

Close-Clearance Conditions Near Railroad Tracks

A report to the Iowa Legislature as per Section 24,
HF2614, Seventy-Ninth General Assembly

Prepared by
Modal Division
Iowa Department of Transportation

December 6, 2002

Close-Clearance Conditions Near Railroad Tracks

Introduction

The Seventy-Ninth General Assembly, in Section 24 of House File 2614, required the Iowa Department of Transportation to conduct a study “concerning close-clearance conditions near railroad tracks.” The results of the study and recommendations are to be reported by January 1, 2003.

Close-clearance means the close proximity of obstructions (utility poles, buildings, equipment, etc.) within a prescribed distance of railroad tracks whereby they create a dangerous situation for persons working on/near the tracks. Close-clearance problems can be vertical, horizontal, or both, as in the case of a tunnel or bridge. Adequate clearance is dependent on a number of factors and can vary from very close to an object (near a loading dock) to well beyond any standard or concern. This study is focused on those locations that may be considered a safety problem because of inadequate clearance. An example of a clearance problem is shown below.



Background

All transportation systems (highways, runways, railways) have engineering specifications relative to vertical and horizontal clear zones. These clear zones or “clearances” provide a margin of safety to vehicles that operate on these systems and to people who work in/on/around these vehicles or systems. For railroads, engineering guidelines for vertical and horizontal clearance have been established by the American Railroad Engineering and Maintenance of Way Association (AREMA). These guidelines are used by individual railroads, railroad engineering firms, and construction firms and are the generally accepted standards for the industry. However, these are guidelines and not mandated standards.

Many states have mandated or established specific standards (either through code or administrative regulation) on clearances and have established specific processes and rules on providing exceptions and warning when these standards cannot or are not met. Currently in Iowa there is no law or regulation (since 1982) that requires railroads to meet specific engineering standards relative to clearances or to provide warning if clearance is less than standard. As such, there could be problems relative to inadequate clearances or lack of warning about close-clearance situations, whether or not the clearances meet or exceed engineering guidelines. It should also be noted that in many instances the rail track facilities do not belong to an operating railroad, but are owned by the shipper or industry as sidings, loading facilities, etc. While service contracts between the railroad and shipper usually include clearance requirements, exceptional situations may occur.

The central issue related to close-clearance is “Should the state require clearance standards and should there be regulations and processes established, including the requirement for warning signs for ‘close clearance’ situations?” To answer this question one needs to look at the accident history, the extent of the problem, and the costs associated with regulation and compliance.

Current Clearance Standards

Adequate clearance, either vertical or horizontal, is necessary to ensure safe rail operations and is an integral part of any rail system engineering. There are obvious costs associated with inadequate clearance: potential damage to customer shipment, damage to rail equipment, damage to the clearance obstruction, potential derailment and, most important, injury or death of employees and others. Railroads know the risks of inadequate clearances and strive to ensure that all clearances meet generally accepted engineering principles.

The AREMA manual outlines the standards for railway clearances required in each state. Generally, AREMA calls for horizontal clearances of nine feet measured from center of tracks, and vertical clearances of 23 feet from the top of the track. Clearances for parallel tracks are generally 14 feet (measured from center of track to center of track). However, many railroads are now using 15 feet or more. It should also be noted the Manual for Uniform Traffic Control Devices, a highway engineering manual, has outlined that 17 feet (8.5 feet from center of track on both sides) should be used as the “dynamic envelope” for pavement marking at highway grade crossing of rail lines. All this indicates there are generally accepted clearances along railroad tracks.

However, clearances can vary depending on the situation, which includes consideration of the type of rail car, type of rail operation, track curvature and track location. Docks, loading areas, etc., can create situations that may require clearances less than the general 9 feet and 23 feet. For example, a loading platform (depending on its height) may require a horizontal clearance of 4 feet 8 inches, while others may need 9 feet, measured from the center of the track. Essentially, some clearances may provide only a few inches from the platform to the edge of the rail car, some may extend under the rail car, and others may

require greater clearance. Similarly, clearance guidelines have been established for various rail infrastructure along or near the tracks (signals, switch boxes, utility poles, etc.), and guidelines for considering track curvature and super elevation.

