

or observed. Although some of this variation is the result of limited exposure to rare events, some of it likely reflects the existence of circumstances that are different in the communities (nighttime vs. 24-hour bans, strong or weak law enforcement, generally good sight lines or poor ones, etc.). Over time, the presence or absence of such factors will be revealed in the accident rate. An important feature of the interim final rule creates an exception for existing whistle ban communities with no recent horn-relevant accidents but with risk levels that are above the Nationwide Significant Risk Threshold but below a value equal to two times that threshold. This exception remains until the community experiences a horn-relevant accident, after which it is judged by the same standards as other communities (with a 3-year grace period if it elects to adopt SSMs or ASMs).

The issue of whether flashing lights and gates should be required as a baseline condition for a quiet zone has similar characteristics. In the NPRM, FRA specified that all crossings in any quiet zone should have flashing lights and gates based on the following practical considerations:

- At passively signed crossings, the motorist is expected to “yield” to oncoming trains. But the only warning of a train’s approach is provided by the train itself, including the headlight and auxiliary alerting lights, and the train horn (if used).
- Because of obstacles in the “sight triangle,” track curvature, angle of intersection, or adverse weather, there are some circumstances where only the horn may be effective in aiding the motorist’s decision.
- It is unfair to place a burden on the motorist to yield without providing the best available information to inform the decision.
- Crossings equipped with flashing lights but no gates are similarly situated, except that the motorist is expected to stop but under most State laws may proceed if “safe” to do so. In many cases motorists are left with ambiguous information regarding the appropriate response.

Accordingly, FRA continues to be convinced that, with respect to quiet zones where the train horn is silenced for the first time, flashing lights and gates should be provided at all public crossings. Motorists using such crossings will for the first time be deprived of auditory warnings, which would place them at significant peril if no additional warnings are provided.

However, FRA recognizes that a significant number of whistle ban crossings exist today, particularly in the

State of Wisconsin, where only passive signage or only flashing lights are provided. There is now risk data specific to those situations. Further, the statute asks us to give “special consideration to the needs” of communities where these crossings are located, and public and private planners have made decisions in reliance on the status quo. Finally, FRA will have achieved the principal safety objective of this rulemaking if significant risk to persons associated with the absence of the train horn has been abated.

Accordingly, FRA has determined that it is appropriate to allow conversion of existing whistle ban corridors into Pre-Rule Quiet Zones without requiring that flashing lights and gates be provided at all crossings. FRA has further provided that, where the proposed Pre-Rule Quiet Zone exceeds the relevant risk threshold (making it necessary to compensate for absence of the train horn), the community may credit the risk reduction associated with installation of flashing lights and gates toward the required effort. In many cases this will not result in all crossings being so equipped, but it will encourage use of the most important single safety improvement available in the highway-rail crossing toolbox.

#### *G. Requirements for the Train Horn and Its Use*

On the effective date of that portion of this rule which mandates use of the train horn, State laws concerning use of the train horn at highway-rail crossings will be preempted. This rule will also require the modification of railroad operating rules that are in conflict with it. FRA already has in place a rule that sets a minimum horn loudness of 96 dB(A) at 100 feet in front of the train. The method for conducting that test, a possible maximum level for the horn, and the manner in which the horn is sounded have been issues in this rulemaking. In approaching this complex of issues FRA has tried to balance several considerations, specifically—

- The need to make it possible for motorists to be warned within their vehicles, with windows closed, at a point on their approach to the crossing where the information is useful; and
- The need to limit dispersal of horn noise into the community (other than at the crossing and its approaches) to the extent feasible.

Although FRA can foresee the possibility of further refinements in these decisions over the next few years as information becomes available, the comments received in this rulemaking,

coupled with further research conducted in response to those comments, have provided a good foundation for resolving these issues.

The first group of issues has to do with the horn itself. FRA had hoped to describe engineering characteristics of the horn that would mitigate the dispersal of noise into the community (in railroad parlance, “to the field”). This issue has been presented primarily due to the relocation of horns to the center of the locomotive roof, a choice made by railroads to reduce crew occupational noise exposure. At FRA’s technical conference on acoustical issues, the major railroads arranged a presentation by a recognized expert who described a “shadow effect” produced by the locomotive profile that results in misleadingly low sound level readings at the location specified in FRA’s current test procedure. The point of calling attention to this was to emphasize that in terms of actual dispersal of noise the noise levels to the field do not, in fact, exceed those to the front (as might be suggested by readings taken just 100 feet directly in front of the locomotive at only four feet above the track). The overall lesson FRA was asked to take from the presentation is that while center-mounted horns are not louder to the field than to the front, neither can they be made highly directional.

A secondary lesson from this presentation and a subsequent field study is that, by testing the horn at roof height (which under the noise models actually is more proportional to the noise received at the crossing), it may be possible to “turn down” some roof mounted horns. As a result, FRA adopts a new test procedure in this interim final rule that retains the 100 foot distance but places the sound level meter receptor at roof height (*i.e.*, out of the locomotive’s “shadow”).

Another objective of this rulemaking has been to set a maximum sound level for the horn. The NPRM proposed consideration of two values—104 dB(A) (which was seen as more appropriate for actively signed crossings) and 111 dB(A) (which was viewed as more appropriate for passively signed crossings). Although FRA’s general rationale was reasonably well received by some commenters, many others appeared convinced that train horns are too loud and should be significantly reduced in volume. FRA has continued to evaluate the issues identified in research referred to in the NPRM, including refined analysis using signal detection theory, and is persuaded that a maximum value of 110 dB(A) should be sufficient to alert motorists in most situations,