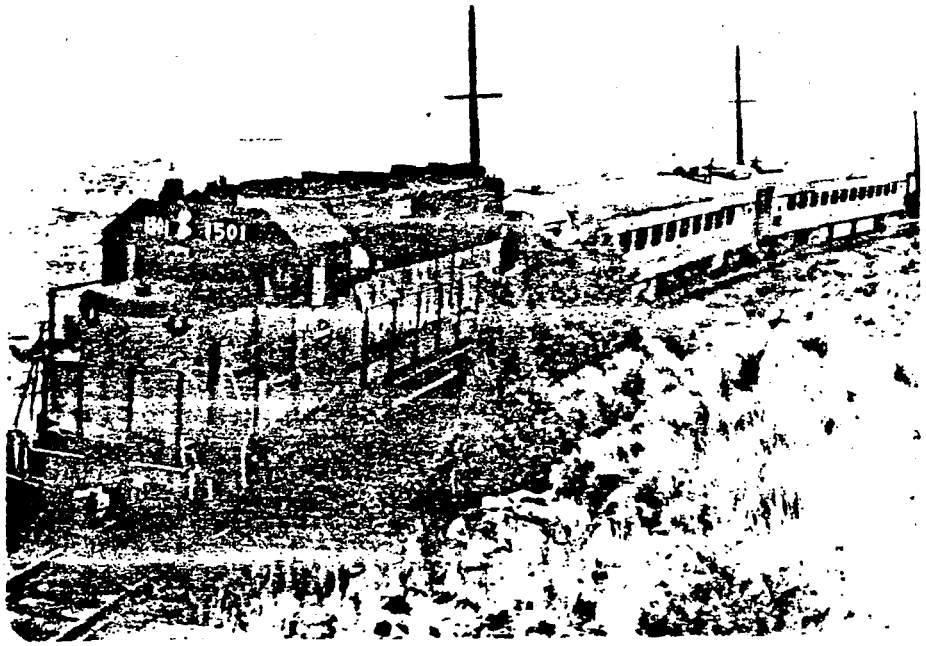
FEDERAL RAILROAD SAFETY ACT OF 1970
Annual Reports on Implementation
(1970-1984)

U.S. Department
of Transportation
**Federal Railroad
Administration**

The President's 1979 Annual Report

To the Congress on the administration of the Federal Railroad Safety Act of 1970



June 1980

The following is extracted from Section 211 of Public Law 91-[illegible], dated October 16, 1970:

SEC. 211 ANNUAL REPORT.

(a) The Secretary shall prepare and submit to the President for transmittal to Congress on or before May 1 of each year a comprehensive report on the administration of this title for the preceding calendar year. Such report shall include, but not be restricted to

(1) a thorough statistical compilation of the accidents and casualties by cause occurring in such year;

(2) a list of Federal railroad safety rules, regulations, orders, and standards issued under this title in effect or established in such year;

(3) a summary of the reasons for each waiver granted under section 202(c) of this title during such year;

(4) an evaluation of the degree of observance of applicable railroad safety rules regulations, orders, and standards issued under this title;

(5) a summary of outstanding problems confronting the administration of Federal railroad safety rules, regulations, orders, and standards issued under this title in order of priority;

(6) an analysis and evaluation of research and related activities completed (including the policy implications thereof) and technological progress achieved during such year;

(7) a list, with a brief statement of the issues, of completed or pending judicial actions for the enforcement of any Federal railroad safety rule, regulation, order, or standard issued under this title;

(8) the extent to which technical information was disseminated to the scientific community and consumer-oriented information was made available to the public;

(9) a compilation of-

(A) certifications filed by State agencies under section 206(a) of this title which were in effect during the preceding calendar year, and

(B) certifications filed under section 206(a) of this title which were rejected, in whole or in part, by the Secretary during the preceding calendar year, together with a summary of the reasons for each such rejection, and

(10) a compilation of—

(A) agreements entered into with State agencies under section 206(c) of this title which were in effect during the preceding calendar year, and

(B) agreements entered into under section 206(c) of this title which were terminated by the Secretary, in whole or in part, during the preceding calendar year, together with a summary of the reasons for each such termination.

(b) The report required by subsection (a) of this section shall contain such recommendations for additional legislation as the Secretary deems necessary to strengthen the national railroad safety program.

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Section I

Executive Summary

This report summarizes the efforts of the Department of Transportation (DOT) and the Federal Railroad Administration (FRA) during calendar year 1979, to improve railroad safety, principally through the administration of the Federal Railroad Safety Act of 1970, 45 U.S.C. 421 et seq.

The number of reportable railroad accidents decreased from 11,277 in 1978, to 9,740 in 1979. This decrease may be attributable in part to the adjustment of the accident reporting threshold from $2,300 for 1977 and 1978, to $2,900 for 1979. In the past, the threshold has been adjusted every two years to account for inflation; however, beginning in 1981, the reporting threshold will be adjusted yearly.

FRA performed system-wide assessments during 1979, on the Chicago, Rock Island and Pacific Railroad, the Illinois Central Gulf Railroad, and the Louisville and Nashville Railroad (L&N). These assessments covered all aspects of railroad operations and produced some dramatic results. As an example, FRA's assessment of the L&N, in conjunction with Emergency Order No. 11, led to a 42 percent reduction in the total number of accidents on the L&N for 1979.[1]

Revised Freight Car Safety Standards and Safety Glazing Standards-Locomotives, Passenger Cars and Cabooses were issued by FRA on December 31, 1979.

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[1] A detailed explanation of Emergency Order No. 11 is contained in Section II of this Report.

There were five major areas of significant research and development projects for calendar year 1979. They were: rolling stock safety, human factors in railroad operations, grade crossing safety, track safety and inspection, and test support activity. The rolling stock safety program included projects in hazardous material transport, component failure prevention, locomotive dynamics, occupant protection and track-train dynamics. In the human factors area, FRA funded a study which detailed the extent and impact of alcohol abuse in the railroad industry. The grade crossing safety program included research in developing concepts for effective and credible train detection devices and the means for enhancing train conspicuity at rail-highway crossings. Track safety research included analytic and development projects in track lateral restraint, longitudinal rail force measurement, parametric studies of vehicle track interaction, and rail integrity.