“Close-clearance” and in many cases “no-clearance” are those situations where clearance may be less than standard and may cause a safety concern or *whenever there is little or no room for a person to pass between the rail car and the obstruction safely*. Certainly, at docks and loading areas, there is usually little or no room for personal access between the rail car and the obstruction. Overhead loading chutes at grain elevators, door heights at maintenance shops, utility wires, etc., can also restrict access or be an obstruction for a person on top of a rail car, even if the vertical clearance meets the standard. *In any situation, it is not so much an issue of having and meeting engineering guidelines or standards, but whether or not there is room for access between the rail cars and any obstruction*. In essence, the engineering standard itself is irrelevant. It is the actual proximity of the obstruction that causes the safety issue.

Number of Locations

An essential question is “How many locations are there where clearance is limited and poses a safety problem?” Iowa has 4,187 miles of rail lines. However, this total is only line miles and is not reflective of actual track miles. Also, this total does not include industrial track, sidings or track owned by shippers. That inventory is not available to the department. A reasonable estimate of the number of actual miles of track in the state of Iowa is in the range of 6,500 to 6,800 miles.

How much of that track would be considered to have a “close-clearance” problem is unknown. Time and resources do not allow a detailed inventory of track and track clearances. It is safe to assume that close-clearance situations can occur at any number of locations and may number into the thousands.



Certainly, close-clearances would occur at nearly all loading/unloading locations and have a reasonable probability of occurring in switchyards, sidings, rail maintenance shop areas and bridge locations (either over or under). It is also safe to assume that the majority of close-clearance situations probably are not caused by poor engineering in meeting a standard, but simply because the track was constructed too close to an object or the object was constructed too close to the track. For example, a loading platform may meet a design standard and still be a close-clearance situation. Conceivably, there are thousands of locations that one could characterize as “close-clearance,” most of which may very well meet or exceed a standard.

State Regulation – Standards and Experience

As shown in the AREMA manual, most states have established clearance standards and many have been in existence for more than a half-century. Iowa is one of seven states that currently do not have standards spelled out either in law or regulation. That has not always been the case. As late as 1982, Iowa continued to have clearance requirements, warning regulations and a process for providing exceptions.

Prior to 1976 and the formation of the Iowa Department of Transportation, rail transportation issues and railroad regulation were the responsibility of the Iowa Commerce Commission. As such, administrative rules were established that provided regulations relative to clearances and other rail activities. In 1976 the Iowa Department of Transportation was organized and rail transportation became part of its responsibility under the Rail Transportation Division. In 1982 a review of the administrative rules inherited from the Iowa Commerce Commission relative to railroads resulted in rescission of many regulations, including those related to clearances and clearance warning. The reason cited was that the rules “concern topics of minimum departmental responsibility under the Iowa code and are competently covered by AREA (American Railway Engineers Association) manuals of standards.”

Although the state of Iowa does not have regulations on clearances, it does not mean that railroads do not follow certain design guidelines. They certainly do, as it is in their best interest to properly design rail systems. However, there may be situations or locations where a standard cannot be met and encroachment into the clearance may occur, causing a safety concern. The railroad decides whether or not to provide a design exception.

In other states, and prior to 1982 in Iowa, there is usually a process whereby these exceptions are reviewed and ruled on by the regulatory agency. Generally, if an exception is provided, some sort of warning of close or no clearance is required. In discussion with states bordering Iowa it was found that:

- 1) Few exceptions are requested because few miles are being constructed and what is being constructed meets standards; i.e., few problems exist relative to clearance standards. However, all recognize *the safety implications of inadequate clearance for rail workers regardless of standards.*
- 2) Most non-railroad (shipper-owned) facilities being constructed are done under railroad guidance through service contracts; i.e., the railroad generally approves any new shipper track facilities prior to providing service.

- 3) Some states are primarily concerned with and have processes for clearances relative to highway facilities; i.e., highway /rail crossings and bridges.
- 4) In most states the rules are administrative regulation as opposed to being codified in state law, and most have been in existence for many years.

Finally, it was also found that few states have a “blanket warning” regulation; i.e., warning signs of no-clearance or close-clearance if side/top-clearance is less than a certain distance. Usually, if a design exception was provided by the regulatory agency, then a sign would be required, but no sign is required if clearance meets standard. Typically, if a safety situation is evident, signs for close-clearance are provided by the railroad or the shipper. *Requiring signs for close-clearance was a very significant part of Iowa’s previous regulation.*

Safety Concerns

Rail employees, and to some extent shipper employees, as part of their jobs must ride on or work along side of rail cars and must have adequate clearance from adjacent obstructions. Without adequate clearance, the employee needs to know the problem locations or be provided adequate warning at the locations where there is no clearance. This is especially true in situations when rail employees are working in a new territory. Railroads often transfer employees from one territory to another without the employee being familiar with areas where there may be close or no-clearance. This is a safety concern. This concern is sometimes addressed in safety bulletins, safety meetings, and supervisor/employee discussions to try and make employees aware of close-clearance locations. However, accidents can and do happen as a result of inadequate clearance.

