noted, in March of 1901 the commission began requiring the direct reporting of accidents, the data being used to develop statistical reports. As it studied the data available at the time the Commission became increasingly convinced there was a need for it to investigate serious accidents. With the implementation of the Accident Reports Act, the investigative functions of the commission grew dramatically. In 1911 the Commission reorganized to create the Division of Safety Appliances (which became the Bureau of Safety in 1917 as a part of a general reorganization.) The investigators from the Bureau of Safety undertook to administer the investigative functions of the Commission, implementing the 1910 law. This function continues today under the aegis of the Federal Railroad Administration. The early accident reports revealed numerous dangers as well as identifying operating conditions and practices which were likely to lead to accidents. The Bureau developed recommendations to eliminate these hazards. Areas in which dangers were identified included obsolete operating methods, inadequate or improperly maintained signals, insufficiently trained employees, inadequate examination of employees on operating rules, substandard operating rules, lax supervision, poor track maintenance, lax discipline and poor equipment maintenance. In addition, the investigations by the Bureau identified defects in materials and manufacture of locomotive and car components that indicated a need for a more thorough study of the specifications, composition and manufacturing process as well as the effects of normal stress and loading to which the components were subject during normal service. The investigation of accidents identified many causes of death and injury resultant from railroad accidents. The findings arising from the Bureau of Safety's investigations led to significant advancements in passenger and employee safety.

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<sup>19</sup>Accident Reports Act , section two.

<sup>20</sup>Accident Reports Act , section three.

<sup>21</sup>Accident Reports Act , section six.

# SIGNAL AND TRAIN CONTROL LEGISLATION (1906 -1937)

One of the benefits of the Accident Reports Act (and its predecessor act) was the development of sufficiently accurate data to support the claims of organizations and other interested parties, that there was still a lot of room for improvement in the safety conditions on the railroads in the United States. At the same time it was becoming clear that the technology existed (or could be reasonably developed) to greatly reduce the danger to passengers, workers and property associated with rail travel. The studies of accident statistics quickly underscored the fact that collisions between trains were a major cause of loss of life and property in railroad accidents.

As early as 1903 the Interstate Commerce Commission pointed to the need for a law requiring the adoption and use of the block signal system of train operation. This finding was noted in the 1904 and 1905 reports as well.

In a joint resolution in 1906,<sup>22</sup> the Congress of the United States directed the ICC to "*investigate and report on the use of and necessity for block signal systems and appliances for the automatic control of railways.*" The Commission employed various experts, and conducted the research directed by the Congress. In a report dated February 23, 1907, the Commission submitted the results of its report to the United States Congress. In the report to the Congress, the ICC recommended the block signal system of train control be required, but admitted there was a lack of actual operating data on the system, and the advantages of block signal systems operation were, at the time of the report, theoretical. As a result, Congress authorized further research and appropriated funds for the study. Once again, the ICC included railway officials in the research as well as representatives from suppliers and other groups. In July of 1907 the Commission appointed a committee, designated the "*Block Signal and Train Control Board,*" to study the available signal and train control systems then available, and to test promising technology under operational conditions. In 1908 the charter of the Board was expanded to include any appliance or system designed to promote the safety of railway operation. The Board operated for five years (upon the demise of the Board its duties fell to the Bureau of Safety), submitting its final report of its investigations in June 1912. The Board recommended the adoption of the block signal system and further development of the automatic train stop system. The recommendation stated the use of the block signal should be mandatory under specified conditions. After a thorough analysis of the results of these studies, the Interstate Commerce Commission, on January 10, 1922, issued an order<sup>23</sup> for more than 50 carriers to show cause why they should not be ordered to install automatic train control equipment on designated high traffic lines. Extensive hearings followed, in June of 1922, resulting in an order being issued to 49 carriers to install automatic train control appliances. This order was to be at least partially implemented by January 1925. In January 1924 an additional 47 railroads were directed to implement similar requirements to those directed in the initial order of June 1922 (A few carriers were permitted to install automatic cab signal appliances to comply with these orders.) In

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<sup>22</sup> 34 Stat. 838, June 30, 1906.

<sup>23</sup> Order number 13413 of January 10, 1922

the years that followed the issuance of the order, thousands of miles of railroad track was fitted with train control systems. By 1954, the peak year, there were over 17,000 miles of signaled track in the United States.

The Signal Inspection Act enacted in 1937<sup>24</sup> further strengthened the ICC's involvement in the signal area of railroad safety. This act gave the ICC the authority to require any carrier to install block signal systems, interlockings<sup>25</sup>, automatic train stop systems and / or cab signal devices and / or other systems intended to promote the safety of railroad operation. The act also prohibited the removal or modification of systems already installed at the time the new law was enacted. The act required the railroads in the U. S. to submit their rules, instructions and standards for the installation, maintenance and operation of these systems to the ICC for approval and review. In addition, the act provided the Commission the authority to establish rules, instructions and standards should the railroads fail to do so within six months of the enactment of the law. Another significant feature of the 1937 law was the requirement for the Commission to inspect and test train control systems to ensure their effectiveness as well their proper maintenance and repair. Further, this act made it unlawful for a carrier to operate any train control system not in safe operating condition. Finally, this law empowered the ICC to employ inspectors to carry out the duties of ensuring these regulations were followed.

