Washington, DC ozone nonattainment area necessitated by the January 24, 2003, reclassification action. The revised COMAR 26.11.09.08A(1) now requires that all stationary sources in the Washington, DC area of $NO_X$ emissions be subject to Maryland's $NO_X$ RACT rule if the emissions of $NO_X$ are 25 tons or more per year.

## IV. Proposed Action

EPA's review of this submittal indicates that Maryland has revised its nonattainment NSR rules and its $NO_X$ RACT rules as required by the reclassification of the Washington DC area to severe ozone nonattainment. EPA is proposing to approve the Maryland SIP revision, which was submitted on December 1, 2003, that revised definition of major stationary source found in COMAR 26.11.17.01B(13), that changed the general emission offset provisions found in COMAR 26.11.17.03B(3), and, that changed COMAR 26.11.09.08A(1) to add the Washington area counties to the areas where $NO_X$ RACT is required on stationary sources emitting 25 tons or more per year. EPA is soliciting public comments on the issues discussed in this document. These comments will be considered before taking final action.

## V. Statutory and Executive Order Reviews

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this proposed action is not a ''significant regulatory action'' and therefore is not subject to review by the Office of Management and Budget. For this reason, this action is also not subject to Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)). This action merely proposes to approve state law as meeting Federal requirements and imposes no additional requirements beyond those imposed by state law. Accordingly, the Administrator certifies that this proposed rule will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*). Because this rule proposes to approve pre-existing requirements under state law and does not impose any additional enforceable duty beyond that required by state law, it does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4). This proposed rule also does not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes, as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), nor will it 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, as specified in Executive Order 13132 (64 FR 43255, August 10, 1999), because it merely proposes to approve a state rule implementing a Federal standard, and does not alter the relationship or the distribution of power and responsibilities established in the Clean Air Act. This proposed rule also is not subject to Executive Order 13045 (62 FR 19885, April 23, 1997), because it is not economically significant.

In reviewing SIP submissions, EPA's role is to approve state choices, provided that they meet the criteria of the Clean Air Act. In this context, in the absence of a prior existing requirement for the State to use voluntary consensus standards (VCS), EPA has no authority to disapprove a SIP submission for failure to use VCS. It would thus be inconsistent with applicable law for EPA, when it reviews a SIP submission, to use VCS in place of a SIP submission that otherwise satisfies the provisions of the Clean Air Act. Thus, the requirements of section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) do not apply. As required by section 3 of Executive Order 12988 (61 FR 4729, February 7, 1996), in issuing this proposed rule, EPA has taken the necessary steps to eliminate drafting errors and ambiguity, minimize potential litigation, and provide a clear legal standard for affected conduct. EPA has complied with Executive Order 12630 (53 FR 8859, March 15, 1988) by examining the takings implications of the rule in accordance with the ''Attorney General's Supplemental Guidelines for the Evaluation of Risk and Avoidance of Unanticipated Takings'' issued under the executive order. This proposed rule to approve Maryland's December 1, 2003, SIP revision that changes its approved SIP pertaining to new source review permitting and $NO_X$ RACT for the Washington, DC area does not impose an information collection burden under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*).

### List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Intergovernmental relations, Nitrogen dioxide, Ozone, Reporting and recordkeeping requirements, Volatile organic compounds.

**Authority:** 42 U.S.C. 7401 *et seq.*

Dated: June 3, 2004.

**Abraham Ferdas,**

*Acting Regional Administrator, Region III.*

[FR Doc. 04–13285 Filed 6–10–04; 8:45 am]

**BILLING CODE 6560–50–P**

## DEPARTMENT OF TRANSPORTATION

## National Highway Traffic Safety Administration

## 49 CFR Part 563

**[Docket No. NHTSA–2004–18029]**

**RIN 2127–AI72**

## Event Data Recorders

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

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** This proposal addresses event data recorders (EDRs), *i.e.*, devices that record safety information about motor vehicles involved in crashes. Manufacturers have been voluntarily installing EDRs as standard equipment in increasingly larger numbers of light vehicles in recent years. They are now being installed in the vast majority of new vehicles. The information collected by EDRs aids investigations of the causes of crashes and injuries, and makes it possible to better define and address safety problems. The information can be used to improve motor vehicle safety systems and standards. As the use and capabilities of EDRs increase, opportunities for additional safety benefits, especially with regard to emergency medical treatment, may become available.

We are not presently proposing to require the installation of EDRs in any motor vehicles. We are proposing to (1) require that the EDRs voluntarily installed in light vehicles record a minimum set of specified data elements useful for crash investigations, analysis of the performance of safety equipment, *e.g.*, advanced restraint systems, and automatic collision notification systems; (2) specify requirements for data format; (3) increase the survivability of the EDRs and their data by requiring that the EDRs function during and after the front, side and rear vehicle crash tests

specified in several Federal motor vehicle safety standards; (4) require vehicle manufacturers to make publicly available information that would enable crash investigators to retrieve data from the EDR; and (5) require vehicle manufacturers to include a brief standardized statement in the owner's manual indicating that the vehicle is equipped with an EDR and describing the purposes of EDRs.

**DATES:** You should submit your comments early enough to ensure that Docket Management receives them not later than August 13, 2004.

**ADDRESSES:** You may submit comments [identified by the docket number in the heading at the beginning of this document] by any of the following methods:

- Web Site: *http://dms.dot.gov.* Follow the instructions for submitting comments on the DOT electronic docket site.
- Fax: 1–202–493–2251.
- Mail: Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL–401, Washington, DC 20590–001.
- Hand Delivery: Room PL–401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays.
- Federal eRulemaking Portal: Go to *http://www.regulations.gov.* Follow the online instructions for submitting comments.

**FOR FURTHER INFORMATION CONTACT:** The following persons at the National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, DC, 20590:

*For technical and policy issues:* Dr. William Fan, Office of Crashworthiness Standards, telephone (202) 366–4922, facsimile (202) 366–4329.

*For legal issues:* J. Edward Glancy, Office of the Chief Counsel, telephone (202) 366–2992, facsimile (202) 366–3820.

**SUPPLEMENTARY INFORMATION:**

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## I. Background

### *A. Event Data Recorders*

Event data recorder devices have been used in other transportation sectors, such as railroads. Over the past several years, there has been considerable interest in the safety community regarding possible safety benefits from the use of event data recorders (EDRs) in motor vehicles.

EDRs collect vehicle crash information.[1] Some systems collect only vehicle acceleration/deceleration data, while others collect these data plus a host of complementary data, such as driver inputs (*e.g.*, braking and steering) and vehicle systems status.

The way in which this is accomplished may be described in the following somewhat simplified manner. The EDR monitors several of the vehicle's systems, such as speed, brakes, and several safety systems. It continuously records and erases information on these systems so that a record of the most recent 8-second period is always available. If an ''event'' occurs, *i.e.*, if a crash meeting a pre-determined threshold of severity occurs, then the EDR moves the last 8 seconds of pre-crash information into its long-term memory. In addition, it records and puts into its long-term memory up to 6 seconds of data relating to what happens after the start of the crash, such as the timing and manner of deployment of the air bags.

[1] Since the term ''EDR'' can be used to cover many different types of devices, we believe it is important to explain the term for purposes of this document. When we use the term ''EDR'' in this document, we are referring to a device that is installed in a motor vehicle to record technical vehicle and occupant-based information for a brief period of time (*i.e.*, seconds, not minutes) before, during and after a crash. For instance, EDRs may record (1) pre-crash vehicle dynamics and system status, (2) driver inputs, (3) vehicle crash signature, (4) restraint usage/deployment status, and (5) certain post-crash data such as the activation of an automatic collision notification (ACN) system. We are not using the term to include any type of device that either makes an audio or video record, or logs data such as hours of service for truck operators.

The information collected by EDRs aids investigations of the causes of crashes and injury mechanisms, and makes it possible to better identify and address safety problems. Thus, the information can be used to improve motor vehicle safety.

EDRs have been installed as standard equipment in an increasingly large number of light motor vehicles in recent years, particularly in vehicles with air bags. We estimate that 65 to 90 percent of model year 2004 passenger cars and other light vehicles have some recording capability, and that more than half record such things as crash pulse data. We do not have more precise estimates because not all vehicle manufacturers have provided us detailed information on this topic.

Vehicle manufacturers have made EDR capability an additional function of the vehicle's air bag control systems. The air bag control systems were necessarily processing a great deal of vehicle information, and EDR capability could be added to the vehicle by designing the air bag control system to capture, in the event of a crash, relevant data in memory.

EDRs have become increasingly more advanced with respect to the amount and type of data recorded.

### *B. Chronology of Events Relating to NHTSA's Consideration of Event Data Recorders*

NHTSA's Special Crash Investigations (SCI) program first utilized EDR information in support of an agency crash investigation in 1991. This was done in cooperation with the vehicle's manufacturer, General Motors (GM). Throughout the 1990s, NHTSA's SCI team utilized EDRs as one of their investigative tools. From 1991 through 1997, SCI worked with manufacturers to read approximately 40 EDRs in support of its program.

In 1997, the National Transportation Safety Board (NTSB) issued Safety Recommendation H–97–18 to NHTSA, recommending that we ''pursue crash information gathering using EDRs.'' NTSB recommended that the agency ''develop and implement, in conjunction with the domestic and international automobile manufacturers, a plan to gather better information on crash pulses and other crash parameters in actual crashes, utilizing current or augmented crash sensing and recording devices.'' Also, in that year, the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL), in a study conducted for NHTSA about advanced air bag technology, recommended that we ''study the feasibility of installing and obtaining

crash data for safety analyses from crash recorders on vehicles.''

In early 1998, NHTSA's Office of Research and Development (R&D) formed a Working Group comprised of industry, academia, and other government organizations. The group's objective was to facilitate the collection and utilization of collision avoidance and crashworthiness data from on-board EDRs.

In 1999, NTSB issued a second set of recommendations to NHTSA related to EDRs, H–99–53 and 54, recommending that we require EDRs to be installed on school buses and motor coaches.

In 2000, NHTSA sponsored a second working group related to EDRs, the NHTSA Truck & Bus EDR Working Group. This Working Group collected facts related to use of EDRs in trucks, school buses, and motor coaches.

In August 2001, the NHTSA-sponsored EDR Working Group published a final report on the results of its deliberations.[2] Highlights of the Working Group findings were the following:

1. EDRs have the potential to greatly improve highway safety, for example, by improving occupant protection systems and improving the accuracy of crash reconstructions.

2. EDR technology has potential safety applications for all classes of motor vehicles.

3. A wide range of crash related and other data elements have been identified which might usefully be captured by future EDR systems.

4. NHTSA has incorporated EDR data collection in its motor vehicle research databases.

5. Open access to EDR data (minus personal identifiers) will benefit researchers, crash investigators, and manufacturers in improving safety on the highways.

6. Studies of EDRs in Europe and the U.S. have shown that driver and employee awareness of an on-board EDR reduces the number and severity of drivers' crashes.

7. Given the differing nature of cars, vans, SUVs, and other lightweight vehicles, compared to heavy trucks, school buses, and motor coaches, different EDR systems may be required to meet the needs of each vehicle class.

8. The degree of benefit from EDRs is directly related to the number of vehicles operating with an EDR and the current infrastructure's ability to use and assimilate these data.

9. Automatic crash notification (ACN) systems integrate the on-board crash sensing and EDR technology with other electronic systems, such as global positioning systems and cellular telephones, to provide early notification of the occurrence, nature, and location of a serious collision.

10. Most systems utilize proprietary technology and require the manufacturer to download and analyze the data.

In 2001, NHTSA developed a website about highway-based EDRs located at the following address: *http://www-nrd.nhtsa.dot.gov/edr-site/index.html.*

The final report of the NHTSA Truck and Bus EDR Working Group was published in May 2002.[3] The record of this Working Group is in Docket No. NHTSA–2000–7699.

*C. Petitions for Rulemaking*

1. Petitions From Mr. Price T. Bingham and Ms. Marie E. Birnbaum

In the late 1990s, the agency denied two petitions for rulemaking asking us to require the installation of EDRs in new motor vehicles. (63 FR 60270; November 9, 1998 and 64 FR 29616; June 2, 1999.)

The first petitioner, Mr. Price T. Bingham, a private individual, asked the agency to initiate rulemaking to require air bag sensors to be designed so that data would be recorded during a crash, allowing it to be read later by crash investigators. The petitioner cited a concern about air bag deployments that might be ''spontaneous,'' but did not limit the petition to that issue.

The second petitioner, Ms. Marie E. Birnbaum, also a private individual, asked us to initiate rulemaking to require passenger cars and light trucks to be equipped with ''black boxes'' (*i.e.*, EDRs) analogous to those found on commercial aircraft.

In responding to these petitions, NHTSA stated that it believed EDRs could provide information that is very valuable in understanding crashes, and that can be used in a variety of ways to improve motor vehicle safety. The agency denied the petitions because the motor vehicle industry was already voluntarily moving in the direction recommended by the petitioners, and because the agency believed ''this area presents some issues that are, at least for the present time, best addressed in a non-regulatory context.''

2. Petition From Dr. Ricardo Martinez

In October 2001, the agency received a petition from Dr. Ricardo Martinez, President of Safety Intelligence Systems Corporation and former Administrator of NHTSA, asking us to ''mandate the collection and storage of onboard vehicle crash event data, in a standardized data and content format and in a way that is retrievable from the vehicle after the crash.''

According to the petitioner, understanding what happens in a crash is essential to preventing injuries and deaths. Dr. Martinez stated that this information is the cornerstone of safety decision-making, whether it is designing the vehicle, making policy, identifying a potential problem or evaluating the effectiveness of safety systems.

The petitioner argued, however, that despite the high-tech nature of motor vehicles today, current methods of crash investigation rely on ''analyzing the 'archaeology of the crash,' subjective witness statements, and expert opinion to determine the 'facts.' '' Dr. Martinez also noted that the movement from mechanical to electrical systems and sensors means that physical evidence of the crash is diminishing. For example, anti-lock brakes reduce skid marks, making it more difficult to make determinations about wheel and vehicle behavior.

According to Dr. Martinez, field investigations of motor vehicle crashes are costly, time consuming, laborious, and often inaccurate. The petitioner stated that there is a significant difference (sometimes more than 100%) between derived crash severity calculations and those directly measured by a vehicle. The petitioner also stated that because of costs and limitations of current crash investigations and reconstructions, the total number of cases available for analysis are limited and skewed toward the more serious crashes. Dr. Martinez stated that, as a result, current data bases are recognized to have major deficiencies because of the small number of crashes they contain and the bias of the information.

