

[Federal Register: May 2, 2005 (Volume 70, Number 83)]

[Notices]

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[DOCID:fr02my05-137]

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Safety Advisory 2005-03; Highway-Rail Grade Crossing Safety

AGENCY: Federal Railroad Administration (FRA), DOT.

ACTION: Notice of safety advisory.

SUMMARY: FRA is issuing a safety advisory to facilitate improved cooperation in the investigation of collisions at highway-rail grade crossings. The advisory describes the roles of the Federal and state governments and of the railroads in highway-rail grade crossing safety. FRA reminds railroads of their responsibility to: Properly report any accident involving grade crossing signal failure; properly maintain records relating to credible reports of grade crossing warning system malfunctions; properly preserve the data from all locomotive-mounted recording devices following highway-rail grade crossing collisions; and cooperate fully with local law enforcement authorities during their investigations of such accidents. FRA also offers assistance to local authorities in the investigation of highway-rail grade crossing collisions where information or expertise within FRA's control is required to complete the investigation.

FOR FURTHER INFORMATION CONTACT: Ron Ries, Staff Director, Highway-Rail Crossing Safety, RRS-23, Mail Stop 25, 1120 Vermont Avenue, NW., Washington, DC 20590 (telephone: (202) 493-6285); Ronald Newman, Staff Director, Motive Power and Equipment Division, FRA Office of Safety Assurance and Compliance, RRS-14, Mail Stop 25, 1120 Vermont Avenue, NW., Washington, DC 20590 (telephone: (202) 493-6241), Tom McFarlin, Staff Director, Signal and Train Control (telephone: (202) 493-6203), or Kathryn Shelton, Trial Attorney, FRA Office of Chief Counsel, Mail Stop 10, 1120 Vermont Avenue, NW., Washington, DC 20590 (telephone: (202) 493-6063).

SUPPLEMENTARY INFORMATION: Public interest in the prevention of collisions at highway-rail grade crossings remains strong. In June of 2004, the Secretary of Transportation released the Department's new Action Plan for Highway-Rail Crossing Safety and Trespass Prevention, which noted that fatalities at highway-rail grade crossings were cut by 42% over the period 1994-2002, despite growing exposure in terms of motor vehicle and train miles. This progress has continued since 2002. Although 2004 saw an increase in fatalities over 2003, 2004 was the safest year on record in terms of the rate at which highway-rail grade crossing incidents occurred. FRA is confident that continued emphasis on education, engineering, and enforcement can drive further reductions in risk.

This advisory describes basic responsibilities of public and private entities that have responsibilities related to highway-rail grade crossing safety, with a specific focus on engineering and railroad operations. In addition, this advisory provides information regarding the roles of FRA, railroads, and state and local officials in the investigation of grade crossing collisions, including suggestions for making the process work better. FRA notes that a basic responsibility of railroads and public authorities at all levels of government is to derive information from these often tragic events to help prevent future occurrences.

This notice does not establish new requirements or specify new responsibilities. Its purpose is to describe responsibilities rooted in statutes, regulations, and established practice upon which persons have come to rely and to suggest additional actions that public and private entities should consider based upon recent events of note.

Role of the FRA

FRA administers and enforces regulatory requirements and exercises statutory powers that bear on highway-rail grade crossing safety:

1. FRA regulations entitled "Railroad Accidents/Incidents: Reports, Classification, and Investigations" (49 CFR Part 225) require each railroad to report in writing, within 30 days following the end of the month in which the event occurred, specified significant events, including any impact between railroad on-track equipment and an automobile, bus, truck, motorcycle, bicycle, farm vehicle or pedestrian at a highway-rail grade crossing (49 CFR 225.5, 225.19). Information is required to be provided on Form FRA 6180.57 for each such event, and separate forms must be filed to provide additional detail if an injury occurs or if damage to railroad property exceeds the current threshold (presently \$6,700). The information is available in full detail on the agency's Web site (<http://www.fra.dot.gov>).

2. Effective May 1, 2003, section 225.9 requires that FRA receive immediate telephonic notification of any fatality at a highway-rail grade crossing. This provision was intended to create a parallel structure with a longstanding requirement of the National Transportation Safety Board (NTSB) and to provide FRA with early information regarding fatal collisions for which FRA might elect to conduct an investigation. (FRA and the NTSB both employ the National Response Center to receive these types of notifications.)

