determination on the FOIA request made by the requester by submitting an appeal of the determination to the Department. Adverse determinations include denials of access to agency records, in whole or in part; "no agency records" responses; and adverse fee decisions, including denials of requests for fee waivers, and all aspects of fee assessments.

(b) *Appeal requirements.* A requester must submit an appeal within 35 calendar days of the date on the adverse determination letter issued by the Department or, where the requester has received no determination, at any time after the due date for such determination. An appeal must be in writing and must include a detailed statement of all legal and factual bases for the appeal. The requester's failure to comply with time limits set forth in this section constitutes exhaustion of the requester's administrative remedies for the purposes of initiating judicial action to compel disclosure.

(c) *Determination on appeal.* (1) The Department makes a written determination on an administrative appeal within 20 working days after receiving the appeal. The time limit may be extended in accordance with § 5.21(c) through (e). The Department's failure to comply with time limits set forth in this section constitutes exhaustion of the requester's administrative remedies for the purposes of initiating judicial action to compel disclosure.

(2) The Department's determination on an appeal constitutes the Department's final action on the FOIA request. Any Department determination denying an appeal in whole or in part includes the reasons for the denial, including any exemptions asserted under the Act, and notice of the requester's right to seek judicial review of the determination in accordance with 5 U.S.C. 552(a)(4). Where the Department makes a determination to grant an appeal in whole or in part, it processes the FOIA request subject to the appeal in accordance with the determination on appeal.

(Authority: 5 U.S.C. 552(a), 5 U.S.C. 552(a)(6), 20 U.S.C. 3474)

[FR Doc. 2010–14127 Filed 6–11–10; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2010–0021]

RIN 2127–AK05

Federal Motor Vehicle Safety Standards; Electric-Powered Vehicles; Electrolyte Spillage and Electrical Shock Protection

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: In response to a petition for rulemaking from the Alliance of Automobile Manufacturers, NHTSA is issuing this final rule to facilitate the development and introduction of fuel cell vehicles, a type of electric-powered vehicle, and the next generation of hybrid and battery electric powered vehicles. It does so by revising the agency's standard regulating electrolyte spillage and electrical shock protection for electric-powered vehicles to align it more closely with the April 2005 version of the Society of Automotive Engineers (SAE) Recommended Practice for Electric and Hybrid Electric Vehicle Battery Systems Crash Integrity Testing (SAE J1766).

The standard currently requires manufacturers to design their vehicles so that, in the event of a crash, a vehicle's propulsion battery system will be electrically isolated from the vehicle's electricity-conducting structure. As amended, this rule provides greater flexibility, requiring manufacturers to design their electrically powered vehicles so that, in the event of a crash, the electrical energy storage, conversion, and traction systems are either electrically isolated from the vehicle's chassis or their voltage is below specified levels considered safe from electric shock hazards.

Since the physiological impacts of direct current (DC) are less than those of alternating current (AC), this rule specifies lower electrical isolation requirements for certain DC components than for AC components. The current standard does not recognize the difference in safety risk between DC and AC components, requiring both types of components to meet the same requirements. As requested by the petitioners, this final rule specifies the following electrical isolation requirements: 500 ohms/volt for AC and DC high voltage sources and 100 ohms/volt for DC high voltage sources with continuous monitoring of electrical isolation.

DATES: *Effective Date:* This rule is effective September 1, 2011, with optional early compliance.

ADDRESSES: *Petitions:* Petitions for reconsideration should refer to the docket number above and be submitted to: Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: For technical issues, you may contact Mr. Charles Hott, Office of Rulemaking, by telephone at (202) 366–0247, or by fax at (202) 493–2990. For legal issues, you may contact Ms. Rebecca Yoon, Office of Chief Counsel, by telephone at (202) 366–2992, or by fax at (202) 366–3820. You may send mail to these officials at the National Highway Traffic Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., Washington, DC 20590.

SUPPLEMENTARY INFORMATION:

I. Background

A. Standard No. 305 and the Alliance Petition for Rulemaking To Upgrade It

The purpose of Federal Motor Vehicle Safety Standard (FMVSS) No. 305, *Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection,* is to reduce deaths and injuries during a crash which occur because of electrolyte spillage from propulsion batteries, intrusion of propulsion battery system components into the occupant compartment, and electric shock. FMVSS No. 305 currently does so in part by requiring electric-powered vehicles to limit electrolyte spillage and retain batteries. To promote electrical safety, it specifies a single criterion, *i.e.,* maintaining electrical isolation between the vehicle's electrical conducting structure and high voltage battery system. In order to protect vehicle occupants, rescue workers, or others who may come in contact with the vehicle after a crash from electrical shock hazards, FMVSS No. 305 currently requires an electrical isolation of 500 ohms/volt between the propulsion batteries and the vehicle's electrical conducting structure after the frontal, side, and rear crash tests of FMVSS Nos. 208, *Occupant Crash Protection,* 214, *Side Impact Protection,* and 301, *Fuel System Integrity,* respectively. The standard currently does not require electrical isolation between other potential high voltage sources that may cause a shock hazard, such as high voltage propulsion motors, fuel cells, inverters, and converters. Also, the standard's 500 ohms/volt isolation requirement does not distinguish between AC and DC systems, despite a difference in human tolerance for the two types of electrical current.

FMVSS No. 305 was originally drafted based on a voluntary consensus standard, the Society of Automotive Engineers (SAE) Recommended Practice for Electric and Hybrid Electric Vehicle Battery Systems Crash Integrity Testing, SAE J1766 (1998 version). SAE J1766 was updated in April 2005 to accommodate current fuel cell vehicle (FCV) designs that were deemed by their manufacturers to be electrically "safe," but that were unable to meet existing electrical isolation requirements. Their inability stemmed from the fact that the liquid coolant needed in those FCV designs to cool the fuel cells tended to increase in conductivity over time, which resulted in the loss of electrical isolation of high voltage components in contact with it and thus prevented those vehicles from maintaining the 500 ohms/volt electrical isolation from the vehicles' electrical conducting structure.

The updated version of SAE J1766 differs from the previous version in two main ways. Instead of only one criterion for promoting electrical safety, it specifies three different alternative criteria: electrical isolation, low voltage, and low energy. It also specifies a revised isolation requirement that distinguishes between AC and certain DC systems.

The Alliance of Automobile Manufacturers ("the Alliance") petitioned NHTSA to conduct a rulemaking to amend the requirements of FMVSS No. 305 in order to bring the standard into alignment with the updated version of SAE J1766. The Alliance argued that such upgrades to FMVSS No. 305 were necessary so that continued development of FCVs could proceed without hindrance.

B. The NPRM

On October 9, 2007, NHTSA published the Notice of Proposed Rulemaking (NPRM) to upgrade FMVSS No. 305, mostly in line with the revised SAE J1766.[1] *The highlights of the NPRM were:*

- Distinguishing between electrical isolation values for DC and AC currents based on relative risk of harm to accommodate fuel cell vehicles and setting the value for DC high voltage systems at 125 ohms/volt.
- Broadening the requirement in S5.3 from "electrical isolation" alone to "electrical safety," and permit achieving compliance either through electrical isolation or through a low voltage option under which the post-crash voltage of the source must be less than or equal to 60 volts of direct current (VDC) or 30 volts of alternating current (VAC).
- Adding a definition for "high voltage source," and applying electrical safety requirements to any high voltage source, instead of to only the propulsion battery.
- Harmonizing the rear moving barrier impact test conditions of S6.2 and S7.4 of FMVSS No. 305 with the revised FMVSS No. 301.

C. Summary of Public Comments Received

Most of the comments received by the agency were from vehicle manufacturers. The Alliance of Automobile Manufacturers (Alliance) and the Association of International Automobile Manufacturers (AIAM) filed comments jointly (this final rule refers to these as the "Alliance/AIAM comments"). The Alliance also filed supplemental comments on June 15, 2009. Four vehicle manufacturers submitted comments individually: Nissan North America, Inc. ("Nissan"), Porsche Cars North America, Inc. ("Porsche"), Toyota Motor Corporation ("Toyota"), and Honda Motor Co., Ltd. ("Honda"). The American Association of Justice ("AAJ," formerly known as the Association of Trial Lawyers of America or ATLA) also submitted comments on the NPRM.

In summary, the vehicle manufacturers generally requested that the agency conform FMVSS No. 305 more closely to the revised SAE J1766. Commenters disagreed with the proposed level of electrical isolation for DC high voltage systems as unnecessarily stringent, and with the omission of proposed regulatory text adopting SAE J1766's monitoring requirement. Regarding the alternative compliance options for providing electrical safety, commenters expressed support for the addition of an option limiting residual electrical energy, as well as an explicit low voltage option. Commenters also raised issues regarding test procedures, including requesting a provision expressly addressing the use of a megohmmeter for electrical isolation measurement. Commenters also suggested changes to the regulatory text, many of which were fairly editorial in nature.

The AAJ objected to the agency's brief discussion in the NPRM of the law relating to the circumstances under which State tort law might be found by a court to be impliedly preempted. Interpreting this discussion as an assertion of implied preemption of state tort law in connection with this particular rulemaking, the AAJ objected to the discussion just as it has objected to similar discussions in other NHTSA rulemaking actions over the last several years.

D. How the Final Rule Differs From the NPRM

The following points highlight the key differences between the requirements of the final rule and the proposed requirements in the NPRM:

- S5.3 has been revised to require 100 ohms/volt electrical isolation for DC systems with continuous monitoring of electrical isolation during vehicle operation, rather than the more conservative value of 125 ohms/volt proposed in the NPRM, based on new analysis of available data.
- S5.3 has been revised to include an explicit low voltage option for providing electrical safety. A new paragraph, S7.7, has been added that details a procedure for voltage measurement to determine if the voltage source is of low voltage.
- A new paragraph, S5.4, has been added to specify requirements for vehicles equipped with electrical isolation monitoring systems. A new paragraph, S8, has been added that details a test procedure to confirm the

[1] 72 FR 57261 (Oct. 9, 2007). The NPRM and comments on it can be found in Docket No. NHTSA–2007–28517. That docket can be accessed online at *http://www.regulations.gov.*

functioning of the isolation monitoring system.

- S3 and S4 now clarify that "working voltage" is used (as opposed to actual voltage only) to identify a vehicle as subject to FMVSS No. 305 and to identify a source as "high voltage."
- S7.6.6 and S7.6.7 are modified to specify that the electrical isolation of a high voltage source in ohms/volt is obtained by dividing the electrical isolation resistance of the high voltage source by its working voltage.
- Some definitions of terms used in FMVSS No. 305 have been added or altered for greater clarity.
- Minor editorial corrections have been made to other parts of the regulatory text and to Figures 1 through 5.

The final rule also notes that there has been a fundamental misunderstanding of its preemption discussions and emphasizes that neither in the FMVSS No. 305 NPRM nor in any of the other actions identified by the AAJ did this agency assert implied preemption.

II. Public Comments on the NPRM and Agency Responses

A. Multiple Options for Providing Electrical Safety in Electric-Powered Vehicles

As discussed above, the NPRM proposed to expand the ways in which electrical safety may be provided under FMVSS No. 305, based on the changes to SAE J1766 to accommodate current FCV designs. This was accomplished in part by proposing a definition for a new term, "electrical safety," (which included "electrical isolation"), and separate requirements for electrical isolation of AC systems and DC systems. It did not include some methods of providing "electrical safety" that the SAE definition does, namely, an electrical energy option requiring that there be less than 0.2 Joules of energy, and a method of using low voltage readings directly as a means of compliance. The NPRM also proposed an isolation value of 125 ohms/volt for DC systems, instead of the 100 ohms/volt with continuous monitoring contained in SAE J1766. Comments received on these issues from vehicle manufacturers primarily took exception to the agency's departure from the SAE J1766 language.