The petitioner noted that today's vehicles generate, analyze and utilize tremendous amounts of vehicle-based information for operations such as engine and speed control, braking, and deployment of safety systems. For example, increasingly sophisticated air bag systems make ''decisions'' based on vehicle speed, crash direction and severity, occupant size and position, and restraint use. However, not all vehicles capture and store this information. Further, not all of the data elements and formats for this information are standardized.

Dr. Martinez argued that the increasing sophistication and decreasing costs of information technology has created the opportunity to now mandate the capture, storage, and retrieval of

[2] Event Data Recorders, Summary of Findings by the NHTSA EDR Working Group, August 2001, Final Report (Docket No. NHTSA–99–5218–9). Persons interested in additional information about EDRs may wish to examine section 12 of the final report, which sets forth a bibliography and references.

[3] Event Data Recorders, Summary of Findings by the NHTSA EDR Working Group, May 2002, Final Report, Volume II, Supplemental Findings for Trucks, Motorcoaches, and School Buses. (Docket No. NHTSA–2000–7699–6).

onboard crash data. The petitioner stated that rulemaking should standardize the collection of existing information as a minimal data set in a standardized format for storage and retrieval. He stated that the NHTSA-sponsored Working Group on EDRs, the Institute of Electrical and Electronics Engineers (IEEE), and the Society of Automotive Engineers (SAE) have all begun work on minimum data sets for EDRs. The petitioner also called for requirements to ensure the crash survivability of the collected data.

Dr. Martinez noted that the agency had previously denied similar petitions based the belief that the automotive industry was already voluntarily moving in the direction recommended by the petitioners and that some issues associated with this area are best addressed in a non-regulatory context. The petitioner argued, however, that an agency rulemaking along the lines discussed above is necessary because overall the industry's response has been ''sluggish and disjointed.'' Dr. Martinez stated that much of the information is proprietary to each individual manufacturer and there is no standardization of the data elements or format of information. The petitioner also stated that while some manufacturers have provided EDRs in their vehicles, others have said they will only install EDRs if the government mandates the devices.

The petitioner also argued that a NHTSA rulemaking would greatly accelerate the deployment of ACN. He noted that the FCC is currently implementing rules to require automatic location information for emergency calls made from wireless phones. According to Dr. Martinez, the nexus between vehicles and communications provides the basis for ACN. The petitioner stated that only a small amount of vehicle information, such as crash severity, restraint use, direction of force and location (if available) is of use to emergency providers. However, the advent of advanced ACN is dependent upon the standardized collection of crash information in the vehicle.

Finally, the petitioner stated that he believes privacy issues can be overcome by ensuring that the vehicle owner is the one who owns the data collected by the EDR and can provide permission for its use and transmission. The petitioner stated that EDR data does not have personal identifier information and is only stored in the event of a crash. He also noted that current crash information in the form of police reports and insurance claims have much more personal identifying information than the information in EDRs.

The petition from Dr. Martinez was submitted shortly after the NHTSA EDR Working Group had published its final report on the results of its deliberations. As discussed in more detail in the next section of this document, in October 2002, after the second working group had completed its work, we decided to request public comments on what future role the agency should take related to the continued development and installation of EDRs in motor vehicles. We decided to respond to Dr. Martinez's petition after considering those comments.

*D. October 2002 Request for Comments*

On October 11, 2002, NHTSA published in the **Federal Register** (67 FR 63493) (Docket No. NHTSA–02–13546), a request for comments concerning EDRs. The agency discussed its involvement with EDRs over the past few years, and explained that particularly since the two NHTSA-sponsored working groups had completed their work, it was requesting comments on what future role the agency should take related to the continued development and installation of EDRs in motor vehicles. The agency discussed a range of issues, including safety benefits, technical issues, privacy issues, and the role of the agency, and asked a number of questions.

We received comments representing light and heavy vehicle manufacturers, equipment manufacturers, vehicle users, the medical community, advocacy organizations, safety research organizations, crash investigators, insurance companies, academia, and government agencies. We also received comments from a number of private individuals.

A summary of the comments follows. To keep the summary short, we do not discuss all comments on particular topics, but instead discuss representative comments. In addition, since this NPRM concerns light vehicles and not heavy vehicles, the summary focuses primarily on comments relevant to EDRs in light vehicles.

1. Safety Benefits

A wide variety of commenters expressed the belief that EDRs will improve vehicle safety by providing necessary and accurate data for crash analysis, information for potential injury prediction, and data for vehicle/roadway design improvement.

NTSB stated that the issue of automatic recording devices for all modes of transportation has been on its ''Most Wanted'' list since 1997. That organization noted that on-board recording devices have proven themselves to be extremely valuable in other modes of transportation, particularly aviation. NTSB stated that effective implementation of on-board recording in highway vehicles can have a similar, positive impact on highway safety.

The Alliance of Automobile Manufacturers (Alliance), which represents most large manufacturers of light vehicles, stated that its members recognize that EDRs have the potential to contribute to the quality of field performance data, roadway designs and emergency response systems. That organization also stated that it is possible that EDRs could improve existing safety databases both with respect to the accuracy of existing data elements and through the addition of new data elements that are not currently available.

The Automotive Occupant Restraints Council, which represents manufacturers of safety belts and air bags, stated that it believes that the installation of EDRs and capture of data related to vehicle crashes has the potential to greatly improve highway safety by providing crash data that can be utilized in designing improved occupant restraint systems.

The Advocates for Highway and Auto Safety stated that research literature and practical experience make it abundantly clear that data obtained from EDRs after crashes and near-crash events can be used to substantially improve traffic safety.

The Insurance Institute for Highway Safety (IIHS) stated that EDRs have enormous potential to aid researchers in understanding the circumstances and precursors of crashes as well as in providing more reliable information on crash severities. That organization stated that a better understanding of these issues ultimately could lead to improved vehicle safety.

The American Automobile Association (AAA) stated that in the effort to reduce the number and severity of crashes, not enough has been in the collection and analysis of scientific data to fully understand the dynamics and trends in crash causation. According to that association, data from EDRs provide an objective measurement of what actually occurred during those last seconds before a crash. AAA stated that obtaining information about the ''crash pulse'' should yield important benefits in vehicle design by identifying the types of changes that manufacturers could pursue to build more crash-friendly vehicles.

A number of commenters from the medical community, including the National Association of EMS

Physicians, the American College of Emergency Physicians, the William Lehman Injury Research Center, and the University of Alabama Center for Injury Sciences, supported the emergency medical system (EMS) connection for improved medical treatment, including support for real time data transmission and easy download capability at a crash scene by EMS personnel.

With regard to possible crash prevention aspects of EDRs, some commenters stated that they do not believe or know of any research supporting the premise that, by itself, a driver's knowledge of the presence of an EDR would have any appreciable direct effect on crash prevention. The Virginia Tech Transportation Institute stated that it had conducted two large instrumented truck-driving studies and based on the results their researchers believe that the commercial drivers would not change their driving behavior because of the existence of an on-board EDR.

2. Technical Issues

One technical issue addressed by commenters was the data elements that should be collected. Mitsubishi believes that the list should be narrow and focused on safety-related items only. Consumers Union and IIHS submitted lists of data elements. Some of the more common data elements discussed by those two include crash pulse information (such as x- and y-acceleration), safety belt usage, air bag deployment status, pre-crash data (such as brake application, engine rpm, throttle position, etc.), and the vehicle identification number. The American Trucking Association supported the 28 data elements listed by NHTSA-sponsored truck and bus working group, but the Automotive Occupant Restraints Council doubts whether these data elements are technically and economically feasible. Public Citizen believes that NHTSA should determine a minimum set of data for light duty vehicles and another set for heavy trucks.

Another technical issue addressed by a number of commenters was how much data should be recorded. Commenters generally agreed that EDRs should collect data for a very brief period of time. IIHS, Consumers Union, Veridian Engineering, and one individual indicated data collection periods up to 10 seconds for pre-crash and post-crash data and several tenths of a second for crash data. Bendix recommended 30 to 60 seconds of pre- and post-crash data.

On the issue of standardization of EDR data, many commenters stated that standardization is desired or helpful. The Truck Manufacturers Association believes that connectors, download protocols, and data output must be standardized. While Mitsubishi believes that standardization of EDR data is desirable, it is not sure about the safety benefits. The Virginia Tech Transportation Institute believes that the data elements of EDRs should be standardized to encourage the ease of use. Public Citizen believes that standardization is the primary determinant for the program's effectiveness and would enhance efforts to monitor emerging technologies. Both the SAE and IEEE commented that they are working on drafting standards for use with EDRs.

Several commenters addressed survivability of EDRs and EDR data. Mitsubishi believes that the EDR survivability has already been demonstrated by the existing EDRs and vehicle manufacturers should be able to determine the EDR's survivability design conditions. Both Bendix and Automotive Occupant Restraints Council believe that EDRs should be installed in a secured location to survive almost all crashes. The Automotive Occupant Restraints Council also believes that a requirement for back-up power is essential, but commented that fire resistant design is not. New Jersey DOT believes that EDR designs should be able to function after a crash, tamper resistant, and waterproof. The Truck Manufacturers Association and Veridian believe that EDRs should be designed to withstand the ''standard automotive environment'' including crash and environmental effects and power failure. Veridian also believes that the EDR needs to be tamperproof. An individual said that EDRs should be mechanically tamperproof and should be designed to withstand the IIHS offset frontal crash tests.

3. Privacy Issues

There were many comments related to NHTSA's questions regarding privacy. Mitsubishi believes that government should set regulations for EDR data usage to protect privacy. The Center for Injury Sciences, University of Alabama at Birmingham believes that privacy issues can be addressed by ensuring the vehicle owner also has ownership of the data and must consent to its use.

Some commenters specifically commented that they believe that the owner of the vehicle owns the EDR data. Veridian Engineering stated that it obtains the owner's permission before collecting data for an investigation.

Chalmers University of Technology (in Sweden) believes that safety improvement is more important than privacy concerns. It also argued that while EDRs can provide more complete and accurate information than thorough crash reconstruction aided by current simulation software and vehicle dynamics theory, it cannot provide new information that cannot already be estimated by such reconstruction. IIHS urged that NHTSA ensure that EDR data it obtains and makes available to researchers do not contain any personal information that would indicate the identities of the occupants involved. Public Citizen believes that the use of EDR data for statistical analysis does not involve privacy concerns, and that issues between safety and privacy can be addressed by partitioning technology (to separate any personally identifying data from other data) and other means best evaluated as part of the rulemaking process. The American Trucking Associations believe that certain EDR data elements should be accessible to rescue/medical personnel.

Consumers Union presented several potential concerns it had regarding access to EDR data, including: Insurers requiring EDRs as a condition of coverage and the use of EDR data in crash-related litigation. It said that most consumers do not know about the existence of EDRs or how the data recorded by EDRs may be used in ways that directly affect them. That organization stated that consumers have ''the right to know that EDRs are installed in the vehicles, that they are capable of collecting data recorded in a crash, and which parties may have access to this data.''

Regarding encryption, Veridian Engineering supports encrypted EDR data and the need for security codes to gain access to the data. Consumers Union urged that NHTSA incorporate standards concerning encryption and data access into the agency EDR requirements.

Mitsubishi and American Trucking Associations believe that the storage and collection of EDR data raises privacy issues, and that NHTSA should address the issue accordingly. They also said that NHTSA should work with other Federal agencies to develop the privacy protection status afforded other industries. New Jersey DOT believes that identification of specific vehicle crash location and time should be limited for emergency purposes to crash victims.

4. NHTSA's Role in the Future of Event Data Recorders

There were many comments on this topic. The Alliance believes that NHTSA has an important role on how to incorporate EDR data into existing

databases. Mitsubishi believed that NHTSA should study the legal and privacy issues associated with the use of EDR technology.

The Association of International Automobile Manufacturers (AIAM) stated that it would be premature for NHTSA to undertake regulation of EDRs at this time. That organization stated that rather than regulating this emerging application now, manufacturers should be permitted to develop systems on their own and work with voluntary standards organizations as a means of achieving consensus.

The Center for Injury Sciences of the University of Alabama at Birmingham and Public Citizen commented that NHTSA should mandate the installation of EDRs with a minimum set of standardized data elements.

The Truck Manufacturers Association and Veridian Engineering believe that NHTSA should perform research and encourage development of EDR standards. Along similar lines, the American Trucking Associations and Automotive Occupant Restraints Council believe that SAE and/or IEEE should issue common EDR standards and that NHTSA should remain technically engaged and act like a catalyst.

IIHS believes that NHTSA should encourage manufacturers to develop and establish standard practices to download and interpret information from EDRs. They also believe that, in the short term, NHTSA should work with manufacturers to increase the availability of data that currently are recorded and include this information in NASS–CDS and FARS databases.

New Jersey DOT believes that NHTSA should continue to meet its mandate for vehicle safety and leave the privacy issues to the public through its representatives in the legislative branch.

5. Other Comments

One university submitted a survey of 437 mostly college-age people. Of those surveyed, 95 percent believe that EDRs have the potential to improve vehicle safety. Over 50 percent expected great safety improvement and 90 percent said EDRs have potential safety application to all classes of vehicles. About 60 percent of these students responded that they favored safety and privacy equally, but when asked to choose between safety and privacy, over 80 percent preferred safety. Regarding NHTSA's role, about 95 percent believed that NHTSA should continue participating in the development of EDRs.

*E. Event Data Recorders and Implementation of Automatic Crash Notification Systems*

As noted above, ACN systems integrate on-board crash sensing and EDR technology with other electronic systems, such as global positioning systems and cellular telephones, to provide early notification of the occurrence, nature, and location of serious crashes. Early notification can save many lives. Each year, there are about 42,000 fatalities from motor vehicle traffic crashes in the United States. In these and other emergencies, more lives can be saved if emergency personnel can determine in advance the likely nature and severity of the injuries, take with them the right resources for treating those particular injuries, and more quickly locate and reach the scene of the crash.[4]

EDRs will help make this possible since they can provide the data necessary to determine crash severity, which can be used to predict injury severity. Software has been developed for evaluating crash data and predicting injury severity. Standardizing EDR data content and format would ensure that these predictions are based on the same foundation data across the entire spectrum of new makes and models of light vehicles.