Work continued during 1979, on the development of FRA's System Safety Plan (SSP). This plan, which will integrate all of FRA's efforts to improve safety, is scheduled to be submitted to Congress by January 31, 1981.

Section II

Evaluation of Compliance

FRA inspection activities focus on five major aspects or disciplines: track, operating practices, motive power and equipment, signal and train control, and hazardous materials. The activities in each of these disciplines involve accident/incident investigations, complaint investigations, routine inspections, petition and application investigations, and follow up investigations.

Inspection

FRA's primary inspection emphasis has been placed on monitoring carriers' field activities and enforcing Federal safety regulations. FRA inspectors determine if a carrier has complied with the regulations. If it has not, a judgment must be made by the inspector as to the appropriate remedial action needed to affect compliance. In petition and application investigations, the FRA must determine whether an exception to compliance with a Federal regulation should be granted to the carrier requesting the exception.

The inspection process is designed to detect defects before they become serious enough to cause damage or violate the regulations. This process also provides the carriers with information as to where preventive maintenance and/or the modification or redirection of other operating practices may be necessary. Each carrier's individual inspection system is monitored internally by management; effectiveness is gauged by a reduction in accidents.

FRA and state safety inspectors monitor the adequacy of a railroad's inspection activities by conducting spot inspections of the carrier's inspection operation.

By the end of 1979, the number of Federal safety supervisors and inspectors had increased to a total of 293. The following chart shows comparative figures for 1978 and 1979, of FRA field inspection staff by discipline:

Supervisory and Inspection Field Staff

Discipline	12/31/78	12/31/79
Directors of Railroad Safety	8	8
Motive Power & Equipment Inspectors	98	109
Operating Practices Inspectors	46	47
Track Inspectors	59	75
Signal & Train Control Inspectors	31	31
Hazardous Materials Inspectors	22	23
Total	264	293

During 1979, additional Regional Offices of Safety were established in Boston, Portland, and Kansas City. This brings the number of FRA safety regions to a total of eight, in an effort to improve communications and strengthen the overall safety program.

Compliance and Enforcement Program

The poor economic condition of the industry and the resultant long-term deferred maintenance of track, roadbed, and other factors have caused FRA to accelerate its compliance and enforcement program until permanent solutions can be developed. This program incorporates the use of three short-range

activities. The first is the use of administrative orders and penalties to bring carriers who persistently violate regulations into conformity with safety standards. The second is the identification of dangerous conditions or practices which have been ignored, and an insistence that accountability systems be instituted to prevent a repetition of the problem. Finally, the increased emphasis on predicting developmental problems is an effort to compel remedial action by the carriers before major disasters occur.

During calendar year 1979, FRA collected $7,549,832 for violations of Federal rail safety statutes, including fines levied under the Hazardous Materials Transportation Act of 1974, 49 U.S.C. 1809. Civil penalties for violations of the Hazardous Materials Transportation Act alone totaled $634,020, an increase of 167 percent over 1978. On August 21, 1979, FRA commenced its first administrative hearing under this statute for an alledged violation of the Act involving the filling and dispatching of tank cars. The presiding Administrative Law Judge rendered a decision in FRA's favor and the decision is currently under administrative appeal.

On February 7, 1979, FRA issued Emergency Order No. 11 against the Louisville and Nashville Railroad Company (L&N). This action was prompted by the L&N's increasingly poor accident history, a pattern of unsafe conditions and practices on L&N property, and a marked increase in the number of accidents involving hazardous materials. The order placed restrictions on the transportation of hazardous materials on the L&N and required the carrier to take certain remedial measures in the area of track maintenance.

The administration of the emergency order involved extensive and intense litigation, as well as active discussions between the L&N and the FRA. These discussions were directed toward eliminating the problems which necessitated the order.

The litigation went through several phases. On February 26, 1979, a divided panel of the U.S. Court of Appeals for the District of Columbia Circuit temporarily stayed that portion of the order which limited to 30 mph the speed of trains which were hauling railroad cars containing hazardous materials. It was not until April 4, 1979, that the full Court of Appeals overturned the panel's decision and reinstated the emergency order, pending proceedings on the merits in the lower court. On June 15, 1979, prior to completion of the administrative review proceedings, the U.S. District Court for the District of Columbia declared Emergency Order No. 11 as invalid. FRA appealed the decision and requested a stay, pending appeal. This request was denied by a two-to-one vote of a panel of the U.S. Court of Appeals for the District of Columbia on August 1, 1979. Very early in 1980, FRA sought dismissal of its appeal on the ground that the L&N had made material safety improvements in response to the order and FRA assessments, and there was no further need for restrictions on a system-wide basis.

During 1979, no new cases were referred to the Department of Justice regarding the enforcement of any Federal railroad safety rules, regulations, orders, or standards. However, two cases were still pending in the Federal courts during 1979.

1980

Association of American Railroads v. Adams
(Civil No. 78-1961, D.D.C., 1978) In this case, the Court granted FRA's motion for summary judgment in a suit brought by the AAR, which contended that FRA regulations on rear end marking devices (49 CFR 221) were arbitrary and capricious in their failure to permit the use of passive marking devices. The AAR appealed this ruling to the U. S. Court of Appeals for the District of Columbia Circuit. Oral argument was held on September 27, 1979, and shortly thereafter, the D.C. Circuit affirmed the District Court's ruling without opinion.

United States v. Penn Central Transportation Company
(Civil No. 78-3036, 6th Circuit) The U. S. District Court rendered a decison in FRA's favor [445 F. Supp. 561 (N.D. Ohio 1977)] stating that deadheading, traveling to an outlying work location, by private automobile constitutes on-duty time within the scope of the Hours of Service Act [45 U.S.C. 61(C)], as interpreted by FRA.

