

Date: December 5, 2000 Reply to Attn. of: S-99-01

Subject: Clarification of Application of 49 CFR §236.023

From: (Original Signed By)
George Gavalla
Associate Administrator for Safety

To: All Regional Administrators, Deputy Regional Administrators,
S&TC Specialists and S&TC Inspectors

The S&TC Technical Resolution Committee, meeting in Omaha, Nebraska the week of August 16, 1999, acted on a request for clarification of the application of 49 CFR Section 236.023(f). The question before the committee was what constitutes a failure of a light-emitting diode (LED) signal. This failure must be detected so that a less restrictive aspect than intended is not displayed.

After a review of historical documents and input from railroad management, labor, and suppliers, it was the consensus of the committee that an independent scientific study should be done to determine when a failure in an LED signal has reached the point where it could cause a less restrictive aspect than intended from being displayed. This failure must be defined by a percentage of non-illuminated LEDs. It was proposed that this study be conducted with support from the manufacturers. This study would determine what percentage of non-illuminated LEDs would cause the signal aspect to be misinterpreted or not seen by an approaching train crew. The study should include looking at the various LED signal colors (red, yellow, green, and lunar) in real world situations. These would include day/night, poor/clear visibility, desert/mountainous terrain, etc. The study should also investigate the effects of sunglasses on the perception of the color produced by the LEDs. The study will be conducted by the Volpe Center.

In addition, we will ask VOLPE to conduct a parallel study on LED flashing light units to determine what constitutes a light out condition and the light intensity levels required for proper visibility. The light out condition determination will affect when a "warning system malfunction" occurs at a grade crossing signal. When flashing light units are not visible to the highway user, the railroad is required to take certain safety precautions outlined in §234.105 "Activation failure" and §234.106 "Partial activation." The light intensity levels required for proper visibility may have a bearing on an approaching highway user's perception about the state (activated/not activated) of the highway-rail grade crossing warning system. Also, the light intensity level determination will affect how FRA applies §234.117 "Flashing Light Unit" and §234.221 "Lamp voltage." At the conclusion of these studies, we will determine whether we can use their conclusions as guidance or will need to amend the relevant regulations. In the meantime, failures of LED signals which clearly result in a less restrictive aspect than intended should be treated in the same manner as conventional lamps currently are. Please direct questions on these issues to the Staff Director of our Signal and Train Control team, who will consult with the Office of Chief Counsel on whether a violation can be sustained.