To implement the new act, the Commission issued initial rules on September 24, 1937. Most carriers failed to submit the train control data as required in the act. The commission then issued rules, standards and instructions on April 13, 1939, which became effective on September 1, 1939.

On June 17, 1947 the Interstate Commerce Commission ordered<sup>26</sup> automatic block signal systems on any track on which freight trains were authorized to operate in excess of 49 mph. or passenger trains in excess of 59 mph. The order also required automatic cab signals, automatic train stop or automatic train control be installed on any line on which trains would be permitted to exceed 79 mph. In addition, these systems were required to comply with the ICC's rules for train control systems.<sup>27</sup>

## **POWER BRAKE REGULATION**

While the ICC was reviewing signals as a means to reduce accidents, it was also studying the standards for the use of power brakes, especially with regard to technical developments. The outcome of this study was a report issued on July 18, 1924, indicating technical improvements in braking were possible and essential for the safe operation of modern trains.<sup>28</sup> In conjunction with the American Railway Association, the

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<sup>24</sup> 49 U.S.C. App.26

<sup>25</sup> An interlocking is defined as "An interconnection of signals and signal appliances (e.g., switches, bridges, gates, etc.) so arranged that everything must be in its proper place before a train can be given clearance to move.

<sup>26</sup>Order number 29543

<sup>27</sup>49 CFR Part 136

<sup>28</sup> Power Brakes and Appliances for Operating, 91 ICC 481, 1924.

ICC requested a study of both existing and new brake equipment available in the United States. The test, conducted at Purdue University, led to the introduction of the AB type air brake system, and the American Railway Association revised its equipment standards to make the new technology a requirement. The American Association of Railroads (successor to the ARA) required AB type brake systems on all cars in interchange service as of January 1, 1935.

## **THE LOCOMOTIVE (OR BOILER) INSPECTION ACT (1911)**

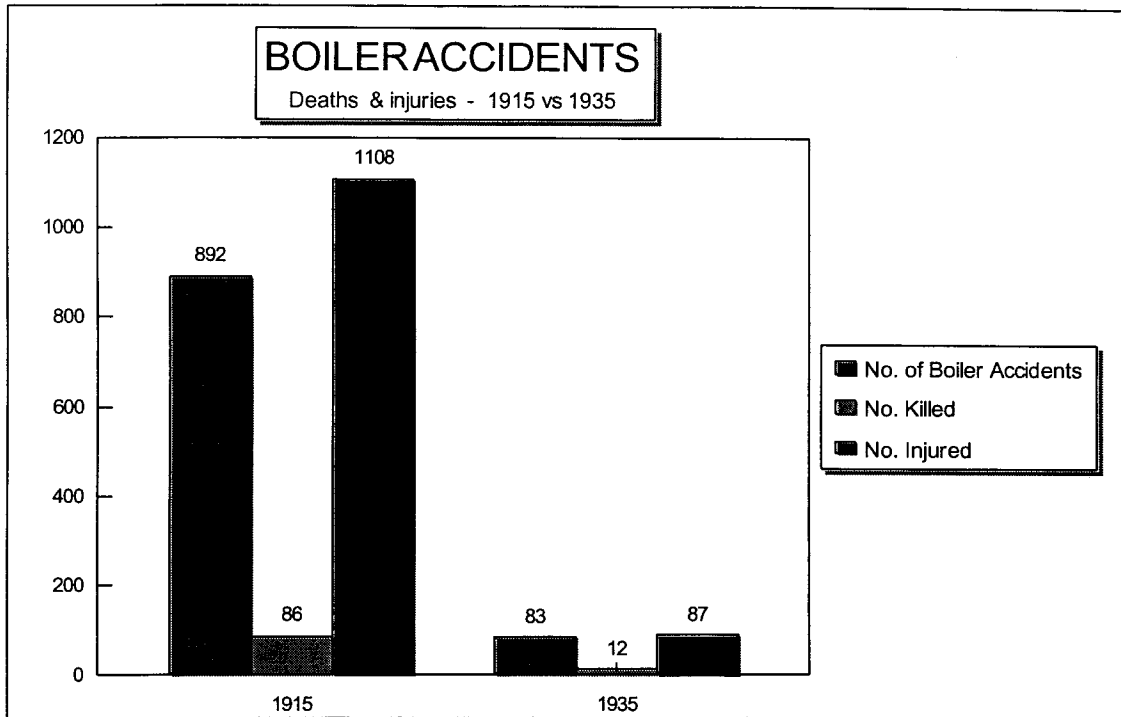
On February 17, 1911, Congress enacted the Boiler Inspection Act.<sup>29</sup> Four years later, despite long and vigorous opposition by the railroad industry, the Congress passed a law on March 4, 1915, requiring the Interstate Commerce Commission to conduct inspections not only of the boilers but also related appliances of locomotives operated in interstate commerce. As locomotive technology developed, the Locomotive Inspection Act was expanded to include all types of locomotives including diesel and electric powered engines, as well as steam. This change became law on June 7, 1924. This law and the inspection program developed to implement the act, resulted in a dramatic drop in the number of railroaders injured or killed by locomotive failures. In addition, the railroads benefited, by improved locomotive availability, as well as less long term maintenance costs that resulted when the amount of deferred maintenance was reduced by the provisions of the act.