1. Electrical Isolation

The NPRM proposed 125 ohms/volt isolation for DC systems, a value more conservative than the 100 ohms/volt contained in SAE J1766 and recommended by the petitioner. We proposed 125 ohms/volt instead of 100 ohms/volt because our analysis indicated that limiting DC to 125 ohms/volt offered the same level of protection against shock hazards as limiting AC to 500 ohms/volt. We used graphs from International Electrotechnical Commission (IEC) Technical Reports,[2] available as part of the technical support document for this rule which is located in the docket, showing physiological effects resulting from different durations of current flow, and made a simple comparison. Based on the IEC report, the human body can withstand up to four times the amount of DC as AC. The 500 ohms/volt requirement in FMVSS No. 305 translates to 2 milliamps of AC.[3] The flow of this amount of AC through the human body may result in perception of the current and likely involuntary muscular contractions, but usually with no harmful physiological effects, and is considered to be safe. Based on the ratio of 4 between DC and AC current, 2 milliamps (mA) of AC (that is considered to be safe) corresponds to 8 mA of DC (that is also considered to be safe for the human body).[4] The agency also did not propose monitoring of isolation, but noted that the petitioner's request for an isolation value of 100 ohms/volt for DC was coupled with a request for continuous monitoring.

(a) Requirements for Electrical Isolation of AC and DC Systems

The Alliance/AIAM comments disagreed with the agency's proposal to adopt an isolation requirement of 125 ohms/volt instead of 100 ohms/volt for DC high voltage systems. The Alliance/AIAM argued that the IEC technical report relied upon by the agency defines the equivalence factor of four (as in, the human body can withstand up to four times the amount of DC as AC) *only* in terms of ventricular fibrillation, and that there is "no technical justification" for applying that particular equivalence factor to levels of current that would cause physiological responses less serious than ventricular fibrillation. The Alliance/AIAM stated that a representative from General Motors consulted with the IEC Working Group responsible for IEC 479–1, and that the Working Group "declined to identify a precise level of DC isolation that would equate to 500 ohms/volt for AC," stating that the group would only say that "a point in the mid-range of AC zone 2 is approximately equivalent to a point in the mid-range of DC zone 2."

The Alliance/AIAM argued that, instead of trying to ascertain a level of DC isolation that is precisely equivalent to 500 ohms/volt AC isolation, the agency should simply "adopt a level of DC isolation that is practicable and meets the need of motor vehicle safety." The Alliance/AIAM stated that 100 ohms/volt DC met those criteria, because it is located in the mid-range of zone 2 and thus "far removed from the potentially life-threatening effects associated with zone 4 currents and durations." The Alliance/AIAM also stated that 100 ohms/volt DC was even safer compared to 500 ohms/volt AC, according to revised IEC charts (the IEC report on which the agency relied was updated in July 2005, after the petition for rulemaking was submitted to NHTSA).[5]

The Alliance/AIAM also argued that 100 ohms/volt would be a good choice for a DC isolation value for harmonization reasons, because it "is specified in the relevant SAE document, ISO document, Japanese regulation, and draft ECE regulation."

Agency response:

The agency has re-analyzed the appropriate value for DC isolation based on the charts provided in the IEC reports. Our new analysis indicates that an isolation value of 100 ohms/volt for DC represents an appropriate level of isolation.

We agree that given the available data and the differing natures of the two kinds of electrical current, no one can determine *exactly* what DC isolation value would be perfectly equivalent to 500 ohms/volt AC. However, this does not alleviate the agency's responsibility to make the best possible estimate. We cannot simply choose, as the Alliance/AIAM would have us do, an isolation limit for DC that "is practicable and meets the need of motor vehicle safety." These are necessary conditions for every

[2] IEC TS 60479–1 and TS 60479–2 Effects of Current on Human Beings and Livestock—Part 1: General Aspects, Part 2: Special Aspects, 2005–07, Reference Nos. CEI/IEC/TS 60479–1:2005 and CEI/IEC/TS 60479–2:2005. These IEC documents are available for public viewing in the Office of Crashworthiness Standards, National Highway Traffic Safety Administration, West Building, 1200 New Jersey Avenue, SE., Washington, DC 20590, or available for purchase at *http://webstore.iec.ch/webstore/webstore.nsf/artnum/034455* (last accessed June 19, 2009).

[3] 500 ohms/volt = 1/I, where I is the current in amperes (A). Then I = 1/500 = 0.002 A or 2 mA.

[4] 8 mA = 0.008 A = V/R (current = voltage/resistance). 1/0.008 = 125 ohms/volt. *See* 72 FR 57262 (Oct. 9, 2007) for a fuller discussion of this issue.

[5] Specifically, the Alliance/AIAM argued that if the agency's concern is the distance of the separation of the isolation value from the nearest point of zone 3 (on the charts), 100 ohms/volt DC continues to provide 15 milliamps of separation from the nearest point of DC zone 3, while 500 ohms/volt AC provides only 3 milliamps of separation from the nearest point of AC zone 3 (but provided 8 milliamps of separation before), due to revision of the charts.

agency rule, but they do not guarantee that such a limit for DC isolation would offer an equivalent level of safety as the limit for AC isolation. In light of the comments submitted, the agency took a fresh look at what level of DC isolation would offer an equivalent level of safety. A fuller explanation of the agency's analysis for this final rule is available in the docket for this rulemaking.

We used the Alliance/AIAM reference to the IEC Working Group statement that "a point in the mid-range of AC zone 2 is approximately equivalent to a point in the mid-range of DC zone 2" as a starting point for our re-analysis. By definition, "zone 2" of both the AC and DC charts represents very similar physiological response to electrical current.[6] Since zones AC–2 and DC–2 represent such similar physiological responses, the agency assumed, for purposes of analysis, that the responses at the upper and lower boundaries of the zones are the same, which allowed us to find appropriate points in the "mid-range" of the zones to compare for equivalence. The upper and lower boundary of zone 2 at 10 second shock duration for AC current is at 5 and 0.5 mA, respectively, and that for DC current is at 26 and 2 mA, respectively.[7] Assuming a logarithmic relationship between zone AC–2 and zone DC–2, the agency interpolated linearly between these upper and lower boundaries of each zone at 10 second shock duration. The resulting relationship between AC and DC levels in Zone 2 at 10 second shock duration is given by log(DC current in mA) = 1.114 * log(AC current mA) + 0.636. Given that an electrical isolation of 500 ohms/volt AC corresponds to 2 mA AC current, and using the mapping between AC and DC current levels in zone 2, the agency determined that the DC current level corresponding to 2 mA of AC current is 9.37 mA DC, which translates to 107 ohms/volt DC.[8] Therefore, the agency's best estimate for purposes of this final rule was reduced from 125 to 107 ohms/volt DC as equivalent to 500 ohms/volt AC. Since the 107 ohms/volt isolation value is only slightly more conservative than the 100 ohms/volt DC isolation value already contained in SAE J1766 and in several international standards, as mentioned by the commenters, we are comfortable that setting the DC electrical isolation value for the final rule at 100 ohms/volt will provide an equivalent level of safety to the 500 ohms/volt requirement for AC isolation.

(b) Continuous Monitoring Requirement for Electrical Isolation

The Alliance petition for rulemaking had argued that an isolation level of 100 ohms/volt for DC was safe when coupled with a requirement that isolation be continuously monitored. In the NPRM, NHTSA set the isolation level for DC at 125 ohms/volt without addressing the issue of continuous monitoring. The Alliance/AIAM comments to the NPRM stated that "it would be preferable to the interests of safety and the viability of fuel cell vehicles for the agency to specify an isolation level of 100 ohms/volt [DC] with monitoring rather than an isolation level of 125 ohms/volt without monitoring." This is simply because, the commenters stated, "electrical isolation declines in service, particularly DC isolation associated with a fuel cell stack," and while "It is not difficult for a new fuel cell vehicle to exhibit * * * 100 ohms/volt isolation while in service," it "is far more challenging * * * for a fuel cell vehicle to maintain 100 ohms/volt isolation while in service." The Alliance/AIAM expressed concern that setting an isolation requirement of 125 ohms/volt for DC with no continuous monitoring would not solve the problem of declining isolation over time.

Agency response:

Although NHTSA did not propose regulatory text for a requirement for continuous monitoring in the NPRM, we noted there that the petitioner's request for an isolation value of 100 ohms/volt for DC was coupled with a request for continuous monitoring. We have considered the issue further and we agree with the Alliance/AIAM comments stating that if the problem for fuel cell stacks is declining electrical isolation over time, solving the problem requires continuous monitoring of electrical isolation for high voltage DC sources that certify compliance by the 100 ohms/V electrical isolation option. We have specified this requirement in S5.3(a). In addition, the agency is adding a new paragraph, S5.4, to the regulatory text to specify that the electrical isolation monitoring system must continuously monitor the level of isolation, and display a warning to the driver if electrical isolation degrades to levels below the minimum required electrical isolation of 100 ohms/volt. We are also adding a test procedure to confirm the function of the electrical isolation monitoring system in S8.

(c) Timing of Measurements for Electrical Isolation

Comments from the Alliance/AIAM and from Porsche expressed concern that the agency intended to require electrical isolation to be measured within 5 seconds after the vehicle crashes. The commenters requested that S5.3 be revised to include a sentence at the end of the paragraph stating that "While electrical isolation can be provided 'within 5 seconds,' as it does not change over time, it is not necessary to actually measure it 'within 5 seconds.' "

Agency response:

The agency had no intent to require measurements to be taken within 5 seconds, and S7 of the proposed regulatory text, which covers test conditions, clearly states that all measurements for calculating electrical isolation will be made *after a minimum of 5 seconds* immediately after the required crash tests. We do not believe that revising S5.3 to explain this further is necessary, but we are revising S7 in the final rule to clarify that we consider time zero for measurements to be when the test vehicle comes to rest, instead of "immediately after" the tests. We believe that this addresses the concerns of the Alliance/AIAM and Porsche.

2. Voltage Level

The existing FMVSS No. 305 essentially only allows manufacturers to prove that their vehicles are electrically safe by satisfying electrical isolation requirements, using an equation provided in FMVSS No. 305. As written, the equation includes dividing voltage measurements by one another, such that it is possible to end up with an undefined result if the voltage measurement that goes in the denominator is zero. An undefined result, theoretically, could prevent manufacturers from certifying that they meet the electrical isolation requirements.

As noted above, in the NPRM, the agency did not explicitly provide for low voltage as a method of certifying electrical safety protection. We stated instead that "We tentatively agree [that a voltage measurement of zero] would be evidence of electrical safety," and proposed to change the "electrical isolation" requirement of S5.3 to a broader one of "electrical safety," and to require the specified electrical isolation between the chassis and the high voltage source. We believed that this

[6] Table 11 of IEC TS 60479–1 (2005) states that the physiological response for AC–2 is "Perception and involuntary muscular contractions likely but usually no harmful electrical physiological effects," while Table 13 states that the physiological response for DC–2 is "Involuntary muscular contractions likely especially when making, breaking or rapidly altering current flow but usually no harmful electrical physiological effects."

[7] Based on Figures 20 and 22 of IEC TS 60479–1 (2005).

[8] 9.37 milliamps = 0.00937 Amps; 1/0.00937 = 107 ohms/volt.

was sufficiently clear evidence of the agency's position that low voltage was an acceptable way to provide electrical safety.

However, comments by the Alliance/AIAM argued that our statements were "ambiguous," and reiterated their position that a reading of zero voltage after the crash test would make it impossible to certify vehicles under the electrical isolation requirements. The Alliance/AIAM stated that, as written, the approach in the NPRM would be "susceptible to misinterpretation in the context of varying and highly integrated vehicle designs. For example, a portion of the high voltage bus might meet the definition of high voltage source, but then have its voltage removed or dissipated during the specified crash tests." To avoid this, the commenters requested that S5.3 include a specific low voltage alternative. Porsche supported the Alliance/AIAM comments.