Implementation of ACN systems requires not only incorporating improved EDRs in vehicles, but also use of advanced information and communications technology. Implementation of wireless enhanced 911 (E911) and ACN systems can result in:

- Faster incident detection and notification;
- Faster emergency response times; and
- Real-time wireless communications links among emergency response organizations.[5]

The nation's existing 911 system is administered through thousands of Public Safety Answering Points (PSAPs). Prior to the advent of wireless telephones, the PSAPs were able to automatically locate nearly all 911 callers. Now, more than half of 911 calls in metropolitan areas cannot be located because they originate from mobile wireless telephones. Lack of location information is a particular problem with 911 calls made from cell phones to report crashes, since the caller is often not able to determine and report precise location information.

Under Federal Communication Commission rules adopted in 1996, wireless carriers must provide E911 service by 2005.[6] This service will provide location information for all wireless 911 calls, provided that the local PSAP is equipped to receive and use the information. DOT has been

[4] Trauma System Agenda For The Future, Coordinated through the American Trauma Society Supported by the U.S. Department of Transportation, National Highway Traffic Safety Administration, October 2002. See *http://www.nhtsa.dot.gov/people/injury/ems/emstraumasystem03/*.

Enhanced communications among all members of the trauma care team during the pre-hospital phase will speed deployment of resources, produce more appropriate triaging, and result in better patient outcomes. Greater use of wireless technology should enable team members to speak to other hospitals and providers in the field and to give direction and assistance wherever the care is being provided. Discovery (Automatic Collision Notification – (ACN), Access (wireless), and Coordination (telemedicine) all will be enhanced through improved technology.

[5] Reducing Highway Deaths and Disabilities with Automatic Wireless Transmission of Serious Injury Probability Ratings from Crash Recorders to Emergency Medical Services Providers, Champion, Augenstein, Digges, Hunt, Larkin, Malliaris, Sacco, and Siegel. See *http://www-nrd.nhtsa.dot.gov/edr-site/uploads/Reducing_Hwy_Deaths_and_Disabilities_w-_Auto_Wireless_Trans-.pdf*.

Emergency medical care experience has shown that for many serious injuries, time is critical. As described by RD Stewart: Trauma is a time-dependent disease. ''The Golden Hour'' of trauma care is a concept that emphasizes this time dependency. That is in polytrauma (typically serious crash victims suffer multiple injuries) patients, the first hour of care is crucial, and the patient must come under restorative care during that first hour.* * * Pre-hospital immediate care seeks to apply supportive measures, and it must do so quickly, within what has been called the ''Golden Ten Minutes.''

The goal in trauma care is to get seriously injured patients to a trauma center for diagnosis, critical care and surgical treatment within the ''Golden Hour''. To get the seriously injured patient into the operating room of a trauma center with an experienced team of appropriately specialized trauma surgeons within the ''Golden Hour'' requires a highly efficient and effective trauma care system. The time/life race of the ''Golden Hour'' to deliver patients to definitive care consists of the following elements:

(1) Time between crash occurrence and EMS Notification,

(2) Travel time to the crash scene by EMS,

(3) On-scene EMS rescue time,

(4) Transport time to a hospital or trauma center,

(5) Emergency Department resuscitation time.

[6] See *http://www.fcc.gov/911/enhanced/*.

The wireless E911 program is divided into two parts—Phase I and Phase II. Phase I requires carriers, upon appropriate request by a local Public Safety Answering Point (PSAP), to report the telephone number of a wireless 911 caller and the location of the antenna that received the call. Phase II requires wireless carriers to provide far more precise location information, within 50 to 100 meters in most cases.

The deployment of E911 requires the development of new technologies and upgrades to local 911 PSAPs, as well as coordination among public safety agencies, wireless carriers, technology vendors, equipment manufacturers, and local wireline carriers. The FCC established a four-year rollout schedule for Phase II, beginning October 1, 2001 and to be completed by December 31, 2005.

actively involved in providing stakeholder leadership, technical assistance, and technological innovation to accelerate full and effective implementation of E911.[7] This includes not only regulating and coordinating the service provided by wireless carriers, but ensuring that local PSAPs are able to receive and effectively use the information.[8]

In the meantime, efforts to provide ACN services have already begun. Current ACN systems, such as GM's OnStar system, provide automatic notification that a motor vehicle has been involved in a crash, information about the nature of the crash, and the location of the crash.[9] While current ACN systems provide the information to a private call center, which then relays this information to 911 dispatchers, future systems may be integrated with the 911 system.

We note that in August 2003, General Motors (GM) announced the introduction of an advanced system on the new Chevrolet Malibu and Malibu Maxx. This system is part of the OnStar package. While that company's earlier ACN system provided automatic notification to the OnStar call center in the event of air bag deployment, its advanced ACN system provides automatic notification if the vehicle is involved in a moderate to severe frontal, rear or side-impact crash, regardless of air bag deployment. Also, the new system provides crash severity information.

For these reasons, we believe that ACN systems offer great potential for reducing deaths and injuries from motor vehicle crashes, and that improving EDRs would make a contribution toward the continued development and implementation of these systems.

## II. Proposal and Response to Petition

As discussed earlier, in the late-1990s, NHTSA denied two petitions for rulemaking requesting the agency to require the installation of EDRs in new motor vehicles, because the motor vehicle industry was already voluntarily moving in the direction recommended by the petitioners, and because the agency believed ''this area presents some issues that are, at least for the present time, best addressed in a non-regulatory context.''

Today, after the completion of the NHTSA-sponsored EDR Working Group's tasks and after considering the public comments and the petition from Dr. Martinez, we have tentatively concluded that motor vehicle safety can be advanced by a limited regulatory approach. In order to promote safety, we are particularly interested in ensuring that when an EDR is provided in a vehicle, the EDR will record the data necessary for effective crash investigations, analysis of the performance of advanced restraint systems, and ACN systems, and that these data can be easily accessed and used by crash investigators and researchers.

Given what the motor vehicle industry is already doing voluntarily in this area, we are not at this time proposing to require the installation of EDRs in all motor vehicles. As indicated earlier, we estimate that 65 to 90 percent of model year 2004 passenger cars and other light vehicles have some recording capability, and that more than half record such things as crash pulse data.

We are proposing a regulation that would specify requirements for light vehicles that are equipped with EDRs, *i.e.,* vehicles that record information about crashes. The proposed regulation would (1) require the EDRs in these vehicles to record a minimum set of specified data elements; (2) specify requirements for data format; (3) require that the EDRs function during and after the front, side and rear vehicle crash tests specified in several Federal motor vehicle safety standards; (4) require vehicle manufacturers to make publicly available information that would enable crash investigators to retrieve data from the EDR; and (5) require vehicle manufacturers to include a brief standardized statement in the owner's manual indicating that the vehicle is equipped with an EDR and discussing the purposes of EDRs. A discussion of each of these items is provided in the sections that follow.

The proposed regulation would apply to the same vehicles that are required by statute and by Standard No. 208 to be equipped with frontal air bags, *i.e.,* passenger cars and trucks, buses and multipurpose passenger vehicles with a GVWR of 3,855 kg (8500 pounds) or less and an unloaded vehicle weight of 2,495 kg (5500 pounds) or less, except for walk-in van-type trucks or vehicles designed to be used exclusively by the U.S. Postal Service. This covers the vast majority of light vehicles. Moreover, these are the vehicles that will generally have advanced restraint systems, since they are the ones subject to the advanced air bag requirements now being phased in under Standard No. 208.

We are not addressing in this document what future role the agency may take related to the continued development and installation of EDRs in heavy vehicles. We will consider that topic separately. Any action we might take in that area would be done in consultation with the Federal Motor Carrier Safety Administration.

Similar to our approach in the area of vehicle identification numbers, we are proposing a general regulation rather than a Federal motor vehicle safety standard. Thus, while a failure to meet EDR requirements would be subject to an enforcement action, it would not trigger the recall and remedy provisions of the National Traffic and Motor Vehicle Safety Act, currently codified at 49 U.S.C. Chapter 301.

### *A. Data Elements To Be Recorded*

As indicated above, we are proposing to require light vehicles that are equipped with EDRs to meet a number of requirements, including one for recording specified data elements.

Before discussing the proposed set of specified data elements, we will briefly address the issue of the crash recording capability that would trigger application of the regulation's requirements. We are proposing to apply the regulation to vehicles that record any one or more of the following elements just prior to or during a crash, such that the information can be retrieved after the crash: The vehicle's longitudinal acceleration, the vehicle's change in velocity (delta-V), the vehicle's indicated travel speed, the vehicle's engine RPM, the vehicle's engine throttle position, service brake status, ignition cycle, safety belt status, status of the vehicle's frontal air bag warning lamp, the driver's frontal air bag deployment level, the right front passenger's frontal air bag deployment level, the elapsed time to deployment of the first stage of the driver's frontal air bag, and the elapsed time to deployment of the first stage of the right front passenger's frontal air bag. Thus, if a vehicle has a device that records any of the basic items of information typically recorded by EDRs, the proposed regulation would apply to that vehicle.

In analyzing what minimum set of specified data elements to propose, we focused on the elements that would be most useful for effective crash investigations, analysis of the

[7] See *http://www.itspublicsafety.net/wireless.htm.*

[8] In August 2002, the ITS Public Safety Advisory Group Medical Subcommittee issued a document titled ''Recommendations for ITS Technology in Emergency Medical Services.'' It may be viewed at *http://www.itspublicsafety.net/docs/recommendations_itsems.pdf.*

[9] For additional information about ACN systems, see ''Enhancing Post-Crash Vehicle Safety Through an Automatic Collision Notification System,'' Joseph Kanianthra, Arthur Carter and Gerard Preziotti, paper presented at the 17th International Technical Conference on the Enhanced Safety of Vehicles, 2001, *http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/esv/esv17/proceed/00085.pdf.*

performance of safety equipment, *e.g.,* advanced restraint systems, and ACN systems. We believe these are the areas where information provided by EDRs can lead to the greatest safety benefits.

EDRs can improve crash investigations by measuring and recording actual crash parameters. They can also measure and record the operation of vehicle devices whose operation cannot readily be determined using traditional post-crash investigative procedures. For example, EDRs could determine whether the ABS system functioned during the crash.

EDRs can also directly measure crash severity. Currently, NHTSA estimates crash severity using crash reconstruction tools. One product of these tools is an estimate of the vehicle's delta-V. With an EDR, delta-V could be directly measured. Another assessment made by the crash investigators is the principal direction of force (PDOF). This is currently estimated based on physical damage. With x-axis and y-axis accelerometers, this could be measured or post-processed for planar (non-rollover) crashes, providing PDOF as a function of time.

EDRs can be particularly helpful in analyzing the performance of advanced restraint systems. They can record important information that is not measurable by post-crash investigations such as time of deployment of pre-tensioners and the various stages of multi-level air bags, the position of a seat during the crash (a seat is often moved by EMS personnel during their extrication efforts), and whether seat belts were latched.

Improved data from crash investigations will enable the agency and others to better understand the causes of crashes and injury mechanisms, and make it possible to better define and address safety problems. This information can be used to develop improved safety countermeasures and test procedures, and enhance motor vehicle safety.

EDRs can also make ACN systems more effective. An important challenge of EMS is to find, treat, and transport to hospitals occupants seriously injured in motor vehicle crashes in time to save lives and prevent disabilities. ACN systems, such as the GM On-Star system, can automatically and almost instantly provide information about serious crashes and their location to EMS personnel, based on air bag deployment or other factors. GM has announced that it will begin equipping vehicles with advanced ACN systems that provide measurements of crash forces for improved EMS decision-making. Data from EDRs can be used as inputs for advanced ACN systems.

As discussed earlier, vehicle manufacturers have made EDR capability an additional function of vehicles' air bag control systems. The air bag control systems necessarily process a great deal of vehicle information. EDR capability can be added to a vehicle by designing the air bag control system to capture, in the event of a crash, the relevant data in memory. The costs of EDR capability have thus been minimized, because it involves the capture into memory of data that is already being processed by the vehicle, and not the much higher costs of sensing much of that data in the first place.

In developing our proposed regulation for EDRs, we have followed a similar approach. That is, we have focused on the recording of the most important crash-related data that care already being processed by vehicles, and not using this rulemaking to require such things as additional accelerometers. (The addition of an accelerometer to a vehicle could add costs on the order of $20 per vehicle.)

For a variety of reasons, including the fact that the light vehicles covered by this proposal are subject to Standard No. 208's requirements for air bags, some of the most important crash-related data we have identified are already being processed (or will soon be processed) by all of these vehicles. Under our proposal, these data elements would be required to be recorded for all vehicles subject to the regulation.

Other important crash-related data are currently processed by some, but not all vehicles. This reflects the fact that some advanced safety systems are provided on some but not all vehicles. Under our proposal, these data elements would be required to be recorded only if the vehicle is equipped with the relevant advanced safety system or sensing capability.

The following table identifies the data elements that would be required to be recorded under our proposal. We note that the vast majority of the elements in the table are being considered by SAE and/or IEEE in their ongoing efforts to develop standards for EDRs.