### **BOILER RELATED ACCIDENTS 1915 - 1935**

<b>TYPE OF ACCIDENT</b>	<b>1915</b>	<b>1935</b>
Total Boiler Accidents	892	83
Killed	86	12
Injured	1,108	87

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<sup>29</sup> 45 U.S.C. 22 *et. Seq.*



## TRANSPORTATION OF HAZARDOUS MATERIALS

Concerns about the safe transportation of dangerous materials led to regulations regarding the methods of transportation of such materials as early as 1866. The Congress passed the *Transportation of Explosives Act of 1908* which addressed, in part, the movement of hazardous materials over the railroads, although this bill did not deal exclusively with rail transportation. A much more encompassing bill was passed in 1909, but the bill did not give the Commission authority to regulate the transportation of these hazardous materials. It was not until 1911 that the Commission took upon itself the authority to regulate the transportation of "dangerous articles" based upon general statutory authority. The result of the implementation of these regulations for the safe transportation of hazardous materials was a reduction of more than 78% during the 15 years following the introduction of the regulations.

## RECENT SIGNIFICANT SAFETY LEGISLATION

### FEDERAL RAILROAD SAFETY ACT OF 1970

Through the period of ICC stewardship of the railroad safety program, the Commission lacked general authority to issue regulations governing railroad safety. Rather, the Commission had been limited to enforcement of statutory provisions and implementing regulations addressed at specific subject matters, such as locomotives,

power brakes or signal systems. Railroad safety inspectors called other safety problems to the attention of the railroad, but they possessed no authority to follow through. This left major gaps in regulatory coverage.

As the FRA took over responsibilities from the ICC in 1967, the Nation faced continued rail safety problems that seemed to be exacerbated by the rapidly increasing transportation of hazardous materials in large capacity tank cars. During the late 1960's, various efforts were made to confer general regulatory authority.

By 1970 the Congress became convinced there was a need for further legislation to improve the safety on the nation's railroads. After considerable debate and consideration the 91st. Congress passed the bill on October 16, 1970. The bill's purpose was to *"promote safety in all areas of railroad operations and to reduce railroad related accidents and to reduce deaths and injuries to persons and to reduce damage to property caused by accidents involving any carrier of hazardous materials."* It gave the FRA<sup>30</sup> specific authority all over safety related matters. In addition, the bill provided legal authority to identify violations of the law and penalize violators. As a result of the Federal Railroad Safety Act of 1970 the Federal Railroad Administration has issued rules on the glazing of windows, radio use, rear end marker use, control of alcohol and drug use, track standards, freight car safety standards and operating rules to cite a few examples. This law also authorized the FRA to establish civil penalties for each violation of the regulations issued under this Safety Act, as well as the specific authority to negotiate the penalties with the railroad charged with violations. This law also provided authority for the FRA to conduct research, development, testing, evaluation and training for all areas of railroad safety.

The bill provided for the waiver by the Secretary (after a hearing) of compliance in whole or part of *"any rule, regulation, order, or standard established under this title, if he determines that such waiver of compliance is in the public interest and is consistent with railroad safety."*

The FRA was required by the bill to issue initial railroad safety rules, regulations, orders and standards within one year of the enactment of the bill. In addition, the law gave specific authority for FRA personnel to enter and inspect or examine rail facilities, equipment, rolling stock, operations and pertinent records.

Passage of the 1970 act provided the railroad safety program with a new and fundamentally different charter. That charter was the product of discussions among the railroads, rail labor, the States, and the Department of Transportation. Its major themes were:

- ◆ Broad regulatory authority to address all areas of railroad safety;
- ◆ Strong emphasis on national uniformity of safety standards;

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<sup>30</sup> The bill gave the authority to the Secretary of Transportation, who delegated it to the Administrator of the FRA.

- ◆ State participation in enforcement of National standards; and
- ◆ Effective sanctions, including the ability to address emergency situations.

The original concept behind the legislation was that FRA, as an expert body, would craft safety standards based on analysis of safety need. This would insulate the Congress from repeated requests from interest groups for further, specific legislative acts. However, the act itself represented a compromise of that principle, since the older safety laws were retained intact.

As time passed, the FRA was to be criticized for insufficiently prompt action; and the Congress would resume the prior practice of addressing specific problems through legislation. However, typically FRA was entrusted with considerable latitude in determining the manner in which specific objectives would be achieved .

## **RAIL SAFETY IMPROVEMENT ACT OF 1974**

Railroading in the early 1970's had taken a turn towards more accidents. As a result, the safety data showed 1973 to be the worst year since 1957. There had been a number of serious passenger-related accidents. The FRA came under heavy criticism for the quality and quantity of its enforcement programs (especially with regard to track related enforcement.) The 1974 law directed a new program be developed to evaluate ways to improve enforcement, inspection and investigative functions. This act was a part of the same legislation as the Hazardous Materials Transportation Act, which was enacted the same year. In addition, the potential for state participation was to be evaluated. Further attention was given to the question of hazardous materials.