Related to the request that NHTSA explicitly include a low voltage option for providing electrical safety, the Alliance/AIAM also requested that that the agency revise S7.6.3, the electrical isolation test procedure, to state that if the voltage is less than or equal to 60 VDC or 30 VAC, the "requirements are met and there is no need to proceed further."

Nissan, in addition to supporting the Alliance/AIAM comments, asked that the agency adopt an additional alternative for measuring voltage, "to mirror SAE Recommended Practice J1766." Specifically, "in addition to measuring the voltage between the vehicle chassis and high voltage source," Nissan asked that the alternative option "would measure Vb (after the crash test) at the positive and negative nodes, around the load, of the high voltage bus." Nissan also asked whether our intent in defining AC high voltage sources was to include sources that "relate to the regenerative braking mode of the vehicle where the AC electric motor behaves as an energy source to recharge the high voltage battery."

Agency response:

NHTSA agreed in the NPRM in principle to the concept that low voltage can provide electrical safety, and provided a letter of interpretation in October 2008 (between the publication of the NPRM and this final rule) confirming that, based on the information provided, the agency would consider a vehicle to have passed S5.3 of FMVSS No. 305 when there is no measurable voltage following a crash test.[9] Nevertheless, in order to alleviate the commenters' concern that manufacturers would still have to attempt to meet the electrical isolation requirement with an undefined answer to the equation in S7, the agency is adding the low voltage option to S5.3 and corresponding sections to the test procedure portion of the regulatory text at S7 and S7.7. Given that we are adding an explicit low voltage option to S5.3 and low voltage test procedures to S7, we do not think it necessary to adopt the Alliance/AIAM recommendation that S7.6.3 be revised as requested.

As part of including a low voltage option in S5.3, the agency is requiring that voltage be measured across the terminals of the voltage source and between the voltage source and the vehicle chassis electrical conducting structure. The voltage source is considered to be low voltage if the voltage measured across its terminals *and* the voltage measured between the vehicle chassis electrical conducting structure *and* the positive and negative terminals of the source are all less or equal to 60 VDC or 30 VAC. Measuring the voltage across the terminals of the voltage source and between the terminals and the vehicle chassis ensures that all potential high voltage sources in both closed and open circuit conditions are captured. The agency believes that this will address Nissan's request that voltage be measured between the positive and negative nodes in addition to measuring the voltage between the high voltage source and the vehicle chassis.

Regarding Nissan's request for clarification about whether regenerative braking motors would be considered a high voltage source, we would consider all sources which have a potential beyond 30 VAC to be AC high voltage sources, including sources relating to the regenerative braking mode of vehicles.

3. Energy Limit (0.2 Joules)

The NPRM did not propose an energy limit option as a method of providing electrical safety, even though SAE J1766 includes one, because the agency did not believe that there was a clear safety need for this additional option. We did, however, seek comment on what safety need might exist, as well as on the practicality of measuring such a small amount of energy in a crash test environment.

The Alliance/AIAM comments submitted in December 2007 argued that a low-energy alternative to providing electrical safety is necessary in FMVSS No. 305 because of the y-capacitors in a fuel cell system. As noted in the NPRM, a capacitor is like a battery in that it stores electrical energy and poses the same electrical safety hazards as a battery, except for electrolyte spillage. The December 2007 Alliance/AIAM comments did not explain the function of x- and y-capacitors in fuel cells. In electrical power distribution, x-capacitors are placed across lines of high voltage differential, while y-capacitors are used in-line. A common application of x- and y-capacitors is filtering of electromagnetic or radio frequency interference, where they are directly connected to the AC power line. They may also be used to suppress electrical noise generated by motors and other components. We assume, for purposes of answering the Alliance/AIAM comment, that x- and y-capacitors are used in some kind of current filtering application in fuel cells.

When coolant flows in a fuel cell, the voltage across individual y-capacitors in the fuel cell becomes asymmetrical. The Alliance's supplemental June 2009 comments stated that this asymmetry in the voltage is, in fact, directly related to the coolant loop in a fuel cell, and that the asymmetry is likely to increase as coolant designs become more efficient. Thus, when x-capacitors in the fuel cell system discharge in the event of a crash, that discharge will leave a residual voltage (sometimes in excess of 60 VDC) on the y-capacitors. The Alliance's supplemental comments explained that as y-capacitor asymmetry increases in FCV designs with more efficient coolants, it could take as much as 10 or 20 seconds for the voltage to dissipate below the low voltage threshold of 60 VDC. However, the Alliance argued that this residual voltage on the y-capacitors would not pose a safety risk because the total energy levels would be very small. The Alliance, Toyota, and Ford told the agency in ex parte communications[10] between the NPRM and the final rule that it would be difficult to provide electrical safety for certain high voltage sources in FCVs using the electrical isolation option because of this coolant-loop-related issue.

The Alliance/AIAM also commented on the agency's request for explanations of the practicality of measuring 0.2 Joules of energy in a crash test environment. NHTSA had stated in the NPRM that the SAE low-energy option

[9] *See* Letter to Mr. Kenneth N. Weinstein, October 28, 2008. *Available at* Docket No. NHTSA–2008–0203–0003.

[10] Records of these ex parte communications are available in the docket for the NPRM for this rule, Docket No. NHTSA–2008–28517.

of 0.2 Joules or less based on 10 ms of contact did not seem realistic in terms of an automobile crash. The Alliance/AIAM initially argued in response that SAE had not based the 0.2 Joules limit specifically on 10 ms of contact, but rather had been looking for the minimum level of energy that might be harmful at *any* duration of contact, which was the border of zones 2 and 3 on the IEC charts. The border of zones 2 and 3 (for a body current of 200 mA and a source of 200 VDC) ended up being 0.4 Joules at 10 ms of contact, such that anything less than 0.4 Joules for any duration of contact would be in or below zone 2, and therefore safe from ventricular fibrillation. SAE then applied a safety factor of 2 to get 0.2 Joules at 10 ms of contact.

However, in their June 2009 supplemental comments, the Alliance presented a different approach to determining acceptable levels of electric energy. The Alliance argued that for current durations less than 2 seconds, no serious damage is observed with sufficiently low energy, even if the current passing through the body is relatively high. They explained that body current with durations less than 10 msec have little effect on involuntary muscular contraction. Therefore, the target threshold in this analysis used by the Alliance was intended to prevent ventricular fibrillation, and not just minimize muscular contraction. The commenter stated that according to paragraph 4.6 of the IEC 60429–1, the lowest level of human body impedance is 500 ohms.

Applying this value of human body impedance along with the human body tolerance zones in Figure 22 of IEC 60429–1 and Figure 20 of IEC 60429–2, the Alliance then computed the body current for a given time duration for which the energy is 0.2 Joules and 0.5 Joules. The commenter stated that in all instances, this line of 0.2 Joules energy plotted on Figure 22 of the IEC 60429–1 would be within zone 2, except at the 10 msec current duration, where the line is at the border of DC–2 and DC–3 corresponding to 200 mA of body current. In addition, the line of 0.5 Joules energy intersects the border of DC–3 and DC–4.1 (representing a 5 percent risk of ventricular fibrillation) for approximately 500 mA body current at 4.3 msec duration (Figure 20 of IEC 60429–2). The Alliance argued that based on this analysis, the 0.2 Joules energy limit has a safety factor of 2.5 to prevent 5 percent risk of ventricular fibrillation.

And finally, the Alliance/AIAM comments also argued that the agency's concern about measuring 0.2 Joules of energy in a crash test environment was misplaced, because energy can be "easily and accurately calculated from the equation that energy (in Joules) = 0.5 * c * v^2, where c is the capacitance of the capacitor(s) in farads and v is the measured voltage." The Alliance/AIAM stated that "Manufacturers routinely measure the voltage and calculate the associated energy without difficulty."

Agency response:

Despite the Alliance/AIAM and Alliance's supplemental comments on this issue, NHTSA remains unpersuaded that a low-energy option of 0.2 Joules for providing electrical safety is necessary for FMVSS No. 305 at this time. Commenters have not provided any data that current FCVs or hybrid electric vehicles are unable to certify to the electrical safety requirements because of residual high voltage in the y-capacitors. Their arguments are based entirely on theoretical values.

In addition, we remain unconvinced that a low energy option is necessary and have concerns about the disparity between the level of safety provided by 0.2 Joules of energy and the electrical isolation requirement. The agency conducted its own analysis using the approach presented in the December 2007 Alliance/AIAM comments submission with several permutations of body current, body resistance, current duration, and safety factors to try to determine safe energy limits. Based on that analysis, the agency determined that applying different permutations of voltage levels, body resistance, shock duration, and factor of safety can result in different safe energy levels, some of which are less than the 0.2 J energy level specified in SAE J1766.

Given that the IEC report indicates that the lowest human body impedance is a resistance of 500 ohms, and that the boundary between zones DC–2 and DC–3 is 200 mA of body current for 10 msec shock duration, we determined the corresponding amount of voltage through the Ohm's Law equation Current (A) * Resistance (ohms) = Voltage (V), in this case, 0.2 A * 500 ohms = 100 V. We then applied the same method used in SAE J1766 to calculate energy for a 10 msec shock duration with the equation Voltage (V) * Current (A) * Time (s) = Energy (J), in this case, 100 V * 0.2 A * 0.01 s = 0.2 J (or, equivalently, 200 mJ). The SAE applied a safety factor of 2. Doing the same for 200 mJ, the agency concluded that a safe energy level would correspond to 100 mJ—half the energy level specified in J1766 and recommended by Alliance/AIAM. Following the same procedure, for a voltage source of 65V and body resistance of 500 ohms, the body current was 130 mA, and the corresponding energy was 84.5 mJ.[11] Applying a factor of safety of 2, the safe energy level was 42.2 mJ. Even without applying a factor of safety, the energy level is less than half of that recommended by the Alliance/AIAM. Based on this analysis, the agency concluded that the assumptions associated with voltage, current, and shock duration used to derive the proposed limit of 0.2 J for the energy option are not well supported.

Based on their assumptions, the Alliance's approach to determine minimum allowable energy levels presented in the June 2009 supplemental comments would allow body currents of 20 mA for shock duration of 1 second, 28 mA for shock duration of 0.5 seconds, and 200 mA for shock duration of 10 msec. In contrast, the electrical isolation option of FMVSS No. 305 does not allow more than 10 mA of body current at either 1 second, 0.5 seconds, or 10 msec shock duration.

Additionally, the Alliance/AIAM comments recognized that according to the IEC Technical Committee 64, a point in the mid-range of AC zone 2 is approximately equivalent to point in the mid-range of DC zone 2. The 28 mA of body current for a duration of 0.5 seconds that would be allowed by the low-energy option expressed by commenters is *not* in the mid-range of zone 2. It is, in fact, significantly closer to the border of zone 2 and zone 3, which indicates a higher level of risk for shock than the electrical isolation option of FMVSS No. 305. The agency thus believes that using a safety factor of 2.5 to protect against ventricular fibrillations in the low-energy option, as the Alliance supplemental comments suggest, would result in a higher risk level than that provided by the electrical isolation option of FMVSS No. 305, which protects against involuntary muscular contractions without any harmful physiological effects. Moreover, the Alliance has provided no technical basis for the assumption that for current durations less than 2 seconds, no serious damage is observed with sufficiently low energy even if the current passing through the body is relatively high. The IEC charts clearly indicate that shock duration for one second is sufficiently long to cause involuntary muscular contractions, which are currently mitigated through the electrical isolation requirement of FMVSS No. 305.

