

have sufficient light to safely work or travel, especially during nighttime operations. The requirements will also help to make these machines more visible to roadway workers on the track and to vehicular traffic at highway-rail grade crossings.

This section makes several references to visibility in normal weather and atmospheric conditions. The requirement to illuminate the track ahead for a minimum distance of 300 feet is a measure to be considered under generally clement weather and atmospheric conditions. FRA understands that during periods of rain, fog, snow and other occurrences that are common in normal weather patterns, the lighting capability of the illumination devices may temporarily be unable to reach a full 300 feet. These temporary instances when full illumination is not possible will not be considered a violation of this regulation. In addition, FRA will not consider unusual weather events such as hurricanes, tornadoes, eclipses, or horizontally driven snow to be normal weather and atmospheric conditions under which the regulation must be met.

Paragraph (a) requires an illumination device, such as a headlight, capable of illuminating obstructions on the track ahead in the direction of travel for a minimum distance of 300 feet under normal weather and atmospheric conditions. In commenting on the NPRM, Loram stated that the requirement should define the area of the track and roadbed to illuminate and include a specific value of adequate illumination or a light intensity minimum. Nevertheless, the Task Group was satisfied with the language of paragraph (a) in the NPRM for purposes of its application to new on-track roadway maintenance machines. FRA has elected not to change paragraph (a). FRA believes that this performance requirement provides sufficient specificity for the regulated industry.

When on-track roadway maintenance machines are operated during the period between one-half hour after sunset and one-half hour before sunrise, or in dimly lit areas such as tunnels, they are required by paragraph (b) to be equipped with operating work lights unless equivalent lighting is otherwise provided, for example, by portable wayside lighting.

Paragraph (c) requires an operative warning light or beacon mounted to the roof of new on-track roadway maintenance machines. The light or beacon must be designed to flash intermittently while rotating 360 degrees or otherwise emitting light in a

360-degree field. Exempt from this requirement are on-track roadway maintenance machines designed without fixed roofs that have a light weight less than 17,500 pounds.

In commenting on the NPRM, Loram stated that the proposed requirement for a light that rotates 360 degrees would seem to disallow the use of strobe lights. In considering Loram's comment, the Task Group concluded that the NPRM's preamble language concerning paragraph (c) was confusing. FRA agrees with Loram and the Task Group and makes clear that, while the light or beacon required by this paragraph must emit light in a 360-degree field, it does not have to rotate to do so. The intent is that the light or beacon be visible to someone in the vicinity of the machine, whether that person is in front, back, or to the side of the machine. A strobe light that intermittently flashes light in a 360-degree field, but does not need to rotate to do so, would certainly fulfill the requirements of this paragraph.

FRA notes that in the NPRM the second sentence of paragraph (c) reads: "New roadway maintenance machines that are not equipped with fixed roofs and have a light weight greater than 7,000 pounds but less than 17,500 pounds are exempt from this requirement;" (emphasis added). The reference to "7,000 pounds" was in error and should have read "7,500 pounds." Yet, FRA is removing the reference as unnecessary because a machine having a weight of 7,500 pounds or less does not meet the definition of an "on-track roadway maintenance machine" in § 214.7 and, therefore, is not subject to the requirements of this section.

Paragraph (d) requires new on-track roadway maintenance machines to be equipped with brake lights activated by an application of the machine braking system. The brake lights must be visible for a distance of at least 300 feet under normal weather and atmospheric conditions.

In commenting on this paragraph, Loram pointed out that the regulation does not seem to consider roadway maintenance machines that move in both directions. To the extent Loram's comment concerns older equipment, FRA notes that such equipment is not covered by the requirements of this section. Rather, existing on-track roadway maintenance machines are covered by the requirements of § 214.517(d), below, which permits the use of reflective material instead of brake lights. Of course, new on-track roadway maintenance machines must be equipped with brake lights, and those new machines that move in both

directions will need to have brake lights on both ends of the machines. Even if a machine that moves in both directions is wired so that the brake lights apply on both ends at the same time, FRA does not believe that this creates an operational problem that needs to be addressed as FRA has done in this rule for change-of-direction alarms. See § 214.511(b). In fact, this may even enhance safety in certain situations. Nevertheless, as was noted in the Task Group's discussions, a machine may be equipped with a toggle switch to allow the operator to indicate the direction of the machine's travel so that the brake lights operate only on the trailing end of the machine's movement. For the foregoing reasons, the text of paragraph (d) remains unchanged from the NPRM.

Paragraph (e) requires that new on-track roadway maintenance machines be equipped with operative rearward viewing devices, such as rearview mirrors or their functional equivalent, to enable machine operators to better see other machines or roadway workers within their immediate work zone. Video cameras and monitors may be used to comply with the requirements of this paragraph.

#### *Section 214.511 Required Audible Warning Devices for New On-Track Roadway Maintenance Machines*

This section requires audible warning devices on new on-track roadway maintenance machines to provide additional safety for roadway workers and other machine operators.

Paragraph (a) requires audible warning devices, such as horns, that produce sound loud enough to be heard by roadway workers and other machine operators within the immediate work area. The triggering mechanism for the audible warning device must be clearly identifiable and within easy reach of the machine operator.

Paragraph (b) requires automatic change-of-direction alarms that produce an audible signal that is at least three seconds long and uniquely distinguishable from any surrounding noise. Except as noted below, the change-of-direction alarm must sound automatically in each instance when the on-track roadway maintenance machine changes its designated forward direction to a reverse direction.

In commenting on the proposed rule, Loram stated that some machines, by their work function on the track, move back and forth at intervals so short that their change-of-direction alarms would sound almost continually while they are performing track work. Such a result could effectively hamper the safety of track work rather than enhance it. In