## **FEDERAL RAILROAD SAFETY AUTHORIZATION ACT OF 1976**

The most important impact of this law was to amend the older safety laws to bring penalties into line with the Safety Act (\$2,500 maximum, \$250 minimum), and to revise the Hours of Service Act to add sleeping quarters provisions, as well as including signal maintainers under the law for the first time. In addition, it required issuance of rules, as necessary on blue signal protection and rear end markers.

## **FEDERAL RAILROAD SAFETY AUTHORIZATION ACT OF 1978**

This statute amended the Hours of Service Act to clarify details relating to signal service and define "designated terminal" (in the wake of conflicting appellate court opinions) and amended the Safety Act to permit States to directly seek civil penalties or an injunction if the FRA has not acted within 90 days of notification of a violation.

## **FEDERAL RAILROAD SAFETY AUTHORIZATION ACT OF 1980**

This law made a number of important revisions to previous statutes. Among the notable additions:

- a. Authorized the FRA to issue emergency orders to address an "*unsafe condition or practice*." This was required because of an earlier adverse court ruling.
- b. Prohibited the discharge of, or reprisal against, an employee for filing a safety complaint, or for refusing to work in the face of a hazardous condition under certain circumstances.
- c. Amended the Safety Act to clarify that its administrative and injunctive powers extend to the enforcement of the older safety laws such as the first Safety Appliance Act.
- d. Provided criminal penalties for false reporting.

These tools have made a positive contribution in reducing the number of accidents on the nation's railroads.

## **RAILROAD SAFETY AUTHORIZATION ACT OF 1982**

This act strengthened existing laws, but broke no new ground in the safety area. The significant modifications to the previous laws were:

- a. Amended the penalty provisions of the Safety Act to make clear it is a strict liability law.<sup>31</sup>
- b. Codified the FRA's jurisdiction over commuter and other short haul passenger services in metropolitan or suburban areas.<sup>32</sup>
- c. Modified the Safety Appliance Acts to permit a receiving carrier, under specified conditions, to move defective cars for repair.

## **RAIL SAFETY IMPROVEMENT ACT OF 1988**

On June 22, 1988, the Congress enacted Public Law 100-342, the Rail Safety Improvement Act of 1988. This law had two significant impacts on the actual operation

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<sup>31</sup>This is in response to a ruling by the 5th Circuit *Ft. Worth & Denver Railway Co. v Lewis*, 693 F.2d 432 (1982).

<sup>32</sup>This resolved the issues surrounding SEPTA's Fox Chase Line.



of trains on railroads in the United States. First, the law called for the licensing or certification of railroad engineers. In the past each railroad had developed its own standards for determining the qualifications of those employees who actually operated locomotives. Under the 1988 law the FRA was to implement a review and approval program for the standards for engineers.<sup>33</sup> In addition, the FRA was to establish minimum standards for engineers, including testing for operating rules knowledge. Secondly, this law introduced several significant changes to the regulation of safety laws and regulations on the railroads of the United States. Among these changes:

- a. Amended the older Safety Statutes to make them apply to "railroads" rather than just common carrier by rail engaged in interstate commerce.
- b. (i) Made individuals liable for civil penalties for wilful violations of the Federal Safety regulations and of specific rules and laws and,  
(ii) For demonstrating unfitness for safety sensitive service.
- c. Provided for the testing and certification of ATS, ACS and ATC systems.
- d. Prohibited tampering with locomotive safety devices.
- e. Addressed the issue of bridge safety.
- f. Required the reporting of the training of railroad dispatchers.
- g. Clairified jurisdiction over high speed rail systems.
- h. Required rules, as needed on event recorders.<sup>34</sup>

The more important items above are addressed separately, but in general it can be said this law was in response to several serious and spectacular train wrecks.

## **RAIL SAFETY ENFORCEMENT AND REVIEW ACT OF 1992**

On September 3, 1992 the President signed Public Law 102-365, the Rail Safety Enforcement and Review Act of 1992. Some of the safety related items contained in this legislation include:

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<sup>33</sup> There was considerable discussion with regard to whether or not the FRA should license engineers, or simply review and approve railroad standards.

<sup>34</sup> The law provided for extensions if a need could be demonstrated.

- a. Remedial reporting by railroads of action taken to correct safety violations
- b. Increased civil penalties
- c. A review of the power brake regulation
- d. A review of the track safety standards
- e. A review of locomotive crashworthiness and working conditions
- f. A safety inquiry on the use of radios and advanced train control
- g. Reports on the transportation of hazardous materials and train dispatcher working conditions.

## **CERTIFICATION OF ENGINEERS**

Following several fatal accidents involving misconduct on the part of train engineers, most notably the tragic wreck at Chase, Maryland involving a Conrail freight passing a stop signal and running into the path of an Amtrak passenger train. The result of this criminal conduct<sup>35</sup> on the part of the freight engineer was the worst passenger train wreck in recent years, with 16 passengers being killed and 175 injured. In the investigation that followed, the Conrail engineer was found to have been using illegal drugs, as well as having safety devices disabled. In the aftermath of this collision, there was a great public outcry for Federal standards for the qualifications of engineers as well as for random drug testing of railroad employees in positions that had a direct impact on the safety of rail travel. In the Railroad Safety Improvement Act of 1988 the Congress required the FRA to establish a program for the certification of engineers.