In reviewing the Federal Rail Administration (FRA) database on rail accidents in Iowa, there is little in the way of empirical data on accidents where inadequate clearance is a cause or contributor to employee casualties (death or injury). Rail accident data on rail employee casualties provides the following information:

- 1) Most casualties occur on railroads with the most miles of track.
- 2) Yard brakeman and yard helpers accounted for 14 percent of all casualties.
- 3) Forty-two percent of casualties occurred in yards.
- 4) Sixty-nine percent involved some type of rail equipment (cars, locomotives, etc.).

Even though the data can identify that a casualty occurred while an employee was standing near a freight car or riding on the side of a freight car, information on whether clearances were a contributing factor is unavailable. In order to assess whether those states with clearance regulations have a better safety record than those states that do not have clearance standards, such data would be needed. It is simply not available.

However, there is anecdotal information on clearances being a safety concern and a contributor to accidents, injuries and even death. In 1970 an Iowa employee was injured while riding on the side of a rail car and was struck by a switching stand located too close to the rail, in this case closer than the standard eight feet. Another example from Ohio reports a rail employee was killed when he was crushed between a rail car and a close-

clearance obstruction. A third example cites a conductor was injured when struck by a rail car at night while working between two sets of tracks where the clearances between the tracks was less than standard. Other anecdotal information was alluded to by railroads and by rail employee unions in our survey on close-clearance issues.

The bottom line is that there are safety concerns and attention should be given to the hazards posed by close or no-clearance by railroads and rail employees. They need to know where these locations are and perhaps have warning devices, training, maps, etc.

OSHA Requirements

The federal Occupational Safety and Health law, administered by the Occupational Safety and Health Administration, and the Iowa Occupational Safety and Health laws and regulations, administered by Iowa Workforce Development, both require employers and employees to reduce hazards and to work together in improving safety in the workplace. Section 88.5(12) of the Iowa Code states, in part, "... The commissioner shall adopt rules requiring railway corporations within the state to provide a safe and healthy workplace." While no specific standard has been established for "clearances" and warning signs for clearances within the rules, there are provisions for filing a complaint and resolving hazardous situations. Compliance with OSHA and state safety and health laws would apply to all employers, including those who own track facilities and are not an operating railroad.

In both the federal and state policy, employees and employers are strongly encouraged to work together to resolve any safety issues. In fact, a proposed rule by the U.S. Department of Labor (OSHA) would require all employers to establish a safety and health program to manage workplace safety. Many, if not all railroads operating in Iowa, already have a safety management program or at least a process for identifying safety concerns. In a survey of the railroads operating in Iowa, railroad companies stated that warning signs are placed when clearances are a concern, safety bulletins are posted for close-clearance situations when identified, and employee safety education/orientation routinely emphasize clearances as a safety concern.

The surveyed railroads are more concerned about regulations regarding clearance standards, and that those standards would be different from the current AREMA standards, than on having a requirement for warning signs. "No clearance" signs are already provided when identified as needed. Also, clearance requirements and signs are established as part of their service contracts with customers. For many railroads, posting warning signs would not be a great burden.

Cost Implications

The cost of compliance for any new regulation would be dependent on the extent of the regulation and the administrative burden placed on the railroad and the regulatory body. A full regulatory response, as was in place in Iowa prior to 1982, would certainly have a higher cost than a more modest approach of a mandatory "warning sign" regulation. In either case, there are costs to regulation.

In discussions with other states that have full-clearance standards, some have a process for approval of new construction and some only for exceptions or variances to standards. For those that require approval of designs, the costs would be substantially higher for the railroads in preparing applications and for the state agency that reviews and renders a decision on the application. However, for those that only require exceptions and render decisions based on complaints, the costs would be significantly less. The process is very dependent on the number of applications, which in some states are very few since there is little in way of new rail construction.

It should be noted that requiring warning signs was not found to be a controversial issue in those states that have clearance regulations. When a design exception was approved, (such as less than eight feet horizontal or 22 feet vertical clearance), the decision usually included the posting of a clearance warning. Little is said in the regulations of other states that require warning signs for clearances that meet standards but are still close (as at docks, elevators, etc). This was previously a part of Iowa's clearance regulation. In essence, the regulation stated that any horizontal clearance of less than eight feet and vertical clearance of 22 feet required a warning sign. In fact, the location and lettering of the sign itself was regulated.