TABLE I.—DATA ELEMENTS THAT MUST BE RECORDED

[R=Required; IE=If Equipped]

| Data element | R/IE | Recording interval / time | Condition for requirement (IE) |
|---|---|---|---|
| Longitudinal acceleration | R | −0.1 to 0.5 sec | N.A. |
| Maximum delta-V | R | Computed after event | N.A. |
| Speed, vehicle indicated | R | 8.0 to 0 sec | N.A. |
| Engine RPM | R | −8.0 to 0 sec | N.A. |
| Engine throttle, % full | R | −8.0 to 0 sec | N.A. |
| Service brake, on/off | R | −8.0 to 0 sec | N.A. |
| Ignition cycle, crash | R | −1.0 sec | N.A. |
| Ignition cycle, download | R | At time of download | N.A. |
| Safety belt status, driver | R | −1.0 sec | N.A. |
| Frontal air bag warning lamp, on/off | R | −1.0 sec | N.A. |
| Frontal air bag deployment level, driver | R | Event | N.A. |
| Frontal air bag deployment level, right front passenger | R | Event | N.A. |
| Frontal air bag deployment, time to deploy, in the case of a single stage air bag, or time to first stage deployment, in the case of a multi-stage air bag, driver. | R | Event | N.A. |
| Frontal air bag deployment, time to deploy, in the case of a single stage air bag, or time to first stage deployment, in the case of a multi-stage air bag, right front passenger. | R | Event | N.A. |
| Multi-event, number of events (1,2,3) | R | Event | N.A. |
| Time from event 1 to 2 | R | As needed | N.A. |
| Time from event 1 to 3 | R | As needed | N.A. |

TABLE I.—DATA ELEMENTS THAT MUST BE RECORDED—Continued

[R=Required; IE=If Equipped]

| Data element | R/IE | Recording interval / time | Condition for requirement (IE) |
|---|---|---|---|
| Complete file recorded (yes, no) | R | Following other data | N.A. |
| Lateral acceleration | IE | −0.1 to 0.5 sec | If vehicle is equipped to measure acceleration in the vehicle's lateral (y) direction. |
| Normal acceleration | IE | −0.1 to 0.5 sec | If vehicle is equipped to measure acceleration in the vehicle's normal (z) direction. |
| Vehicle roll angle | IE | −1.0 to 6.0 sec | If vehicle is equipped to measure or compute vehicle roll angle. |
| ABS activity (engaged, non-engaged) | IE | −8.0 to 0 sec | If vehicle is equipped with ABS. |
| Stability control status, on, off, engaged | IE | −8.0 to 0 sec | If vehicle is equipped with stability control, ESP, or other yaw control system. |
| Steering input (steering wheel angle) | IE | −8.0 to 0 sec | If vehicle equipped to measure steering wheel steer angle. |
| Safety belt status, right front passenger (buckled, not buckled). | IE | −1.0 sec | If vehicle equipped to measure safety belt buckle latch status for the right front passenger. |
| Frontal air bag suppression switch status, right front passenger (on, off, or auto). | IE | −1.0 sec | If vehicle equipped with a manual switch to suppress the frontal air bag for the right front passenger. |
| Frontal air bag deployment, time to Nth stage, driver * | IE | Event | If vehicle equipped with a driver's frontal air bag with a second stage inflator. |
| Frontal air bag deployment, time to Nth stage, right front passenger*. | IE | Event | If vehicle equipped with a right front passenger's frontal air bag with a second stage inflator. |
| Frontal air bag deployment, Nth stage disposal, Driver, Y/N (whether the Nth stage deployment was for occupant restraint or propellant disposal purposes)*. | IE | Event | If vehicle equipped with a driver's frontal air bag with a second stage that can be ignited for the sole purpose of disposing of the propellant. |
| Frontal air bag deployment, Nth stage disposal, right front passenger, Y/N (whether the Nth stage deployment was for occupant restraint or propellant disposal purposes)*. | | Event | If vehicle equipped with a right front passenger's frontal air bag with a second stage that can be ignited for the sole purpose of disposing of the propellant. |
| Side air bag deployment, time to deploy, driver | | Event | If the vehicle is equipped with a side air bag for the driver. |
| Side air bag deployment, time to deploy, right front passenger. | | Event | If the vehicle is equipped with a side air bag for the right front passenger. |
| Side curtain/tube air bag deployment, time to deploy, driver side. | | Event | If the vehicle is equipped with a side curtain or tube air bag for the driver. |
| Side curtain/tube air bag deployment, time to deploy, right side. | | Event | If the vehicle is equipped with a side curtain or tube air bag for the right front passenger. |
| Pretensioner deployment, time to fire, driver | | Event | If the vehicle is equipped with a pretensioner for the driver safety belt system. |
| Pretensioner deployment, time to fire, right front passenger. | | Event | If the vehicle is equipped with a pretensioner for the right front passenger safety belt system. |
| Seat position, driver (whether or not the seat is forward of a certain position along the seat track). | | −1.0 | If the vehicle is equipped to measure the position of the driver's seat. |
| Seat position, passenger (whether or not the right front passenger seat is forward of a certain position along the seat track). | | −1.0 | If the vehicle is equipped to measure the position of the right front passenger's seat. |
| Occupant size classification, driver | | −1.0 | If the vehicle is equipped to determine the size classification of the driver. |
| Occupant size classification, right front passenger | | −1.0 | If the vehicle is equipped to determine the size classification of the right front passenger. |
| Occupant position classification, driver | | −1.0 | If the vehicle is equipped to dynamically determine position of the driver. |
| Occupant position classification, right front passenger | | −1.0 | If the vehicle is equipped to dynamically determine position of the right front occupant. |

* List this element n–1 times, once for each stage of a multi-stage air bag system.

As indicated above, in developing this list, we focused on the elements that would be most useful for effective crash investigations, analysis of the performance of safety equipment, *e.g.*, advanced restraint systems, and ACN systems. Some of the data elements will be useful for all three of these purposes; others, for only one or two. The following table shows NHTSA's assessment of the application for each element.

TABLE II.—DATA ELEMENTS AND APPLICATION

| Data element name | Crash investigation | Advanced restraints operation | ACN |
|---|---|---|---|
| Longitudinal acceleration | X | X | X |
| Maximum delta-V | X | X | X |
| Speed, vehicle indicated | X | | |

TABLE II.—DATA ELEMENTS AND APPLICATION—Continued

| Data element name | Crash investigation | Advanced restraints operation | ACN |
|---|---|---|---|
| Engine RPM | X | | |
| Engine throttle, % full | X | | |
| Service brake, on/off | X | | |
| Ignition cycle, crash | X | | |
| Ignition cycle, download | X | | |
| Safety belt status, driver | X | X | X |
| Frontal air bag warning lamp, on/off | X | X | |
| Frontal air bag deployment level, driver | X | X | |
| Frontal air bag deployment level, right front passenger | X | X | |
| Frontal air bag deployment, time to first stage, driver | X | X | |
| Frontal air bag deployment, time to first stage, right front passenger | X | X | |
| Frontal air bag deployment, time to second stage, driver | X | X | |
| Frontal air bag deployment, time to second stage, right front passenger | X | X | |
| Frontal air bag deployment, second stage disposal, driver, Y/N | X | X | |
| Frontal air bag deployment, second stage disposal, right front passenger, Y/N | X | X | |
| Multi-event, number of events | X | X | |
| Time from event 1 to 2 | X | | |
| Time from event 1 to 3 | X | | |
| Complete file recorded | X | X | X |
| Lateral acceleration | X | X | X |
| Normal acceleration | X | | |
| Vehicle roll angle | X | | X |
| ABS activity | X | | |
| Stability control, on, off, engaged | X | | |
| Steering input | X | | |
| Safety belt status, right front passenger | X | X | X |
| Frontal air bag suppression switch status, right front passenger | X | X | |
| Side air bag deployment, time to deploy, driver | X | X | |
| Side air bag deployment, time to deploy, right front passenger | X | X | |
| Side curtain/tube air bag deployment, time to deploy, driver side | X | X | |
| Side curtain/tube air bag deployment, time to deploy, right side | X | X | |
| Pretensioner deployment, time to fire, driver | X | X | |
| Pretensioner deployment, time to fire, right front passenger | X | X | |
| Seat position, driver | X | X | |
| Seat position, right front passenger | X | X | |
| Occupant size classification, driver | X | X | |
| Occupant size classification, right front passenger | X | X | |
| Occupant position classification, driver | X | X | |
| Occupant position classification, right front passenger | X | X | |

Several of the elements are associated with crash severity. These include longitudinal acceleration, lateral acceleration, normal acceleration, delta-V, and vehicle roll angle. The longitudinal, lateral, and normal accelerations are vehicle crash signatures in the x, y, and z directions. Delta-V represents the overall crash severity. These are important elements used in determining vehicle crash severity. Vehicle roll angle is important to determining crash severity in non-planar (rollover) crashes and useful for advanced ACN systems.

The service brake on/off and steering input elements are important to understanding the human response to avoiding a pending crash. Several elements cover pre-crash vehicle dynamics and system status: Vehicle speed, engine RPM, engine throttle (% full), ABS activity, and stability control (on, off, or engaged). These elements are helpful in determining crash causation.

The elements concerning ignition cycle provide data on how many times the ignition has been switched on since its first use. The difference in the two measurements provides the number cycles between the time when the data were captured and when they were downloaded. GM, in its EDRs, currently records these data. They aid investigators in determining the interval between the recorded event and the time when it occurred. Small differences between these data indicate that the event in the EDR was generated recently, while large differences indicate that they are from an earlier event that may not be associated with a current crash.

Many of the data elements relate to the usage and operation of restraint systems. These elements are important in analyzing advanced restraint operations. For example, without an EDR, it may not be possible after a crash to determine whether a multi-stage air bag deployed at a low or high level.

As discussed above, we are proposing to require some of the data elements to be recorded only if the vehicle is equipped with the relevant safety system or sensing capability. We note that as manufacturers equip greater numbers of their vehicles with advanced safety systems, a number of these data elements would be required to be recorded on an increasing number of vehicles, or even all vehicles. Of particular note, as manufacturers upgrade the side impact performance of their vehicles it is expected that all light vehicles will measure lateral acceleration.

We request comments on the data elements listed in Table I, including whether the list sufficiently covers technology that is likely to be on vehicles in the next five to 10 years. NHTSA encourages manufacturers to develop, to the extent possible, additional data elements for inclusion in the EDR as these new technologies emerge.

**B. Data Standardization**

As discussed earlier, one of our goals in this rulemaking is to ensure that data are recorded and can be accessed in a manner that enables crash investigators and researchers to use them easily. One aspect of this is the format of the recorded data. To increase the value of these data in assessing motor vehicle safety, the proposed regulation would require that the data be recorded in a standardized format.

We believe that data standardization would enable crash investigators and researchers to more easily identify, interpret, and compare data retrieved from vehicles involved in a crash. Currently, the data format of an EDR is established by individual manufacturers and is based on that manufacturer's specific technical specifications. In the absence of any standardization, there is presently a wide variation among vehicle manufacturers as to the format of data recorded by an EDR. Comparisons between data recorded by different manufacturers are less precise when differences exist between the parameters recorded and the precision and accuracy specified. Such comparisons become even less useful if manufacturers do not rely on a common definition of a given data element.

To address this issue, the Society of Automotive Engineers (SAE) established a committee to establish a common format for the display and presentation of the data recorded by an EDR. The SAE Vehicle Event Data Interface Committee (J1698–1), which held its first meeting in late February 2003, has been considering common data definitions for specific data elements, as well as other aspects of EDR standardization.

The Institute of Electrical and Electronics Engineers (IEEE) is also addressing the standardization of EDR data formats. The IEEE Motor Vehicle Event Data Recorder (MVEDR) working group (P1616) is drafting a data dictionary and standards document for EDRs. P1616 is considering specifying the data format with a set of attributes for each defined data element. IEEE stated that it expected to complete a standard to standardize data output and retrieval protocols by March 2004.

In light of the current lack of adopted industry standards, we are proposing a standardized format that would ensure the usability of EDR data, while still providing manufacturers flexibility in design. The proposed regulation would define each data element and specify the corresponding recording interval/time, unit of measurement, sample rate, data range, data accuracy, data precision, and where appropriate, filter class.

The proposed data format would require EDRs to capture crash data of sufficient detail and time duration to ensure the usefulness of the data in crash reconstruction without threatening its integrity. NHTSA crash testing has shown that the typical offset frontal crash may last as long as 250 milliseconds. We are also aware that underride and override crashes may last even longer. Furthermore, rollover crashes can last several seconds, depending on the number of rolls.

The proposed time periods (set forth in Table I above) would establish a recording duration of 8 seconds prior to beginning of the event to capture relevant pre-crash and event data. Acceleration data would be required to be captured during the event. Finally, only rollover data would be required to be recorded for several seconds after the event. To the extent possible, the specified recording duration is limited to reduce the likelihood of data being corrupted by failure in the vehicle's electric system resulting from the crash

The proposed format would not mandate storage or output parameters.

*C. Data Retrieval*

A second aspect of accessibility is the necessity for crash investigators and researchers to have the capability of downloading crash data from the EDR. To ensure the availability of these data, we are proposing to require vehicle manufacturers to submit to the NHTSA docket specifications for accessing and retrieving the recorded EDR data that would be required by this regulation. We are also seeking comment on alternative approaches.

At the present time, investigators and researchers can access crash data stored by EDRs for only a limited number of vehicles. Prior to 2000, only vehicle manufacturers could access the EDR data for their vehicles. In 2000, Vetronix released its Crash Data Retrieval (CDR) tool for sale to the public. The CDR tool is a software and hardware device that allows someone with a computer to communicate directly with certain EDRs and download the stored data. It is estimated that about 40 million vehicles on the road have EDRs that can be read using the CDR tool, including many late model GM vehicles and some new Ford vehicles.

However, Vetronix is licensed by only a limited number of vehicle manufacturers to build these devices. Vetronix must presently use proprietary vehicle manufacturer information to develop and configure the hardware and software needed to allow the CDR tool to retrieve data from a vehicle's EDR. If a vehicle manufacturer declines to license or otherwise provide any proprietary information needed to build a device, tool companies will not be able to produce them.

Both the SAE Vehicle Event Data Interface Committee (J1698–1) and the IEEE Motor Vehicle Event Data Recorder working group (P1616) discussed above have considered the downloading of EDR data by means of the On Board Diagnostic (OBD) connector developed in conjunction with the Environmental Protection Agency (EPA). EPA has established requirements for onboard diagnostic technologies, which manage and monitor a vehicle's engine, transmission, and emissions. The EPA regulations include a new standardized communications protocol for the next generation of onboard diagnostic technology that allows a single common interface between the OBD connector and diagnostic tools used to read and interpret vehicle data and convert them into engineering units.

The EPA communications protocol utilizes a Controller Area Network (CAN) to provide a standardized interface between the OBD connector and the tools used by service technicians and vehicle emission inspections stations. CAN employs a serial bus for networking computer modules as well as sensors. The standardized interface allows technicians to use a single communications protocol to download data to pinpoint problems and potential problems related to a vehicle's emissions.

Full implementation of the CAN protocol is required by 2008. Because it is a universal system, the use of the OBD connector and the CAN serial bus could assure uniform access to EDR data and alleviate concerns that the data would only be accessible through the use of multiple interfaces and different kinds of software, if at all.

While standardizing the means of downloading EDR data, possibly using the OBD connector, offers potential benefits, we are at this time proposing only to require vehicle manufacturers to submit to the agency docket specifications necessary for building a device for accessing and retrieving recorded EDR data. This approach will help ensure that EDR data can be accessed in a manner readily usable by crash investigators and researchers. It will also allow motor vehicle manufacturers the flexibility to standardize protocols for data extraction.