The FRA announced in June 1991, standards for the qualification of locomotive engineers. The rules, which were to become mandatory on January 1, 1992, required railroads to:

- a. Determine the qualifications of employees to be employed as engineers
- b. Devise and adhere to an FRA approved training program for locomotive engineers
- c. Develop and employ standard methods for identifying qualified engineers and monitoring their performance.

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<sup>35</sup> The engineer was convicted of several crimes in subsequent criminal actions.

The stated purpose of these rules was to "*minimize the potentially grave risks posed when unqualified people operate trains.*" The FRA elected to require railroads to develop certification standards. First, the wide differences in the operating conditions of the various railroads would make the development of a valid nation wide standard difficult. Second, the goal of the Federal Railroad Administration seems to have been to intrude as little as possible in the day-to-day operations of the railroads in implementing the mandate of the Congress.

## **ALCOHOL AND DRUG CONTROL PROGRAM**

The FRA began to recognize a railroad industry alcohol and drug problem in the early 1970's. In 1974, the National Transportation Safety Board (NTSB) recommended that the FRA issue a regulation prohibiting the use of alcohol or drugs prior to and while on duty. In the late 1970's the FRA decided to withhold a rulemaking effort and work cooperatively with rail labor and management on voluntary measures.

In 1979, the FRA sponsored "*Railroad Employee Assistance Project Report*" was published. The findings were based on a survey of employees on seven railroads. Major conclusions reached were that 23% of operating employees were problem drinkers and five per cent of workers reported to work very drunk or got so at least once during the study year (1978.)

In the early 1980's accident data was accumulated indicating alcohol or drug use was implicated in a series of tragic train accidents. In 1983, the NTSB issued three recommendations to the FRA concerning the inclusion of a prohibition, post-accident testing and improved reporting in the FRA safety regulatory program. The FRA responded with an Advance Notice of Proposed Rulemaking (1983), Notice of Proposed Rulemaking (1984), and a final regulation in 1985. The final regulation included the following provisions: a prohibition against on duty alcohol/drug use, possession or impairment; mandatory post-accident testing; pre-employment drug testing; reasonable cause drug and alcohol testing; employee assistance provisions; and improved reporting requirements. After delays related to litigation, the rule was implemented in February 1986. In 1989, the U. S. Supreme Court found the regulation to be constitutional.

In the late 1980's the FRA gathered additional information, pursuant to it's post accident testing program, indicating drug use contributed to a significant number of major train accidents. In response, the FRA issued random drug testing regulations that became effective in January 1990.

In 1991, the Congress passed the *Omnibus Transportation Employee Testing Act*. This legislation, known as the Hollings/Danforth Act, requires pre-employment, random and reasonable suspicion and post-accident alcohol testing in four of the transportation modes, including railroads. On December 15, 1992 the FRA joined the other modal administrations in issuing Notices of Proposed Rulemakings to implement the legislation. Final regulations were pending as this document was being prepared.

## IMPACT OF FEDERAL REGULATIONS

These laws and regulations form the basis for the system of railroad regulations that currently are applied to ensure the safe operation of railroads in the United States. To gauge the real impact of the Federal Railroad Administration's safety programs it is instructive to compare the accident statistics for 1892, the year prior to the introduction of the first Safety Appliance Act to 1992.

DEATHS IN TRAIN SERVICE 1892 - 1992\*

	1892	1992	Percentage of Change
Deaths	627	25	-250.8%

\* Excludes highway related since these accidents were not a factor in 1892.

## PROGRAM ADMINISTRATION

### THE INTERSTATE COMMERCE COMMISSION

The ICC had the initial responsibility for the development and implementation of Federal policy and regulation of the railroad industry in the United States. From the earliest safety regulations in 1903, the ICC was the agency acting on the part of the United States government in its dealings with railroad related issues including safety issues. When the first safety legislation was enacted enforcement was the responsibility of the Secretary of the Commission. The first safety inspector was appointed in 1896.<sup>36</sup> By 1908 the number of inspectors had grown to 25. On July 1, 1911 the ICC organized the Division of Safety Appliances, which became the Bureau of Safety in 1917.

### THE DEPARTMENT OF TRANSPORTATION

In 1966, the Congress passed the Department of Transportation Act creating the Department of Transportation (DOT.) This new cabinet-level department, received the responsibility of acting as the prime agency for Federal oversight and administration in the field of transportation, including rail, air, water and other ground transport. On April 1, 1967 the Department of Transportation as well as the Federal Railroad Administration came into existence. The Department ultimately assumed most of the railroad related functions of the ICC with a few exceptions such as abandonments, some right-of-way related matters and tariff issues. All safety matters formerly regulated by the ICC now came under the Department of Transportation.