Railroad Assessments

FRA performed system-wide safety assessments during 1979, of the Chicago, Rock Island and Pacific Railroad; the Illinois Central Gulf Railroad; and the Louisville and Nashville Railroad (L&N). These assessments covered all aspects of railroad operations, motive power and equipment programs, and track conditions. The operating practices analyses included evaluation of the railroad's operating rules, training, efficiency testing programs, and safety program management.

The motive power and equipment evaluation focused on equipment availability and condition, the qualifications and training of personnel at repair points, the adequacy of repair facilities, and on maintenance and inspection procedures. The track assessment evaluated the carrier's track by the Federal Track Safety Standards (49 CFR 213), as well as the general condition of the track and the ability of its components to adequately carry both present and projected levels of rail traffic. Carrier inspection and maintenance programs were also included in FRA's assessment.

This method of concentrated monitoring produced some dramatic results. For example, FRA's assessment of the L&N in conjunction with Emergency Order No. 11 led to a 42 percent reduction in the total number of accidents on the L&N during 1979. Reportable damages decreased from $22.7 million in 1978, to $13.1 million in 1979. Fatality and injury figures for the L&N showed that exceptional progress was made. There were no fatalities during 1979, compared to 21 in 1978; injuries declined from 84 in 1978, to 19 injuries for 1979.

FRA initiated an assessment of Amtrak's train operations in the Northeast Corridor between Washington, D.C. and Boston, Massachusetts during 1979. In addition, numerous meetings were held with officials of Amtrak's mechanical division to discuss Amtrak equipment problems, as well as the development of acceptance tests for new locomotives which will be put into service during 1980.

Rules and Regulations

The responsibility of FRA's Office of Safety is to plan, develop, and administer an effective and comprehensive program which will achieve safe operating and mechanical practices in the railroad industry. This program includes the enforcement of Federal railroad safety laws and related regulations, which are designed to promote railroad safety as they affect employees, travelers, and the general public.

The FRA has been granted broad regulatory and administrative authority to identify and address all areas of railroad safety. As such, the FRA proposes and promulgates regulations governing many aspects of rail safety. Technical changes and various other developments in the rail industry require regulatory changes. Railroad safety rules, regulations and proposals are contained in Title 49 of the Code of Federal Regulations, Parts 200 through 299.

In response to Executive Order 12044, FRA conducted five two-day hearings as a first step toward improving both existing and future rail safety regulations.[1] This series of hearings was completed in 1979.

On January 5, 1979, FRA issued a "Notice of Proposed Rulemaking" which represented a complete revision of the Railroad Freight Car Safety Standards (49 CFR 215). The previous standards had been in effect since their initial introduction in 1974.

A public hearing on the proposed revision was held on March 7, 1979, and a general public discussion was held on the issues developed in the proposed revisions to the regulation. FRA's

[1] On March 23, 1978, Executive Order 12044 was issued by the President, setting basic goals for Federal agencies to improve existing and future regulations.

primary goal has been to eliminate those regulations dealing with maintenance, and which are derived in part from industry practices of several years ago. This allows for concentration on the safety performance of the railroads, rather than on the means used to achieve safety.

The revised freight car standards delete the periodic inspection requirement, but do require an initial inspection of all freight cars. Further, the new rule eliminates the specific lubrication schedules for plain and roller bearings. Also, the new regulation requires the installation of safety hangers for boxcar doors, a valuable industry-initiated idea which FRA felt should be incorporated into the new requirements.

The final rule was issued on December 31, 1979, and became effective on March 1, 1980. Petitions for reconsideration of the final rules were filed by the Association of American Railroads and the Railway Labor Executives Association.

The issuance of the Railroad Locomotive Safety Standards and Locomotive Inspection was delayed during 1979, but was issued early in 1980 (49 CFR 229 and 230).

Appendix B contains a complete listing and brief explanation of other safety regulations and proposed regulations issued during 1979.

Accident Trends

The total number of reportable railroad accidents decreased in 1979 to 9,740 as compared with a total of 11,277 accidents in 1978. This decrease is attributable in part to the adjustment of the accident reporting threshold from $2,300 for 1977 and 1978, to $2,900 for 1979. The current reporting threshold was adjusted to conform with current inflation factors, in accordance with 49 CFR 225.19(c).

Track-caused accidents accounted for 41.6 percent of the total number of railroad accidents in 1979, equipment-related accidents comprised 18.6 percent, human factors caused 27.3 percent, with the remaining 12.5 percent due to miscellaneous causes. Miscellaneous causes include grade crossings, vandalism, interaction of lateral/vertical forces, and "acts of God."

Rail-highway crossing accidents at public crossings accounted for 65 percent of the total fatalities and 30 percent of the total injuries during 1979. In 1978, there were 12,441 rail-highway crossing accidents resulting in 1,018 fatalities and 4,260 injuries. These figures decreased to 11,552 accidents, 834 fatalities, and 4,172 injuries for calendar year 1979.

During 1978, 228 railroad cars released hazardous materials. Figures for 1979, show that only 165 cars released hazardous materials due to accidents, a 28 percent reduction over figures for 1978. Of the total number of railroad cars that carried hazardous materials during 1978, .3 percent released such materials; last year, it decreased to .2 percent. During 1978, 24 fatalities were attributed to accidents involving hazardous materials; there were no fatalities caused by hazardous materials releases in 1979. Further, there was a 93 percent reduction in the number of injuries caused by accidents involving hazardous materials. Figures for 1978, show 221 injuries, while there were only 15 such injuries in 1979. The number of people who had to be evacuated as a result of hazardous materials releases declined by 38 percent from 25,981 persons to 16,093 persons in 1979. These figures do not include rail-highway statistics.

Detailed statistical information on all railroad accidents which occurred during 1979, is contained in Appendix A. Each table provides information on accident causes, detailed casualty statistics, and accident damage figures.

Section III

Research and Technical Advances

During 1979, the five major areas of significant research and development projects were rolling stock safety, human factors in railroad operations, rail-highway crossing safety, track safety and inspection, and test support activity.

