3. Section 73.202(b), the Table of FM Allotments under Nebraska, is amended by adding Channel 263C1 and removing Channel 271C1 at Alliance, adding Channel 275C1 at McCook, and by adding Channel 271C and removing Channel 275C at Imperial.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 00–31311 Filed 12–15–00; 8:45 am]

BILLING CODE 6712–01–U

DEPARTMENT OF TRANSPORTATION

Federal Motor Carrier Safety Administration

49 CFR Parts 392 and 393

[FMCSA Docket No. FMCSA–97–2289]

RIN 2126–AA27

Development of a North American Standard for Protection Against Shifting and Falling Cargo

AGENCY: Federal Motor Carrier Safety Administration (FMCSA), DOT.

ACTION: Notice of proposed rulemaking (NPRM); request for comments.

SUMMARY: The FMCSA proposes to revise the regulations concerning protection against shifting and falling cargo for commercial motor vehicles (CMVs) engaged in interstate commerce. We would issue new cargo securement standards based on the North American Cargo Securement Standard Model Regulations, reflecting: The results of a multi-year comprehensive research program to evaluate current U.S. and Canadian cargo securement regulations; the motor carrier industry's best practices; and recommendations presented during a series of public meetings involving U.S. and Canadian industry experts, Federal, State and Provincial enforcement officials, and other interested parties. Generally, the proposed revision would require motor carriers to change the way they use cargo securement devices to prevent certain articles from shifting on or within, or falling from CMVs. In some instances, the proposed changes could require motor carriers to increase the number of tiedown devices used to secure certain types of cargoes. The intent of this rulemaking is to reduce the number of accidents caused by cargo shifting on or within, or falling from, CMVs operating in interstate commerce, and to harmonize to the greatest extent practicable U.S., Canadian, and Mexican cargo securement regulations.

DATES: You must submit comments on or before March 19, 2001.

ADDRESSES: You can mail or hand deliver comments to the U.S. Department of Transportation, Dockets Management Facility, Room PL–401, 400 Seventh Street, SW., Washington, DC 20590–0001. You can also submit your comments electronically at *http://dms.dot.gov.* We can view the NPRM and all items in the docket at that same internet address. You should include the docket number that appears in the heading of this document in your comment. You can examine and copy all comments in the Docket Management System (DMS) from 9 a.m. to 5 p.m., e.t., Monday through Friday, except Federal holidays. If you want to be notified that we received your comments please include a self-addressed, stamped envelope or postcard, or print the acknowledgment page that appears after submitting comments electronically.

FOR FURTHER INFORMATION CONTACT: Mr. Larry W. Minor, Office of Bus and Truck Standards and Operations, MC–PSV, (202) 366–1790; or Mr. Charles E. Medalen, Office of the Chief Counsel, MC–CC, (202) 366–1354, Federal Motor Carrier Safety Administration, 400 Seventh Street, SW., Washington, D.C. 20590–0001. Office hours are from 7:45 a.m. to 4:15 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Background

On July 27, 1993, the House of Representatives held a hearing concerning the adequacy of Federal regulations on cargo securement, as well as the enforcement of those regulations (''Truck Cargo Securement Regulations and Enforcement, 1993: Hearing Before the Subcommittee on Investigations and Oversight of the House of Representatives' Committee on Public Works and Transportation,'' 103rd Cong., 1st Sess. 32 (1993)) . The report of the July 1993 hearing is included in the public docket. The hearing was prompted by several cargo securement accidents that occurred in New York between 1990 and 1993. During the hearing, the Federal Highway Administrator stated that the Ontario Ministry of Transportation had requested that the FHWA review a proposal prepared on behalf of the Canadian Council of Motor Transport Administrators (CCMTA)—a non-profit association of senior officials from Federal, Provincial, and Territorial departments and agencies responsible for the administration, regulation, and control of motor vehicle transportation and highway safety—for a research program to evaluate cargo securement regulations and industry practices. The Administrator informed the subcommittee that the FHWA would participate in the research effort and consider incorporating the results of the research into the Federal Motor Carrier Safety Regulations (FMCSRs).