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<sup>36</sup> *Interstate Commerce Commission Activities 1887 - 1937*, page 122

## **OFFICE OF SAFETY**

The Department addresses its rail related duties through the Federal Railroad Administration (FRA). The Department of Transportation works to ensure the safety of passengers, railroad workers as well as the general public through the operations of the FRA's Office of Safety. This branch of the DOT is charged with the enforcement of the various safety laws and regulations. In general, the way the United States Government implements the various railroad safety regulations is somewhat unique. From the outset, the Interstate Commerce Commission and later the Department of Transportation, have approached the subject of industry regulation from a perspective of cooperation with the railroads. The earliest railroad safety regulation was intended to make rail travel safer. The Federal regulators approached the enforcement of regulations with the goal of making railroad transportation safer..... not with the goal of finding fault for the sake of finding fault. The intent continues to be to help the regulated railroads to comply with the various regulations and to help find ways to make rail operations safer. Unusual among Federal agencies, the FRA's inspectors are normally former railroad employees with extensive experience in the railroad industry. The inspectors' railroad background provide them valuable insights into the actual operational problems faced by the industry they inspect. The inspectors come from both labor and railroad management, thereby ensuring a wide overview of the industry. The FRA is assisted in it's inspection and enforcement effort by a cadre of state inspectors who enforce FRA regulations

The FRA divides the safety inspection function into five general areas: motive power and equipment, track, signal and train control, operating practices and hazardous materials.

## **MOTIVE POWER AND EQUIPMENT**

Inspectors in this discipline enforce the Federal safety standards for locomotives and other rolling stock. This includes periodic inspections and tests of locomotives and cars and the review of compliance with standards for component wear. In addition, the inspector establishes corrective actions required in the event of the discovery of noncompliance. They review the condition of safety appliances on locomotives and rolling stock. The inspector ensures power brakes are in good operating order and of the prescribed type. These inspectors are also charged with the enforcement of safety glazing standards on locomotives, passenger cars and cabooses, as well as the rear end marking rules. The equipment and rolling stock inspector also has responsibility for enforcement of the noise emission rules as well as blue flag regulations.<sup>37</sup> With almost 30,000 locomotives and many times that number of rail cars in service the job of ensuring safety standards is met is a challenging one. While rail passengers represent a much smaller segment of the traveling public than they did 40 years ago, ensuring their safety is one of the major concerns of the FRA's Office of Safety. The careful inspection of passenger motive power and rolling stock contributes significantly to the high level of safety enjoyed by today's rail traveler. The work of the Motive Power and Equipment inspector

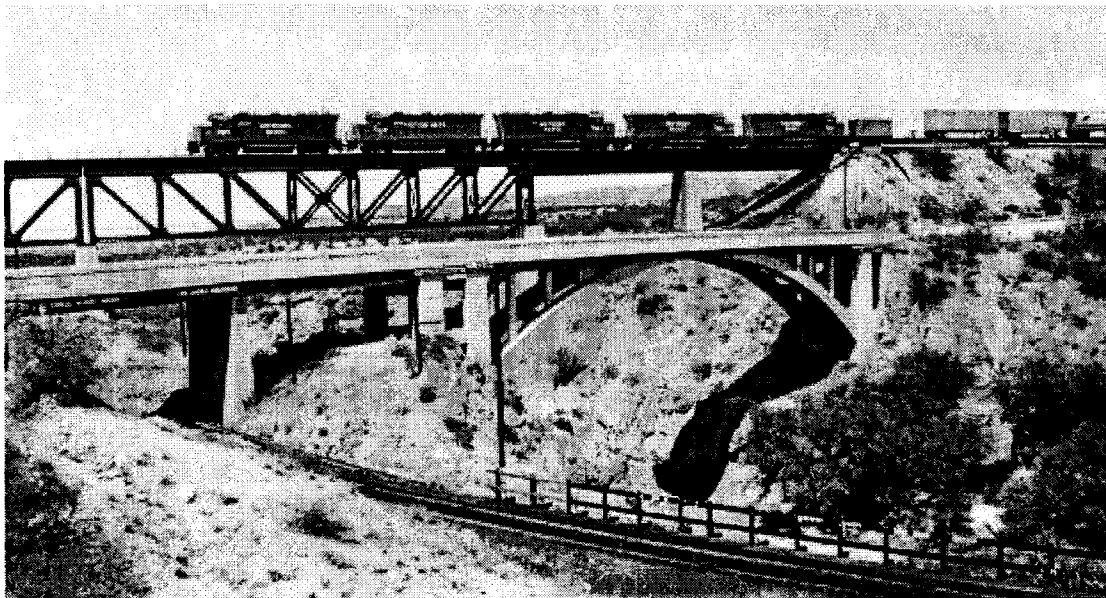
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<sup>37</sup>The "Blue Flag" rule is a safety regulation designed to prevent the movement of locomotives and rolling stock while workers are working on or under the equipment.

is particularly difficult since the equipment is constantly moving from one place to another, making follow up inspections almost impossible. In recent years the MP&E inspectors have started using computers to assist them in their work. After capturing data, the computer uses the information to identify areas in need of enhanced inspection.

## TRACK

The Congress has charged the FRA with the enforcement of safety regulations governing railroad track in the United States. The FRA has prescribed safety standards for all railroad track used in interstate commerce. The standards published direct minimum conditions for track safety. In addition, speed restrictions for track in various classification are established by the FRA. To ensure the track is maintained at the levels required by the classification established for that particular segment of track, FRA track inspectors inspect all lines at least once per year. Track that is considered to be on a key line (e.g., passengers or significant amounts of hazardous materials) is inspected at least twice per year. These requirements are a minimum and are often exceeded in actual practice.



