



DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

[Safety Advisory No. 2016-01]

Movement of Roadway Maintenance Machines Over Highway-Rail Grade Crossings

AGENCY: Federal Railroad Administration (FRA), Department of Transportation.

ACTION: Notice of Safety Advisory.

SUMMARY: FRA recently completed its investigation into a fatal accident that occurred when an on-track roadway maintenance machine traveling on main track collided with a motor vehicle at a highway-rail grade crossing. FRA is issuing this Safety Advisory 2016-01 to heighten rules compliance and situational awareness of railroads, railroad contractors, and their respective employees when operating roadway maintenance machines over highway-rail grade crossings. This Safety Advisory makes recommendations to railroads and railroad contractors regarding the need to review, update, and follow rules and procedures governing the safe movement of roadway maintenance equipment over highway-rail grade crossings.

FOR FURTHER INFORMATION CONTACT: Patrick T. Warren, Deputy Associate Administrator for Safety Compliance and Program Implementation, Office of Railroad Safety, FRA, 1200 New Jersey Avenue, SE., Mail Stop 25, Washington, DC 20590, (202) 493-1366; or Joseph Riley, Track Specialist, Track Division, Office of Railroad Safety, FRA, 1200 New Jersey Avenue, SE., Mail Stop 25, Washington, DC 20590, (202) 493-6357.

SUPPLEMENTARY INFORMATION: In January 2015, a fatal accident occurred when an on-track roadway maintenance machine, traveling as part of a large roadway work group (rail gang) over main track, collided with a private motor vehicle at a public highway-rail grade crossing in Gilroy, California (Gilroy). The driver of the motor vehicle died as a result of the collision.

While investigating this 2015 accident, FRA reviewed its accident data regarding other collisions at highway-rail grade crossings involving railroad maintenance-of-way equipment. FRA's review found that between January 2010 and November 2015, 187 accidents involving maintenance-of-way equipment and motor vehicles occurred at highway-rail grade crossings. The 187 accidents resulted in 2 fatalities to highway vehicle motorists, 62 injuries to motor vehicle occupants, and 6 injuries to railroad employees.

The January 2015 accident referenced here and FRA's review of accident data described above illustrate the safety risk to railroad and railroad contractor employees and the public when roadway maintenance machines travel over highway-rail grade crossings. This risk is heightened when roadway maintenance machines, including hi-rail vehicles, fail to activate grade crossing warning devices. To reduce this safety risk, FRA recommends that the railroad industry evaluate relevant railroad rules and emphasize compliance with those rules and any other procedures governing the safe movement of on-track equipment over highway-rail grade crossings.

Accident Summary

The accident description provided below is based on FRA's investigation of the January 2015 accident and serves to illustrate the risks associated with moving railroad

roadway maintenance machines over highway-rail grade crossings. On January 9, 2015, near Gilroy, a Union Pacific Railroad Company (UP) system rail gang was in the process of changing job locations from a siding track to an industrial lead track approximately 12 miles away. The rail gang consisted of 62 pieces of roadway maintenance machinery moving over UP main track to a new job location under the authority of a train dispatcher. At approximately 1:05 pm, a spiker/gager roadway maintenance machine (40th machine in the consist) was traveling approximately 12 miles per hour over the Masten Avenue highway-rail grade crossing in Gilroy and collided with a motor vehicle (pickup truck) as it proceeded westbound over the crossing. The driver was the sole occupant of the pickup truck and received fatal injuries.

The spiker/gager operator was operating in reverse and was not facing the direction of the machine's movement, relying on side mirrors to see in the direction of movement. Additionally, a semi-tractor trailer had stopped short of the crossing for a traffic light and may have blocked the spiker/gager operator's view of westbound vehicular traffic approaching the highway-rail grade crossing. Applicable UP rules require that "[t]rack cars and on-track equipment must approach all grade crossings prepared to stop and must yield the right-of-way to vehicular traffic. If necessary, personnel will be deployed to flag the crossing to protect movement of a track car or other on-track equipment." UP's rules further specify:

When approaching any grade crossing equipped with automatic warning devices and the automatic warning devices are not activated, all track cars and on-track equipment must stop short of the crossing and not proceed until safe to do so, unless the crossing has been closed or barricaded or is protected by properly equipped flaggers.