We note that the context of NHTSA's proposal is quite different from the

context of EPA's requirements for collecting, storing, and downloading emissions-related data. The EPA approach is very structured. It needed to be appropriate for facilitating the routine monitoring and servicing of mandated emission control systems on motor vehicles, thus helping to ensure that those systems perform properly over the useful life of those vehicles. Establishing that approach has required many years of effort and the development of numerous industry standards.

On the other hand, we are proposing a standard for voluntarily installed EDRs, and need to ensure that it is appropriate for the much more limited purpose of crash investigations. We are interested in a simple, flexible approach, while maintaining the ability to extract data efficiently from a motor vehicle's voluntarily installed EDR. To obtain the desired outcome, NHTSA believes that it need not and should not become involved in managing the interface between the auto industry and the companies that may manufacture EDR download tools. But it is evident that some interface is needed, and to that extent we are proposing that certain information be provided.

We are proposing to require that each manufacturer of vehicles equipped with EDRs provide information of sufficient detail to permit companies that manufacture diagnostic tools to develop and build devices for accessing and retrieving the data stored in the EDRs. The vehicle manufacturer would be required to specify which makes and models (by model year) of its vehicles utilize the corresponding EDR system and to specify the interface locations. The leadtime we are providing for implementing this proposed regulation (discussed below) would enable vehicle manufacturers to design their EDRs so that the data may be accessed by use of a standardized interface and communications protocol. In the event that SAE, IEEE, or other voluntary standard organization establishes a standard for a protocol to be used in downloading EDR data, manufacturers would be able to reference the industry protocol in their submissions.

Manufacturers would be required to submit this information in a timely manner to ensure that the specifications were received by NHTSA's docket not less than 90 days before the start of production of makes and models utilizing EDR systems. This would give tool companies time to develop a tool before an EDR-equipped vehicle is used on public roads.

We are also seeking comment on alternative approaches to providing access to EDR crash data, such as permitting the vehicle manufacturer to demonstrate that a reasonably priced tool is publicly available for a particular make/model or to offer to licence at a reasonable price any proprietary information needed to build such tools. We note that EPA permits manufacturers to request a reasonable price for provided OBD-related information. See EPA final rule at 68 FR 38427, June 27, 2003. Comments are requested on the similarities and differences between OBD and EDR related information, the uses of that information, and relevant statutory authorities, and on whether this type of approach would be appropriate for EDR information. We note that one difference is that OBD tools are used as part of commercial activity, i.e., routine servicing and repair of motor vehicles, while EDR tools as used in crash investigations. The market for EDR tools would likely be much smaller. If we were to adopt an approach along these lines, what factors should be used for determining a ''reasonable price?''

Commenters supporting any of these or other alternative approaches are encouraged to suggest specific regulatory text and to explain how the recommended approach would ensure that crash investigators and researchers have the capability of downloading data from EDRs. Depending on the comments, we may adopt an alternative approach in the final rule.

*D. Functioning of Event Data Recorders and Crash Survivability*

If an EDR is to provide useful information, it must function properly during a crash, and the data must survive the crash. We are proposing several requirements related to the functioning of the EDR and survivability.

*Performance of EDRs in crash tests.* First, we are proposing to require EDRs to meet the requirements for applicable data elements and format in the crash tests specified in Standards No. 208, 214, and 301. These tests are (some have been issued as final rules, but not yet taken effect) a frontal barrier crash test conducted at speeds up to 35 mph, a frontal offset test conducted at 25 mph, a rear-impact crash test conducted at 50 mph, and a side impact test conducted at 33.5 mph. Data would be required to be retrievable by the method specified by the vehicle manufacturer (discussed above) after the crash test.

This requirement would provide both a check on EDR performance and also ensure a basic level of survivability. Manufacturers are familiar with these crash tests since they are specified in the Federal motor vehicle safety standards.

As to the issue of survivability, the EDRs of light vehicles are currently part of the air bag module. These modules are located in the occupant compartment of vehicles, providing protection against crush in all but the most severe crashes. Moreover, because EDRs are part of the air bag module, their electronics are designed to operate in a shock environment. However, current EDRs lack protection from fire and immersion in water and motor vehicle fluids.

While requiring EDRs to function properly during and after the crash tests specified in Standards No. 208, 214, and 301 would ensure a basic level of survivability, it would not ensure that EDR data survive extremely severe crashes or ones involving fire or fluid immersion. While EDR data would be useful to crash investigators and researchers analyzing such crashes, we do not have sufficient information to propose survivability requirements that would address such crashes. Research is needed to develop such requirements, and information on the costs of countermeasures to meet these additional requirements would need to be developed. Countermeasures that would ensure the survivability of EDR data in fires may be costly. For all of these reasons, we are not including such requirements in this proposal.

*Trigger threshold.* We are also proposing requirements concerning the level of crashes for which EDRs must capture [10] data. These requirements would ensure that EDRs capture information about crashes of interest to crash investigators and researchers.

The EDR operates in two modes. One is the steady state monitoring of pre-crash data. EDRs operate continuously in this mode whenever the vehicle is operating. This process allows momentary recording [11] of the pre-crash data. EDRs operate in the second mode when the vehicle is involved in a crash. In this mode, two decisions are made. The first is the determination of the occurrence of a crash and is accomplished by use of a trigger threshold. The second is the decision to capture the recorded data and accomplished using a comparative process. Based on the outcome of this process, the recorded data associated with a crash are captured or deleted.

In current light-duty vehicle applications, the trigger threshold is

[10] Capturing is the process of saving recorded data.

[11] Recording is the process of storing data into volatile memory for later use.

associated with the air bag crash severity analyzer. The circumstances that cause the threshold to be met are called an ''event.'' The beginning of the event that causes current EDRs to start capturing data in its permanent memory is sometimes defined as the vehicle's exceeding a specified deceleration threshold, typically around 2 g's. After the event is over, and the air bags are deployed, the data are stored in the EDR, if appropriate.

For determination of the beginning of an event, we are proposing to require the EDR to start recording data when the vehicle's change in velocity during any 20 millisecond (ms) time interval equals or exceeds 0.8 km/h. That is equivalent to slightly more than 1 g of steady-state deceleration.

The vehicle's change in velocity is determined in one of two ways, depending on the data collected by the EDR. In the case of a vehicle that does not record and capture lateral acceleration, the delta-V is based on the longitudinal acceleration only. In the more complex case of a vehicle whose EDR records and captures both longitudinal and lateral acceleration, the delta-V is calculated based on both sets of data, or, simply stated, change in velocity of the vehicle in the horizontal plane.

Timing of the unique, non-recurrent actions like the deployment of an air bag in an event is very important. The trigger threshold is used to define time zero. Time zero is used to determine many of the parameters required for collection by the EDR, such as the time when the front air bag deploys. Time zero is defined as the beginning of the first 20 ms time interval in which the trigger threshold is met during an event. Time zero is used to determine many of the parameters required for collection by the EDR, such as the time of front air bag deployment.

*Recording multi-event crashes.* A crash may encompass several events. For example, a vehicle may sideswipe a guardrail and then hit a car, or a vehicle may hit one vehicle, then another, and finally a tree. In fact, analysis of crash data from NHTSA's NASS-CDS data system shows that while 54 percent of the crashes involve a single event, 28 percent involve 2 events, and 18 percent involve 3 or more events.[12] Thus, if an EDR captures only a single event as the depiction of a multi-event crash, in nearly one-half of the cases, it could be difficult to determine the event of the crash with which the EDR record was associated.

Current EDRs vary with respect to the number of events they capture. For example, current Ford systems capture single events. GM systems can capture two events, one non-deployment event and one deployment event. These two events can be linked ones under certain circumstances. If they are linked, the amount of time between events is recorded. Current Toyota EDRs can capture up to three events. These can also be linked to a chain of events making up a single crash sequence.

We are proposing to require that EDRs be capable of capturing up to 3 events in a multi-event crash. For any given event that generates a change in velocity that equals or exceeds the trigger threshold, the EDR would be required to record and possibly capture that event and any subsequent events, up to a total of three, that begin within a 5 second window from time zero of the first event. Subsequent events are events that meet the trigger threshold more than 500 milliseconds after time zero of the immediately preceding event. We note it is very likely that in a crash, the trigger threshold could be met or exceeded many times Thus, we are requiring that when the EDR is currently recording event data, the exceeding of the trigger threshold be disregarded until 500 milliseconds has elapsed.

To prevent unassociated events from being captured in the multi-event EDR, we are proposing that the maximum time from the beginning of the first event to the beginning of the third event be limited to 5.0 seconds. To understand the timing between the associated events, we are proposing to require that the number of associated events be included as a data element, and that the time from the first to the second event and the time from the first to the third event also be included as a data element.

The pre-event data, such as vehicle speed and engine RPM, need to be recorded continuously. Similarly, pre-event acceleration data need to be recorded continuously. Finally, pre-event statuses, such as safety belt usage, determined at $-1.0$ second, need a similar treatment. The recording of these data is sometimes referred to as a circular buffer; that is, data are continuously updated as they are generated. When the trigger threshold is met, additional types of data are recorded, including acceleration data and rollover angle.

*Capture of EDR data.* Once the trigger threshold has been met or exceeded, the data discussed above are recorded by the EDR. The EDR continues to analyze the acceleration signal(s) to determine if a second or third event, determined by the trigger threshold's being equaled or exceeded more than 500 milliseconds after time zero of the immediately preceding event, will occur in a possible multi-event crash. This continues for 5 seconds after time zero of the first event.

A decision is then required to determine if these recorded data should be captured in the EDR's memory bank or discarded in favor of a previously captured data set. This decision is based on the maximum delta-V in the sequence of up to 3 events and air bag deployment status.

The maximum delta-V for a multi-event crash would be defined as the absolute value of the maximum of the individual delta-Vs from each of the events in the crash. Since events in a multi-event crash may occur from the front, side, or rear, we are proposing that the maximum delta-V be based on the magnitude of the value, that is, irrespective of the direction, or sign of the value.

We are proposing that the recorded data be captured in the EDR's memory only if the maximum delta-V for the recorded crash sequence exceeds that of the maximum delta-v associated with the data currently stored in the EDR's memory. We are making this proposal to prevent the capturing of EDR crash data with data from new events that may occur subsequent to the event of greatest interest. In the absence of such a requirement, the trigger threshold might be exceeded when the vehicle is towed from the scene or moved in a salvage yard, thus capturing a new record and erasing data regarding the event of greatest interest.

With regard to air bag deployment status, we are proposing that an event that generates information related to an air bag deployment, either frontal or side bag systems, must be captured by the EDRs and cannot be overwritten.

We note that on current GM systems, the EDR locks the data in memory after a crash that involves an air bag deployment. This results in the air bag control system's needing replacement as part of the vehicle's repair after an air bag deployment. On Ford vehicles, the file is not locked when an air bag deploys. However, it is Ford's current service policy that the control module must be replaced after each deployment event.

In the case of multi-event crashes, some of the pre-crash data will be common to each event. For example, vehicle speed data would be collected for 8 seconds prior to the first event. If the second event occurs 1 second later, an additional sample of speed data

[12] Gabler and Roston, ''Estimating Crash Severity: Can Event Data Recorders Replace Crash Reconstruction,'' ESV Paper 490, 2003, *http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/esv/esv18/CD/Files/18ESV–000490.pdf.*

would be recorded before the second event. For these cases, only the additional pre-crash data that occur during and between the events would need to be recorded as part of the subsequent event.

To prevent confusion between different multi-event crashes, we are proposing that if a crash includes an event that has a maximum delta-V of sufficient magnitude to warrant capturing the data relating to that event, all previously captured data in the EDR memory must be erased and replaced with that new data. We believe that unless this is done, events that occur days or months apart may be mistakenly interpreted as being part of the same crash.

*E. Privacy*

The recording of information by EDRs raises a number of potential privacy issues.[13] These include the question of who owns the information that has been recorded, the circumstances under which other persons may obtain that information, and the purposes for which those other persons may use that information.

We recognize the importance of these legal issues. The EDR Working Group, too, recognized their importance and devoted a considerable amount of time to discussing them. It also included a chapter on them in its August 2001 final report. Among other things, the chapter summarizes the positions that various participants in the EDR Working Group took on privacy issues.

We also recognize the importance of public acceptance of this device, whether voluntarily provided by vehicle manufacturers or required by the government. We note that General Motors informed the EDR Working Group (Docket No. NHTSA–99–5218–9; section 8.3.5) that it believes the risk of private citizens reacting negatively to the ''monitoring'' function of the EDR can be addressed through honest and open communications to customers by means of statements in owners' manuals informing them that such data are recorded. That company indicated that the recording of these data is more likely to be accepted if the data are used to improve the product or improve the general cause of public safety.

While we believe that continued attention to privacy issues is important, we observe that, from the standpoint of statutory authority, our role in protecting privacy is a limited one. For example, we do not have authority over such areas as who owns the information that has been recorded. Some of these areas are covered by a variety of Federal and State laws not administered by NHTSA.

Moreover, we believe that our proposed requirements would not create any privacy problems. We are not proposing to require the recording of any data containing any personal or location identifiers. In addition, given the extremely short duration of the recording of the information and the fact that it is only recorded for crashes, the required information could not be used to determine hours of service of commercial drivers.

The recorded information would be technical, vehicle-related information covering a very brief period that begins a few seconds before a crash and ends a few seconds afterwards. Many of these same data are routinely collected during crash investigations, but are based on estimations and reconstruction instead of direct data. For example, investigators currently estimate vehicle speed based on a variety of factors such as damage to the vehicle. The proposal would simply help ensure a more accurate determination of these factors by providing direct measurements of vehicle operation during a crash event.

To help address possible concerns about public knowledge about EDRs, we are proposing to require manufacturers of vehicles equipped with EDRs to include a standardized statement in the owner's manual indicating that the vehicles are equipped with an EDR and that the data collected in EDRs is used to improve safety.[14] The proposed statement would read as follows:

> This vehicle is equipped with an event data recorder. In the event of a crash, this device records data related to vehicle dynamics and safety systems for a short period of time, typically 30 seconds or less. These data can help provide a better understanding of the circumstances in which crashes and injuries occur and lead to the designing of safer vehicles. This device does not collect or store personal information.

Moreover, while access to data in EDRs is generally a matter of state law, we believe that access is and will continue to be possible in only limited situations. While the proposal would require public access to information on the protocol for downloading EDR data, this will not result in public access to EDR data. The interfaces for downloading EDR data will most likely be in a vehicle's passenger compartment. The interface locations will not be accessible to individuals unless they have access to the passenger compartment.