A cargo securement research working group was organized by the CCMTA and the Ontario Ministry of Transportation to discuss the research methodology with industry groups and Federal, State, and Provincial governments in the United States and Canada. The working group, which included representatives from the FHWA, Transport Canada (the Federal department responsible for developing and enforcing the regulatory aspects of motor vehicle and motor carrier safety in Canada), the CCMTA, the Commercial Vehicle Safety Alliance (CVSA), several States and Provinces, and U.S. and Canadian industry, held its first meeting August 16–17, 1993. A report identifying the cargo securement issues to be examined through the research program and describing the selected research methodology was published by the Ontario Ministry of Transportation in November of 1993. A copy of the minutes of the first meeting and a copy of the report entitled ''A Proposal for Research to Provide a Technical Basis for a Revised National Standard on Load Security for Heavy Trucks'' are included in the public docket.

Discussion of the Research Project

The North American Load Security Research Project was initiated to develop an understanding of the mechanics of cargo securement on heavy trucks. The research was intended to provide a sound technical basis for development of the North American Cargo Securement Standard Model Regulations. Tests were conducted to examine the fundamental issues of anchor points, tiedowns, blocking and friction, and issues related to securement of dressed lumber (representative of cargoes that are loaded lengthwise on a vehicle and secured with transverse tiedowns), large metal coils, concrete pipe, intermodal containers, and other commodities. The research is documented in the following reports:

1. ''Experimental Evaluation of Friction Coefficients of Typical Loads and Trailer Decks Under Vertical Vibration, North American Load Security Research Project, Report 2,'' Canadian Council of Motor Transport Administrators, 1997.

2. ''Slippage Tests with Anti-skid Mats, North American Load Security Research

Project, Report 3,'' Canadian Council of Motor Transport Administrators, 1997.

3. ''Dressed Lumber Tiedown Tests, North American Load Security Research Project, Report 4,'' Canadian Council of Motor Transport Administrators, 1997.

4. ''Effect of Cargo and Tiedown Characteristics on Equalization of Tension in the Spans of Tiedowns, North American Load Security Research Project, Report 5,'' Canadian Council of Motor Transport Administrators, 1997.

5. ''Effect of Binder Type and Chain Length on Tension in Chain Tiedowns, North American Load Security Research Project, Report 6,'' Canadian Council of Motor Transport Administrators, 1997.

6. ''Friction Coefficients Between Typical Cargo and Truck Decks, North American Load Security Research Project, Report 7,'' Canadian Council of Motor Transport Administrators, 1997.

7. ''Load Capacity of Nailed Wood Blocking, North American Load Security Research Project, Report 8,'' Canadian Council of Motor Transport Administrators, 1997.

8. ''Effect of Cargo Movement on Tension in Tiedowns, North American Load Security Research Project, Report 9,'' Canadian Council of Motor Transport Administrators, 1997.

9. ''Evaluation of the Strength and Failure Modes of Heavy Truck Cargo Anchor Points, North American Load Security Research Project, Report 10,'' Canadian Council of Motor Transport Administrators, 1997.

10. ''Tests on Methods of Securement for Thick Metal Plate, North American Load Security Research Project, Report 11,'' Canadian Council of Motor Transport Administrators, 1997.

11. ''Tests on Methods of Securement of Large Boulders, North American Load Security Research Project, Report 12,'' Canadian Council of Motor Transport Administrators, 1997.

12. Bending Strength of Trailer Stakes, North American Load Security Research Project, Report 13, Canadian Council of Motor Transport Administrators, 1997.

13. ''Effect of Tiedowns on Wood Blocks Used as Dunnage, North American Load Security Research Project, Report 14,'' Canadian Council of Motor Transport Administrators, 1997.

14. ''Tests on Methods of Securement for Metal Coils, North American Load Security Research Project, Report 15,'' Canadian Council of Motor Transport Administrators, 1997.

15. ''Tests on Methods of Securement for ISO Containers, North American Load Security Research Project, Report 15,'' Canadian Council of Motor Transport Administrators, 1997.

16. ''Analysis of Heavy Truck Cargo Anchor Points, North American Load Security Research Project, Report 16,'' Canadian Council of Motor Transport Administrators, 1997.

17. ''North American Load Security Research Project Summary Report, North American Load Security Research Project, Report 18,'' Canadian Council of Motor Transport Administrators, 1997.

18. ''Assessing a Securement Method for the Transportation of Heavy Machinery Using a Combination of Highway Vehicles, North American Load Security Research Project, Report 19,'' Canadian Council of Motor Transport Administrators, 1997.