Rolling Stock Safety

The Rolling Stock Safety Program includes projects in hazardous material transport, component failure prevention, locomotive dynamics, occupant protection, and track-train dynamics. During 1979, work in the hazardous materials area included testing and analysis to determine the response of spent nuclear casks in fires, and the development of on-board alarm systems designed to detect a release of hazardous materials.

The continuing goal of the component failure prevention project is to reduce the number and severity of accidents resulting from the failure of rail car components such as wheels, axles, bearings, side frames, and bolsters. This means developing performance specifications and guidelines for the design of vehicle components which will be less prone to failure, as well as for techniques and mechanisms which predict, detect, and react to those failures which do occur. Activities in this area include determining the service lives of vehicle components, the service loads encountered by vehicle components in revenue service, and the feasibility of on-board devices which would detect overheated bearings and derailments.

During 1979, work continued with an emphasis on translating test results into specific recommendations for revising the Railroad Freight Car Safety Standards (49 CFR 215). FRA conducted a congressionally mandated study on the relationship of the size, weight, and length of rail cars to the safety and efficiency of rail transportation.[1] The aim of this study was to isolate the benefits, as well as the problems, which can directly or indirectly be attributed to the increasing size, weight, and length of freight cars. This study also suggested possible approaches to solving the problems which were identified.

In the area of occupant protection, work is directed at reducing injuries and fatalities sustained by rail vehicle occupants in collisions and derailments.

Previously developed performance specifications for window glazing materials to protect passengers and crew members from bullets, rocks and other projectiles became the basis for a new proposed regulation in 1979. FRA also developed a concept for reducing the severity of train to train collisions. Small-scale head-on collisions at 25 mph indicated that this concept is effective. Small-scale tests at higher speeds and full-scale tests are planned for the near future.

The FRA continued to participate in the joint Track-Train Dynamics Program with the member railroads of the AAR, the Railway Progress Institute, and the Transportation Development Commission of Canada. During 1979, projects were completed on the effects of track parameters on harmonic roll motions, fatigue data analysis, and wheel thermal and mechanical load environment characterization.

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[1] Issues and Dimensions of Freight Car Size: A Report by the Secretary of Transportation for the United States Congress, March 1980.

Human Factors

The FRA funded a study which detailed the extent and impact of alcohol abuse in the railroad industry and made recommendations for addressing the alcohol problem. In December 1979, FRA published a report, entitled "Prevalence, Costs and Handling of Drinking Problems on Seven Railroads," which was researched by the University Research Corporation.

There is evidence that employee drinking contributes to railroad accidents, but this has not been adequately investigated. Employee drinking most notably incurs costs to the railroads in terms of employee productivity, absenteeism, illness, and labor-management disputes.

The FRA agrees with the conclusions of the University Research Corporation's study of seven railroads, that the mechanisms capable of bringing on-the-job drinking under better control are already present on the seven railroads. However, they are not currently being properly used or adequately supported. Further, job-related drinking problems should be addressed by voluntary company efforts and the Federal Government should confine itself to supporting these efforts, at least for the time being.

The study recommended that FRA and the railroad industry should document and control the impact of employee drinking on railroad safety. Further, railroad companies should reform the application of their drinking rules while developing an employee assistance program to support disciplinary measures. The report also recommended that FRA support the development of employee assistance programs through the delivery of technical assistance, the development of training, and through additional research on alcohol and drug abuse in the rail industry.

In September 1979, the FRA awarded a contract for the design, fabrication, and installation of a Research Locomotive and Train Handling Evaluator. When fully operational, the facility will be FRA's primary experimental tool for evaluating train accidents which are influenced by human factors. It will be used to conduct experiments simulating in-service conditions, allowing evaluation of the effect of train handling in different locomotive cab environments, on selected real-time train performance indicator/aids, on various train handling controls and techniques, and on train handling effects for a number of accident variations.

Very few railroad employee injuries or fatalities occur in train accidents. Most occur in train yards and shops where heavy equipment is used. A large number of the casualties are sustained by workers who perform routine tasks in, around, or on locomotives or rail cars.

In 1977, a contractor was selected to determine the personal injury risk potential associated with work performance around rail equipment. The risks or hazards have been categorized and ranked in terms of their severity, and recommendations for the development of countermeasures are being made. The first in a planned series of studies will focus on train and engine-worker job categories and will expand to other classes of employees.

Rail-Highway Crossing Safety

The Rail-Highway Crossing Safety Program includes research in the areas of developing concepts for effective and credible train detection devices and the means for enhancing train conspicuousness at rail-highway crossings. Train detection research, as well as other research for warning motorists, is included in a joint program with the Federal Highway Administration (FHWA). The Association of American Railroads

(AAR), the Railway Progress Institute, and the Brotherhood of Railroad Signalmen are actively involved in the program. Program research dealt with locomotive conspicuity, rail-highway crossing injury minimization, and warning systems.

Work in the area of locomotive conspicuity involved securing the cooperation of four railroads to equip varying numbers of their locomotives with strobe lights and then to collect comparative safety effectiveness and strobe light maintenance data. In 1979, data covering one full year, which compared strobe-equipped and non-equipped locomotives, became available for three of the four railroads.

The one-year measurement period was too short to determine whether strobe-equipped locomotives have fewer accidents than those without strobes. Before a relationship is established, further data collection and analysis is necessary. The data failed to show that strobe lights are effective in reducing accidents, due to significant maintenance problems with the strobe equipment. As a result, alternate types of locomotive illumination are being explored.

FRA continued participation in a joint program with FHWA regarding off-track train detection, constant warning time, and active advance crossing warning devices.

The FRA, in cooperation with the FHWA, sponsored research at the Transportation Research Center at Cambridge, Massachusetts, which led to the development of a resource allocation model. This model is intended for use by state and railroad program managers in reviewing rail-highway crossings for warning device upgrade consideration. The model produces specific recommendations regarding the installation of automated warning devices. Cost and effectiveness data were gathered and documented as part of the resource allocation model's development. TSC is documenting accident prediction formulas to complete the model.