Having a mandatory "warning sign" regulation, however, could still have a cost implication, primarily for the railroads and the shippers who own rail facilities. The relatively minor cost of placing signs where needed is one part of the overall cost. In most cases, these signs would already be in place at close clearance locations, either as a result of railroad safety actions or as a result of contractual guidance for shipper locations. For those locations that do not have signs but are identified as needing one, the railroads most likely would already have such signs in inventory, so the actual cost of posting warning signs would be small. There may be an initial cost after the regulation is imposed relative to identifying close-clearance locations. However, rail employees could or should know where those locations exist.

A more significant cost than a mandatory warning sign regulation could be added liability to a railroad or shipper for potentially not having signed all locations that may be required. As diligent as one might be, there may be locations that miss being signed, which could expose the railroad or shipper to increased liability. Whether or not this added liability is significant and greater than the safety benefit received is debatable. Some of this concern could be decreased by good faith efforts of an employee/employer safety management process as envisioned by OSHA.

Conclusion and Recommendations

In reviewing the close-clearance conditions and issues along railroad tracks, it is concluded that:

- 1) There is insufficient empirical accident data but sufficient anecdotal data to conclude there exists a safety concern related to close-clearance along railroad tracks.
- 2) The extent of close-clearance problems is unknown, but there are numerous locations where inadequate clearance poses a safety concern. The problems are not just locations where clearances are less than standard, but all locations that provide a clearance hazard to persons working on/near rail cars.
- 3) There currently exists guidelines/standards for rail clearances, and each railroad strives to adhere to these industry standards. The imposition of clearance standards through state law or regulation is not necessary. The safety issue is not addressed by the existence of standards, but whether appropriate warning, information and training is provided to employees relative to close-clearance hazard locations. An appropriate law concerning the provision of warning signs could provide an impetus for safety relative to close-clearance locations.
- 4) The costs to provide warning signs and safety information and training would be minimal for the railroads and others who own track facilities since many already do these things. In addition, the cost for the state to enforce a law relative to mandatory signage would also be minimal.

It is recommended that railroads review close-clearance problem areas and install warning signs at all close-clearance locations as a matter of policy.

Railroads should work closely with shippers and customers where docks/loading facilities could cause safety concerns, and require warning signs as part of their service agreements for the safety of customer employees as well as railroad employees.

Railroads should also work closely with rail employees, who are in the best position to identify close-clearance problem areas, and together review and improve training and information relative to clearance issues. Rail employees and rail management, working together, could alleviate many of the safety concerns with close-clearances along rail track.

Finally, legislation could be prepared similar to the former Iowa Administrative Rule, Iowa Commerce Commission Chapter 5 section 3 (Rescinded 1982). See Appendix I. The rule required warning signs for vertical and horizontal clearances less than some prescribed distance – eight feet horizontal and less than 22 feet vertical. Also included in Appendix I is draft language introduced in the 2002 legislative session and sponsored by United Transportation Union (UTU). Either could be a model for legislation that would give close clearance safety the force of law.

Close-Clearance Conditions Near Railroad Tracks

Appendix I

Potential Bill Language

Previous Language – Iowa Administrative Rules (ICC Ch. 5, sec 3. Rescinded 1982)

Warning Signs required. At all overhead freight loading platforms, awnings, canopies, coal chutes, ore tipples, entrances to warehouses, shop buildings and similar structures where vertical clearance is less than 22 feet, and at all high freight loading platforms where the horizontal clearance is less than eight feet, warning signs must be erected as a caution to employees.

Language entered as HF 2054 in 2002 Legislative Session

NEW SECTION. 327F.8 CLOSE-CLEARANCE WARNING DEVICES.

1. A railroad company shall place a warning device at a location where the close-clearance between a railway owned by the railroad company and a building, machinery, trees, brush, or other object is such that the building, machinery, trees, brush, or other object physically impedes a person who is lawfully riding the side of the train in the course of the person's duties in service to the railroad company from clearing the building, machinery, trees, brush, or other object.
2. The warning device shall be placed in a location which provides adequate notice to a person riding the side of a train so that the person may prepare for the close-clearance.
3. Placement of a warning device pursuant to this section does not relieve a railroad company from any duties required under chapter 317 or section 327F.27.
4. A violation of this section is punishable as a schedule "one" penalty under section 327C.5.