As for commenters' suggestion that the agency need not require measurement for the low energy option

[11] 0.13 A = 65/500; 0.0845 J = 65 * 0.13 * 0.01.

and could simply make a calculation to verify compliance, the agency does not regard the Alliance/AIAM solution of calculating energy to be practicable for our purposes. The effective capacitance of a high voltage DC source will depend on the capacitance of individual capacitors in the source, the configuration of these capacitors, and the open/closed status of the contactors. This information is specific for each vehicle crash test, which means that the manufacturer-supplied capacitance value may be different from the effective capacitance after the crash test. Therefore, the computed energy of a high voltage source using the method recommended by Alliance/AIAM may not represent the true energy of the source after a crash test. Given the practical difficulties that we continue to see with including a low-energy option for providing electrical safety, and given the results of our analysis which shows that the energy option requested by commenters would be less stringent and pose a greater risk of electric shock hazard than the electrical isolation option, the agency is not including the low-energy option for providing electrical safety in the final rule.

B. Other Issues Relating to the Electrical Isolation Requirement

In the current FMVSS No. 305, sections S7.6.6 and S7.6.7 provide a method of computing electrical isolation in ohms/volt. However, in the NPRM, the agency inadvertently omitted specifying the method of determining electrical isolation in ohms/volts from the calculated isolation resistance. The Alliance/AIAM comments requested that the agency re-include similar language for S7.6.6 and S7.6.7 in the final rule, so that FMVSS No. 305 remains "clear that nominal operating voltage is the applicable voltage for calculating the electrical isolation requirement." Along the same lines, the Alliance/AIAM requested that the agency add the word "nominal" in front of the word "volts" in S3, to ensure that the standard is addressing "nominal voltage."

The Alliance/AIAM comments also requested an alternative method of electrical isolation testing to the existing "additional resistance insertion" method, namely, use of a megohmmeter.[12] The Alliance/AIAM argued that use of a megohmmeter was a valid alternative, and that Japanese and International Standards Organization (ISO) regulations both allow it. Honda, in comments submitted after the close of the comment period, concurred and offered similar information in more detail.[13]

Agency response:

We agree with the Alliance/AIAM comment that specifying how electrical isolation in ohms/volt is computed is necessary to provide clarity and avoid confusion. The term "nominal operating voltage" is not defined in SAE J1766 itself, although SAE J1715 (2000)—Electrical Vehicle Technology, which is referenced by SAE J1766, defines "nominal operating voltage" as "[t]he voltage of a battery, as specified by the manufacturer, discharging at a specified rate and temperature." However, this definition of nominal operating voltage only applies during normal operation. For purposes of FMVSS No. 305, in contrast, the electrical isolation and low voltage specifications are tested after a crash test when the vehicle need not be in normal operation and some of the contactors may have opened creating an open circuit condition. The agency thus believes that the term "nominal operating voltage" is not appropriate for this specification. Instead, the agency is using the term "working voltage" which is currently used in the proposal for the 01 series of amendments to ECE R.100.[14] For purposes of FMVSS No. 305, working voltage for a voltage source in a circuit means "the highest root mean square voltage of the voltage source, specified by the manufacturer, which may occur across its terminals or between its terminals and any conductive parts in open circuit conditions or under normal operating conditions." As defined, "working voltage" applies during normal operation of the vehicle as well as in open circuit conditions and encompasses the possible range of conditions of a voltage source after a vehicle crash. Therefore, the agency believes that "working voltage" is more relevant for use in FMVSS No. 305, and will help to avoid the potential for confusion identified by the commenters.

For consistency throughout the standard, the agency will use "working voltage" to identify a vehicle as subject to FMVSS No. 305, to identify a source as "high voltage," and to calculate electrical isolation in ohms/volt. Thus, the agency has added the following sentence in S7.6.6 and S7.6.7: "Divide Ri (in ohms) by the working voltage of the high voltage source (in volts) to obtain the electrical isolation (in ohms/volt)." The agency has also modified S3 to specify that working voltage shall be used for determining whether FMVSS No. 305's requirements are applicable to a given vehicle, and has modified the definition for "high voltage source" in S4 based on the same reasoning.

As for the use of megohmmeters for electrical isolation testing, NHTSA is still researching the use of megohmmeters for testing electrical isolation for purposes of FMVSS No. 305. Since the agency has reached no conclusions yet in that research, and since the use of megohmmeters was not raised in the NPRM and is thus outside the scope of this rulemaking, we are not providing additional test procedures for electrical safety using megohmmeters in this final rule. As the agency has noted in other rulemakings, manufacturers are not prohibited from using test procedures and devices other than those in the FMVSSs as a basis for their compliance certifications.

C. Comments Regarding Test Procedures

In the NPRM, the agency tentatively accepted the premise that low voltage could be another way besides electrical isolation to provide electrical safety, but did not specifically include it in the proposed "electrical safety" requirement and did not develop a test procedure for it. The Alliance/AIAM comments requested additional test procedure paragraphs (suggesting a new S7.7 and S7.8) for evaluating low voltage and low energy alternatives for providing electrical safety. The commenters suggested that the agency adopt the exact language used in SAE J1766.

The NPRM also stated that the agency was not addressing the issue of crash testing FCVs in this rulemaking because of practical difficulties: Test procedures for safely crashing FCVs fueled with hydrogen have not been established; but without hydrogen, fuel cells will not generate any electrical energy from which to measure electrical output. The Alliance/AIAM comments suggested that the agency could take the same approach that the Japanese government does in its regulations, which call for the fuel cell to be filled with helium and then for using a megohmmeter to measure isolation. Honda, in its late comments, concurred with the Alliance/AIAM position.

Agency response:

We agree with the Alliance/AIAM that a test procedure paragraph should be added for the low voltage option for providing electrical safety, and have

[12] A megohmmeter, roughly speaking, is an instrument used for measuring electrical resistance which consists of two main elements: (1) A DC generator, which supplies the necessary voltage for taking the measurement, and (2) the instrument portion itself, which indicates the value of the resistance being measured.

[13] NHTSA–2007–28517–0006.

[14] ECE/TRANS/WP.29/GRSP/2009/16, 23 September 2009. *Available at http://www.unece.org/trans/doc/2009/wp29grsp/ECE-TRANS-WP29-GRSP-2009-16e.pdf* (last accessed Oct. 31, 2009).

revised the regulatory text accordingly. Since we remain unconvinced of the need for a low-energy option, as discussed above, we are not adding a test procedure for that option.

Regarding the use of helium-filled fuel cells and megohmmeters for crash testing FCVs, we reiterate our position in the NPRM that the agency is still researching potential crash test methods for FCVs, and will not address this issue as part of this rulemaking.

D. Regulatory Text Wording

The Alliance/AIAM comments contained a number of requests for greater specificity in and corrections to the regulatory text for the updated FMVSS No. 305.

First, the Alliance/AIAM requested that the agency add the word "electric" in multiple places in the regulatory text, so that it would be clear for hybrid vehicles that the agency intended to focus the FMVSS No. 305 requirements only on "electric" energy storage devices and not mechanical storage devices, like hydraulic accumulators. To that end, the commenters requested that a definition be added for "electric energy storage device," and that S5.2, S7.1 and S7.6.1 all have the word "electric" added.

Agency response:

We agree that the regulatory text should clarify that the agency means to apply the requirements of FMVSS No. 305 to electric energy storage devices only, and that a definition should be added for electric energy storage devices. We have revised the regulatory text accordingly.

Second, the NPRM included a definition for "energy storage system," but the Alliance/AIAM argued that FCVs are "energy conversion systems" and not "energy storage systems," so the definition should be revised to accommodate both FCVs and battery-powered electric vehicles.

Agency response:

We agree with the Alliance/AIAM comment, and have revised the regulatory text accordingly.

Third, the NPRM defined a "high voltage source" as "any item that produces voltage levels equal to or greater than 30 VAC or 60 VDC." The Alliance/AIAM stated that since S3, the application paragraph, states that FMVSS No. 305 applies to vehicles that use "more than" 60 VDC or 30 VAC, the words "equal to or" should be removed from the definition of high voltage source.

Agency response:

We agree with the Alliance/AIAM comment, and have revised the regulatory text accordingly.

Fourth, the Alliance/AIAM requested that the agency add a definition for "propulsion system," a term used in S7.6.1 of FMVSS No. 305, but not defined. The Alliance/AIAM suggested that the definition read as follows:

Propulsion system means the components or electric circuit to propel the vehicle using the energy that is supplied by a high voltage source. These include, but are not limited to, the propulsion motor, electric converter, associated wire harnesses and connectors.

Agency response:

We agree that this would be a useful definition, and have added it to the regulatory text.

And fifth, the Alliance/AIAM suggested the following editorial corrections: Figure 1 should refer to S7.6.3, not S7.6.6; in Figure 4, V1 should be V1′, and the denominator should be V1′; and in Figure 5, the denominator should be V2′.

Agency response:

We agree with these corrections and have revised the regulatory text accordingly.

E. Physical Barriers as an Additional Option for Providing Electrical Safety

The Alliance/AIAM also requested another compliance option that was not included in SAE J1766, but is included in the Japanese regulation for electrical vehicle safety. The commenters stated that "This new option would allow for isolation from high voltage sources via physical barriers that are in place to insure that there is no direct or indirect contact with live voltage sources after a vehicle crash." This would be safe, the commenters argued, because "if a person cannot access the potentially high voltage sources, then there is little chance of the occupants or rescue personnel helping the occupants from being injured from such sources." The Alliance/AIAM stated that this alternative compliance option was necessary because some FCVs may "use capacitors that take some time to discharge," and allowing it would provide "greater flexibility in order to allow introduction of advanced powertrain technologies." However, the Alliance/AIAM recognized that the agency might not be able to include this option in the final rule for procedural reasons, and requested that if this were so, the agency "publish a separate NPRM to address the option of using a physical barrier to provide electrical safety."

The Alliance further elaborated on this compliance option in their June 2009 supplemental comments. They stated that the DC components of the fuel cell can connect with the AC components through the inverter, even when the vehicle is stationary, after certain crash tests that may not result in the opening of the contactors. In such a condition, when the contactors are closed and the DC and AC components are connected, the isolation resistance at the AC component is in parallel with the isolation resistance of the DC component fuel cell. Therefore, even if the electrical isolation provided for the AC component is significantly greater than the required 500 ohms/volt, the effective isolation resistance measured at the AC component can be, at most, as high as that provided for the DC component fuel cell, which is in turn limited by the fuel cell coolant. Therefore, it may not be practical to achieve the required 500 ohms/volt electrical isolation for the AC component. The Alliance thus argued that there is a need to include finger-proof barriers [15] in FMVSS No. 305 as a fourth alternative.

The Alliance also stated in their supplemental comments that the finger-proof barrier is similar to an option that already exists in FMVSS No. 305 for battery packs, where the electrical isolation measurement is made from the traction side of the automatic disconnect that is enclosed and is physically contained within the battery pack system. They argued that the protective barrier option would be further strengthened by requiring that the barrier remain finger-proof after the crash. The commenter also stated that for electric vehicles that provide galvanic bonding for conductive materials that are not designed to conduct electrical current for vehicle operation,[16] such as the vehicle chassis electrical conducting structure (a design requirement by SAE J2578—Recommended Practice for General Fuel Cell Vehicle Safety), the only current potentially remaining in the FCV after a crash is in the high voltage components themselves. As long as those components are guarded by finger-proof barriers, the commenter argued that there would be no risk of electric shock to the first responder or the vehicle occupant after a crash.

Agency response:

The use of physical barriers as another option for providing electrical safety is beyond the scope of this rulemaking, as the Alliance/AIAM comments acknowledged. The agency is not familiar with the proposed

[15] Barriers that prevent a finger-sized probe from penetrating into an enclosed space.