Track Safety and Inspection

The continuing goal of the Improved Track Structures Research Program is to produce recommendations which, when implemented, will lead to a reduction in the number of track-caused train accidents. Attainment of this goal is based on the development of track performance safety standards which may be more effective in preventing derailments than the current "design-type" standards. As research results become available through the program, recommendations are offered to FRA's Office of Safety. New approaches are continually being developed through the cooperation of the Office of Safety and the railroad industry for the eventual formulation of performance standards.

A variety of analytic research and development projects were conducted in 1979, to support proposed improvements in track safety regulations. These projects included testing in track lateral restraint, longitudinal rail force measurement, track strength measuring, specific performance standard development, and parametric studies of vehicle track interaction.

During 1979, analyses data were oriented toward isolating information which would permit a preliminary design of the Stability Assessment Facility for Equipment (SAFE). SAFE will be a standardized test track, designed to give the railroads and equipment manufacturers an opportunity to better evaluate new car and locomotive models before they enter revenue service.

A continuing goal of the Facility for Accelerated Service Testing (FAST), located at DOT's Transportation Test Center in Pueblo, Colorado, is the durability testing of track and vehicle components. Useful track safety data are continuously being accumulated, especially in the area of rail defect occurrence. Rail flaw growth has been carefully followed and adequate data have emerged which will help to define a safety standard for rail inspection frequency.

In 1979, the Office of Safety monitored the operation of three automated towed track geometry vehicles and one highway-rail vehicle. A need for improved performance in several areas was noted and corrective actions were taken. The resultant designs were incorporated into the existing systems and into the systems now under construction.

Further, procurement was initiated for a self-propelled rail vehicle to replace one of the three existing towed inspection vehicles. Design efforts were initiated for a track geometry measuring system to be installed on the self-propelled vehicle to insure reliability, lowered maintenance, lower operating costs, and ease of operation.

A rail-highway vehicle (RFDV #3) was developed to support Office of Safety inspection requirements on low-speed branch lines. A rail flaw detection system using B-SCAN techniques was also developed. FRA's Office of Safety has secured a contract with the Transportation Systems Center in Cambridge, Massachusetts, to evaluate the system. The system is being evaluated to permit faster inspection speeds, more accurate and reliable rail flaw identification, and improved rail flaw presentations to the vehicle operator. The evaluation is scheduled for May through July of 1980.

Test Support Activity

The detection of faulty rail vehicle components and unsafe performance characteristics is vital to FRA's effort to reduce the number of accidents caused by component failure. Wheels, bearings, and dynamic performance have been the major factors in component-related accidents. To investigate better detection methods, FRA established the Wayside Detection Research Facility (WDRF) at the Transportation Test Center in Pueblo, Colorado.

The WDRF currently has a test siding with 1,500 feet of tangent track, a research van overlooking the entire siding, and eight sensor systems. The instrumentation and equipment integrate the sensor system response signals, generate consolidated defect reports, and provide operation system control.

The benefits which are anticipated from the application of wayside detection technology for rail vehicle inspection include fewer derailments, reduced inspection and maintenance costs, a reduction of the requirements for manual inspections, and an improvement in the detection and reporting of suspected unsafe conditions.

Information Dissemination

The Railroad Research Information Service (RRIS) collects the results of worldwide research and makes them available to railroad companies, equipment manufacturers, research organizations, colleges and universities, and FRA. Safety research results are furnished to the Transportation Research Board on a voluntary basis for inclusion in the RRIS. The RRIS data files currently contain almost 19,500 railroad technical literature references and were increased by approximately 2,400 references in 1979.

Appendix D lists the technical studies on railroad safety research published by the FRA during 1979, which are available to the public through the National Technical Information Service, located in Springfield, Virginia.

Section IV

State Participation Program

FRA's approach to the administration of the State Participation Program must follow the directives stated in Section 206 of the Federal Railroad Safety Act of 1970. The FRA must fulfill the congressional mandate requiring that those states capable of making a contribution, be permitted to do so. Also, the FRA must retain the enforcement prerogatives specified in the statute, recognizing that it is ultimately responsible, as the agent of the Secretary of Transportation, for conducting the Federal railroad safety effort.

During 1979, FRA transferred program management of the State Participation Program from the Office of Federal Assistance to the Office of Safety. This has unified the flow of information to the states and clarified the program's direction. In bringing together within the Office of Safety all safety-related rail programs, the resulting improved management will strengthen the ties between the Headquarters office, the states, and the FRA regional offices.

To ensure the success of the State Participation Program, the FRA is responsible for five major aspects of this program: recruitment guidance, training, monitoring, coordination with regional activities, and management of the national inspection program. The role of the states must be to supplement FRA efforts to the point where state and FRA resources are engaged in an optimally effective rail safety compliance effort.

In many states, current salary levels make it difficult for the states to attract highly qualified candidates for inspector positions. Some states advocate the liberalization of the Federally mandated employee qualifications. However, FRA feels that to maintain credibility, all safety inspectors must be able to communicate authoritatively with railroad officials concerning a wide range of safety-related compliance issues. Rather than relax current standards, FRA believes that the entire safety program would be better served by selective candidate recruitment and comprehensive special training.

During 1979, FRA continued to provide 100 percent funding for state inspectors' training at the Transportation Safety Institute at Oklahoma City, Oklahoma. FRA will provide such funding in the future, as this facility offers excellent, essential orientation and refresher training in a classroom atmosphere for both state and Federal inspectors.

At the end of 1979, a total of 30 states were participating in the program with a total of 84 inspectors.

According to the desire and ability of a state, a state agency may participate on one of three levels in investigative and surveillance activities. The levels of participation are full certification, certification, and agreement. To achieve full certification in a safety area, a state must provide at least the minimum level of man-years of inspection effort, as specified in the State Participation Regulation (49 CFR 212). When a state agency achieves full certification, it assumes the primary authority and responsibility for conducting routine investigative and surveillance activities of the particular safety area. However, FRA retains all inspection authority under those regulations issued by statutory authority other than the Federal Railroad Safety Act of 1970.

Certification is a level of participation permitted to a state agency for three years, during which time the state agency may provide less than the level of effort prescribed in the regulation. This level is used by states which are developing a staff of inspectors, and a reduced level of inspection effort may be necessary while inspector trainees are being trained to become fully qualified inspectors.