3. FRA is authorized to conduct an investigation of any accident or casualty associated with railroad operations. FRA judiciously exercises its discretion to investigate accidents, because its inspectors have such a broad array of other duties, including inspection and enforcement activities. Accordingly, FRA must confine its accident investigations to those events most likely to yield important information for use in achieving regulatory compliance, improving regulations, or fashioning other countermeasures. These are often cases where significant harm to multiple members of the public, railroad passengers, railroad personnel or property--or strong public interest in the circumstances (e.g., involvement of a school bus)--warrant use of agency resources.

Historically, FRA has also investigated most accidents where questions have arisen regarding the proper functioning of active warning systems. FRA's Office of Safety has now adopted a formal accident assignment criterion under which each highway-rail grade crossing collision involving a credible allegation that the warning device failed to provide the required warning will be routinely investigated.

Additional collisions will be assigned for investigation, as warranted, based upon supportable concerns regarding the railroad's discharge of its responsibilities for grade crossing safety. (FRA regional managers sometimes assign for less intensive investigation additional collisions, where available information and resources warrant.)

4. FRA enforces regulations entitled "Grade Crossing Signal System Safety" (49 CFR Part 234) which require the inspection, testing, and maintenance of active warning systems at highway-rail grade crossings according to specified standards. These regulations include safeguards to be observed, such as stopping or slowing train movements, when the railroad has notification that a warning system is malfunctioning. A railroad is also required to report telephonically, within 24 hours, any accident/incident involving an activation failure (49 CFR 234.7).

5. FRA's "Locomotive Safety Standards" (49 CFR Part 229) require that each locomotive operated in excess of 30 miles per hour be equipped with an operative event recorder capable of capturing and preserving certain data elements for the last 48 hours of operation. Essentially all locomotives operated by major freight and passenger railroads are so equipped. Following an accident required to be reported to FRA, including an impact at a highway-rail grade crossing, data are required to be safeguarded and preserved for at least 30 days. Section 229.135(d)(1) reads as follows:

If any locomotive equipped with an event recorder is involved in an accident that is required to be reported to FRA, the railroad using the locomotive shall, to the extent possible, and to the extent consistent with the safety of life and property, preserve the data recorded by the device for analysis by FRA. This preservation requirement permits the railroad to extract and analyze such data; provided the original or a first-order accurate copy of the data shall be retained in secure custody and shall not be utilized for analysis or any other purpose except by direction of FRA or the National Transportation Safety Board. This preservation requirement shall expire 30 days after the date of the accident unless FRA or the Board notifies the railroad in writing that the data are desired for analysis.

The requirements for preservation of data include all on-board locomotive data storage devices and are not limited to the event recorder required by section 229.135.

6. Through the Locomotive Safety Standards, FRA has also required, effective December 31, 1997, that all locomotives operating greater than 20 miles per hour be equipped with operative auxiliary alerting lights (49 CFR 229.125(d)). When displayed with the locomotive headlight, these lights provide a distinctive triangular pattern that aids identification of an approaching locomotive and improves the ability of the user of the highway-rail grade crossing to determine when the train will arrive at the crossing.

7. FRA has issued a final rule on the Reflectorization of Freight Rail Rolling Stock that is intended to improve the visibility ("conspicuity") of locomotives and freight cars during nighttime and periods of restricted visibility, particularly at crossings where there is no active warning system (e.g., flashing lights) (70 FR 144; January 3, 2005). Almost one-fourth of collisions at highway-rail grade crossings involve motor vehicles hitting the sides of trains. The final rule requires application of retroreflective material over a ten-year period and renewal of the material every ten years. The national car and locomotive fleets consist of over 1.3 million units. The Government of Canada has indicated its intent to adopt compatible requirements.

8. FRA has issued a final rule on Use of Locomotive Horns at Highway-Rail Crossings (49 CFR Part 222), which is scheduled for publication in the Federal Register on April 27, 2005 and will be effective on June 24, 2005. The final rule requires the horn to be sounded for 15 to 20 seconds prior to arrival of the train at each public crossing, subject to certain exceptions where risk is low or where action has been taken to compensate for the absence of warning provided by the locomotive horn.

9. FRA also conducts outreach to law enforcement and judicial officials to encourage enforcement of state laws governing motorist behavior at highway-rail grade crossings. Further, FRA works with the Federal Motor Carrier Safety Administration and major motor carriers to encourage driver compliance.

10. FRA and the Federal Highway Administration (FHWA) provide funding designated by the Congress to Operation Lifesaver, Inc. (OLI), which conducts programs of education and awareness through state chapters and sponsors public service announcements. Working with railroad police departments, FRA, and others, OLI also provides Grade Crossing Collision Investigation Courses at the Basic (4-hour), Intermediate (8-hour) and Advanced (16-hour) levels to help law enforcement officers more effectively investigate these events. This training was developed for the North American law enforcement community with the cooperation of the International Association of Chiefs of Police and the National Sheriffs Association. FRA and OLI also conduct outreach to the state and local judiciary, calling attention to the tragic consequences of grade crossing collisions and encouraging enforcement of state laws governing motorist behavior.