[16] "Galvanic bonding" refers to a direct electrical connection, in this case for conductive materials not designed specifically to conduct electrical current for vehicle operation, as opposed to a capacitive or inductive connection.

methodology and would have to examine the issue further to judge its suitability for inclusion in FMVSS No. 305. While the Alliance supplemental comments stress the efficacy of the protective barrier option for electric shock protection due to *direct* contact with high voltage sources, there are many possible failure modes in which vehicle occupants and rescue workers are at risk of electric shock due to *indirect* contact. Additionally, the design guidelines in SAE J2578 on which the Alliance comments rely to provide protection against electric shock due to indirect contact require that all conductive materials in the vehicle be galvanically bonded if they are not designed to conduct electrical current for vehicle operation. However, the commenters suggested no test procedure to confirm that a vehicle has been designed to meet this design requirement specified in SAE J2578. The agency is thus uncertain whether indirect contact failure modes would be sufficiently accounted for by this design requirement.

For these reasons, we are not including a finger-proof protective barrier option in FMVSS No. 305 as requested by the Alliance and other manufacturers in their comments to the NPRM. However, the agency has initiated a research program to get a better understanding of the issues related to requiring this as an option to satisfy electrical safety.

F. Effective Date

In the NPRM, NHTSA proposed that the amendments made by this rulemaking would apply to vehicles manufactured on or after one year from the date of publication of the final rule, with optional early compliance. The agency believed that one year should be sufficient for manufacturers to verify that they can meet the new electrical isolation requirements, particularly since similar requirements already exist as a SAE recommended practice and currently, all manufacturers of electric-powered vehicles already isolate the high voltage sources from the vehicle chassis.

NHTSA did not receive any comments related to the proposed effective date during the comment period. However, in comments provided by Toyota (June 24, 2009), the manufacturer requested that the effective date be set three years from the date the final rule is published. Thus, it said, if the final rule were issued by September 1, 2009, compliance should not be required before September 2012. They argued that the additional time was needed so that they could incorporate the necessary changes across their current and near future HEVs to comply with the new electric safety requirements.

Agency response:

The agency evaluated the information provided by Toyota and is not convinced that leadtime of three full model years from the publication of the final rule is needed in order for their current and near future HEVs to comply with the amended requirements in FMVSS No. 305. We continue to believe that Toyota's HEVs in the current fleet already comply with the amended requirements, given that similar performance criteria were added to SAE J1766 in April 2005 at the request of the Alliance. Plans for their near future HEVs presumably include means of complying with those criteria.

Moreover, in their comments, Toyota stated expressly that their current HEVs include battery disconnection and inverter shut-down in the event of a crash. NHTSA believes that these features should allow these vehicles to comply with the electrical safety requirements using a combination of the low voltage option and the electrical isolation option for all high voltage components. NHTSA does not anticipate that near future HEV (or other electric vehicle) designs will be so different from current ones that they will be unable to comply with either the low voltage option or the electrical isolation option, or some combination thereof. Therefore, we have decided that one year lead time is sufficient to comply with the amended requirements in FMVSS No. 305. Accordingly, this final rule will become effective on September 1 in the year after the final rule is issued.

G. Hyundai Request for Interpretation on S5.2 Battery Retention

On March 9, 2009, Hyundai requested an interpretation of language in S5.2, "Battery retention." Hyundai argued that as currently written, the language of S5.2 allows a battery module located outside the passenger compartment to become dislodged as long as it does not enter the occupant compartment, while a module that is located within the occupant compartment must simply remain in the location in which they are installed. Hyundai stated that this may not properly address the intent of the standard in some circumstances. Hyundai referred to the preamble of the final rule, which stated that the intended purpose of not allowing battery modules located outside the occupant compartment was "to ensure that battery modules would not become unattached and become flying projectiles in a crash or subsequent rollover." [17] Hyundai also argued that FMVSS No. 305 does not provide a definition of the passenger compartment, but that a previous interpretation to Mazda implied that the passenger compartment was an area that shares "occupant air space" that included the area where people ride. Hyundai stated that a portion of a properly restrained battery module located outside the occupant compartment, may move into the occupant compartment during a test due to deformation of the vehicle structure without rupturing the mounting points and without becoming a "flying projectile." They further argued that in a vehicle such as a sport utility vehicle (SUV) or station wagon, where a battery module is located inside the occupant compartment and moves during impact due to the deformation of the floor, but remains firmly attached to its mounting, would technically fail the test.

Hyundai suggested that the proper interpretation of the language should not treat these two conditions separately. They argued that in the case where a battery module remains attached to the location in which it is installed but due to deformation of the vehicle structure, it moves or causes a portion of the module to enter the occupant compartment, NHTSA should not consider these to constitute a failure of the standard.

Agency response:

We have decided to respond to Hyundai's request for interpretation of S5.2 in this final rule because the NPRM had already proposed to modify the language in S5.2. The agency agrees that battery modules located inside the occupant compartment technically may move a small amount from the location from which they are installed during the impact tests. The agency also agrees that battery modules located outside the occupant compartment that partially move into the occupant compartment because of structural deformation of the vehicle structure do not impose a projectile hazard provided that they remain attached to the mounting structure. Therefore, the agency concurs that battery modules located outside the occupant compartment should be treated in the same manner as those located inside the occupant compartment, provided that they remain attached to their anchorages. Technical changes to the proposed text in S5.2 have been made accordingly.

[17] 65 FR 57985 (Sept. 27, 2000).

H. Preemption

In the view of AAJ, NHTSA's discussion in the FMVSS No. 305 NPRM of the 2000 Supreme Court case, *Geier* v. *American Honda Motor Co.,* 529 U.S. 861, and the agency's assessment of the possibility of preemption represented a "sudden decision to claim [implied] preemption" of State tort law.

Agency response:

As an initial matter, we wish to emphasize our strong belief that State law can play an important role in safeguarding public safety. In the words of the President's May 20, 2009 memorandum on preemption:

> * * * State law and national law often operate concurrently to provide independent safeguards for the public. Throughout our history, State and local governments have frequently protected health, safety, and the environment more aggressively than has the national Government.

Consistent with that memorandum, we have examined past rulemaking notices to determine if they contained statements finding implied preemption of State law. The highlights of that examination are set forth below.

We believe that a fundamental misunderstanding lies at the heart of AAJ's characterization of that discussion and assessment in the Standard No. 305 NPRM and of similar discussions and assessments in approximately two dozen other vehicle safety standard rulemaking notices issued from February 2007 to November 2008. This agency did not express or even suggest any intent to preempt State tort law impliedly in those rulemaking notices. Instead, this agency responded to the requirements of Executive Order 13132 (Federalism) in part by examining whether there might be any possible basis for a judicial finding of implied preemption of state tort law. In each of those notices, the agency concluded its examination without identifying any potential obstacle or conflict that might give rise to such a finding and without even suggesting that there was any probability that one might exist in the future. As the agency has increasingly emphasized in other vehicle safety standard rulemaking notices, it is fundamental that without any obstacle or conflict, there cannot be any implied preemption.

Those approximately two dozen 2007–2008 notices contrast markedly with three vehicle safety standard rulemaking notices issued in mid-2005. In those three notices, this agency did state that it discerned a potential obstacle or conflict that might be posed by state tort law and stated further that if a court found that an obstacle or conflict existed, it could result in the court's finding that such state tort law was impliedly preempted. Further, in each of those three rulemakings, the agency was unmistakably explicit in identifying the potential existence and nature of the obstacle or conflict.

Those three notices were the June 2005 NPRM on designated seating positions;[18] the August 2005 NPRM on roof crush;[19] and the September 2005 NPRM on rearview mirrors.[20] In each of those NPRMs, the agency identified types of state requirements that it had discerned and said might create a conflict and therefore might be found to be impliedly preempted as a result of the rulemaking.

We note that none of the statements about preemption in those three rulemakings is still operative. *The final disposition of each of those statements is as follows—*

- *Rearview mirrors*—The tentative statement about preemption in the proposal was never finally adopted. It became moot when the agency withdrew this rulemaking in July 2008 without ever issuing a final rule.[21]
- *Roof crush*—In the final rule on roof crush published on May 12, 2009, the agency said that it no longer perceived any potential conflicts or obstacles, and accordingly stated there was no likelihood of a court's finding there to be any implied preemption of State tort law;[22] and
- *Designated seating position*—In response to petitions for reconsideration of the agency's inclusion in procedures for determining the number of "designated seating positions" in a motor vehicle of a statement declaring the preemptive effect of those procedures, the agency recently issued a final rule deleting that statement from the regulatory text and said, as it did in the roof crush final rule, that it no longer perceived any obstacles or conflict, and accordingly there was no likelihood of a court's finding there to be any implied preemption of State tort law.[23]

The 2007–2008 notices, including the FMVSS No. 305 NPRM, are completely different from those three 2005 rulemakings. Although AAJ characterized the preemption assessment in the FMVSS No. 305 NPRM, as it has similar preemption assessments in the other 2007–2008 vehicle safety notices, as an assertion of implied preemption of State tort law, a careful reading of the agency's discussions under Executive Order 13132 does not support that characterization. The pertinent paragraph in the FMVSS No. 305 NPRM reads as follows:

> In addition to the express preemption noted above, the Supreme Court has also recognized that State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law, can stand as an obstacle to the accomplishment and execution of a NHTSA safety standard. When such a conflict is discerned, the Supremacy Clause of the Constitution makes their State requirements unenforceable. *See Geier* v. *American Honda Motor Co.,* 529 U.S. 861 (2000). NHTSA has not outlined such potential State requirements in today's rulemaking, however, in part because such conflicts can arise in varied contexts, but it is conceivable that such a conflict may become clear through subsequent experience with today's standard and test regime. NHTSA may opine on such conflicts in the future, if warranted. *See id.* at 883–86.[24]

This discussion does not contain any statement that that particular rulemaking was intended to or had the effect of impliedly preempting State law. Further, neither the discussion in the FMVSS No. 305 NPRM nor any of the other similar discussions in the other vehicle safety rulemaking notices was viewed by the agency at the time of issuance as an assertion of implied preemption with respect to the safety standard under discussion, and none of them is so viewed now. The agency did not at the time of issuing any of those notices suggest the existence of any obstacle or other conflict that might give rise to a judicial finding of implied preemption, and does not now discern, or anticipate the possibility of, any obstacle or conflict.

Far from indicating in the FMVSS No. 305 NPRM that it had found an obstacle or conflict, the agency stated that it had "not outlined" any obstacles or conflicts. The agency went further, indicating to the contrary that there were no clear obstacles or conflicts. These judgments were based in part upon the agency's consideration of the nature (*e.g.,* the language and structure of the regulatory text) and objectives of each of the rules. Since without obstacle or conflict, there could not be any implied preemption of State tort law, the agency did not anticipate that those discussions would somehow be characterized as assertions of implied preemption of State tort law.

Nevertheless, since misunderstandings occurred and continued to occur, the agency initiated

[18] 70 FR 36094, 36098 (June 22, 2005).

[19] 70 FR 49223, 49245–6 (August 23, 2005).

[20] 70 FR 53753, 53768–9 (September 12, 2005).

[21] 73 FR 42309 (July 21, 2008).

[22] 74 FR 22348, 22380–83 (May 12, 2009).

[23] 74 FR 68185 (December 23, 2009).

[24] 72 FR 57260, 57265 (October 9, 2007).

in late summer of 2008 a progressive and continuing series of evolutionary efforts to clarify the language of similar agency discussions in subsequent vehicle safety notices.

