reflect the differing failure modes. In the 1991 SNPRM, the agency proposed slightly different stopping distances to reflect the increase in system reaction time and higher decelerations on the cold effectiveness test, while maintaining the same percentages as in the 1987 SNPRM.

For Antilock functional failure, NHTSA proposed a stopping distance of 85 m from a test speed of 100 km/h. The proposed requirement would apply only to functional failures of the ABS system and not to structural failures that are covered by the hydraulic circuit failure requirements. The proposed stopping distance maintains the philosophy that antilock functional failure performance should be 80 percent of the cold effectiveness performance requirement, and is consistent with the requirements adopted for Regulation R13H.

Without explaining what it perceived to be inconsistent, Fiat requested that the agency make the antilock failure requirements in FMVSS No. 135 consistent with R13H. Advocates and CAS requested that NHTSA adopt a stopping distance of 80 meters as proposed in the NPRM. They commented that the SNPRM's proposed stopping distance of 85 meters, while lower than the distance proposed in the 1987 SNPRM, still exceeded the NPRM by 5 meters.

NHTSA has decided to adopt the 85 meter stopping distance requirement for antilock functional failure, as proposed. The agency believes Fiat's comment must have been based on a mistaken impression that the requirement in Regulation 13H was some other value. In fact, the two requirements are harmonized.

The observations of CAS and Advocates that the performance requirement has changed by 5 meters since the NPRM (Notice 1) is correct. Due to various changes in the equations, which have been explained in the two SNPRMs, the proposed requirement went from 80 meters to 86 meters, and then back to 85 meters. Nevertheless, the 80 percent of cold effectiveness performance concept has been maintained throughout this rulemaking. The value being adopted is in agreement with that philosophy, is harmonized with the proposed Regulation 13H, and is considerably more stringent than the corresponding requirement in FMVSS No. 105. CAS and Advocates have provided no justification for returning to an 80 meter value. Ford, ITT-TEVES, GM, BMW,

Ford, ITT=TEVES, GM, BMW, Chrysler, the GRRF, and MVMA requested that the agency clarify the definition of an ABS "functional failure simulation" to indicate that only the ABS system is covered by this requirement. GM and Chrysler stated that the ABS failure test should not be misunderstood to include failures affecting other aspects of the service brake system. They explained that although ABS have previously been added on to the service brake system, increasingly ABS is completely integrated into the service brake system.

Based on the comments, NHTSA believes that it is necessary to clarify the meaning of the phrase "any single functional failure in any such system." Since this requirement applies to antilock systems, only a failure in an antilock system is covered by this requirement. Nevertheless, if a functional failure of the ABS also affects or degrades the service brake system, no artificial means are entailed to keep the service brake system intact when that failure is introduced. In such a situation, the vehicle with the failed ABS and failed service brake system resulting from the single failure, will then be subject to both the ABS failure and partial system failure tests. As the commenters state, manufacturers are increasingly building integrated brake systems rather than installing add-on antilock systems. The agency believes that this requirement is appropriate since it will prohibit any single ABS failure from degrading the service brake systems beyond the performance requirements of the ABS failure test. To ensure clarity, NHTSA has decided to add the following provision to S7.8.2(g)(1): "Disconnect the functional power source, or any other electrical connector that would create a functional failure.'

Ford recommended deleting the ABS functional failure test at LLVW, stating it was the same as the LLVW cold effectiveness test, if the ABS functional failure is limited to a non-actuation failure mode. In the cold effectiveness test, ABS is active and therefore may actuate during the test. For the ABS functional failure test, the ABS is not working. If the ABS is of an add-on type design rather than an integrated system, and if the cold effectiveness test is conducted at a brake force level that does not result in activation of the ABS, then it is true that the tests would be redundant. However, in many cases one or both of those conditions are not met, so the tests would be different. Therefore, it would be inappropriate to delete the test as requested by Ford.

Bendix stated that with respect to S7.8.2(g)(2)<sup>11</sup>, the electrical function

failure induced should be one that makes the system inoperative in order to activate the warning indicator. Kelsey-Hayes requested that the agency clarify the meaning in S7.8.2(g)(2) about the continuing operation of the system.

An electrical functional failure that makes the ABS inoperative is required by S5.5.1(b) to activate the warning indicator. S7.8.2(g)(2) is the test to determine compliance with S5.5.1(b). In response to Kelsey-Hayes, the agency notes that an unplugged ABS module should activate the antilock system warning indicator. The agency has decided to clarify paragraph S7.8.3 by adding the words "service brake" before the word "system." c. Variable brake proportioning

functional failure.—In the 1991 SNPRM (Notice 5) NHTSA proposed a stopping distance of 110 meters from a test speed of 100 km/h to evaluate variable proportioning valve failure. This was slightly shorter than the distance of 112 meters proposed in the 1987 SNPRM. In both notices, the proposal was based on the mean fully developed deceleration rate of 60 percent of that required for the cold effectiveness test. In the 1991 SNPRM, the agency revised the proposal to better define how a variable proportioning valve failure is simulated and to clarify that a warning to the driver of valve failure is only required where there is an electrical functional failure in the variable proportioning valve.

Fiat commented that the variable proportioning valve functional failure test is not necessary given that neither EEC directive 75–524 nor R13 and R13H test for this type of failure, despite years of experience.

NHTSA believes that the lack of documented variable proportioning valve passenger car failures in the U.S. is not a sufficient reason against specifying this requirement. The agency notes that there have been considerable problems with variable proportioning valves on trucks, the vehicle type most typically equipped with variable proportioning valves, both in the U.S. and in Europe. Fiat produced no data to support its assertion that the test is unnecessary for passenger cars. NHTSA notes that a corresponding requirement is included in the proposed Regulation 13H

ITT-TEVES recommended a stopping distance of 168 m for the variable proportioning valve failure test. It reasoned that vehicles would not be able to meet the 110 m stopping distance because of wheel lock caused by a dynamic load transfer from the rear to the front of the vehicle during braking.

<sup>&</sup>lt;sup>11</sup>This section requires a determination of whether an ABS electrical functional failure activates the brake system warning indicator.