For additional detail, see Role of Railroads, below.

Role of the NTSB

The NTSB is the only agency established by federal law whose primary missions are to investigate transportation accidents and to make recommendations for improvement of transportation safety programs. NTSB's organic statute provides in pertinent part as follows:

(a) General.--(1) The National Transportation Safety Board shall investigate or have investigated (in detail the Board prescribes) and establish the facts, circumstances, and cause or probable cause of--
* * * * *

(B) a highway accident, including a railroad grade crossing accident, the Board selects in cooperation with a State;

(C) a railroad accident in which there is a fatality or substantial property damage, or that involves a passenger train;
* * * * *

(F) any other accident related to the transportation of individuals or property when the Board decides--

- (i) The accident is catastrophic;
 - (ii) The accident involves problems of a recurring character; or
 - (iii) The investigation of the accident would carry out this chapter.
- * * * * *

49 U.S.C. 1131] (emphasis supplied)

NTSB receives notification of fatal crossing impacts in the same manner as FRA. Event recorder data required to be maintained under FRA regulations is also required by FRA to be made available to the NTSB upon request (49 CFR 229.135).

In practice, NTSB investigates a small number of highly significant grade crossing accidents each year. Based upon review of full and memorandum reports listed on the NTSB web site, it appears that in the seven-year period 1997-2003 the Board investigated 12 highway-rail grade crossing collisions, with the clear majority being assigned highway numbers (generally indicating principal focus on highway-side considerations). The most events assigned in one year was four (1997, 2000), and the fewest was zero (2001, 2002).\2\ FRA and other designated parties work closely and cooperatively with NTSB when NTSB elects to investigate a highway-rail grade crossing accident.

\2\ It is possible that one or more reports from this period remain unpublished.

NTSB also prepares special studies that may address grade crossing safety, most recently Safety at Passive Grade Crossings; NTSB Report Number: SS--98-02, -03; July 21, 1998. Board staff looked into the circumstances of a significant number of collisions at passive crossings in aid of this study.

Role of Railroads

Railroads possess the right-of-way at highway-rail grade crossings for the same reasons that large ships possess the right-of-way on navigable waterways, i.e., large and heavy conveyances cannot stop quickly. As a result, a highway-rail grade crossing collision can rarely be avoided through actions of the locomotive engineer or conductor (e.g., stopping the train short of the crossing). However, railroads and their employees have a variety of responsibilities that they must discharge under Federal or state law that are critical to safety at highway-rail grade crossings. They also have a responsibility to preserve and report information following grade crossing accidents, so that local public authorities can determine responsibility of the parties to the event, and so that Federal and state regulatory agencies can derive information useful for improving grade crossing safety.

The following discussion summarizes those responsibilities owed by railroads to the FRA, acting on behalf of the public, that relate to highway-rail grade crossing safety:

Inspect, test, and maintain grade crossing warning systems in accordance with 49 CFR Part 234, and take other actions required by those regulations to avoid continuously operating signals, to provide for safety in the event of a signal malfunction or when it is necessary to remove a system from service (for testing or repair), to avoid interference in the normal functioning of these devices, and to restore malfunctioning signals to proper functioning without undue delay. See FRA Safety Advisory 2002-1 (67 FR 3258; January 23, 2002) and FRA Safety Advisory 2004-03 (69 FR 48904; August 11, 2004). (See further discussion below.)

Report all activation failures in writing within 15 days (49 CFR 234.9).

Maintain track structure in accordance with the Track Safety Standards (49 CFR Part 213). This includes maintaining adequately drained (non-fouled) ballast that otherwise could permit the existence of low ballast resistance adversely affecting the operation of grade crossing signals (49 CFR Sec. 213.103) and removing vegetation on railroad property that could interfere with preview of grade crossing warning signs and signals, whether active or passive (49 CFR Sec. 213.37).

Operate trains in accordance with applicable speed limitations imposed by Federal regulation (49 CFR Parts 213, 234 and 236) and the railroad's operating rules, timetables, and special instructions (see 49 CFR Parts 217 and 240).

Provide and maintain locomotive event recorders on all locomotives operating greater than 30 miles per hour, preserving data following any reportable event (49 CFR 229.135).

Provide and maintain locomotive auxiliary alerting lights on any lead locomotive operating greater than 20 miles per hour (49 CFR 229.125(d)).

