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with those procedures that it designates as mandatory for the safety of the equipment and its occupants.

§ 238.105 Train hardware and software safety.

These requirements of this section apply to hardware and software used to control or monitor safety functions in passenger equipment ordered on or after September 8, 2000, and such components implemented or materially modified in new or existing passenger equipment on or after September 9, 2002.

(a) The railroad shall develop and maintain a written hardware and software safety program to guide the design, development, testing, integration, and verification of computer software and hardware that controls or monitors equipment safety functions.

(b) The hardware and software safety program shall be based on a formal safety methodology that includes a Failure Modes, Effects, Criticality Analysis (FMECA); verification and validation testing for all hardware and software components and their interfaces; and comprehensive hardware and software integration testing to ensure that the software functions as intended.

(c) Under the hardware and software safety program, software that controls or monitors safety functions shall be considered safety-critical unless a completely redundant, failsafe, non-software means ensuring the same function is provided. The hardware and software safety program shall include a description of how the following will be accomplished, achieved, carried out, or implemented to ensure software safety and reliability:

(1) The software design process;

(2) The software design documentation;

(3) The software hazard analysis;

(4) Software safety reviews;

(5) Software hazard monitoring and tracking;

(6) Hardware and software integration safety tests; and

(7) Demonstration of overall software safety as part of the pre-revenue service tests of equipment.

(d) Hardware and software that controls or monitors passenger equipment safety functions shall include design feature(s) that result in a safe condition in the event of a computer hardware or software failure.

(e) The railroad shall comply with the elements of its hardware and software safety program that affect the safety of the passenger equipment.

§ 238.107 Inspection, testing, and maintenance plan.

(a) *General.* Beginning July 12, 2001 the following provisions of this section apply to railroads operating Tier I passenger equipment covered by this part. A railroad may request earlier application of these requirements upon written notification to FRA's Associate Administrator for Safety as provided in § 238.1(c).

(b) Each railroad shall develop, and provide to FRA upon request, a detailed inspection, testing, and maintenance plan consistent with the requirements of this part. This plan shall include a detailed description of the following:

(1) Inspection procedures, intervals, and criteria;

(2) Test procedures and intervals;

(3) Scheduled preventive maintenance intervals;

(4) Maintenance procedures; and

(5) Special testing equipment or measuring devices required to perform inspections and tests.

(c) The inspection, testing, and maintenance plan required by this section is not intended to address and should not include procedures to address employee working conditions that arise in the course of conducting the inspections, tests, and maintenance set forth in the plan. When requesting a copy of the railroad's plan, FRA does not intend to review any portion of the plan that relates to employee working conditions.

(d) The inspection, testing, and maintenance plan required by this section shall be reviewed by the railroad annually.

§ 238.109 Training, qualification, and designation program.

(a) Beginning July 12, 2001 each railroad shall have adopted a training, qualification, and designation program for employees and contractors that perform safety-related inspections,