It did so first by removing and replacing the statement that the agency "has not outlined" any obstacles or conflicts. Recognizing that some persons might be concerned that such a statement leaves open the theoretical possibility that obstacles or conflicts might have been discerned, but not outlined, the agency sought to ensure that that possibility was clearly negated. Beginning with a September 2008 proposal on seat belt lockability, the agency switched to affirmatively stating that the agency "has not discerned" any obstacles or conflicts:

> NHTSA has not discerned any conflict in today's rulemaking. However, in part because such conflicts can arise in varied contexts, the agency cannot rule out the possibility that such a conflict may become clear through subsequent experience with the proposed standard and test regime. NHTSA may opine on such conflicts in the future, if warranted.[25]

As this clarification did not bring an end to the petitions from AAJ, the agency made further clarifying changes in an early March 2009 interim final rule on air brake systems:

> NHTSA has considered today's interim final rule and does not currently foresee any potential State requirements that might conflict with it.[26]

For further emphasis, the agency added an additional sentence to its discussion under E.O. 13132 to emphasize the fundamental significance of not discerning any conflicts or obstacles:

Without any conflict, there could not be any implied preemption.[27]

In August 2009, the agency began including a brief description of what the agency typically considers in assessing whether there might be any conflict or obstacle. The essential point in the notice remained that the agency had not identified any conflict or obstacle:

> Second, the Supreme Court has recognized the possibility of implied preemption: In some instances, State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law, can stand as an obstacle to the accomplishment and execution of a NHTSA safety standard. When such a conflict is discerned, the Supremacy Clause of the Constitution makes the State requirements unenforceable. *See Geier* v. *American Honda Motor Co.,* 529 U.S. 861 (2000). However, NHTSA has considered *the nature and purpose* of today's rule and does not currently foresee any potential State requirements that might conflict with it. Without any conflict, there could not be any implied preemption. (Emphasis added.)[28]

This discussion, and the one below in Section III.C assessing this final rule under Executive Order 13132, represent the latest in the continuing series of clarifications to assuage concerns, ensure an end to the misunderstandings, and promote consistency with the President's May 20, 2009 memorandum on preemption.[29] The pertinent portion of the Section III.C discussion reads as follows:

> Second, the Supreme Court has recognized the possibility, in some instances, of implied preemption of State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law. That possibility is dependent upon there being an actual conflict between a FMVSS and the State requirement. If and when such a conflict exists, the Supremacy Clause of the Constitution makes the State requirements unenforceable. *See Geier* v. *American Honda Motor Co.,* 529 U.S. 861 (2000), finding implied preemption of State tort law on the basis of a conflict discerned by the court, not on the basis of an intent to preempt asserted by the agency itself.
>
> NHTSA has considered the nature (*e.g.,* the language and structure of the regulatory text) and objectives of today's final rule and does not discern any existing State requirements that conflict with the rule or the potential for any future State requirements that might conflict with it. Without any conflict, there could not be any implied preemption of State law, including state tort law.

III. Rulemaking Analyses and Notices

A. Executive Order 12866 and DOT Regulatory Policies and Procedures

This rulemaking document was not reviewed by the Office of Management and Budget under E.O. 12866. It is not considered to be significant under E.O. 12866 or the Department's Regulatory Policies and Procedures (44 FR 11034; Feb. 26, 1979). This final rule will have no significant effect on the national economy as it simply provides alternative means for achieving compliance and aligns FMVSS No. 305 with current industry recommended practices to facilitate the development and introduction of fuel cell vehicles and next generation electric powered vehicles into the market.

B. Regulatory Flexibility Act

NHTSA has considered the effects of this final rule under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996). I certify that this final rule will not have a significant economic impact on a substantial number of small entities. Any small manufacturers that might be affected by this final rule are already subject to the requirements of FMVSS No. 305. Further, the agency believes the testing associated with the requirements added by this final rule are not substantial and to some extent are already being voluntarily borne by the manufacturers pursuant to SAE J1766. Therefore, there will be only a minor economic impact.

C. Executive Order 13132 (Federalism)

NHTSA has examined today's final rule pursuant to Executive Order 13132 (64 FR 43255; Aug. 10, 1999) and concluded that no additional consultation with States, local governments, or their representatives is mandated beyond the rulemaking process. The agency has concluded that the rule does not have sufficient federalism implications to warrant consultation with State and local officials or the preparation of a federalism summary impact statement. The rule does not have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

NHTSA rules can have preemptive effect in two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemption provision:

> When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter.

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[25] 73 FR 52939, 52941 (September 12, 2008).

[26] 74 FR 9173, 9175 (March 3, 2009).

[27] *Id.* The full discussion reads as follows:* * * the Supreme Court has recognized the possibility of implied preemption: State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law, can stand as an obstacle to the accomplishment and execution of a NHTSA safety standard. When such a conflict is discerned, the Supremacy Clause of the Constitution makes the State requirements unenforceable. *See Geier* v. *American Honda Motor Co.,* 529 U.S. 861 (2000). NHTSA has considered today's interim final rule and does not currently foresee any potential State requirements that might conflict with it. Without any conflict, there could not be any implied preemption.

[28] 74 FR 40760, 40763–4 (August 13, 2009).

[29] The President's memorandum recognizes that State law and national law often operate concurrently to provide independent safeguards for the public and states that the general policy of his Administration is that preemption of State law by executive departments and agencies should be undertaken only with full consideration of the legitimate prerogatives of the States and with a sufficient legal basis for preemption. *See http://www.whitehouse.gov/the_press_office/presidential-memorandum-regarding-preemption/* (last accessed February 4, 2010).

49 U.S.C. 30103(b)(1). It is this statutory command that preempts any non-identical State legislative and administrative law [30] addressing the same aspect of performance, not today's rulemaking, so consultation would be inappropriate.

Second, the Supreme Court has recognized the possibility, in some instances, of implied preemption of State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law. That possibility is dependent upon there being an actual conflict between a FMVSS and the State requirement. If and when such a conflict exists, the Supremacy Clause of the Constitution makes the State requirements unenforceable. *See Geier,* v. *American Honda Motor Co.,* 529 U.S. 861 (2000), finding implied preemption of State tort law on the basis of a conflict discerned by the court,[31] not on the basis of an intent to preempt asserted by the agency itself.[32]

NHTSA has considered the nature (*e.g.,* the language and structure of the regulatory text) and objectives of today's final rule and does not discern any existing State requirements that conflict with the rule or the potential for any future State requirements that might conflict with it. Without any conflict, there could not be any implied preemption of state law, including State tort law.

D. National Environmental Policy Act

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action will not have any significant impact on the quality of the human environment.

E. Executive Order 12988 (Civil Justice Reform)

With respect to the review of the promulgation of a new regulation, section 3(b) of Executive Order 12988, "Civil Justice Reform" (61 FR 4729; Feb. 7, 1996), requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect; (2) clearly specifies the effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct, while promoting simplification and burden reduction; (4) clearly specifies the retroactive effect, if any; (5) specifies whether administrative proceedings are to be required before parties file suit in court; (6) adequately defines key terms; and (7) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. This document is consistent with that requirement.

Pursuant to this Order, NHTSA notes as follows. The issue of preemption is discussed above. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceedings before they may file suit in court.

F. Privacy Act

Please note that anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (65 FR 19477–78), or online at *http://www.dot.gov/privacy.html.*

G. Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (PRA), a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. There are no information collection requirements associated with this final rule.

H. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, as amended by Public Law 107–107 (15 U.S.C. 272), directs the agency to evaluate and use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or is otherwise impractical. Voluntary consensus standards are technical standards (*e.g.,* materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies, such as the Society of Automotive Engineers (SAE). The NTTAA directs us to provide Congress (through OMB) with explanations when the agency decides not to use available and applicable voluntary consensus standards. The NTTAA does not apply to symbols.

FMVSS No. 305 has historically drawn largely from SAE J1766, and does so again for this current rulemaking, which updates FMVSS No. 305 based on the April 2005 version of SAE J1766. In accordance with SAE J1766, this final rule (a) specifies electrical safety requirements to all high voltage sources and not just the propulsion battery, (b) distinguishes between AC and DC high voltage sources and specifies electrical isolation of 500 ohms/volt for AC high voltage sources and 100 ohms/volt for DC high voltage sources with continuous isolation monitoring during vehicle operation, and (c) permits a low voltage option to comply with electrical safety requirements. NHTSA is not, however, adopting SAE J1766 verbatim into the FMVSSs and has not adopted the electrical energy option for electrical safety that is permitted in SAE J1766 because our analysis indicates that it is less stringent and poses a greater risk of electric shock hazard than the electrical isolation option. In addition, the method proposed by commenters for determining compliance with the low energy option was found not to be practical for the agency's purpose.

In the NPRM, NHTSA requested public comment on the appropriateness of also considering the 2006 International Organization for Standardization (ISO) standard ISO 23273–3, "Fuel cell road vehicles—safety specifications—Part 3: Protection of persons against electric shock." No comments were received on this issue. This ISO standard which specifies in-use requirements of fuel cell vehicles for the protection of persons and the environment inside and outside the vehicles against electric shock, is currently in the process of being superseded by another standard under development, ISO–6469–3, "Electric road vehicles—safety specifications—part 3: Protection of persons against electric hazards." Since the purpose of FMVSS No. 305 is to reduce deaths and injuries during a crash and not during vehicle operation as in the ISO standard and since the ISO standard is still in flux, the agency is not incorporating any part of this standard into this final rule.

IV. Regulatory Text

List of subjects in 49 CFR Part 571

Imports, Motor vehicles, Motor vehicle safety.

■ In consideration of the foregoing, NHTSA amends 49 CFR part 571.305 as follows:

[30] The issue of potential preemption of State tort law is addressed in the immediately following paragraph discussing implied preemption.

[31] The conflict was discerned based upon the nature (*e.g.,* the language and structure of the regulatory text) and the safety-related objectives of FMVSS requirements in question and the impact of the State requirements on those objectives.

[32] Indeed, in the rulemaking that established the rule at issue in this case, the agency did not assert preemption.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

■ 1. The authority citation for part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

■ 2. Amend § 571.305 by revising S1, S2, S3, S4, S5, S5.2, S5.3, S6.2, S7, S7.1, S7.2, S7.4, S7.6, S7.6.1, S7.6.2, S7.6.3, S7.6.4, S7.6.5, S7.6.6, S7.6.7, Figure 1, Figure 2, Figure 3, Figure 4, and Figure 5, and adding S5.4, S7.7, and S8 to read as follows:

§ 571.305 Standard No. 305; Electric-powered vehicles: Electrolyte spillage and electrical shock protection.

S1. *Scope.* This standard specifies requirements for limitation of electrolyte spillage, retention of electric energy storage devices, and protection from harmful electric shock during and after a crash.

S2. *Purpose.* The purpose of this standard is to reduce deaths and injuries during and after a crash that occur because of electrolyte spillage from electric energy storage devices, intrusion of electric energy storage device components into the occupant compartment, and electrical shock.

S3. *Application.* This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks, and buses that have a GVWR of 4,536 kg or less, that use electrical components with working voltages more than 60 volts direct current (VDC) or 30 volts alternating current (VAC), and whose speed attainable over a distance of 1.6 km on a paved level surface is more than 40 km/h.

S4. *Definitions.*

Electrical isolation means the electrical resistance between the vehicle high voltage source and any vehicle conductive structure.

Electric energy storage/conversion/power generating system means the components comprising, but not limited to, the vehicle's high voltage battery system, capacitor system, or fuel cell system, and rechargeable energy storage systems. These include, but are not limited to, the battery or capacitor modules, interconnects, venting systems, battery or capacitor restraint devices, and electric energy storage boxes or containers that hold the individual battery or capacitor modules. Hydrogen system components of fuel cell vehicles, such as the hydrogen tanks and hydrogen tubes, are not included in the electric energy storage/conversion system.

Electric energy storage device means a high voltage source that can store energy, such as a battery or capacitor modules.

High voltage source means any electric component that has a working voltage greater than 30 VAC or 60 VDC.