A copy of each of the reports listed above is in the public docket. Copies of these reports may be purchased from the CCMTA, 2323 St. Laurent Boulevard, Ottawa, Ontario K1G 4J8. The telephone number for the CCMTA is 613–736–1003; the web site address is *http://www.ccmta.ca.*

There were a number of important findings, conclusions, and recommendations discussed by the researchers. The following is a summary of three of the major concerns discussed by the authors and how they apply to the transportation of a wide range of commodities.

Anchor Points

The researchers believe the results of their work indicate that vehicles used to transport heavy articles, such as metal coils, should be equipped with anchor points designed for the load. The anchor points on CMVs should be provided with a load-rating based on the manufacturer's analysis of the possible directions that the applied forces will act on the anchor point.

Tiedowns

The researchers observed that tiedowns either resist applied forces, or increase friction between the cargo and the vehicle deck. The researchers believe that if more attention is focused on other means of cargo securement (i.e., blocking and bracing, etc.) it may be possible to improve current cargo securement methods without any change to the tiedown requirements. The authors indicated that the current requirement for aggregate working load limits may be adequate for general commodities secured by transverse tiedowns, but other cases may require a different tiedown capacity depending on the other securement provided.

Friction

The researchers concluded that friction is the principal factor that keeps most cargo from shifting, so its role should be formally recognized. Trailer decks, and cargo handling equipment like skids used during transportation, should be designed with high coefficients of friction. Rubber mats appear to increase the coefficient of friction beyond 0.5 for many combinations of cargo and deck, and the use of these mats should be encouraged. However, friction should never be the sole means of cargo securement.

Use of Research Results

As various portions of the research were completed, the results were provided to the Standard Drafting Group which was responsible for leading the effort at drafting the North American Model Regulations. Almost all of the research was completed by late 1997, with a few remaining items completed in 1998. The drafting group was responsible for reviewing the draft research reports to determine how the information could best be used to improve specific cargo securement requirements in the U.S., Canada, and Mexico.

Process for Development of the North American Model Regulations

The Standard Drafting Group developed the outline for the model regulations with most of the detailed performance criteria added as the research reports were completed. Membership in the drafting group included representatives from the FHWA, Transport Canada, CCMTA, the Ontario Ministry of Transportation, Quebec Ministry of Transportation—Ontario and Quebec conducted most of the research—and the CVSA. The CVSA was included in the drafting group because it is an organization of Federal, State, and Provincial government agencies and representatives from private industry in the United States, Canada, and Mexico dedicated to improvement of commercial vehicle safety. The membership of the drafting group was limited because there was an informal agreement among the interested parties that it would have been impractical to draft a technical document with a larger number of participants.

The process used for further developing this outline for the model regulations involved the North American Cargo Securement Harmonization Committee, a group which reviewed major portions of this outline as it was completed by the drafting group. Membership in the harmonization group was open to all interested parties in the U.S., Canada, and Mexico. This process was intended to ensure that all interested parties had an opportunity to participate in the development of the model regulations, and to identify and consider the concerns of the Federal, State, and Provincial governments, carriers, shippers, industry groups, and associations, as well as safety advocacy groups and the general public. The harmonization group held public meetings at locations in the United States and Canada, during which drafts

of the North American Cargo Securement Standard were presented for review and comment. Representatives of the CCMTA and the CVSA served as co-chairpersons for the harmonization group and organized the public meetings. The meetings held in the U.S. concerning the review of substantive material that would be included in the model regulations were announced by the FHWA in the **Federal Register**. There were nine meetings held in the U.S. and Canada. Copies of the minutes from the meetings, including lists of the agencies, organizations and companies represented at the meetings, are in the public docket.

For individuals and groups unable to attend the meetings, the CCMTA posted information on the Internet. The Internet address is *http://www.ab.org/ccmta/ccmta.html.* Individuals and organizations with Internet electronic mail addresses were provided with the opportunity to have their names added to an electronic mailing list to receive information on the development of the standard.

After all interested parties were given the opportunity to comment and their concerns had been considered, the final version of the North American Cargo Securement Standard was published in May 1999 by the CCMTA. A copy of the standard is in the public docket. Federal, State, and Provincial governments throughout North America have now been encouraged to adopt it through their respective rulemaking processes.