Fast trains such as this one demand high standards of maintenance of motive power and equipment well as track and signal systems.

Robert C. Del Grosso Photo

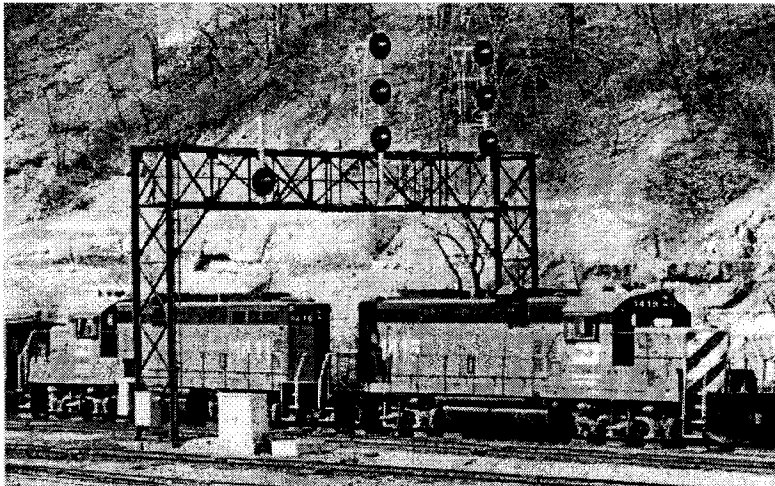
Track inspectors also participate in the investigation of wrecks, accidents, derailments and other incidents to determine any part played by track in the matter under investigation. Among the key roles of the track inspector is that of teacher. Since these employees of the FRA are experienced railroaders, they also spend time teaching railroad employees about the Federal safety requirements. Further, they assist the railroad maintenance forces, when violations are discovered, by showing them how they can most easily comply with the governing regulations. Again, the goal of the FRA inspector is to help ensure the safe operations of the railroad.

## TRACK CLASSIFICATION

CLASS OF TRACK	MAXIMUM SPEED - FREIGHT	MAXIMUM SPEED - PASSENGER
Class 1 Track	10 m.p.h.	15 m.p.h.
Class 2 Track	25 m.p.h.	30 m.p.h.
Class 3 Track	40 m.p.h.	60 m.p.h.
Class 4 Track	60 m.p.h.	80 m.p.h.
Class 5 Track	80 m.p.h.	90 m.p.h.
Class 6 Track	110 m.p.h.	110 m.p.h.

## SIGNALS AND TRAIN CONTROL

The FRA prescribes minimum standards for the design, installation, maintenance and testing of signal systems and train control systems. Signal and train control inspectors conduct periodic inspections of signal equipment to ensure it functions as it is designed to function, and that the system is in good working order. The vital importance of this work speaks for itself. The signal



The maintenance and proper operation of signal systems is of prime importance to the safety of passengers and goods transported by rail. Robert C. Del Grosso photo

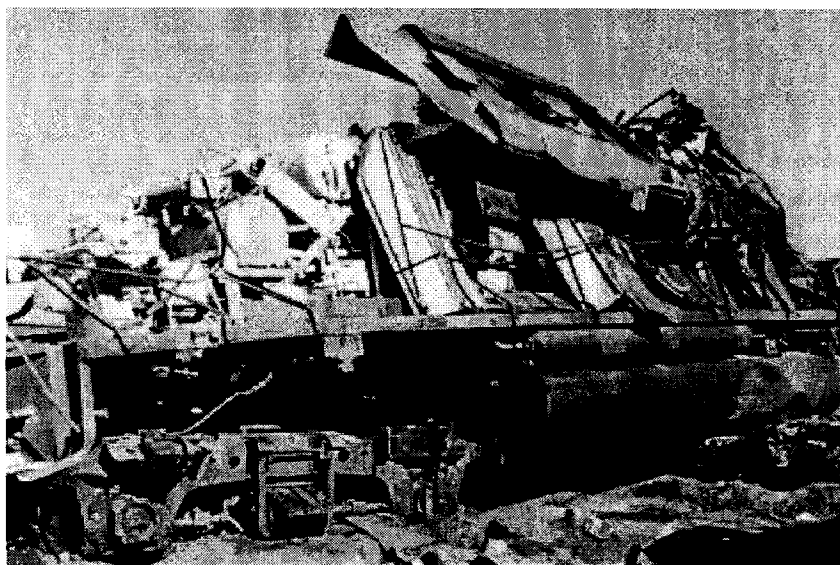
systems used by the railroads in the United States are the key to rapid and orderly movement of trains especially on congested high traffic routes. In addition, signal inspectors prepare reports and recommendations for the FRA staff on railroad's requests to modify or remove signal systems. These recommendations and reports become, in part, the basis for the decision to approve or reject the railroad's request. Inspectors also work with the various railroads to help them develop plans for signaling systems that will comply with Federal requirements.

As technology has advanced, the radio has increasingly come into use for the control of train movements. The radio is especially well adapted to use outside busy metropolitan areas. Radio usage by railroads is monitored by the FRA, and the signal inspector has the duty of ensuring the proper use of radio by railroads.