Propulsion system means the components or electric circuit to propel the vehicle using the energy that is supplied by a high voltage source. These include, but are not limited to, the propulsion motor, electric converter, and associated wire harnesses and connectors, and coupling systems for charging rechargeable energy storage systems.

Working voltage means the highest root mean square voltage of the voltage source, which may occur across its terminals or between its terminals and any conductive parts in open circuit conditions or under normal operating conditions.

VAC means volts of alternating current (AC).

VDC means volts of direct current (DC).

S5. *General Requirements.* Each vehicle to which this standard applies, must meet the requirements in S5.1, S5.2, and S5.3 when tested according to S6 under the conditions of S7.

* * * * *

S5.2 *Electric energy storage/conversion system retention.* All components of the electric energy storage/conversion system must be anchored to the vehicle. All component anchorages, including any brackets or structures that transfer loads from the component to the vehicle structure, shall remain attached to the vehicle structure at all attachment locations during and after testing performed pursuant to the procedures of S6 of this standard.

S5.3 *Electrical safety.* After each test, each high voltage source in a vehicle must meet the electrical isolation requirements of subparagraph (a) or the voltage level requirements of subparagraph (b).

(a) The electric isolation between each high voltage source and the vehicle chassis electricity-conducting structure must meet one of the following:

(1) Electrical isolation must be greater than or equal to 500 ohms/volt for all DC high voltage sources without continuous monitoring of electrical isolation during vehicle operation and for all AC high voltage sources; or

(2) Electrical isolation must be greater than or equal to 100 ohms/volt for all DC high voltage sources with continuous monitoring of electrical isolation, in accordance with the requirements of S5.4, during vehicle operation.

(b) The voltage of the voltage source must be less than or equal to 30 VAC for AC components or 60 VDC for DC components.

S5.4 *Electrical isolation monitoring.* For each continuously monitored DC high voltage source, the continuous monitoring of electrical isolation during vehicle operation referred to in S5.3(a)(2) must be achieved through an electrical isolation monitoring system that displays a warning for loss of isolation when tested according to S8. The system must monitor its own readiness and the warning display must be clearly visible from the driver's designated seating position.

* * * * *

S6.2 *Rear moving barrier impact.* The vehicle must meet the requirements of S5.1, S5.2, and S5.3 when it is impacted from the rear by a barrier that conforms to S7.3(b) of 571.301 of this chapter and that is moving at any speed up to and including 80 km/h (50 mph) with dummies in accordance with S6.2 of 571.301 of this chapter.

* * * * *

S7. *Test conditions.* When the vehicle is tested according to S6, the requirements of S5.1 through S5.3 must be met under the conditions specified in S7.1 through S7.7. All measurements for calculating voltage(s) and electrical isolation are made after a minimum of 5 seconds after the vehicle comes to rest in tests specified in S6. Where a range is specified, the vehicle must be capable of meeting the requirements at all points within the range.

S7.1 *Electric energy storage device state of charge.* The electric energy storage device is at the state of charge specified in subparagraphs (a), (b), or (c), as appropriate:

(a) At the maximum state of charge recommended by the manufacturer, as stated in the vehicle owner's manual or on a label that is permanently affixed to the vehicle;

(b) If the manufacturer has made no recommendation in the owner's manual or on a label permanently affixed to the vehicle, at a state of charge of not less than 95 percent of the maximum capacity of the electric energy storage device; or

(c) If the electric energy storage device(s) is/are rechargeable only by an energy source on the vehicle, at any state of charge within the normal operating voltage defined by the vehicle manufacturer.

S7.2 *Vehicle conditions.* The switch or device that provides power from the high voltage system to the propulsion motor(s) is in the activated position or the ready-to-drive position.

* * * * *

S7.4 *Rear moving barrier impact test conditions.* In addition to the conditions of S7.1 and S7.2, the conditions of S7.3(b) and S7.6 of 571.301 of this chapter apply to the conducting of the rear moving deformable barrier impact test specified in S6.2.

* * * * *

S7.6 *Electrical isolation test procedure.* In addition to the conditions of S7.1 and S7.2, the conditions in S7.6.1 through S7.6.7 apply to the measuring of electrical isolation specified in S5.3(a).

S7.6.1 Prior to any barrier impact test, the high voltage source is connected to the vehicle's propulsion system, and the vehicle ignition is in the "on" (propulsion system energized) position. Bypass any devices or systems that do not allow the propulsion system to be energized at the time of impact when the vehicle ignition is on and the vehicle is in neutral. For a vehicle that utilizes an automatic disconnect between the high voltage source and the traction system that is physically contained within the high voltage electric energy storage/conversion/ power generating system, the electrical isolation measurement after the test is made from the traction-system side of the automatic disconnect to the vehicle chassis electricity-conducting structure. For a vehicle that utilizes an automatic disconnect that is not physically contained within the high voltage electric energy storage/conversion/ power generating system, the electrical isolation measurement after the test is made from both the high voltage source side and from the traction-system side of the automatic disconnect to the vehicle chassis electricity-conducting structure.

S7.6.2 The voltmeter used in this test has an internal resistance of at least 10 MΩ.

S7.6.3 The voltage(s) is/are measured as shown in Figure 1 and the high voltage source voltage(s) (Vb) is/are recorded. Before any vehicle impact test, Vb is equal to or greater than the nominal operating voltage as specified by the vehicle manufacturer.

S7.6.4 The voltage(s) is/are measured as shown in Figure 2, and the voltage(s) (V1) between the negative side of the high voltage source and the vehicle chassis electricity-conducting structure is/are recorded.

S7.6.5 The voltage(s) is/are measured as shown in Figure 3, and the voltage(s) (V2) between the positive side of the high voltage source and the vehicle chassis electricity-conducting structure is/are recorded.

S7.6.6 If V1 is greater than or equal to V2, insert a known resistance (Ro) between the negative side of the high voltage source and the vehicle chassis electricity-conducting structure. With the Ro installed, measure the voltage (V1′) as shown in Figure 4 between the negative side of the high voltage source and the vehicle chassis electricity-conducting structure. Calculate the electrical isolation resistance (Ri) according to the formula shown. Divide Ri (in ohms) by the working voltage of the high voltage source (in volts) to obtain the electrical isolation (in ohms/ volt).

S7.6.7 If V2 is greater than V1, insert a known resistance (Ro) between the positive side of the high voltage source and the vehicle chassis electricity-conducting structure. With the Ro installed, measure the voltage (V2′) as shown in Figure 5 between the positive side of the high voltage source and the vehicle chassis electricity-conducting structure. Calculate the electrical isolation resistance (Ri) according to the formula shown. Divide Ri (in ohms) by the working voltage of the high voltage source (in volts) to obtain the electrical isolation (in ohms/volt).

S7.7 *Voltage measurement.* For the purposes of determining low voltage source specified in S5.3(b), voltage is measured as shown in Figure 1. Voltage Vb is measured across the two terminals of the voltage source. Voltages V1 and V2 are measured between the source and the vehicle chassis electricity-conducting structure.

S8 Test procedure for on-board electrical isolation continuous monitoring system. Prior to any impact test, the requirements of S5.4 for the on-board electrical isolation continuous monitoring system shall be confirmed using the following procedure.

(1) The electric energy storage device is at the state of charge specified in S7.1.

(2) The switch or device that provides power from the high voltage system to the propulsion motor(s) is in the activated position or the ready-to-drive position.

(3) Determine the isolation resistance, Ri, of the high voltage source with the electrical isolation monitoring system using the procedure outlined in S7.6.2 through S7.6.7.

(4) Insert a resistor with resistance equal to Ro=1/(1/(95 times the working voltage of the high voltage source)—1/ Ri) between the positive terminal of the high voltage source and the vehicle chassis electric conducting structure.

The electrical isolation monitoring system indicator shall display a warning to the driver.

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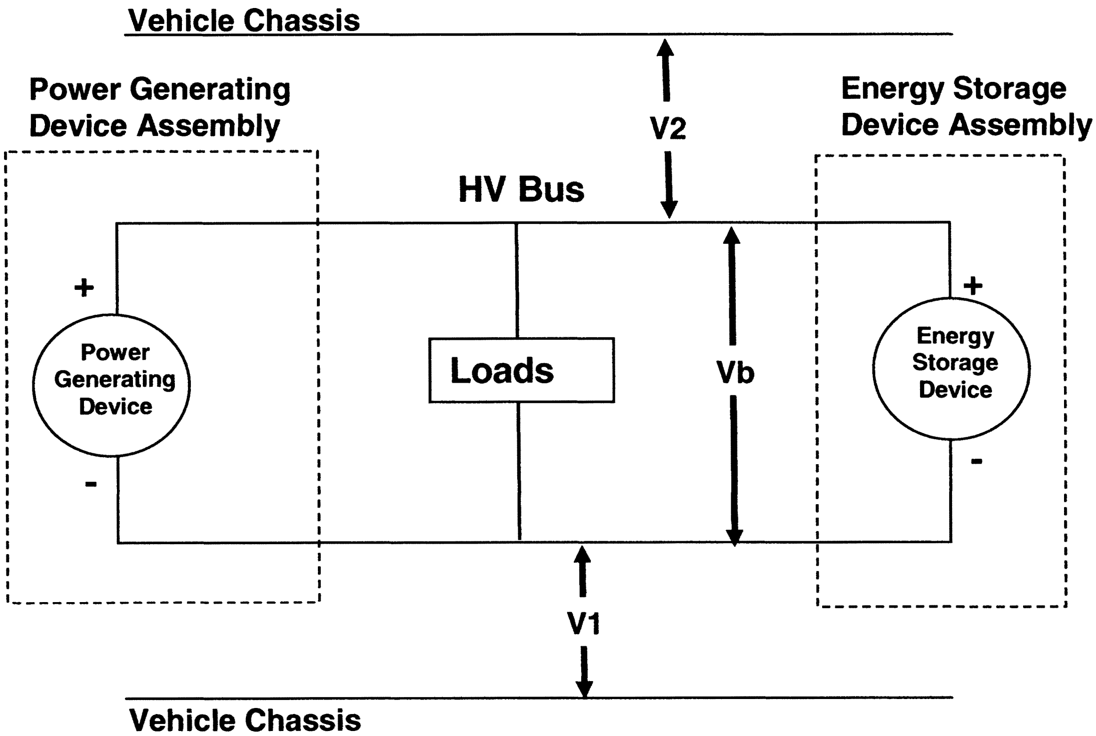


Figure 1. S7.6.3 and S7.7 Measurement of Voltage Source Voltage

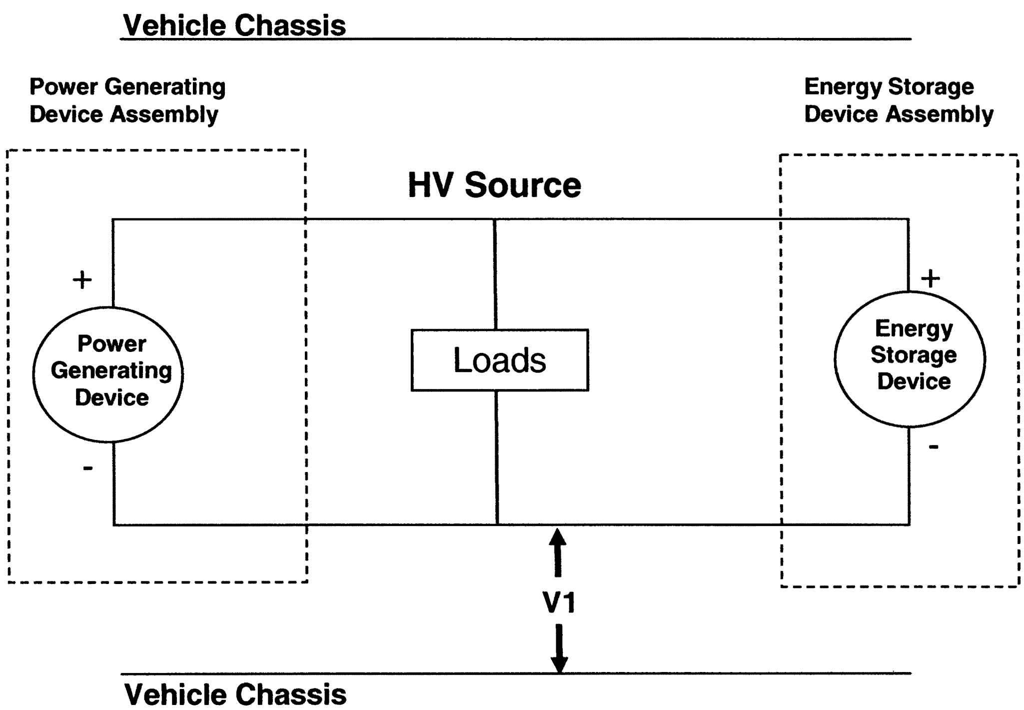


Figure 2. S7.6.4 Measurement for V1 Voltage between the Negative Side of the High Voltage Source and the Vehicle Chassis Electricity-Conducting Structure