Further, in our own use of information from EDRs, we are careful to protect privacy. As part of our crash investigations, including those that utilize EDRs, we often obtain personal information. In handling this information, the agency complies with applicable provisions of the Privacy Act of 1974, the Freedom of Information Act (section (b)(6)), and other statutory requirements that limit the disclosure of personal information by Federal agencies. In order to gain access to EDR data to aid our crash investigations, we obtain a release for the data from the owner of the vehicle. We assure the owner that all personally identifiable information will be held confidential.

*F. Leadtime*

We are proposing an effective date of September 1, 2008. This would enable manufacturers to make design changes to their EDRs as they make other design changes to their vehicles, thereby minimizing costs.

*G. Response to Petition From Dr. Martinez*

As discussed earlier, in October 2001, the agency received a petition from Dr. Ricardo Martinez, President of Safety Intelligence Systems Corporation, asking us to ''mandate the collection and storage of onboard vehicle crash event data, in a standardized data and content format and in a way that is retrievable from the vehicle after the crash.'' We are granting the petition in part and denying it in part.

As discussed above, our proposed regulation would specify requirements concerning the collection and storage of onboard vehicle crash event data by EDRs, in a standard data and content format, and in a way that is retrievable from the vehicle after the crash. To that extent, we are granting Dr. Martinez's petition. We are not proposing to mandate EDRs, however, and to that extent we are denying the petition.

We believe that the motor vehicle industry is continuing to move voluntarily in the direction of providing EDRs. As indicated earlier, we estimate that 65 to 90 percent of model year 2004 passenger cars and other light vehicles have some recording capability, and that more than half record such things as crash pulse data.

The trends toward installation of EDRs in greater numbers of motor vehicles, and toward designing EDRs to record greater amounts of crash data, are

[13] We note that, in some press articles and op-ed pieces, persons have cited privacy issues as a reason for opposing the basic concept of EDRs.

[14] On September 20, 2003, the Governor of California approved a law requiring that manufacturers of new motor vehicles that are manufactured on or after July 1, 2004 and are equipped with EDRs must disclose the existence of the EDRs in the vehicle owner's manual.

continuing ones. General Motors (GM) first began installing EDRs in its air bag equipped vehicles in the early 1990's. In 1994, that company began phasing in upgraded EDRs that record crash pulse information. GM upgraded its EDRs again around 1999–2000 to begin recording pre-crash information such as vehicle speed, engine RPM, throttle position, and brake status.

Also around 1999–2000, Ford began equipping the Taurus with EDRs that recorded both longitudinal and lateral acceleration and several parameters associated with the restraint systems, including safety belt use, pretensioner deployment, air bag firing, and others. Also in the past few years, Toyota began installing EDRs in its vehicles.

As of now, GM, Ford and Toyota record what would be considered a large amount of crash data. Honda, BMW and some other vehicle manufacturers record small amounts of crash data.

Given these trends, we do not believe it is necessary for us to propose to require EDRs at this time.[15] Moreover, we believe that as manufacturers provide advanced restraint systems in their vehicles, such as advanced air bags, they will have increased incentives to equip their vehicles with EDRs. Vehicle manufacturers will want to understand the real world performance of the advanced restraint systems they provide. EDRs will provide important data to help them understand that performance.

We believe our focus should be on helping to ensure that when an EDR is provided in a vehicle, it will record appropriate data in a consistent format and will be accessible in a manner that makes it possible for crash investigators and researchers to use them easily.

We note that we believe our proposed regulation would not adversely affect the numbers of EDRs provided in motor vehicles.[16] We recognize that, if a regulation made EDRs costly, it could act as a disincentive to manufacturers' providing EDRs. However, as discussed earlier, vehicle manufacturers have minimized the costs of adding EDR capability by designing the air bag control system to capture into memory data that are already being processed by the vehicle. Similarly, in developing our proposal, we focused on the recording of the most important crash-related data that are already being processed by vehicles, and not using the rulemaking to require such things as additional accelerometers. The additional costs associated with an EDR meeting the proposed requirements, compared with those currently being provided voluntarily by the vehicle manufacturers, would therefore be small.

[15] If our expectations prove incorrect, we may revisit this issue.

[16] See the immediately previous footnote.

## III. Rulemaking Analyses and Notices

### *A. Executive Order 12866 and DOT Regulatory Policies and Procedures*

NHTSA has considered the potential impacts of this proposed rule under Executive Order 12866 and the Department of Transportation's regulatory policies and procedures. This document was reviewed by the Office of Management and Budget under E.O. 12866, ''Regulatory Planning and Review.'' This document has been determined to be significant under the Department's regulatory policies and procedures. While the potential cost impacts of the proposed rule are far below the level that would make this a significant rulemaking, the rulemaking addresses a topic of substantial public interest.

The agency has prepared a separate document addressing the benefits and costs for the proposed rule. A copy is being placed in the docket.

As discussed in that document and in the preceding sections of this NPRM, the crash data that would be collected by EDRs under the proposed rule would be extremely valuable for the improvement of vehicle safety by improving and facilitating crash investigations, the evaluation of safety countermeasures, advanced restraint and safety countermeasure research and development, and advanced ACN. However, the improvement in vehicle safety would not occur directly from the collection of crash data by EDRs, but instead from the ways in which the data are used by researchers, vehicle manufacturers, ACN and EMS providers, government agencies, and other members of the safety community. Therefore, it is not presently practical to quantify the safety benefits.

We estimate that about 67 to 90 percent of new light vehicles are already equipped with EDRs. As discussed earlier, vehicle manufacturers have provided EDRs in their vehicles by adding EDR capability to their vehicles' air bag control systems. The costs of EDRs have been minimized, because they involve the capture into memory of data that is already being processed by the vehicle, and not the much higher costs of sensing much of that data in the first place.

The costs of the proposed rule would be the incremental costs for vehicles equipped with EDRs to comply with the proposed requirements. As discussed in the agency's separate document on benefits and costs, we estimate the total annual costs of the proposed rule to range from $5.7 to $8.6 million. While the potential costs include technology costs, paperwork maintenance costs, and compliance costs, the paperwork maintenance and compliance costs are estimated to be negligible. The proposal would not require additional sensors to be installed in vehicles, and the major technology cost would result from a need to upgrade EDR memory chips. The total cost for the estimated 11.2 to 15.2 million vehicles that already have an EDR function to comply with the proposed regulation is estimated to be $5.7 to $7.7 million. If manufacturers were to provide EDRs in all 16.8 million light vehicles, the estimated total cost is $8.6 million. A complete discussion of how NHTSA arrived at these costs may be found in the separate document on benefits and costs.

### *B. Regulatory Flexibility Act*

NHTSA has considered the impacts of this rulemaking action under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*). I certify that the proposed amendment would not have a significant economic impact on a substantial number of small entities.

The following is the agency's statement providing the factual basis for the certification (5 U.S.C. 605(b)). If adopted, the proposal would directly affect motor vehicle manufacturers, second stage or final manufacturers, and alterers. SIC code number 3711, Motor Vehicles and Passenger Car Bodies, prescribes a small business size standard of 1,000 or fewer employees. SIC code No. 3714, Motor Vehicle Part and Accessories, prescribes a small business size standard of 750 or fewer employees.

Only four of the 18 motor vehicle manufacturers affected by this proposal would qualify as a small business. Most of the intermediate and final stage manufacturers of vehicles built in two or more stages and alterers have 1,000 or fewer employees. However, these small businesses adhere to original equipment manufacturers' instructions in manufacturing modified and altered vehicles. Based on our knowledge, original equipment manufacturers do not permit a final stage manufacturer or alterer to modify or alter sophisticated devices such as air bags or EDRs. Therefore, multistage manufacturers and alterers would be able to rely on the certification and information provided by the original equipment manufacturer. Accordingly, there would be no significant impact on small businesses, small organizations, or small

governmental units by these amendments. For these reasons, the agency has not prepared a preliminary regulatory flexibility analysis.

*C. Paperwork Reduction Act*

Under the Paperwork Reduction Act of 1995, 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. For the standardization and information collection requirements, NHTSA has submitted to OMB a request for approval of the following collection of information. Public comment is sought on the proposed collection.

*Agency:* National Highway Traffic Safety Administration (NHTSA).

*Title:* Event Data Recorder Information Collection Requirements.

*Type of Request:* New collection.

*OMB Clearance Number:* None assigned.

*Form Number:* This collection of information will not use a standard form.

*Requested Expiration Date of Approval:* Three years from the date of approval.

*Summary of the Collection of Information:* To improve the availability and usability of data collected by motor vehicle sensors during a crash event, the proposed regulation would require manufacturers that voluntarily equip vehicles with an EDR to record specified data elements and to standardize the format of the resulting data.

Motor vehicle manufacturers voluntarily equipping vehicles with an EDR would also be required to submit information to the agency on accessing and retrieving the stored data. The technical specifications would be required to be of sufficient detail to permit an individual to design and build a tool for accessing and downloading the data in the specified format. This information would be required to be submitted not later than 90 days before the beginning of the production year in which the EDR equipped vehicles are to be offered for sale.

*Description of the Need for the Information and Proposed Use of the Information:* The information sought by NHTSA in this collection would be used by the agency and crash investigators (*e.g.,* other government agencies, police investigators, motor vehicle crash researchers, etc.) to access and retrieve standardized crash data from voluntarily installed EDRs. Improving the availability of crash event data would permit the agency to improve analysis of a restraint system's crash protection performance and the determination of crash-avoidance system effectiveness. Improving the data elements and data available to the agency would allow NHTSA to make more targeted rulemaking decisions, thus improving overall vehicle safety in the future.

*Description of the Likely Respondents (Including Estimated Number, and Proposed Frequency of Response to the Collection of Information):* NHTSA estimates that a maximum of 18 vehicle manufacturers would submit the required information. The manufacturers are makers of passenger cars, multipurpose passenger vehicles, trucks and buses that have a GVWR of 3,855 kg (8,500 pounds) or less and an unloaded vehicle weight of 2,495 kg (5,500 pounds). For each report, a manufacturer would provide, in addition to its identity: (1) Non-proprietary technical information of sufficient detail to permit an individual to design and build a tool to download the EDR data in the specified format and (2) information of sufficient detail to permit access to the data in each vehicle make and model produced by the manufacturer that is equipped with an EDR.

Manufacturers would be required to submit the above information once per year.

*Estimate of the Total Annual Reporting and Recordkeeping Burden Resulting from the Collection of Information:* NHTSA estimates that each manufacturer would incur a total of 30 burden hours per year under this collection. The agency estimates that each manufacturer would incur 20 burden hours per year to comply with the information collection and 10 burden hours per year for data standardization. The estimate for the hour burden arising from the information submission is based on the fact that manufacturers would be submitting existing information from its vehicle production data and equipment specification data. As the industry voluntarily standardizes EDR output, the agency anticipates this burden would decrease because manufacturers will be able to cite voluntary industry standards in place of technical specifications. The burden arising from the recordkeeping portion of this request would be a result of manufacturers reprogramming existing sensor systems to meet the data standardization requirements of this program. Given the lead time of the proposed regulation, this reprogramming could be accomplished during a scheduled upgrade of a motor vehicle's sensor systems. This one time reprogramming cost is estimated between $100,000 and $180,000, for the entire industry. Once a manufacturer has standardized all of the existing sensors, we would anticipate this burden to be reduced to a minimal number.

NHTSA estimates the total annual burden hours to be $18,900. (30 burden hours × 18 manufacturers × $35/burden hour)

If a manufacturer needed to increase the electronic storage capability of the existing sensors to comply with the proposal, this would result in an additional cost of $0.50 per vehicle. As discussed above and in the separate document on costs and benefits, the estimated cost for the entire industry from the increased memory and software reprogramming is $5.7 to $8.6 million.

Persons desiring to submit comments on the information collection requirements should direct them to the Office of Information and Regulatory Affairs, OMB, Room 10235, New Executive Office Building, Washington, DC, 20503; Attention: Desk Officer for U.S. Department of Transportation.

The agency will consider comments by the public on this proposed collection of information in:

- Evaluating whether the proposed collection of information is necessary for the proper performance of the functions of NHTSA, including whether the information will have a practical use;
- Evaluating the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
- Enhancing the quality, usefulness, and clarity of the information to be collected; and
- Minimizing the burden of collection of information on those who are to respond, including collection techniques or other forms of information technology; e.g., permitting electronic submission of responses.

OMB is required to make a decision concerning the collection of information contained in the proposed regulation between 30 and 60 days after publication of this document in the **Federal Register.** Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. This does not affect the deadline for the public to comment to NHTSA on the proposed regulation.

NHTSA requests comments on its estimates of the total annual hour and cost burdens resulting from this collection of information. Please submit comments according to the instructions under the Comments heading of this

notice. Comments are due by August 13, 2004.

*E. Executive Order 13132 (Federalism)*

Executive Order 13132 requires NHTSA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that 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.'' Under Executive Order 13132, the agency may not issue a regulation with Federalism implications, that imposes substantial direct costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or the agency consults with State and local officials early in the process of developing the proposed regulation. NHTSA may also not issue a regulation with Federalism implications and that preempts State law unless the agency consults with State and local officials early in the process of developing the proposed regulation.

The agency has analyzed this rulemaking action in accordance with the principles and criteria contained in Executive Order 13132 and has determined that, although the proposed regulation would preempt conflicting State law, it does not have sufficient federalism implications to warrant consultation with State and local officials or the preparation of a federalism summary impact statement. The proposed rule would have no substantial effects on the States, or on the current Federal-State relationship, or on the current distribution of power and responsibilities among the various local officials.

*F. Executive Order 12778 (Civil Justice Reform)*

This proposed rule would not have any retroactive effect. Under section 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a state may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard, except to the extent that the state requirement imposes a higher level of performance and applies only to vehicles procured for the state's use. This section would not apply to the proposed rule, because it would not be a Federal motor vehicle safety standard. General principles of preemption law would apply, however, to displace any conflicting state law or regulations. If the proposed rule were made final, there would be no requirement for submission of a petition for reconsideration or other administrative proceedings before parties could file suit in court.

*G. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272) directs us to use voluntary consensus standards in regulatory activities unless doing so would be inconsistent with applicable law or 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, explanations when we decide not to use available and applicable voluntary consensus standards.