Publication of Advance Notice of Proposed Rulemaking

On October 17, 1996, the FHWA published an advance notice of proposed rulemaking (ANPRM) concerning the development of the North American Cargo Securement Standard Model Regulations (61 FR 54142). The agency requested comments on its consideration of a rulemaking to overhaul the Federal cargo securement regulations based on the research program described above and other published cargo-securement related research, such as Southern Illinois University's March 1995 report entitled ''Analysis of Rules and Regulations for Steel Coil Truck Transport.'' A copy of this report is included in the public docket. The agency also requested comments on the process that would be used to develop the North American Cargo Securement Standard Model Regulations.

Discussion of Comments to the ANPRM

We analyzed 10 comments that we received in response to the ANPRM. The commenters were: Advocates for Highway and Auto Safety (Advocates); the American Trucking Associations (ATA); the CCMTA; CVSA; the Illinois Department of Transportation (IDOT); Insurance Corporation of British Columbia (ICBC); the International Brotherhood of Teamsters; Landstar Gemini (Landstar); the Truck Trailer Manufacturers Association (TTMA); and the Web Sling and Tiedown Association.

Generally, the commenters agreed with the agency's plan to participate in the research program to evaluate cargo securement systems, and the approach the agency described for developing the North American Cargo Securement Standard Model Regulations. However, some of the commenters expressed concerns about specific issues they believe were not discussed adequately in the research and standards development program described in the ANPRM.

General Comments

The Illinois Department of Transportation stated that the use of a diverse ''drafting group'' to develop guidelines and performance standards based upon current research appears to be a viable method of regulatory development. They asked that the standards be based on sound engineering principles. The output should be both user friendly and enforceable.

The CCMTA and CVSA indicated that they strongly support the agency's decision to use the research results to overhaul the Federal cargo securement regulations. Both organizations stated that they believe a uniform, performance-based cargo securement standard will not only improve highway safety, but also will provide equipment manufacturers and carriers with increased flexibility to meet the objectives of the standard.

The Web Sling and Tiedown Association indicated that it supports updating the current regulations to improve the safe transportation of cargo. The association believes that allowing industry to participate in the writing of standards will be beneficial both to the public and to industry.

Accident Data

The ATA and TTMA indicated that they believe the agency should review currently available accident data prior to making significant changes to the cargo securement regulations. They suggested that the agency should also conduct a study of accidents to learn from actual experience where improper loading has either caused or contributed to safety problems. Among their concerns were that the new rules not be burdensome with details for every type of cargo to be secured.

The TTMA pointed out that since accidents involving metal coils seemed to be the impetus for this rule, a rule for coils should precede this current NPRM. Then, if data supported a broader application of securement rules, at that time rules for other types of cargo should be implemented.

Securement of Intermodal Containers

Landstar believed the rules for securing intermodal cargo must be unambiguous. They recommended using integral pins on chassis, avoiding using cargo containers only secured by chains, straps, or other binders, and using integral locking devices.

Crashworthiness Standards for Cargo Securement Systems

The Advocates requested that the agency develop standards that would ensure that cargo remains inside or on the CMV during a collision or rollover, and accommodate a variety of crash types, especially rollovers and trailer detachment collisions.

FMCSA Response to Comments

The FMCSA believes the adoption of the North American Cargo Securement Standard Model Regulations would ensure that the FMCSRs concerning protection against shifting and falling cargo provide clear and objective guidelines to both motor carriers and enforcement officials on what is necessary to ensure safety and achieve compliance with the rules. At the same time, the rulemaking would ensure that the rules are technically sound. This rulemaking would close the gap between the letter and the purpose of the regulations, so that the intent of the rules is better expressed in the regulatory language.

On the issue of harmonization of the cargo securement regulations, the FMCSA agrees with the CCMTA and CVSA that there is a need to establish more uniform requirements among all the jurisdictions in North America and that the requirements should be based on engineering data and test results. There is no readily apparent reason why the cargo securement rules should vary significantly from jurisdiction to jurisdiction in North America. There may be differences in the exact wording, but there need not be substantial differences in what is required.

While the FMCSA agrees with commenters that the uniform regulations being considered should be performance-based, the agency believes

the rules must contain sufficient detail to be easily understood, used, and enforced. The rules should be performance-based to the greatest extent practicable, but must be written in a manner that ensures that motor carriers and enforcement officials will find the rules meaningful. The agency believes that its proposed adoption of the North American Cargo Securement Standard Model Regulations would accomplish this objective.