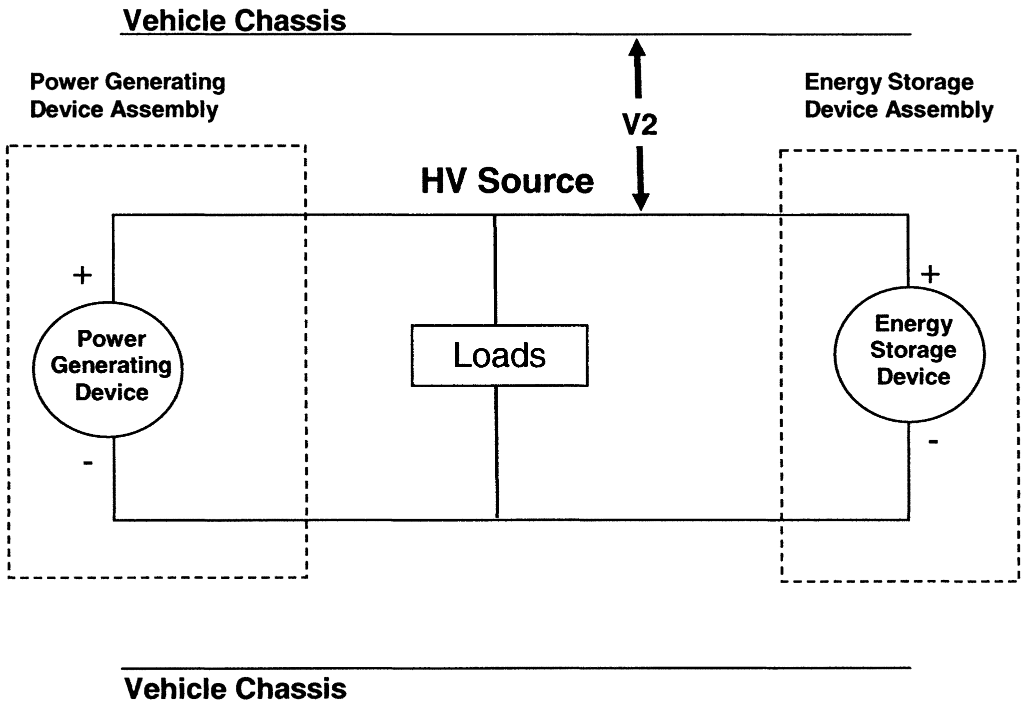
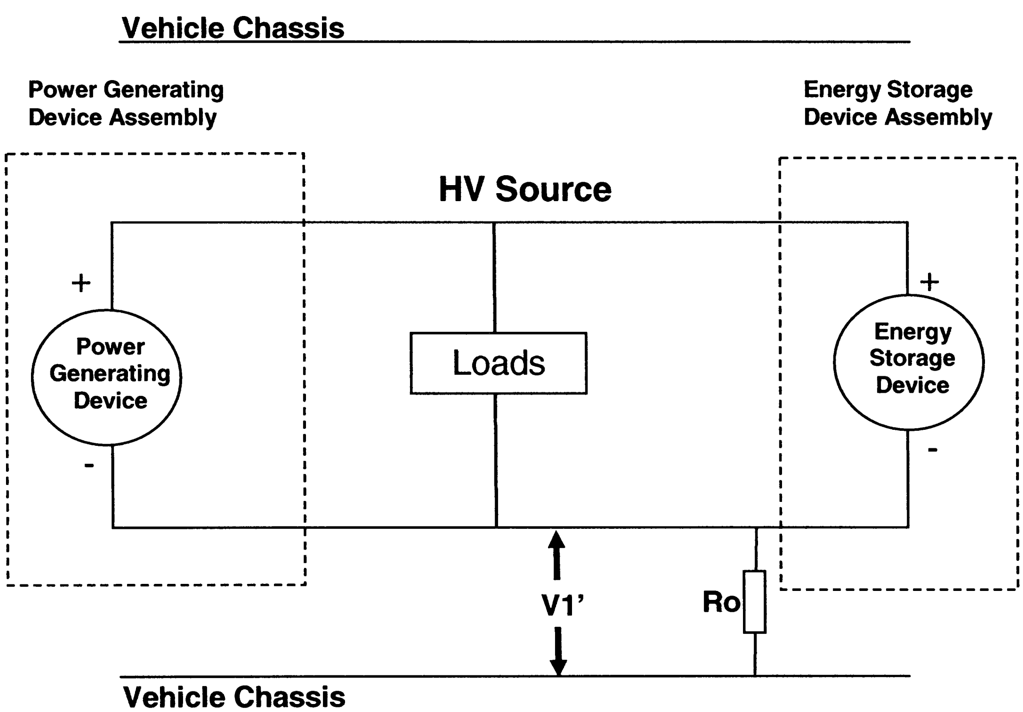


Figure 3. S7.6.5 Measurement for V2 Voltage between the Positive Side of the High Voltage Source and the Vehicle Chassis Electricity-Conducting Structure



$$Ri = Ro\,(1+V2/V1)((V1-V1')/V1')$$

Figure 4. S7.6.6 Measurement for V1' Voltage across Resistor between Negative Side of the High Voltage Source and Vehicle Chassis Electricity-Conducting Structure

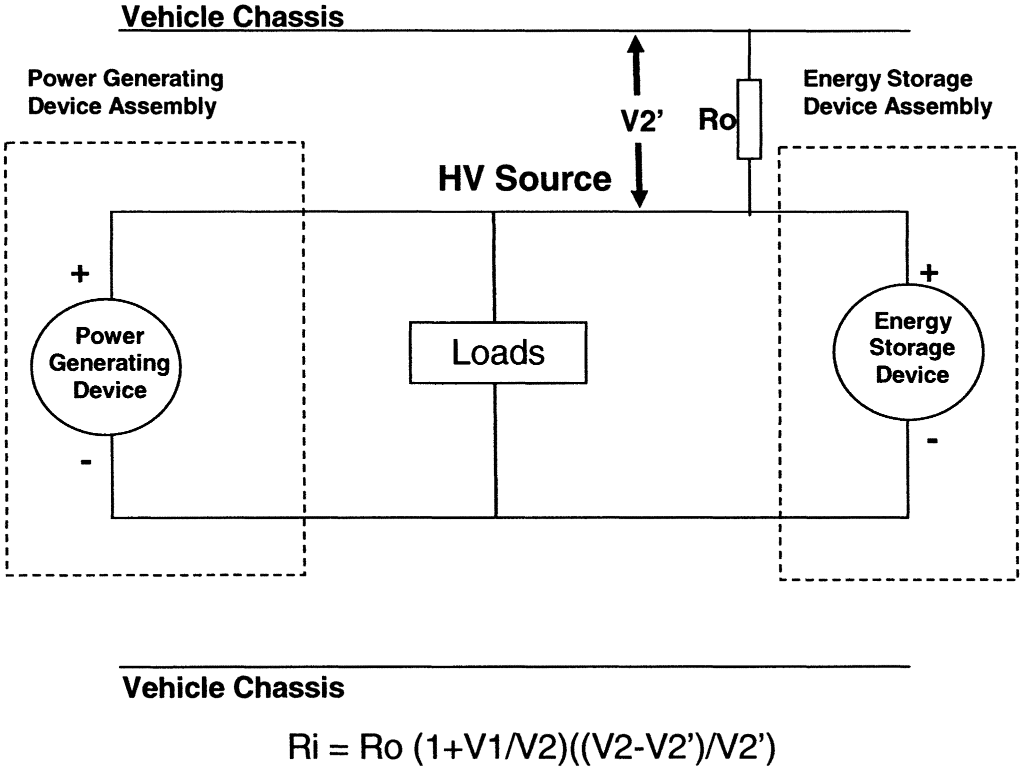


Figure 5. S7.6.7 Measurement for V2' Voltage across Resistor between Positive Side of the High Voltage Source and Vehicle Chassis Electricity-Conducting Structure

Issued: June 8, 2010.

David L. Strickland,

Administrator.

[FR Doc. 2010–14131 Filed 6–11–10; 8:45 am]

BILLING CODE 4910–59–C

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

RIN 0648–XW79

Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Fisheries

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Temporary rule; inseason Angling category retention limit adjustment; southern area trophy fishery closure; quota transfer.

SUMMARY: NMFS has determined that the Atlantic bluefin tuna (BFT) daily retention limit should be adjusted for the remainder of 2010, based on consideration of the regulatory determination criteria regarding inseason adjustments. These actions apply to vessels permitted in the Highly Migratory Species (HMS) Angling category and Charter/Headboat category (when fishing recreationally for BFT). NMFS also closes the southern area Angling category fishery for large medium and giant ("trophy") BFT, and transfers 1.7 mt from the Reserve to the northern area trophy category subquota. These actions are being taken consistent with the BFT fishery management objectives of the 2006 Consolidated HMS Fishery Management Plan and to prevent overharvest of the 2010 Angling category quota.

DATES: Effective June 12, 2010 through December 31, 2010.

FOR FURTHER INFORMATION CONTACT: Sarah McLaughlin or Brad McHale, 978–281–9260.

SUPPLEMENTARY INFORMATION:

Regulations implemented under the authority of the Atlantic Tunas Convention Act (16 U.S.C. 971 *et seq.*) and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. 1801 *et seq.*) governing the harvest of BFT by persons and vessels subject to U.S. jurisdiction are found at 50 CFR part 635. Section 635.27 subdivides the U.S. BFT quota recommended by the International Commission for the Conservation of Atlantic Tunas (ICCAT) among the various domestic fishing categories, per the allocations established in the 2006 Consolidated Highly Migratory Species Fishery Management Plan (2006 Consolidated HMS FMP) (71 FR 58058, October 2, 2006).

The 2010 BFT fishing year, which is managed on a calendar-year basis and subject to an annual calendar-year quota, began January 1, 2010. The Angling category season opened January 1, 2010, and continues through December 31, 2010. Currently, the default Angling category daily retention limit of one school, large school, or small medium BFT (measuring 27 to less than 73 inches (68.5 to less than 185 cm)) applies (§ 635.23(b)(2)). An annual limit of one large medium or giant BFT (73 inches or greater) per vessel also applies (§ 635.23(b)(1)). These retention limits apply to HMS Angling and HMS Charter/Headboat category permitted vessels (when fishing recreationally for BFT).

The 2008 ICCAT recommendation regarding Western BFT management resulted in a U.S. quota of 1,034.9 mt for 2009, and 977.4 mt for 2010. Consistent with the allocation scheme established