Memorandum

U.S. Department
of Transportation

Federal Railroad
Administration

Date: Reply to Attn. of: S-99-03

Subject: Clarification of Application, Interpretation and Enforcement of 49 CFR Sections 234.213, 236.2, 234.249 & 236.107

From: 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, interpretation, and enforcement of 49 CFR Sections 234.213 and 236.2 (Grounds), and Sections 234.249 and 236.107 (Ground Tests). The question before the committee was to determine if an isolated energy source should be considered an energy bus. A secondary issue was the allowable limit of current value of a ground on electronic equipment.

After a review of current industry testing procedures, recommended practices and input from railroad management, labor, and suppliers, it was the consensus of the committee that energy sources from electronic devices that provide one or more individual isolated power supplies, the functioning of which affects the safety of train operations or highway-rail grade crossing warning systems operation, are to be considered an energy bus. On the second issue the committee could not reach a consensus on what the allowable limit of current of a ground should be on electronic equipment.

It is an accepted practice in the railroad industry to use electronic devices to provide one or more individual isolated power supplies from a single common storage battery or power supply. One example of this would be dc to dc converters. These devices produce a energy source that may be used in vital circuitry and, if grounded, create a safety risk to the safe operation of trains, highway-rail grade crossing warning system operation, and the public.

Discussion within the committee and external customers revealed that the intent of testing these sources was to check all circuits functioning outside the structure in conjunction with what is already required. It is not the intent to perform a ground test on isolated

energy sources circuited within the structure. One example of this would be an energy source to a relay within the structure (i.e., MD relay drive to XR relay).

Concerning the second issue; Section 234.213 requires electronic devices designed to be ground free shall be kept free of grounds having a value that affects the proper operation of the device.

Suppliers were unable provide a value of grounded current that would affect the safe and proper operation of the device. The committee recommends further discussions with suppliers to obtain recommended values.

It was a concern to all parties that consistency of the requirements of grounds and ground tests in Parts 234 and 236 be established. Section 234.213 requires electronic devices designed to be ground free shall be kept free of grounds having a value that affects the proper operation of the device. This language does not currently exist in Section 236.2. Section 234.249 allows the use of an external battery source as an acceptable means of testing, while Section 236.107 does not address this. Section 236.107 also states that tests should be applied to each output circuit of those electronic devices installed to provide one or more individual isolated power supplies from a single common storage battery or power supply. This language is not in Section 234.249.

In an effort to standardize the application of the rules of Sections 234.213, 234.249, 236.2 and 236.107, the following changes will be made to the application of the rules:

Add to 236.2: **Electronic devices designed to be ground free shall be kept free of grounds having a value that affects the proper operation of the device.**

Add to 236.107: **Use of an appropriate external battery source is an acceptable means of testing.**

Change in 236.107: The ground test ~~should~~ **shall** be applied to each output circuit of those electronic devices installed to provide one or more individual isolated power supplies from a single common storage battery or power supply.

Add to 234.249: **Tests shall be applied to each output circuit of those electronic devices installed to provide one or more individual isolated power supplies from a single common storage battery or power supply.**

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