A state may participate under agreement when it chooses to commit less than the level of inspection effort prescribed in the regulation or otherwise restricts its participation. States having only inspector trainees may participate under agreement until one or more of the trainees become fully qualified inspectors.

Fifteen states were certified to participate in the Federal Railroad Safety Program at the end of 1979. None of the states which applied under Section 206(a) of the Federal Railroad Safety Act of 1970, were denied certification or recertification during calendar year 1979.

Alabama, Arizona, Florida, Maryland, Michigan, Oregon, Pennsylvania, and Washington are certified to participate in the enforcement of both track and freight car standards. Iowa, Missouri, and Vermont are certified to participate in track enforcement only. Massachusetts, Nebraska, Rhode Island, and West Virginia are certified only in freight car standards enforcement.

Under Section 206(c) of the Act, which authorizes investigative work, agreements were in effect in 18 states during 1979. New York, North Carolina, Ohio, and Utah are participating by agreement in the enforcement of both track and freight car standards. South Carolina is participating by agreement in the enforcement of freight car standards only.

The remaining states participate by agreement only in the enforcement of track standards. Nebraska, Rhode Island, and West Virginia participate by agreement in the enforcing of track standards, and are currently certified for the freight car inspection program. During 1979, the Secretary of Transportation did not terminate any agreements under Section 206(c) which were in effect with state agencies.

California, Mississippi and Oklahoma began recruiting qualified personnel for the program during 1979. These three states anticipate applying for certification or agreement during 1980.

The summary chart on the following page presents a complete listing of state participation status.

1979 STATE PARTICIPATION STATUS SUMMARY

State	TRACK		FREIGHT CAR	
	Inspectors	Participation	Inspectors	Participation
Alabama	2	Full Certification	2	Full Certification
Arizona	2(1*)	Full Certification	2	Full Certification
Connecticut	1*	Agreement		
Florida	2	Certification	2	Certification
Illinois	3	Agreement		
Indiana	1	Agreement		
Iowa	3	Full Certification		
Kansas	1	Agreement		
Kentucky	1	Agreement		
Louisiana	1*	Agreement		
Massachusetts			1	Certification
Maryland	1	Full Certification	1	Full Certification
Michigan	4	Full Certification	2	Full Certification
Minnesota	2	Agreement		
Missouri	3	Full Certification		
Nebraska	1	Agreement	1	Full Certification
Nevada	1*	Agreement		
New Hampshire	1*	Agreement		
New Jersey	3*	Agreement		
New York	3	Agreement	4	Agreement
North Carolina	1*	Agreement	1*	Agreement
Ohio	3(2*)	Agreement	2(1*)	Agreement
Oregon	2	Full Certification	2	Full Certification
Pennsylvania	3	Certification	3	Certification
Rhode Island	1*	Agreement	1	Full Certification
South Carolina			1	Agreement
Utah	1*	Agreement	1*	Agreement
Vermont	2	Full Certification		
Washington	2	Full Certification	2	Full Certification
West Virginia	3*	Agreement	2	Full Certification
TOTAL	54		30	

* Denotes trainee

Section V

Safety Objectives and Policy Directions

FRA safety goals, objectives, and policy directions will be detailed in the System Safety Plan (SSP), which is scheduled to be submitted to Congress by January 31, 1981.

The SSP will be the result of a three-year planning and research effort. This plan will integrate all of FRA's efforts to improve railroad safety. The effectiveness of current programs and possible new initiatives will be evaluated from a cost-effectiveness and risk-analysis standpoint, and the most promising results will be adopted by FRA. The Transportation Systems Center (TSC) is doing a wide range of research which will be helpful to FRA in developing the SSP.

In addition to studying methods for improving the effectiveness of FRA's inspection effort, TSC is assessing improvements in equipment and human factors, grade crossings, and the transportation of hazardous materials. The most significant results to date, concern the transportation of hazardous materials. Identification of the major hazardous materials flow corridors together with relevant accident statistics, has been useful in directing the efforts of FRA's safety inspectors.

APPENDIX A

ACCIDENT/INCIDENT STATISTICS

ACCIDENT SUMMARY BY CAUSE[1]

1978 AND 1979

Causes	Number Of Accidents 1978	Number Of Accidents 1979	Reportable Damage 1978	Reportable Damage 1979	Killed 1978	Killed 1979	Injured 1978	Injured 1979	Hazmat[2] Releases 1978	Hazmat[2] Releases 1979
TRACK, ROADBED AND STRUCTURES										
Roadbed defects	240	213	9,632,676	11,004,966	2	0	18	47	5	2
Track geometry defects	2,227	1,893	50,901,222	43,514,385	0	0	63	54	31	18
Rail and joint bar defects	1,327	1,105	42,861,000	42,501,753	0	0	61	63	22	23
Frogs, switches and track appliances	961	795	11,145,617	9,657,424	1	0	21	11	3	4
Other way and structure	25	30	1,255,408	3,535,945	0	0	2	3	0	2
Signal and communication failures	17	14	1,312,978	368,020	0	0	22	1	1	0
	4,797	4,050	117,108,901	110,582,493	3	0	187	179	62	49
MECHANICAL AND EQUIPMENT FAILURES										
Brakes	234	206	7,426,848	4,832,224	0	0	7	8	2	4
Trailer or container on flat car	20	16	412,800	487,153	0	0	1	0	0	0
Body	243	186	7,576,110	6,306,473	0	0	5	7	4	2
Coupler and draft system	255	198	7,680,068	6,693,580	0	0	10	12	5	3
Truck components	456	401	12,794,675	13,616,847	0	0	17	17	3	5
Axles and journal bearings	299	255	13,521,076	15,658,313	3	0	5	7	8	9
Wheels	415	326	18,534,713	21,156,876	16	0	69	51	9	8
Locomotives	199	161	9,815,149	6,477,071	0	0	47	29	1	1
Doors	21	25	355,173	564,776	0	0	0	1	0	0
Other mechanical and electrical failures	27	41	1,001,369	1,227,917	2	0	1	9	2	0
	2,169	1,815	79,117,981	77,021,230	21	0	162	141	34	32
TRAIN OPERATION - HUMAN FACTORS										
Brakes, use of	354	363	5,042,180	8,337,781	1	1	29	22	4	1
Employee physical condition	6	5	556,617	1,536,934	2	1	6	5	0	0
Flagging, fixed, hand and radio signals	97	92	3,688,294	10,442,438	3	6	23	308	0	1
Other rules and instructions	820	766	11,524,391	13,038,034	2	1	102	103	2	1
Speed	276	266	12,453,661	22,919,328	12	3	97	159	5	3
Switches, use of	467	435	6,342,786	7,715,549	1	3	23	68	0	0
Miscellaneous human factors	824	733	16,416,053	16,129,706	0	2	171	31	11	8
	2,844	2,660	56,023,982	80,119,770	21	17	451	696	22	14
MISCELLANEOUS										
Collision with hwy user at grade crossing	286	248	8,684,617	8,014,634	78	77	250	179	2	0
Vandalism	172	176	6,157,455	7,024,323	8	0	161	24	2	1
Load shifted	88	87	2,255,364	6,802,864	0	1	10	4	0	2
Interaction of lateral/vertical forces	147	125	4,677,783	5,841,346	0	0	4	2	3	1
Miscellaneous causes not otherwise listed	774	579	30,925,344	18,500,549	8	5	686	50	16	7
	1,467	1,215	52,700,563	46,183,716	94	83	1,111	259	23	11
GRAND TOTAL	11,277	9,740	304,951,427	313,907,209	139	100	1,911	1,275	141	106