FRA's investigation indicates that the operator of the spiker/gager involved in the

collision failed to follow applicable UP rules by not stopping short of the crossing and failing to yield the right-of-way to vehicle traffic. It appears that the spiker/gager had fallen several hundred feet behind the machine it was following and FRA's review of the downloaded grade crossing warning device data indicated the crossing gates had recovered (lifted) before the spiker/gager arrived at the crossing. Unlike trains, roadway maintenance machines do not always shunt or maintain shunt in track circuits to trigger activation of grade crossing warning device systems and, in most cases, roadway maintenance machines are not designed or built to shunt the track circuit.

FRA's investigation also indicates that before the rail gang equipment started its movement, a job briefing was held that identified the railroad's safety procedures to follow during the movement. The job briefing instructed the machine operators to "bunch-up" at grade crossings, allowing no more than 50 feet between equipment. The bunching-up of equipment is intended to allow the equipment to travel over highway-rail grade crossings in a safe and efficient manner, as well as to lessen the time the public is stopped at the crossing. The job briefing did not include instructions regarding the use of flaggers to protect movements over highway-rail grade crossings.

Rules Compliance, Situational Awareness, and Grade Crossing Protection Measures

Generally, railroad rules govern the movement of roadway maintenance machines over highway-rail grade crossings.¹ Under most applicable railroad rules governing movement of on-track equipment over highway-rail grade crossings, roadway

¹ FRA's grade crossing safety regulations in 49 CFR part 234 do not specifically address roadway maintenance machine movements over grade crossings. In addition, 49 CFR part 214, subpart C establishes protections to prevent roadway workers from being struck by rolling equipment, but does not mention, nor is it generally intended to address, movement of roadway maintenance machines in travel mode over highway-rail grade crossings under the authority of a train dispatcher. See 61 FR 65959, 65961 (Dec. 16, 1996). FRA conducted a post-accident inspection of the spiker/gager that was involved in the collision and found it was in compliance with applicable FRA regulations governing roadway maintenance machines at 49 CFR part 214, subpart D.

maintenance machines do not have the right-of-way over vehicular traffic. Industry practices typically require such equipment to approach every highway-rail grade crossing prepared to stop and not proceed until it is seen that the grade crossing is clear. For example, under the applicable UP rule in question, roadway maintenance machines are required to stop when approaching a grade crossing with automatic warning devices when such devices are not activated unless the crossing has been closed or barricaded or is protected by properly equipped flaggers. When grade crossing warning devices are activated, machine operators must still be prepared to stop.

Most of the 187 accidents described above occurred while on-track equipment was traveling over a highway-rail grade crossing and not when roadway work groups were performing work at a crossing. FRA's review of the data indicates that tampers and regulators were involved in the highest number of roadway maintenance machine/highway vehicle accidents. Further, when railroads operate roadway maintenance machines singly or in pairs, machines may not be readily visible to motorists. Railroads and railroad contractors should develop procedures for the safe movement of all configurations of roadway work group equipment and ensure that operators are trained and qualified to recognize crossing characteristics that present greater safety risks.

As mentioned above, roadway maintenance machines do not reliably shunt track circuits and may not always, or continually, activate highway-rail grade crossing warning devices. Operators may encounter a variety of challenging grade crossing characteristics, including: heavy vehicular traffic, long-angled four-lane crossings, right-turn-on-red locations, and highway traffic signals interconnected with the highway-rail grade

crossing warning devices. Railroads should review their inventory of grade crossings and identify crossings that pose significant challenges to roadway maintenance machine operators. Railroads should also consider installing lockable wayside warning device activation equipment or other appropriate measures for use by operators of roadway maintenance machines at heavily trafficked four-lane crossings or long-angled crossings.

FRA also recommends that railroads emphasize compliance with rules governing the safe movement of roadway maintenance machines over highway-rail grade crossings in job safety briefings and employee training. Railroads and railroad contractors should monitor employee compliance with rules addressing equipment movement over highway-rail grade crossings. On certain railroads where rules governing the safe movement of machines over crossings are contained in the railroads' operating rules, Federal regulation requires that each railroad conduct operational tests to ensure its employees comply with the railroad's operating rules. See 49 CFR 217.9. As the description of the January 2015 accident indicates, compliance with railroad rules governing the movement of on-track equipment over highway-rail grade crossings is safety-critical. FRA recommends that railroads evaluate their current procedures for monitoring compliance with rules governing the movement of roadway maintenance machines over highway-rail grade crossings and determine whether their procedures are sufficient.

FRA is aware that some railroads have installed shunting devices on roadway maintenance machines, such as hi-rail vehicles, that can be switched on or off to activate grade crossing warning devices as a roadway maintenance machine approaches a

crossing.² FRA strongly recommends that railroads utilizing such devices stress to operators that such shunts are not fail-safe and may lose shunt without warning.