With regard to comments about the need to study accident data, the agency believes that it is always important to consider accident data in determining whether to initiate a rulemaking. However, it is not always necessary to have accident data to justify initiating a rulemaking to improve the technical adequacy of safety regulations and to expand the regulatory text to better explain what is required of motor carriers.

Currently available accident data indicates that shifting or falling cargo is a contributing factor in less than one percent of the accidents self-reported by motor carriers that typically complied with the agency's former accident reporting requirements under 49 CFR part 394.

Note: On February 2, 1993 (58 FR 6726), the FHWA published a final rule amending the FMCSRs by removing part 394, Notification and Reporting of Accidents. As a result of that rulemaking, motor carriers are no longer required to file accident reports (Form MCS 50–T, Form MCS 50–B) with the agency or to make notification of fatal accidents. The effective date for the final rule was March 4, 1993.

Although the data suggests that the occurrence of cargo securement-related accidents is low compared to some other contributing factors for CMV accidents, the fact that these accidents continue to happen is reason enough for the agency to consider taking action.

The TTMA is correct that a major factor prompting Federal, State and Provincial agencies to participate in the research and standard development effort is accidents involving metal coils transported on flat-bed or platform trailers. The FMCSA does not, however, believe this rulemaking should be limited to the development of requirements for the transportation of metal coils, while the adoption of rules covering other commodities is postponed indefinitely until the agency gathers accident statistics to support rulemaking for those commodities. Metal coils result in some of the most horrific cargo securement-related accidents, but they are not the only commodity associated with accidents. Some effort is required not only to reduce the occurrence of metal coils shifting on or within vehicles, but to ensure proper securement of other commodities that can cause an accident resulting in fatalities and serious injuries when they are not properly secured.

In response to the ATA's statement about the importance of determining whether accidents are the result of rules that are technically incorrect, or improper loading and securement practices, the agency believes the current regulations have served their purpose well. They have provided performance-based requirements that allow for flexibility in the means for securing cargo. However, the research reports listed above identify several issues for which the current regulations do not include adequate guidance on proper securement. For example, the current regulations do not specifically account for the role friction plays in keeping certain loads in place. As a result, some motor carriers focus almost exclusively on the tiedowns and not enough on actions to increase the level of friction between cargo, the load-carrying surfaces of the CMV, and the level of friction between articles being transported.

Another example is that the current regulations do not make a distinction between direct and indirect tiedowns. Despite concerns that some participants expressed in the public meetings there is a fundamental difference between direct and indirect tiedowns.

Note: A ''direct tiedown'' is one that is intended to provide direct resistance to potential shifting of an article being transported. A direct tiedown may be attached to an article and to an anchor point on the CMV, or it may be attached to an anchor point, go around or through an article, then be attached to another anchor point. An ''indirect tiedown'' is one that is intended to increase the pressure of an article or stack of articles on the CMV. An indirect tiedown is attached to the vehicle, runs directly over or through an article, then is attached to another anchor point on the other side of the article, and is tightened.

This difference should not be overlooked when determining the number of tiedowns needed for heavy loads such as metal coils and construction equipment. Under the current rules, motor carriers could secure loads in a manner that complies with the safety regulations, but would provide a relatively small safety factor. If the motor carrier overestimated the strength of its securement system by a slight amount, there would be an increased likelihood that the load would shift or fall from the vehicle. By taking into account the differences between direct and indirect tiedowns, the rules would increase the safety factor and further reduce the likelihood of a cargo securement-related accident.

The proposal would make the regulations easier to understand, use, and enforce. Through an improved understanding of what is necessary to prevent cargo from shifting on or within a CMV, or falling from a vehicle, motor carriers that experience these types of accidents may learn effective methods to prevent future occurrences. Regulations that provide greater detail in specifying what is required of motor carriers would also help enforcement officials who must determine whether motor carriers have satisfied the rules.

In response to Landstar's comments about the securement of intermodal containers, and a question raised by the TTMA on the same issue, the FMCSA believes this rulemaking will establish appropriate requirements for the transportation of intermodal cargo containers. The agency has long recognized safety concerns about the transportation of intermodal cargo containers on flatbed and lowboy trailers.