[1] Rail-highway crossing accidents which exceeded the reporting threshold of $2,900 are included in this table.

[2] Hazardous Materials.

ACCIDENT/INCIDENT STATISTICS

CASUALTY DATA

1978 AND 1979

Type Accident/Person	1978 % Of Total	1978 Total Cases	1978 Killed	1978 Injured	1978 Illness	1979 % Of Total	1979 Total Cases	1979 Killed	1979 Injured	1979 Illness
TRAIN ACCIDENTS - RAIL EQUIPMENT ACCIDENT/INCIDENT CASUALTIES										
EMPLOYEE ON DUTY.....	.90	667	27	625	15	.91	689	22	651	16
EMPLOYEE NOT ON DUTY.	.01	5	1	4	0	.01	10	0	10	0
PASSENGER ON TRAIN...	1.12	829	4	825	0	.53	402	0	402	0
NONTRESPASSER.....	.28	207	24	183	0	.01	10	0	2	8
TRESPASSER.....	.02	12	5	7	0	.01	5	1	4	0
CONTRACTOR EMPLOYEE..	.00	2	0	2	0	.00	3	0	3	0
TOTAL	2.32	1,722	61	1,646	15	1.48	1,119	23	1,072	24
TRAIN INCIDENT CASUALTIES										
EMPLOYEE ON DUTY.....	13.86	10,282	50	10,016	216	13.87	10,482	40	10,231	21
EMPLOYEE NOT ON DUTY.	.02	12	1	11	0	.03	20	0	20	0
PASSENGER ON TRAIN...	.25	184	9	175	0	.41	311	5	304	1
NONTRESPASSER.....	.13	95	10	85	0	.13	98	6	92	0
TRESPASSER.....	1.13	837	386	451	0	1.20	906	398	508	0
CONTRACTOR EMPLOYEE..	.01	4	1	3	0	.01	11	4	6	1
TOTAL	15.38	11,414	457	10,741	216	15.65	11,828	453	11,161	214
NONTRAIN INCIDENT CASUALTIES										
EMPLOYEE ON DUTY.....	72.84	54,042	42	52,491	1,509	73.67	55,662	30	54,046	1,586
EMPLOYEE NOT ON DUTY.	.95	707	4	699	4	1.11	839	1	811	27
PASSENGER ON TRAIN...	.32	234	0	234	0	.39	292	1	290	1
NONTRESPASSER.....	.60	443	5	438	0	.55	419	11	391	17
TRESPASSER.....	.11	85	12	73	0	.13	99	22	77	0
CONTRACTOR EMPLOYEE..	.04	32	1	31	0	.05	36	5	31	0
TOTAL	74.86	55,543	64	53,966	1,513	75.90	57,347	70	55,646	1,631
RAIL-HIGHWAY GRADE CROSSING ACCIDENT/INCIDENT CASUALTIES [1]										
EMPLOYEE ON DUTY.....	.27	202	3	198	1	.25	192	9	183	0
EMPLOYEE NOT ON DUTY.	.01	8	3	5	0	.01	4	0	4	0
PASSENGER ON TRAIN...	.02	18	0	18	0	.00	2	0	2	0
NONTRESPASSER.....	6.71	4,979	969	4,010	0	6.29	4,752	779	3,971	2
TRESPASSER.....	.41	304	89	215	0	.41	311	95	216	0
CONTRACTOR EMPLOYEE..	.00	1	0	1	0	.00	0	0	0	0
TOTAL	7.43	5,512	1,064	4,447	1	6.96	5,261	883	4,376	2
TOTAL	100.00	74,191	1,646	70,800	1,745	100.00	75,555	1,429	72,255	1,871

[1] Rail-highway crossing casualties include those occurring at both public and private crossings, and are excluded from the previous categories.

APPENDIX B

Federal Railroad Safety Rules, Regulations, Orders, and Standards

1979 Safety Regulations and Proposals

49 CFR Part 222 - Display of Alerting Lights by Locomotives at Public Grade Crossings (Notice of Proposed Rulemaking)

On June 18, 1979, FRA published a notice of proposed rulemaking that would require locomotives to display flashing alerting lights at rail-highway grade crossings. The effect of this action would be to alert motorists and pedestrians of an approaching train. This action was taken by FRA in an effort to reduce the number of accidents which have occurred at points where highways cross railroad tracks. Public hearings were held in Chicago, Illinois on September 17, 1979, and in Washington, D.C. on September 20, 1979.