Railroads should emphasize that roadway maintenance machine shunting devices should be utilized only as a supplement to compliance with railroad rules that govern the movement of roadway maintenance machines over highway-rail grade crossings.

Operators of roadway maintenance machines should approach every crossing prepared to stop and yield the right-of-way to vehicular traffic unless the crossing has been closed or barricaded or is protected by properly equipped flaggers.

Railroad rules often establish minimum spacing requirements when roadway maintenance machines are travelling. The number of machines in large equipment groupings, such as the one described in the January 2015 accident above, can make it very difficult for machine operators to maintain appropriate spacing. The combined length of a large production gang's equipment may not permit movement over a crossing in a single unit. To avoid the impacts from improper machine spacing and to prevent accidents, FRA recommends that railroads utilize appropriately equipped flaggers³ to provide warning for motor vehicle traffic while large groups of roadway maintenance machines, such as the one in the accident described above, travel over a highway-rail grade crossing. Flag protection at highway-rail grade crossings reduces the risk of a collision.

Finally, it is imperative that roadway maintenance machine operators exercise vigilance and awareness with regard to railroad rule requirements, equipment spacing,

² Typically, railroads instruct machine operators to approach each crossing prepared to stop and not proceed into the crossing until the grade crossing is seen to be clear because a loss of shunt can occur in these situations.

³ See 49 CFR 234.5.

speed, and the status of active warning devices when approaching and traveling over highway-rail grade crossings. For movements over extended distances, rail-bound machines with turntables should be turned to run forward or flag protection should be provided at all highway-grade crossings. FRA encourages railroad management to adopt and adhere to policies that promote the safest course of action in conducting on-track equipment movements over highway-rail grade crossings, particularly by taking into account the unique characteristics that exist at individual crossings. FRA also encourages the use of job briefings whenever work or job conditions change to heighten employees' situational awareness of relevant safety risks.

RECOMMENDATIONS: In light of the above discussion, and in an effort to improve situational awareness and rules compliance for roadway maintenance machine movements over highway-rail grade crossings, FRA recommends that railroads and railroad contractors:

1. Review with their roadway maintenance machine operators the circumstances of the fatal incident described in this Safety Advisory 2016-01 and these recommendations;
2. Review, and update as necessary, their rules and procedures governing the movement of roadway maintenance machines over highway-rail grade crossings and provide instruction on those rules and procedures to their employees;
3. Identify grade crossings that pose significant challenges to roadway maintenance machines traversing the crossings and consider installing lockable wayside warning-device activation equipment or other appropriate measures for use by

roadway maintenance machine operators to ensure safe movement over such crossings;

4. Emphasize that their roadway maintenance machine operators must approach every highway-rail grade crossing prepared to stop and ensure that warning devices (where installed) are activated, the grade crossing is clear, and motor vehicle traffic has stopped (or is under the control of an appropriately equipped flagger) prior to entering a crossing;
5. Emphasize to their roadway maintenance machine operators that shunting devices are not fail-safe and may lose shunt without warning if railroad rules permit the use of roadway maintenance machine shunting devices (capable of being turned on or off to activate grade crossing warning devices). Railroads should also emphasize that roadway maintenance machine shunting devices should only be utilized as a supplement to compliance with rules requiring machine operators to approach crossings prepared to stop and to yield the right-of-way to vehicle traffic;
6. Emphasize the importance of job briefings to discuss applicable railroad rules governing operation of roadway maintenance machines movements over highway-rail grade crossing(s), including the identification of any higher-risk crossings and whether any crossings will be protected by appropriately equipped flaggers or signal personnel;
7. Ensure that when roadway maintenance machines are required to travel extended distances, their machine operators are able to operate this equipment while facing in the direction of the machine's movement; and

8. Review their current procedures for monitoring compliance with rules governing the movement of roadway maintenance machines over grade crossings and make necessary updates. Regularly conduct operational tests to ensure their employees comply with applicable rules governing movement over grade crossings.

FRA encourages railroads and railroad contractors to take action consistent with the preceding recommendations and to take other actions to help ensure the safety of the Nation's railroad employees and the travelling public. FRA may modify this Safety Advisory 2016-01, issue additional safety advisories, or take other appropriate actions necessary to ensure the highest level of safety on the Nation's railroads, including pursuing other corrective measures under its rail safety authority.

Robert C. Lauby,
Associate Administrator for Railroad Safety
Chief Safety Officer.

[FR Doc. 2016-05996 Filed: 3/16/2016 8:45 am; Publication Date: 3/17/2016]