On August 23, 1993, the FHWA published an advance notice of proposed rulemaking, Parts and Accessories for Safe Operation; Intermodal Cargo containers. The ANPRM announced that the agency was considering changes to the rules concerning securement of cargo containers (58 FR 44485, FHWA Docket No. MC–93–24). At that time the FHWA noted that there were substantial differences between the regulatory requirements of the FMCSRs, several States' cargo securement regulations, and industry practices. Some cargo containers are transported on container chassis or other trailers with twist locks, while others are transported on flatbed trailers or lowboy trailers and secured with chains and straps. The former method complies with current Federal regulations while the latter appears to be a common practice that can be done safely and effectively provided certain guidelines are followed. The proposed rule would include requirements for both methods of transporting cargo containers.

In a separate document to be published at a later date, the FMCSA will terminate the rulemaking started on August 23, 1993. The agency has considered all of the comments submitted in response to the 1993 ANPRM and shared this information with other members of the drafting group responsible for writing the North American Cargo Securement Standard Model Regulations. The agency does not believe it is necessary to handle the

issue of intermodal cargo container securement separately from all other cargo securement issues. Since the research included an examination of the performance of tiedowns used to secure cargo containers to vehicles other than container chassis, the agency believes there is sufficient technical data to support the proposed requirement.

On the subject of crashworthiness standards for cargo securement systems raised by Advocates, the FMCSA believes it would be extraordinarily expensive, and probably impracticable, to require that all cargo securement systems be capable of keeping loads in place during moderate to severe collisions, rollover accidents, and trailer detachments. The cargo securement regulations were never intended to provide protection against shifting and falling cargo under such circumstances, and there is no evidence that a significant number of secondary injuries or fatalities are caused by the impact of cargo thrown from a CMV as the result of an accident, as opposed to the impact of the CMV itself with the roadway, nearby objects or other vehicles. Crashworthiness standards would probably require many vehicles to be withdrawn from service (in the absence of a grandfather clause) and would certainly require others to be redesigned or retrofitted with additional equipment. The agency believes that its safety objectives can be accomplished at far lower cost by developing regulations directed at collision avoidance (*i.e.,* ensuring the prevention of cargo movement which could contribute to the accident) instead of imposing heavy regulatory burdens to manage the outcome of the crash.

Discussion of Proposal

The FMCSA proposes these rules based upon the North American Cargo Securement Standard Model Regulations. The agency would replace its current cargo securement-related regulations under § 392.9, concerning driver inspection of cargo and cargo securement systems, and §§ 393.100 through 393.106 concerning cargo securement methods.

The agency also proposes to amend § 393.5 to adopt definitions of: Aggregate working load limit; anchor point; bell pipe concrete; blocking; bracing; direct tiedown; frame vehicle; friction mat; hook-lift container; indirect tiedown; integral securement system; longwood; rail vehicle; shortwood; sided vehicle; tiedown; tractor-pole trailer; void filler; well; and working load limit. The agency would adopt these definitions to ensure a common understanding of the terminology used in the regulations. The definitions would be based on those in the model regulations.

The FMCSA notes that there are numerous other definitions in the model regulations. However, the agency does not believe it is necessary to adopt many of those definitions because the terms are already defined in the FMCSRs, even though with slightly different wording.

Inspection of Cargo and Securement Devices

The FMCSA would revise § 392.9 to propose that drivers be required to inspect the cargo and the securement devices within the first 50 miles (80.4 kilometers). Currently, § 392.9 requires inspection within the first 25 miles (40.2 kilometers). The FMCSA believes research concerning the effects of vibration on cargo securement devices and changes in the tension of indirect tiedowns, suggests that conditions of the securement system which would require the driver to make readjustments are more likely to occur after the vehicle has been driven between 25 and 50 miles, rather than 0 to 25 miles. This is because traveling beyond 25 miles would subject the vehicle to more vibration and forces over a longer period of time. However, the agency believes the maximum distance the vehicle could be operated safely prior to the inspection of the tiedowns should not exceed 50 miles. All other requirements currently contained in § 392.9 would remain the same. The agency would rewrite the section by putting it into plain language, but is not proposing any other substantive changes.

Applicability of the Proposed Rules

The FMCSA proposes that § 393.100 establish the applicability for the cargo securement rules under subpart I of part 393. The applicability of the proposed rule would be the same as the existing rule, covering all cargo-carrying commercial motor vehicles (as defined in 49 CFR 390.5) operated in interstate commerce.