## OPERATING PRACTICES AND RULES

Various Federal statutes direct the Federal Railroad Administration with regard to establishing and enforcing rules and standards for operating rules and practices. The FRA is charged with establishing minimum standards for operating rules to ensure the safe operation of America's railroads. To implement this requirement, the railroads are required to file their operating rules with the FRA. Further, the industry is required to provide employees with periodic and ongoing instruction on their rules. An area of growing importance to the safe operation of railroads in the United States, two-way radio is also regulated by the FRA, as is the matter of hours of service. In addition, programs to control the use by key employees of alcohol and drugs falls under this classification.

The operating practice (OP) inspectors assigned to enforce this category of rules and regulations are responsible for reviewing the hours worked by railroad employees covered by the Hours of Service regulations, and ensuring railroaders do not exceed allowable tours of duty. A



When safety programs fail..... this pile of junk was a new GM Corp. GP 60

recent addition to the duties of FRA staff members working these areas is the program for *Control of Alcohol and Drug Use in Railroad Operations* (also called "alcohol and drug rules") These programs provide for the testing of employees for drug and/or alcohol use in the event of an accident, as well as under other certain conditions, including pre-employment testing. FRA personnel work with railroad officials to ensure the industry's drug and alcohol control programs comply with published Federal standards. OP inspectors also ensure the various railroad's radio operations are in conformance with published standards, particularly important to the overall safe operation of railroads, since the radio is increasingly being used by dispatchers to control train movements.

## HAZARDOUS MATERIALS

In 1967, authority to regulate the transportation of hazardous materials was transferred from the ICC to the Department of Transportation. Within DOT, separate modal administrations were retained to preserve organizational continuity; the FRA was charged with responsibility for rail transportation safety matters. A separate



entity, the Hazardous Materials Regulations Board, was created by the Secretary to coordinate hazardous materials activities within the Department.

The 1975 enactment of the Hazardous Materials Transportation Act (HMTA) improved Departmental regulatory and enforcement activities by giving the Secretary of Transportation authority to establish regulations to govern any safety aspect of the transportation of hazardous materials which the Secretary deems necessary or appropriate. Shortly after passage, the Secretary created the Materials Transportation Bureau (MTB) within the Research and Special Programs Administration (RSPA). MTB was named the lead DOT agency for issuing hazardous materials regulations pertaining to all transportation modes. Enforcement authority was divided between the MTB and the modal administration. In 1986, the MTB was abolished and its hazardous materials functions vested in the Office of Hazardous Materials Transportation and the RSPA Administrator.

The goal of the FRA's Hazardous Materials Program is to reduce societal risks associated with the transportation of hazardous materials by railroad. This goal is accomplished through a variety of compliance tools consisting of education, inspection, system assessments and enforcement. FRA's hazardous materials inspectors enforce regulations covering car placement in trains, equipment standards, placarding and safety systems.

FRA also investigates accidents involving the release of hazardous materials and provides emergency response personnel and local authorities with the requirements for hazardous material documentation, marking, labeling, placarding, and handling and in-train placement of hazardous materials rail cars. Emergency response personnel and local authorities use this information to plan for emergencies related to the transportation of hazardous materials by rail.

## **SUCCESS OF FEDERAL SAFETY PROGRAMS**

There can be little question that the first Safety Appliance Act, in the 100 years since its enactment, has saved tens of thousands of lives and prevented hundreds of thousands of injuries. In addition, a vast amount of property loss has been prevented by the Safety Appliance Act and the other laws and regulations that followed. Although no one will ever know how many people have benefited from these statutes, it seems fair to say almost every American has profited from these acts.

Some examples of the success of the Federal Railroad Administration's programs to support the railroads safety efforts can be seen by the fact that during the 12 year period, 1979 to 1991, overall accident rates have fallen 62.8%. Track-and equipment-related accidents have fallen 75.2% and in-service deaths for railroad employees have declined more than 46%.

In 1893, when the first Safety Appliance Act became law, railroading was the second most dangerous vocation in the United States, second only to coal mining. Today, workers on America's railroads work in conditions that are no more dangerous than other heavy industrial occupations. In addition, the railroads safely transport large quantities of hazardous materials that were unknown 100 years ago. Today's trains are longer, faster and heavier than those in the 1890's. With the higher speeds and heavier trains there is a greater potential for damage and loss of life in accidents. The success of the Congress, ICC, FRA, railroads, labor organizations and suppliers in making the rail lines of the United States safer reflects great credit on these groups and organizations, as well as on the willingness of all of these groups to work towards a common goal.....the safety of the workers, the passengers and the general public.

The ability of the FRA to play its part in making America's railroads safer is a result of the hard work and dedication of the actual inspectors working at the local level with the employees of the various railroads. These men and women do the daily job of ensuring the safe operations of trains by railroad employees. As railroading becomes more and more technologically advanced, there will be a growing requirement for the establishment of standards for an increasingly interdependent railroad industry. These standards will have to be developed by the Federal Railroad Administration, in consultation with the railroads, employee representatives, participating state governments, railroad suppliers and other interested groups and individuals in the United States. Only in this manner can the industry move into 21st. century railroad technology in a planned way and move into the new century with an even safer environment for workers, passengers and the general public.