As discussed above, both the SAE Vehicle Event Data Interface (J1698–1) Committee and the IEEE Motor Vehicle Event Data Recorder (MVDER) working group (P1616) are developing standards specific to EDRs. While there are currently no voluntary consensus standards for EDR data elements or data format, the agency will consider such standards when they are available. Where appropriate, the agency has incorporated by reference SAE J211, Class 60 for the specified data filtering requirements.

*H. Unfunded Mandates Reform Act*

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of more than $ 100 million in any one year (adjusted for inflation with base year of 1995). Before promulgating a rule for which a written statement is needed, section 205 of the UMRA generally requires NHTSA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows NHTSA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the agency publishes with the final rule an explanation why that alternative was not adopted. If adopted, this proposed rule would not impose any unfunded mandates under the Unfunded Mandates Reform Act of 1995. This proposed rule would not result in costs of $100 million or more to either State, local, or tribal governments, in the aggregate, or to the private sector. Thus, this proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA.

*I. Regulation Identifier Number (RIN)*

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

## IV. Submission of Comments

*How Do I Prepare and Submit Comments?*

Your comments must be written and in English. To ensure that your comments are filed correctly in the Docket, please include the docket number of this document in your comments.

Your comments must not be more than 15 pages long. (49 CFR 553.21) NHTSA established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Please submit two copies of your comments, including the attachments, to Docket Management at the address given above under **ADDRESSES.** You may also submit your comments to the docket electronically by logging onto the Docket Management System (DMS) Web site at *http://dms.dot.go.* Click on ''Help & Information'' or ''Help/Info'' to obtain instructions for filing your comments electronically. Please note, if you are submitting comments electronically as a PDF (Adobe) file, we ask that the documents submitted be scanned using Optical Character Recognition (OCR) process, thus allowing the agency to

search and copy certain portions of your submissions.[17]

*How Can I Be Sure That My Comments Were Received?*

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

*How Do I Submit Confidential Business Information?*

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under **FOR FURTHER INFORMATION CONTACT**. In addition, you should submit two copies, from which you have deleted the claimed confidential business information, to Docket Management at the address given above under **ADDRESSES**. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in NHTSA's confidential business information regulation (49 CFR Part 512).

*Will the Agency Consider Late Comments?*

NHTSA will consider all comments that Docket Management receives before the close of business on the comment closing date indicated above under **DATES**. To the extent possible, the agency will also consider comments that Docket Management receives after that date. If Docket Management receives a comment too late for the agency to consider it in developing a final rule (assuming that one is issued), the agency will consider that comment as an informal suggestion for future rulemaking action.

*How Can I Read the Comments Submitted by Other People?*

You may read the comments received by Docket Management at the address given above under **ADDRESSES**. The hours of the Docket are indicated above in the same location.

You may also see the comments on the Internet. To read the comments on the Internet, take the following steps:

1. Go to the Docket Management System (DMS) Web page of the Department of Transportation (*http://dms.dot.gov*).
2. On that page, click on ''search.''
3. On the next page (*http://dms.dot.gov/search*), type in the four-digit docket number shown at the beginning of this document. Example: If the docket number were ''NHTSA–1998–1234,'' you would type ''1234.'' After typing the docket number, click on ''search.''
4. On the next page, which contains docket summary information for the docket you selected, click on the desired comments. You may download the comments. Although the comments are imaged documents, instead of word processing documents, the ''pdf'' versions of the documents are word searchable.

Please note that even after the comment closing date, NHTSA will continue to file relevant information in the Docket as it becomes available. Further, some people may submit late comments. Accordingly, the agency recommends that you periodically check the Docket for new material.

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 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://dms.dot.gov.*

**List of Subjects in 49 CFR Part 563**

Motor vehicle safety, Motor vehicles, Reporting and recordkeeping requirements.

In consideration of the foregoing, NHTSA proposes to amend chapter V of title 49 of the Code of Federal Regulations by adding 49 CFR part 563 to read as follows:

## PART 563—EVENT DATA RECORDERS

Sec.



**Authority:** 49 U.S.C. 30111, 30115, 30117, 30166, 30168; delegation of authority at 49 CFR 1.50.

### § 563.1 Scope.

This part specifies uniform, national requirements for vehicles equipped with event data recorders (EDRs) concerning the collection, storage and retrievability of onboard motor vehicle crash event data. It also specifies requirements for vehicle manufacturers to make publicly available information that would enable crash investigators and researchers to retrieve data from EDRs.

### § 563.2 Purpose.

The purpose of this part is to help ensure that EDRs record, in a readily usable manner, the data necessary for effective crash investigations, analysis of the performance of safety equipment, *e.g.*, advanced restraint systems, and automatic crash notification systems. These data will help provide a better understanding of the circumstances in which crashes and injuries occur and will lead to the designing of safer vehicles.

### § 563.3 Application.

This part applies to passenger cars, multipurpose passenger vehicles, trucks, and buses with a GVWR of 3,855 kg (8500 pounds) or less and an unloaded vehicle weight of 2,495 kg (5500 pounds) or less, except for walk-in van-type trucks or vehicles designed to be sold exclusively to the U.S. Postal Service, that are equipped with an event data recorder (EDR) and to manufacturers of these vehicles.

### § 563.4 Incorporation by reference.

The Society of Automotive Engineers (SAE) Recommended Practice J211–1, March 1995, ''Instrumentation For Impact Test—Part 1—Electronic Instrumentation'' (SAE J211–1) is incorporated by reference, and is hereby made part of this regulation. The Director of the Federal Register approved the material incorporated by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51 (*see* § 571.5 of this part). A copy of SAE J211–1 may be obtained from SAE at the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096. A copy of SAE J211–1 may be inspected at NHTSA's technical reference library, 400 Seventh Street, SW., Room 5109, Washington, DC, or at the Office of the Federal Register, 900 North Capitol Street, NW., Suite 700, Washington, DC.

### § 563.5 Definitions.

(a) *Motor vehicle safety standard definitions.* Unless otherwise indicated, all terms that are used in this part and are defined in the Motor Vehicle Safety

[17] Optical character recognition (OCR) is the process of converting an image of text, such as a scanned paper document or electronic fax file, into computer-editable text.

Standards, part 571 of this subchapter, are used as defined therein.

(b) *Other definitions.*

*ABS activity* means the anti-lock brake system (ABS) is actively controlling the vehicle's brakes.

*Capture* means the process of saving recorded data.

*Delta-v* means, for vehicles with only longitudinal acceleration measurement capability, the change in velocity of the vehicle along the longitudinal axis, and for vehicles with both longitudinal and lateral acceleration measurement capability, the change in velocity of the resultant of the longitudinal and lateral vehicle velocity time-histories, within the time interval starting from the time zero and ending 500 ms after time zero.

*Deployment level* means the highest-level inflator ignited in an air bag deployment.

*Disposal* means the deployment of the second (or higher, if present) stage of a frontal air bag for the purpose of disposing the propellant from the air bag device.

*Engine RPM* means, for vehicles powered by internal combustion engines, the number of revolutions per minute of the main crankshaft of the vehicle's engine, and for vehicles not powered by internal combustion engines, the number of revolutions per minute of the motor shaft at the point at which it enters the vehicle transmission gearbox.

*Engine throttle, percent full* means, for vehicles powered by internal combustion engines, the percent of the engine throttle opening compared to the full open position of the engine throttle opening, and for vehicles not powered by internal combustion engines, the percent of vehicle accelerator depression compared to the fully depressed position.

*Event* means a crash or other physical occurrence that causes the trigger threshold to be met or exceeded after the end of the 500 ms period for recording data regarding the immediately previous event.

*Event data recorder* (EDR) means a device or function in a vehicle that records any vehicle or occupant-based data just prior to or during a crash, such that the data can be retrieved after the crash. For purposes of this definition, vehicle or occupant-based data include any of the data elements listed in Table I of this part.

*Forward seat position* means a seat position that is in the forwardmost third of the measured distance between the full forward and the mid-track positions of the seat.

*Frontal air bag* means the primary inflatable occupant restraint device that is designed to deploy in a frontal crash to protect the front seat occupants.

*Ignition cycle, crash* means the number (count) of the ignition key applications sufficient to start the engine and/or the power vehicle accessories, from the date of manufacture to and including the time of the event.

*Ignition cycle download* means the number (count) of the ignition key applications sufficient to start the engine and/or the power vehicle accessories, from the date of manufacture to and including the time when the data are downloaded from the EDR.

*Lateral acceleration* means the component of the vector acceleration of a point in the vehicle in the y-direction. The lateral acceleration is positive from left to right, from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.

*Longitudinal acceleration* means the component of the vector acceleration of a point in the vehicle in the x-direction. The longitudinal acceleration is positive in the direction of forward vehicle travel.

*Multi-event crash* means the occurrence of 2 or more events, the first and last of which begin not more than 5 seconds apart.

*Normal acceleration* means the component of the vector acceleration of a point in the vehicle in the z-direction. The normal acceleration is positive in a downward direction.

*Occupant size classification* means, for the right front passenger, the classification of an occupant as an adult or a child occupant, and for the driver, the classification of the driver as being or not being a small female.

*Pretensioner* means a device that is activated by a vehicle's crash sensing system and removes slack from a vehicle belt system.

*Record* means the process of storing data into volatile memory for later use.

*Safety belt status* means an occupant's safety belt is buckled or not buckled.

*Seat position* means the position of a seat along the track for moving the seat in a forward or rearward direction.

*Service brake, on, off* means the vehicle's service brake is being applied or not being applied.

*Side air bag* means any inflatable occupant restraint device that is mounted to the seat or side structure of the vehicle interior at or below the window sill, and that is designed to deploy and protect the occupants in a side impact crash.

*Side curtain/tube air bag* means any inflatable occupant restraint device that is mounted to the side structure of the vehicle interior above the window sill, and that is designed to deploy and protect the occupants in a side impact crash or rollover.

*Speed, vehicle indicated* means the speed indicated on the vehicle's speedometer.

*Stability control* means any device that is not directly controlled by the operator (*e.g.,* steering or brakes) and is intended to prevent loss of vehicle control by sensing, interpreting, and adjusting a vehicle's driving and handling characteristics.

*Steering wheel angle* means the angular displacement of the steering wheel measured from the straight-ahead position (position corresponding to zero average steer angle of a pair of steered wheels).

*Suppression switch status* means the status of the switch indicating whether an air bag suppression system is on or off.

*Time to deploy* means the elapsed time between time zero and the time when the inflator of a side air bag or side curtain/tube air bag is fired.

*Time to first stage* means the elapsed time between time zero and the time when the first stage of a frontal air bag is fired.

*Time to nth stage* means the elapsed time between time zero and the time when the second stage of a frontal air bag is fired.

*Time zero* means the beginning of the first 20 ms interval in which the trigger threshold is met during an event.

*Trigger threshold* means a change in vehicle velocity, in the longitudinal direction for vehicles with only longitudinal acceleration measurements or in the horizontal plane for vehicles with both longitudinal and lateral measurements, that equals or exceeds 0.8 km/h within a 20 ms interval.

*Vehicle roll angle* means the angle between the vehicle y-axis and the ground plane.

*X-direction* means in the direction of the vehicle X-axis, which is parallel to the vehicle's longitudinal centerline.

*Y-direction* means in the direction of the vehicle Y-axis, which is perpendicular to its X-axis and in the same horizontal plane as that axis.

*Z-direction* means in the direction of the vehicle Z-axis, which is perpendicular to its X and Y-axes.

### § 563.6 Requirements for vehicles.

Each vehicle equipped with an EDR must meet the requirements specified in § 563.7 for data elements, § 563.8 for data format, § 563.9 for data capture, § 563.10 for crash test performance and survivability, and § 563.11 for information in owner's manual.

**§ 563.7 Data elements.**

(a) *Data elements required for all vehicles.* Each vehicle equipped with an EDR must record all of the data elements listed in Table I, during the interval/time and at the sample rate specified in that table.

TABLE I.—DATA ELEMENTS REQUIRED FOR ALL VEHICLES EQUIPPED WITH AN EDR

| Data element | Recording interval/time (relative to time zero) | Data sample rate samples per second |
|---|---|---|
| Longitudinal acceleration | −0.1 to 0.5 sec | 500 |
| Maximum delta-V | Computed after event | N.A. |
| Speed, vehicle indicated | −8.0 to 0 sec | 2 |
| Engine RPM | −8.0 to 0 sec | 2 |
| Engine throttle, % full | −8.0 to 0 sec | 2 |
| Service brake, on/off | −8.0 to 0 sec | 2 |
| Ignition cycle, crash | −1.0 sec | N.A. |
| Ignition cycle, download | At time of download | N.A. |
| Safety belt status, driver | −1.0 sec | N.A. |
| Frontal air bag warning lamp, on/off | −1.0 sec | N.A. |
| Frontal air bag deployment level, driver | Event | N.A. |
| Frontal air bag deployment level, right front passenger | Event | N.A. |
| Frontal air bag deployment, time to deploy, in the case of a single stage air bag, or time to first stage deployment, in the case of a multi-stage air bag, driver. | Event | N.A. |
| Frontal air bag deployment, time to deploy, in the case of a single stage air bag, or time to first stage deployment, in the case of a multi-stage air bag, right front passenger. | Event | N.A. |
| Multi-event, number of events (1, 2, 3) | Event | N.A. |
| Time from event 1 to 2 | As needed | N.A. |
| Time from event 1 to 3 | As needed | N.A. |
| Complete file recorded (yes, no) | Following other data | N.A. |

(b) *Data elements required for vehicles under specified conditions.* Each vehicle equipped with an EDR must record each of the data elements listed in column 1 of Table II for which the vehicle meets the condition specified in column 2 of that table, during the interval/time and at the sample rate specified in that table.

