

**Pt. 229, App. H**

**49 CFR Ch. II (10–1–13 Edition)**

the correction of these deficiencies and confirms that they are corrected?);

(3) A clear statement of position for all parties involved for each product vulnerability cited by the reviewer;

(4) Identification of any documentation or information sought by the reviewer that was denied, incomplete, or inadequate;

(5) A listing of each design procedure or process which was not properly followed;

(6) Identification of the software verification and validation procedures for the product's safety-critical applications, and the reviewer's evaluation of the adequacy of these procedures;

(7) Methods employed by the product manufacturer to develop safety-critical software, such as use of structured language, code checks, modularity, or other similar generally acceptable techniques; and

(8) Methods by which the supplier or railroad addresses comprehensiveness of the product design which considers the safety elements.

[77 FR 21352, Apr. 9, 2012]

**APPENDIX G TO PART 229 [RESERVED]**

**APPENDIX H TO PART 229—STATIC NOISE TEST PROTOCOLS—IN-CAB STATIC**

This appendix prescribes the procedures for the in-cab static measurements of locomotives.

**I. MEASUREMENT INSTRUMENTATION**

The instrumentation used should conform to the following: An integrating-averaging sound level meter shall meet all the requirements of ANSI S1.43-1997 (Reaffirmed 2002), "Specifications for Integrating-Averaging Sound Level Meters," for a Type 1 Instrument. In the event that a Type 1 instrument is not available, the measurements may be conducted with a Type 2 instrument. The acoustic calibrator shall meet the requirement of the ANSI S1.40-1984 (Reaffirmed 2001), "Specification for Acoustical Calibrators." The Director of the Federal Register approves the incorporation by reference of ANSI S1.43-1997 (Reaffirmed 2002) and ANSI S1.40-1984 (Reaffirmed 2001) in this section in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of the incorporated standards from the American National Standards Institute at 1819 L Street, NW., Washington, DC 20036 or <http://www.ansi.org>. You may inspect a copy of the incorporated standards at the Federal Railroad Administration, Docket Room, 1200 New

Jersey Avenue, SE., Washington, DC 20950, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html)

**II. TEST SITE REQUIREMENTS**

The test site shall meet the following requirements:

(1) The locomotive to be tested should not be positioned where large reflective surfaces are directly adjacent to or within 25 feet of the locomotive cab.

(2) The locomotive to be tested should not be positioned where other locomotives or rail cars are present on directly adjacent tracks next to or within 25 feet of the locomotive cab.

(3) All windows, doors, cabinets seals, etc., must be installed in the locomotive cab and be closed.

(4) The locomotive must be running for sufficient time before the test to be at normal operating temperature.

(5) The heating, ventilation and air conditioning (HVAC) system or a dedicated heating or air conditioner system must be operating on high, and the vents must be open and unobstructed.

(6) The locomotive shall not be tested in any site specifically designed to artificially lower in-cab noise levels.

**III. PROCEDURES FOR MEASUREMENT**

(1)  $L_{Aeq, T}$  is defined as the A-weighted, equivalent sound level for a duration of T seconds, and the sound level meter shall be set for A-weighting with slow response.

(2) The sound level meter shall be calibrated with the acoustic calibrator immediately before and after the in-cab static tests. The calibration levels shall be recorded.

(3) Any change in the before and after calibration level(s) shall be less than 0.5 dB.

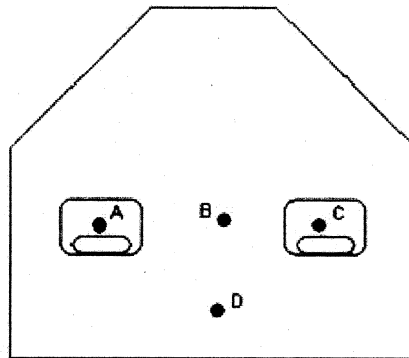
(4) The sound level meter shall be measured at each of the following locations:

(A) 30 inches above the center of the left seat;

(B) Centered in the middle of the cab between the right and left seats, and 56 inches above the floor;

(C) 30 inches above the center of the right seat; and

(D) One foot (0.3 meters) from the center of the back interior wall of the cab and 56 inches above the floor. See Figure 1.



**Figure 1. Microphone Locations inside Typical Locomotive Cab**

(5) The observer shall stand as far from the microphone as possible. No more than two people (tester, observers or crew members) shall be inside the cab during measurements.

(6) The locomotive shall be tested under self-loading conditions if so equipped. If the locomotive is not equipped with self load, the locomotive shall be tested with no-load (No-load defined as maximum RPM—no electric load) and an adjustment of 3 dB added to the measured level.

(7) The sound level shall be recorded at the highest horsepower or throttle setting.

(8) After the engine speed has become constant and the in-cab noise is continuous,  $L_{Aeq, T}$  shall be measured, either directly or using a 1 second sampling interval, for a minimum duration of 30 seconds at each measurement position ( $L_{Aeq, 30s}$ ).

(9) The highest  $L_{Aeq, 30s}$  of the 4 measurement positions shall be used for determining compliance with §229.121(a).

(10) A locomotive that has failed to meet the static test requirements of this regulation may be re-tested in accordance with the requirements in section II of this appendix.

#### IV. RECORDKEEPING

To demonstrate compliance, the entity conducting the test shall maintain records of the following data. The records created under this procedure shall be retained and made readily accessible for review for a minimum of three years. All records may be maintained in either written or electronic form.

(1) Name(s) of persons conducting the test, and the date of the test.

(2) Description of locomotive being tested, including: make, model number, serial number, and date of manufacture.

(3) Description of sound level meter and calibrator, including: make, model, type, serial number, and manufacturer's calibration date.

(4) The recorded measurement during calibration and for each microphone location during operating conditions.

(5) Other information as appropriate to describe the testing conditions and procedure, including whether or not the locomotive was tested under self-loading conditions, or not.

(6) Where a locomotive fails a test and is re-tested under the provisions of §III(9) of this appendix, the suspected reason(s) for the failure.

[71 FR 63136, Oct. 27, 2006, as amended at 74 FR 25174, May 27, 2009]

## PART 230—STEAM LOCOMOTIVE INSPECTION AND MAINTENANCE STANDARDS

### Subpart A—General

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