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**49 CFR Ch. II (10–1–14 Edition)**

(d) Collisions in the group containing the gated crossings nationwide where horns were routinely sounded will then be identified as fatal, injury only or no casualty. Collisions will be identified as fatal if one or more deaths occurred, regardless of whether injuries were also sustained. Collisions will be identified as injury only when injuries, but no fatalities, resulted.

(e) The collisions (incidents) will be summarized by year for the five-year period preceding the year in which the risk index is being updated. The fatality rate for each year will be calculated by dividing the number of fatalities by the number of fatal incidents. The injury rate will be calculated by dividing the number of injuries in injury only incidents by the number of injury only incidents. FRA will publish updated fatality and injury rates on an annual basis in the FEDERAL REGISTER.

(f) Per guidance from DOT, \$3 million is the value placed on preventing a fatality. The Abbreviated Injury Scale (AIS) developed by the Association for the Advancement of Automotive Medicine categorizes injuries into six levels of severity. Each AIS level is assigned a value of injury avoidance as a fraction of the value of avoiding a fatality. FRA rates collisions that occur at train speeds in excess of 25 mph as an AIS level 5 (\$2,287,500) and injuries that result from collisions involving trains traveling under 25 mph as an AIS level 2 (\$46,500). About half of grade crossing collisions occur at speeds greater than 25 mph. Therefore, FRA estimates that the value of preventing the average injury resulting from a grade crossing collision is \$1,167,000 (the average of an AIS-5 injury and an AIS-2 injury).

(g) Notice that the quantity  $[PC \cdot P(FC|C)]$  represents the expected number of fatal collisions. Similarly,  $\{PC \cdot [P(CC|C) - P(FC|C)]\}$  represents the expected number of injury collisions. These are then multiplied by their respective average number of fatalities and injuries (from the table above) to develop the number of expected casualties. The final parts of the expressions attach the dollar values for these casualties.

(h) The Risk Index for a Crossing is the integer sum of the Predicted Cost of Fatalities and the Predicted Cost of Injuries.

**NATIONWIDE SIGNIFICANT RISK THRESHOLD**

The Nationwide Significant Risk Threshold is simply an average of the risk indexes for all of the gated public crossings nationwide where train horns are routinely sounded. This value will be recalculated annually

Struck/Struck by Highway User; 28—Number of Locomotive Units; and 29—Number of Cars on the current FRA Form 6180-57 Highway-Rail Grade Crossing Accident/Incident Report.

and published in a notice in the FEDERAL REGISTER. For the most recent value of the Nationwide Significant Risk Threshold, please visit FRA's public Web site at <http://www.fra.dot.gov>.

**CROSSING CORRIDOR RISK INDEX**

The Crossing Corridor Risk Index is the average of the risk indexes of all the public crossings in a defined rail corridor.

**QUIET ZONE RISK INDEX**

The Quiet Zone Risk Index is the average of the risk indexes of all the public crossings in a Quiet Zone. It takes into consideration the absence of the horn sound and any safety measures that may have been installed.

[71 FR 47634, Aug. 17, 2006, as amended at 72 FR 44792, Aug. 9, 2007]

**APPENDIX E TO PART 222—  
REQUIREMENTS FOR WAYSIDE HORNS**

This appendix sets forth the following minimum requirements for wayside horn use at highway-rail grade crossings:

1. Highway-rail crossing must be equipped with constant warning time device, if reasonably practical, and power-out indicator;
2. Horn system must be equipped with an indicator or other system to notify the locomotive engineer as to whether the wayside horn is operating as intended in sufficient time to enable the locomotive engineer to sound the locomotive horn for at least 15 seconds prior to arrival at the crossing in the event the wayside horn is not operating as intended;
3. The railroad must adopt an operating rule, bulletin or special instruction requiring that the train horn be sounded if the wayside horn indicator is not visible approaching the crossing or if the wayside horn indicator, or an equivalent system, indicates that the system is not operating as intended;
4. Horn system must provide a minimum sound level of 92 dB(A) and a maximum of 110 dB(A) when measured 100 feet from the centerline of the nearest track;
5. Horn system must sound at a minimum of 15 seconds prior to the train's arrival at the crossing and while the lead locomotive is traveling across the crossing. It is permissible for the horn system to begin to sound simultaneously with activation of the flashing lights or descent of the crossing arm;
6. Horn shall be directed toward approaching traffic.

**APPENDIX F TO PART 222—DIAGNOSTIC  
TEAM CONSIDERATIONS**

For purposes of this part, a diagnostic team is a group of knowledgeable representatives of parties of interest in a highway-rail