As noted above, the railroads will soon undertake additional duties related to sounding the locomotive horn (presently done under state law and the railroad operating rules) and reflectorization of freight rail rolling stock.

Special Emphasis: Railroad's Duties After an Accident

FRA reminds railroads that event recorder data must be preserved following accidents at highway-rail grade crossings and notes that FRA will conduct periodic records audits to determine that this information is being retained and made available to FRA and NTSB as required.

Following a highway-rail grade crossing accident/incident, the railroad has additional responsibilities that vary based on the circumstances:

Event recorder data, including data from all locomotive-mounted recording devices designed to record information concerning the functioning of a locomotive or train, must be preserved for 30 days or longer if so notified by FRA or NTSB (49 CFR 229.135(d)).

If it is determined that the grade crossing warning system experienced an activation failure, the railroad must make a telephonic report to FRA through the National Response Center (49 CFR 234.7), and thereafter file an activation failure report in writing (49 CFR 234.9(a)).

In the case of a fatal highway-rail grade crossing accident/incident, the railroad must make a telephonic report immediately, again through the National Response Center (49 CFR 225.9).

Railroads involved in the event must provide written reports of the accident/incident within 30 days after the month in which the event occurred (see, e.g., 49 CFR 225.11 and 225.19). FRA's Guide for Preparing Accident/Incident Reports, available for downloading on FRA's web site (<http://safetydata.fra.dot.gov/officeofsafety>), describes the applicable requirements.

FRA reminds railroads that each of these duties must be faithfully discharged. Through routine inspections and special assessments, FRA will continue to verify compliance with these requirements.

State and Local Government Roles

States and local governments play very critical roles in highway-rail grade crossing safety. Highway users, railroads, and others are responsible for compliance with requirements imposed by state and local governments. Those requirements are not defined by FRA, except to the extent that FRA's exercise of jurisdiction over a subject matter has the effect of preempting state action (see 49 U.S.C. 20106). Notwithstanding various actions that FRA and other Federal authorities have taken to promote highway-rail grade crossing safety, state and local agencies of appropriate jurisdiction daily exercise their own responsibilities, which include:

Selection of traffic control devices, including highway-rail grade crossing warning systems, advance signage, pavement marking, etc., generally in conformity with the Manual for Uniform Traffic Control Devices (MUTCD), which is issued by the FHWA;\3\

\3\ In some States, railroads are responsible for ``marking" each public crossing with a crossbuck placed on railroad property, to the extent other signage is not provided by the roadway authority. A small number of States specify signage that the railroad must install at private crossings.

Determination, in cooperation with the railroad, of the need for, and design of, interconnections between highway-rail grade crossing warning systems and other traffic control signals in the immediate vicinity, including appropriate timing;

Investigation of all accidents on public roads to determine user compliance with motor vehicle and other state code requirements and to determine if a crime has occurred;

Examination and licensing of motor vehicle operators, including holders of Commercial Drivers Licenses;

Enforcement of state requirements, if any, regarding clearance of sight obstructions on railroad (or other) property at highway-rail grade crossings.

Other Federal authorities assist States and localities in accomplishing this work, as do various private standards bodies. For instance, FHWA provides formula-based financial assistance that has been responsible for installation of the majority of highway-rail grade crossing active warning systems in the nation. FHWA also develops and maintains the MUTCD with the help of a national advisory committee comprised of experts in the field, including state and local traffic engineers. In addition to providing overall strategic leadership through the Secretary's Action Plan, the U.S. Department of Transportation's modal administrations, including FRA, have contributed to the development of key technical material, most recently the report of the Secretary's Technical Working Group entitled Guidance on Traffic Control Devices at Highway-Rail Crossings (November 2003) which is available on line at <http://www.fra.dot.gov/us/content/817>.

Despite the close working relationships forged over the years among public authorities responsible for highway-rail grade crossing safety, public misunderstandings persist. For instance, it has been alleged that FRA regulations interfere with toxicological testing of railroad crew members following crossing collisions. As a practical matter, that is not generally the case, because the preemptive effect of FRA's regulations do not extend to areas where state and local authorities have traditionally exercised authority with respect to breath or body fluid testing.