TABLE II.—DATA ELEMENTS REQUIRED FOR VEHICLES UNDER SPECIFIED CONDITIONS

| Data element name | Condition for requirement | Recording interval/time (relative to time zero) | Data sample rate (per second) |
|---|---|---|---|
| Lateral acceleration | If vehicle is equipped to measure acceleration in the vehicle's lateral (y) direction. | –0.1 to 0.5 sec | 500 |
| Normal acceleration | If vehicle is equipped to measure acceleration in the vehicle's normal (z) direction. | –0.1 to 0.5 sec | 500 |
| Vehicle roll angle | If vehicle equipped to measure or compute vehicle roll angle. | –1.0 to 6.0 sec | 10 |
| ABS activity (engaged, non-engaged) | If vehicle equipped with ABS | –8.0 to 0 sec | 2 |
| Stability control, on, off, engaged | If vehicle equipped with stability control, ESP, or other yaw control system. | –8.0 to 0 sec | 2 |
| Steering input (steering wheel angle) | If vehicle equipped to measure steering wheel steer angle. | –8.0 to 0 sec | 2 |
| Safety belt status, right front passenger (buckled, not buckled). | If vehicle equipped to measure safety belt buckle latch status for the right front passenger. | –1.0 sec | N.A. |
| Frontal air bag suppression switch status, right front passenger (on, off, or auto). | If vehicle equipped with a manual switch to supress the frontal air bag for the right front passenger. | –1.0 sec | N.A. |
| Frontal air bag deployment, time to nth stage, driver [1]. | If vehicle equipped with a driver's frontal air bag with a multi-stage inflator. | Event | N.A. |
| Frontal air bag deployment, time to nth stage right front passenger [1]. | If vehicle equipped with a right front passenger's frontal air bag with a multi-stage inflator. | Event | N.A. |
| Frontal air bag deployment, nth stage disposal, driver, Y/N (whether the nth stage deployment was for occupant restraint or propellant disposal purposes) [1]. | If vehicle equipped with a driver's frontal air bag with a multi-stage that can be ignited for the sole purpose of disposing of the propellant. | Event | N.A. |
| Frontal air bag deployment, nth stage disposal, right front passenger, Y/N (whether the nth stage deployment was for occupant restraint or propellant disposal purposes) [1]. | If vehicle equipped with a right front passenger's frontal air bag with a multistage that can be ignited for the sole purpose of disposing of the propellant. | Event | N.A. |
| Side air bag deployment, time to deploy, driver | If the vehicle is equipped with a side air bag for the driver. | Event | N.A. |
| Side air bag deployment, time to deploy, right front passenger. | If the vehicle is equipped with a side air bag for the right front passenger. | Event | N.A. |

TABLE II.—DATA ELEMENTS REQUIRED FOR VEHICLES UNDER SPECIFIED CONDITIONS—Continued

| Data element name | Condition for requirement | Recording interval/time (relative to time zero) | Data sample rate (per second) |
|---|---|---|---|
| Side curtain/tube air bag deployment, time to deploy, drive side. | If the vehicile is equipped with a side curtain or tube air bag for the driver. | Event | N.A. |
| Side curtain/tube air bag deployment, time to deploy, drive side. | If the vehicile is equipped with a side curtain or tube air bag for the right front passenger. | Event | N.A. |
| Pretensioner deployment, time to fire, driver | If the vehicle is equipped with a pretensioner for the driver safety belt system. | Event | N.A. |
| Pretensioner deployment, time to fire, right front passenger. | If the vehicle is equipped with a pretensioner for the right front passenger safety belt system. | Event | N.A. |
| Seat position, driver (whether or not the seat is in a forward seat position). | If the vehicle is equipped to determine whether or not the seat is in a forward seat position. | –1.0 | N.A. |
| Seat position, passenger (whether or not the right front passenger seat is in a forward seat position). | If the vehicle is equipped to determine whether or not the right front passenger seat is in a forward seat position. | –1.0 | N.A. |
| Occupant size classification, driver | If the vehicle is equipped to determine the size classification of the driver. | –1.0 | N.A. |
| Occupant size classification, right front passenger | If the vehicle is equipped to determine the size classification of the right front passenger. | –1.0 | N.A. |
| Occupant position classification, driver | If the vehicle is equipped to dynamically determine position of the driver. | –1.0 | N.A. |
| Occupant position classification, right front passenger. | If the vehicle is equipped to dynamically determine position of the right front occupant. | –1.0 | N.A. |

[1] List this element n – 1 times, once for each stage of a multi-stage air bag system.

**§ 563.8 Data format.**

(a) The data elements listed in Tables I and II, as applicable, must be recorded in accordance with the range, accuracy, precision, and filter class specified in Table III.

TABLE III.—RECORDED DATA ELEMENT FORMAT

| Data element | Range | Accuracy | Precision | Filter class |
|---|---|---|---|---|
| Longitudinal acceleration | –100G to +100G | ±1G | 1G | SAE J211, Class 60. |
| Lateral acceleration | –100G to +100G | ±1G | 1G | SAE J211, Class 60. |
| Normal acceleration | –100G to +100G | ±1G | 1G | SAE J211, Class 60. |
| Delta-v | –100km/h to 100 km/h | ±1 km/h | 1 km/h | N.A. |
| Vehicle roll angle | –1080deg to +1080Deg | ±10 deg | 10 deg | N.A. |
| Speed, vehicle indicated | 0 km/h to 200 km/h | ±1 km/h | 1 km/h | N.A. |
| Engine rpm | 0 to 10,000 rpm | ±100 rpm | 100 km/h | N.A. |
| Engine throttle, percent full | 0 to 100% | ±5% | 5 % | N.A. |
| Service brake, on, off | On and Off | N.A. | On and Off | N.A. |
| ABS activity | On and Off | N.A. | On and Off | N.A. |
| Stability control, on, off, engaged. | On, Off, Engaged | N.A. | On, Off, Engaged | N.A. |
| Steering wheel angle | –250 deg CW to +250 deg CCW. | ±5 deg | 5 deg | N.A. |
| Ignition cycle, crash | 0 to 60,000 | ±1 cycle | 1 cycle | N.A. |
| Ignition cycle, download | 0 to 60,000 | ±1 cycle | 1 cycle | N.A. |
| Safety belt status, driver | On or Off | N.A. | On or Off | N.A. |
| Safety belt status, right front passenger. | On or Off | N.A. | On or Off | N.A. |
| Frontal air bag suppression switch status, right front passenger. | On or Off | N.A. | On or Off | N.A. |
| Frontal air bag warning lamp, on, off. | On of Off | N.A. | On or Off | N.A. |
| Frontal air bag deployment level, driver. | 1 to 100 | ±0 | 1 | N.A. |
| Frontal air bag deployment level, right front passenger. | 1 to 100 | ±0 | 1 | N.A. |
| Frontal air bag deployment, time to deploy/first stage, driver. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Frontal air bag deployment, time to deploy/first stage, right front passenger. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |

TABLE III.—RECORDED DATA ELEMENT FORMAT—Continued

| Data element | Range | Accuracy | Precision | Filter class |
|---|---|---|---|---|
| Frontal air bag deployment, time to nth stage, driver. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Frontal air bag deployment, time to nth stage, right front passenger. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Frontal air bag deployment, nth stage disposal, driver, y/n. | Yes/No | N.A. | Yes/No | N.A. |
| Frontal air bag deployment, nth stage disposal, right front passenger, y/n. | Yes/No | N.A. | Yes/No | N.A. |
| Side air bag deployment, time to deploy, driver. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Side air bag deployment, time to deploy, right front passenger. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Side curtain/tube air bag deployment, time to deploy, driver side. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Side curtain/tube air bag deployment, time to deploy, right side. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Pretensioner deployment, time to fire, driver. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Pretensioner deployment, time to fire, right front passenger. | 0 to 250 ms | ±2 ms | 2 ms | N.A. |
| Seat position, driver | Yes/No | N.A. | Yes/No | N.A. |
| Seat position, right front passenger. | Yes/No | N.A. | Yes/No | N.A. |
| Occupant size driver occupant 5th female size y/n. | Yes/No | N.A. | Yes/No | N.A. |
| Occupant size right front passenger child y/n. | Yes/No | N.A. | Yes/No | N.A. |
| Occupant position classification, driver oop y/n. | Yes/No | N.A. | Yes/No | N.A. |
| Occupant position classification, right front passenger oop y/n. | Yes/No | N.A. | Yes/No | N.A. |
| Multi-event, number of events (1,2,3). | 1,2 or 3 | N.A. | 1,2 or 3 | N.A. |
| Time from event 1 to 2 | 0 to 5.0 | 0.1 sec | 0.1 sec | N.A. |
| Time from event 1 to 3 | 0 to 5.0 | 0.1 sec | 0.1 sec | N.A. |
| Complete file recorded (Yes/No). | Yes/No | N.A. | Yes/No | N.A. |

(b) Acceleration Time-History data and format: The longitudinal, lateral, and normal acceleration time-history data, as applicable, must be recorded to include:

(1) The Time Step (TS) that is the inverse of the sampling frequency of the acceleration data and which has units of seconds;

(2) The number of the first point (NFP), which is an integer that when multiplied by the TS equals the time relative to time zero of the first acceleration data point;

(3) The number of the last point (NLP), which is an integer that when multiplied by the TS equals the time relative to time zero of the last acceleration data point; and

(4) NLP–NFP+1 acceleration values sequentially beginning with the acceleration at time NFP*TS and continue sampling the acceleration at TS increments in time until the time NLP*TS is reached.

**§ 563.9 Data capture.**

The EDR must collect and store the data elements for events in accordance with the following conditions and circumstances:

(a) The EDR collects data for an event, starting at time zero and ending 500 ms later.

(b) The EDR must be capable of recording not less than 3 events in a multi-event crash.

(c) The highest delta-v of any of the events in a crash sequence is used to quantify the maximum delta-v for a multi-event crash.

(d) If an air bag, either side or frontal, deployment occurs in a single or multi-event crash, the data captured from any previous crash must be deleted, the data related to that deployment must be captured and the memory must be locked to prevent any future overwriting of these data.

(e) If an air bag deployment does not occur and if the absolute value of the maximum delta-v recorded from a multi-event crash is greater than the absolute value of the maximum delta-v currently stored in the EDR's memory, delete all previously captured data in the EDR's memory and capture the current data.

(f) If an air bag deployment does not occur and if the absolute value of the maximum delta-v from a multi-event crash is less than or equal to the

absolute value of the maximum delta-v currently in the EDR's memory, do not capture the recorded data.

**§ 563.10 Crash test performance and survivability.**

(a) Each vehicle subject to the requirements of S13 of § 571.208, *Occupant crash protection,* must comply with the requirements in subpart (d) of this section when tested according to S13 of § 571.208. Any vehicle subject to the requirements of S5, S14.5 or S17 of § 571.208 must comply with the requirements in subpart (d) of this section when tested according to S5, S8, and S18 of § 571.208.

(b) Any vehicle subject to the requirements of § 571.214, *Side impact protection,* must comply with the requirements of subpart (d) of this section when tested in a 33.5 miles per hour impact in which the car is struck on either side by a moving deformable barrier under the test conditions in S6 of § 571.214.

(c) Any vehicle subject to the requirements of S6.2 of § 571.301, *Fuel system integrity,* must comply with the requirements in subpart (d) of this section when tested according to the conditions in S7.3 of § 571.301.

(d) The data elements required by § 563.7 must be recorded in the format specified by § 563.8, exist at the completion of the crash test, and be retrievable by the methodology specified by the vehicle manufacturer under § 563.12 for not less than 30 days after the test and without external power, and the complete data recorded element must read yes after the test.

**§ 563.11 Information in owner's manual.**

The owner's manual must contain the following statement: ''This vehicle is equipped with an event data recorder. In the event of a crash, this device records data related to vehicle dynamics and safety systems for a short period of time, typically 30 seconds or less. These data can help provide a better understanding of the circumstances in which crashes and injuries occur and lead to the designing of safer vehicles. This device does not collect or store personal information.''

**§ 563.12 Data retrieval information.**

(a) *Information filing requirements.*

(1) Each manufacturer of a motor vehicle equipped with an EDR must furnish non-proprietary technical specifications at a level of detail sufficient to permit companies that manufacture diagnostic tools to develop and build a device capable of accessing, retrieving, interpreting, and converting the data stored in the EDR that are required by this part.

(2) The technical information provided under paragraph (a)(1) must identify the make, model, and model year of each vehicle equipped with an EDR, specify the interface locations and permit the access, retrieval, interpretation and conversion of the data in an identifiable manner consistent with the requirements of this part for each vehicle of every identified make, model, and model year. If the information differs for different vehicles of same make, model, and model year, the information provided must explain how the VINs for the vehicles of that make, model and model year can be used to determine which aspects of the information apply to a particular vehicle.

(b) *Submission of information.*

(1) This information must be submitted to Docket No. (a specific docket number would be included in the final rule) Docket Management, Room PL–401, 400 Seventh Street, SW., Washington, DC 20590. Alternatively, the information may be submitted electronically by logging onto the Docket Management System (DMS) Web site at *http://dms.dot.gov,* using the same docket number.

(2) The manufacturer must submit such information not later than 90 days prior to the start of production of the EDR-equipped makes and models to which that information relates. In addition, the manufacturer must update the information, as necessary to keep it accurate, not later than 90 days prior to any changes that would make the previously submitted information no longer valid.

Issued on: June 7, 2004.

**Stephen R. Kratzke,**

*Associate Administrator for Rulemaking.*

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## DEPARTMENT OF TRANSPORTATION

### National Highway Traffic Safety Administration

### 49 CFR Parts 571 and 588

**[Docket No. NHTSA–2004–17745]**

**RIN 2127–AI95**

### Federal Motor Vehicle Safety Standards; Child Restraint Systems; Child Restraint Systems Recordkeeping Requirements

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

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** This document proposes to amend the content of the owner registration form required by the Federal child restraint standard to allow information about registering on-line to be on the card. The proposed amendments would enhance the opportunity of consumers to register their restraints online, which may increase registration rates. The proposal would also better enable manufacturers to supplement recall notification via first-class mail with e-mail notification, which may increase the number of owners learning of a recall and responding to it. This NPRM also proposes that the telephone number that manufacturers must provide on child restraint labels for the purpose of enabling consumers to register by telephone must be a U.S. number.

**DATES:** You should submit comments early enough to ensure that Docket Management receives them not later than August 13, 2004.

**ADDRESSES:** You may submit comments (identified by the DOT DMS Docket Number) by any of the following methods:

- Web site: *http://dms.dot.gov.* Follow the instructions for submitting comments on the DOT electronic docket site.
- Fax: (202) 493–2251.
- Mail: Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL–401, Washington, DC 20590–001.
- Hand Delivery: Room PL–401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays.
- Federal eRulemaking Portal: Go to *http://www.regulations.gov.* Follow the online instructions for submitting comments.

*Instructions:* All submissions must include the agency name and docket number or Regulatory Identification Number (RIN) for this rulemaking. For detailed instructions on submitting comments and additional information on the rulemaking process, see the Comments heading under the **SUPPLEMENTARY INFORMATION** section of this document. Note that all comments received will be posted without change to http://dms.dot.gov, including any personal information provided. Please see the information regarding the Privacy Act under the Comments heading.