49 CFR Part 218 - Railroad Operating Rules (Final Rule)

On January 10, 1979, FRA published an amendment concerning the requirements for blue signal protection given to workmen engaged in the inspection, repair, testing, and servicing of railroad rolling equipment. The purpose of this amendment was to resolve all of the outstanding issues which are associated with the existing regulation.

49 CFR Part 211 - Rules of Practice (Interim Rule)

On March 9, 1979, FRA issued interim rules for the review of emergency orders issued under the emergency powers provision of the Federal Railroad Safety Act of 1970. The interim procedures were necessary to facilitate a review of the emergency action taken by FRA to abate conditions affecting the safety of railroad operations.

49 CFR Part 223 - Safety Glazing Standards - Locomotives, Passenger Cars and Cabooses (Final Rule)

On December 31, 1979, the FRA published a new regulation detailing the requirements for Safety Glazing Standards to be used on locomotives, passenger cars, and cabooses. This regulation resulted from a joint petition submitted by railroad labor and management. It is intended to reduce the exposure of railroad crews and passengers to hazards resulting from derailments and acts of vandalism.

AAR Requirements for Lifting Lugs

A group of tank car builders submitted a petition to FRA on September 13, 1978, requesting that the FRA issue a stay order which would exempt these companies from complying with AAR's Mechanical Division Standard D.V. 1897. This standard requires that all new or rebuilt rail cars be equipped with lugs to provide a means of vertically lifting a loaded, upright car to facilitate rerailing operations and improve the method of handling derailed cars.

On May 16, 1979, the FRA issued a notice of revocation of the temporary stay order which was placed on the AAR on October 5, 1978. This prevented the AAR from requiring that lifting lugs be implemented until all facts concerning the issue had been developed and evaluated. The revocation of the stay order, in effect, granted to the AAR permission to enforce Mechanical Division Standard D.V. 1897 for rail cars offered in interchange.

APPENDIX C

Waiver Petitions

During 1979, the FRA received a total of 325 petitions to waive specific requirements of FRA safety regulations under Section 202(c) of the Federal Railroad Safety Act of 1970. The following chart shows each category and its corresponding citation in the regulations, the number of approvals granted, and the number of conditional approvals granted. These figures were obtained from the official records of of the Railroad Safety Board. The Board is responsible for the review and subsequent granting or denial of all petitions for permanent or temporary waivers and exemptions from railroad safety rules.

Category	Total Number of Petitions	Approved	Conditional Approval
Block Signal Applications (Application for approval of material modification of a signal system-49 CFR 235)	155	105	5
Rules, Standards & Instructions for Railroad Signal Systems (Applications for relief - 49 CFR 236)	80	69	3
Railroad Freight Car Safety Standards (49 CFR 215), Safety Appliances (49 CFR 231), Power Brakes (49 CFR 232), and Inspection and Testing of Locomotives (49 CFR 230)	36	5	16
Railroad Operating Rules (49 CFR 217)	15	5	5
Hours of Service (49 CFR 228)	29	19	0
Crew Lodging	6	2	0
Track Safety Standards (49 CFR 213)	4	1	1

APPENDIX D

Technical and Consumer Publications

1. PB 296294/AS
   SDP-40F/E-8 Locomotives/Test Results Report, Volume I
   FRA-ORD-79/11/1

2. PB 296295/AS
   SDP-40F/E-8 Locomotives/Test Results Report, Volume II
   FRA-ORD-79/11/2

3. PB 297711/AS
   Tests of the AMTRAK SDP-40F Train Consists Conducted on Chessie System Track
   FRA-ORD-79/19

4. PB 298312/AS
   Fracture Resistance and Fatigue Crack Growth Characteristics of Railroad Wheels and Axles
   FRA-ORD-79/30

5. PB 80022955
   Effects of Rail Vehicle Size - A Special Bibliography
   FRA-ORD-79/49

6. PB-291-376/AS
   Evaluation of Improved Track Structural Components Under Sub-Arctic Conditions
   FRA-ORD-79/01

7. PB-295-715
   Modern Concrete Crosstie Experience in France and Mexico
   FRA-ORD-79/02

8. PB 80127012
   Lateral Resistance of New and Relay Red Oak Crossties
   FRA-ORD-79/03

9. PB 80138316 (Vol. I) PB 80138324 (Vol. II)
   Post Mortem Investigation of the Kansas Test Track, Volume I
   Post Mortem Investigation of the Kansas Test Track, Volume II
   FRA-ORD-79/07 I & II

10. PD-058387
    Feasibility Study for Railroad Embankment Evaluation with Radar Measurements
    FRA-ORD-79/07

11. PB 80128390 (Vol. I) PB 80134562 (Vol. II)
The Kansas Test Track, Volume I - Analysis of Data
The Kansas Test Track, Volume II - Appendices
FRA-ORD-79/22 I & II

12. PB 80165293
Track Stiffness Measurement System Evaluation Program
FRA-ORD-79/30

13. PB 80165624
Vertical Track Modulus: Test Results & Comparison of Analysis Techniques
FRA-ORD-79/34

14. PB 80126881
Correlation of Statistical Representation of Track Geometry with Physical Appearance
FRA-ORD-79/35

15. PB 183882
Measurement and Correlation Analysis Plan for Concrete Tie and Fastener Performance Evaluation
FRA-ORD-79/51

16. Plate Instrumented Wheelset for the Measurement of Wheel/Rail Forces[1]
FRA-ORD-79/58

17. PB-297-678/AS
On-Board Failure-Protection Requirements for Railroad-Vehicle Equipment
FRA-ORD-78/22

18. PB-299-735/AS
Prevention of Roller Bearing-Initiated Burnoffs in Railroad Freight Car Journals
FRA-ORD-78/16

19. PB-300-760/AS
Test Train Program Tenth Annual Report
FRA-ORD-78/75

20. PB80-137888
Legal Effects of Use of Innovative Equipment at Railroad-Highway Grade Crossings on Railroads' Accident Liability
FRA-RRS-80-01

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[1]Publication number has not been assigned.