It is true that FRA has excluded highway-rail grade crossing collisions from the events for which mandatory post-accident toxicological testing is required under its regulations. The reason for that exclusion is that crew member actions seldom contribute to these events--rather, they frequently become additional victims as they observe close-up events they are powerless to prevent. However, if at any time a railroad crew member is on duty, and that person is reasonably suspected of being under the influence of or impaired by alcohol or other drugs, then the railroad is required to conduct a breath or urine test, or both, as applicable. Further, any state or local law enforcement official with probable cause to believe that a violation of a state criminal law that imposes sanctions for reckless conduct that leads to actual loss of life, injury or damage to property has been committed is free to take any action that would be authorized against any other person, including requiring production of body fluids for analysis. Thus, while FRA has not delegated to state and local officials the conduct of Federal tests, neither does FRA preempt appropriate criminal investigative authority a state or local law enforcement agency enjoyed prior to issuance of the FRA regulations-provided probable cause exists supporting that action. See 49 CFR 219.13(b).

To the extent train and engine crew fitness is an issue with respect to grade crossing safety, FRA's regulations governing random alcohol and drug testing provide an important safeguard by detecting and deterring misuse of these substances in the subject population. Among highway users, only commercial drivers are subject to random testing.

Opportunities for More Effective Cooperation

FRA has expertise, shared only by the NTSB and state rail agencies that are members of FRA's State Safety Participation Program, that can be helpful in evaluating safety issues at highway-rail grade crossings, whether before or after an event occurs. FRA Highway-Rail Grade Crossing Managers and Assistant Managers in each FRA region are fully devoted to supporting safety programs that reduce risk at grade crossings. As noted above, these managers and other key FRA personnel, including law

enforcement liaison officers (on loan from state or local law enforcement agencies), conduct outreach to law enforcement agencies and the judiciary and provide access to appropriate training.

FRA can also offer assistance in resolving questions about safety raised following grade crossing collisions. FRA operating practices personnel are skilled in reviewing railroad operating rules and practices pertinent to grade crossing safety. FRA signal and train control inspectors are experts in the functioning of active warning systems (grade crossing signals) and can normally verify from testing, or review of recorded data, how the events related to railroad operations unfolded. FRA field personnel are also familiar with locomotive event recorder data and how to interpret it in relation to railroad operating rules, timetables, and special instructions.

In the great majority of the approximately 3,000 grade crossing collisions each year, the event would have been avoided had the vehicle operator or pedestrian heeded state law, and that person had available all necessary means for doing so.¹⁴ However, in a small but nevertheless significant minority of events, other factors may have contributed, such as interference with the normal functioning of a warning system, failure of the warning system, or operation of the train in a manner not consistent with safety requirements (e.g., short warning due to overspeed operation, failure to properly sound train horn, etc). In those cases, it is important for highway and rail authorities to cooperate in completing their respective investigations. Exchange of factual information pertinent to the cause of a transportation accident is clearly within the letter and spirit of FRA's authorizing statutes (see, e.g., 49 U.S.C. 20902).

¹⁴ For instance, the NTSB's study of collisions at passive crossings found that driver error was the probable cause for 49 out of 60 accident cases. In 7 of the remaining 11 cases, the probable cause was determined to be related to roadway conditions that affected the driver's ability to detect the presence of a passive crossing or an oncoming train; roadway and track conditions (e.g., curvature) were cited as the probable cause in 3 of the 11 cases. Safety at Passive Crossings, NTSB Report Number: SS-98-02; July 28, 1998 at vii, viii. Review of FRA accident/incident data suggests that motorist involvement is significantly higher at crossings equipped with automated warning devices. It should be emphasized, however, that "driver error" can be significantly mitigated through a variety of strategies generally clustered under the themes of engineering, education and enforcement.

Special emphasis: Availability of FRA Support for State and Local Investigations

Through this Safety Advisory, FRA invites state and local law enforcement agencies responsible for investigating highway-rail grade crossing collisions to contact FRA if it appears from initial investigation that rail-related factors may have played a role in the occurrence. FRA will consult with the State or local agency and determine if FRA should initiate investigative activity regarding matters within our purview. If FRA determines that a credible issue is presented that is within our authority and responsibility, factual information that is developed during the investigation will be made available to the state or local agency initiating the request. FRA will also provide technical consultation as appropriate to explain the significance of railroad-related information.

Current office numbers for FRA regional offices are found at <http://www.fra.dot.gov>.

You may determine the appropriate Regional office by searching the Federal Railroad Administration Web site [<http://www.fra.dot.gov/us/content/373>], selecting a State and clicking on the corresponding regional office for contact information. Outside of normal business hours, requests should be placed through the National Response Center (1-800-424-8802 or 1-800-424-0201) for communication to the

FRA Duty Officer. FRA will distribute this Advisory through major national law enforcement associations and will make this Advisory available through outreach at the state and local level.

Issued in Washington, DC, on April 25, 2005.

Daniel C. Smith,

Associate Administrator for Safety.

[FR Doc. 05-8626 Filed 4-29-05; 8:45 am]

BILLING CODE 4910-06-P