Performance Criteria

The agency would establish new performance requirements concerning the longitudinal, lateral, and vertical accelerations that cargo securement systems must withstand to satisfy the proposed rules. Acceleration is the rate at which the speed or velocity of an object increases and deceleration is the rate at which the velocity decreases. Accelerations are commonly reported as a proportion of the acceleration due to gravity (g). This acceleration is 9.81 meters/second/second (32.3 feet/second/second), which means that the velocity of an object dropped from a high elevation increases by 9.81 meters/second (32.3 feet/second). The FMCSA would require that cargo securement systems be capable of withstanding the following three forces, applied separately:

(1) 0.8 g deceleration in the forward direction;

(2) 0.5 g deceleration in the rearward direction; and

(3) 0.5 g acceleration in a lateral direction.

The values chosen are based on the researchers' analysis of previous studies concerning commercial motor vehicle performance. The analysis indicated that the highest deceleration likely for an empty or lightly loaded vehicle with an antilock brake system, all brakes properly adjusted, and warmed to provide optimal braking performance, is in the range of 0.8–0.85 g. However, a typical loaded vehicle would not be expected to achieve a deceleration greater than 0.6 g on a dry road.

The typical lateral acceleration while driving a curve or ramp at the posted advisory speed is in the range 0.05–0.17 g. Loaded vehicles with a high center of gravity roll over at a lateral acceleration above 0.35 g. Lightly loaded vehicles, or heavily loaded vehicles with a lower center of gravity, may withstand lateral acceleration forces greater than 0.50 g. The FMCSA believes the information presented by the researchers supports the use of the decelerations listed above and requests public comment on this issue.

Safe and Proper Working Condition for Tiedowns

The FMCSA would add new regulatory language requiring that all vehicle structures, systems, parts, and components used to secure cargo must be in proper working order. The agency would also prohibit the use of devices that have visible damage, including but not limited to, cracks, cuts, and deformation. Although these defects are not currently discussed in the FMCSRs, it is understood that the use of damaged tiedowns is a violation. The FMCSA would revise the rule to make it clear that this is a violation.

Standards for Tiedowns

The current FMCSRs incorporate by reference manufacturing standards for certain types of tiedowns including steel strapping, chain, synthetic webbing, wire rope, and cordage. The FMCSA would update its reference to the National Association of Chain Manufacturers' (NACM) Welded Steel Chain Specifications, June 15, 1990,

edition to incorporate by reference the May 1, 1996 version. The agency notes that some of the working load limit values in the 1996 version differ slightly from those in the 1990 version. Also, the 1996 version includes working load limits for a new grade of alloy chain, grade 100. The FMCSA encourages commenters to compare the current table of working load limits in § 393.102 (b) with those in the proposed rule to determine if the different values presented in the 1996 version of the NACM publication would adversely affect their motor carrier operations or make it more difficult to comply with the FMCSRs.

Securement of Intermodal Containers and the Contents of Such Containers

The FMCSA proposes commodity-specific requirements which would apply to intermodal cargo containers. The agency is also proposing specific rules for metal coils transported in intermodal cargo containers. Although the agency does not believe the proposed rules would create difficulties for motor carriers or shippers offering loaded containers for transportation, the agency requests comments concerning actions motor carriers believe they would have to take to ensure compliance when transporting containers from foreign countries.

For example, § 392.9(a) requires drivers to assure themselves that cargo is properly distributed and adequately secured before operating a commercial motor vehicle. Section 392.9(b) requires drivers to examine the cargo and load-securing devices during the trip and make adjustments when necessary to maintain the security of the load. Section 392.9(b) provides an exception for driver's of sealed commercial motor vehicles who have been ordered not to open the vehicle to inspect its cargo, or to drivers of vehicles loaded in a manner that makes inspection of the cargo impracticable. The requirements of § 392.9 when combined with the explicit requirements concerning the securement of the contents inside intermodal containers would make it clear that each motor carrier and each driver must ensure that such loads are properly secured. Unless containers are sealed and motor carriers instructed not to open it for inspection of the cargo, the proposed rules would require an inspection of the loads inside containers. The FMCSA requests comments about motor carriers' ability to inspect the contents of the intermodal containers they typically transport. The FMCSA also requests comments on whether the cargo securement methods typically used by shippers of intermodal containers would comply with the proposed rules.

Direct Versus Indirect Tiedowns

The FMCSA would adopt the North American Cargo Securement Standard Model Regulations provision concerning direct and indirect tiedowns. The agency would continue to require that the aggregate working load limit of tiedowns used to secure an article or group of articles against movement must be at least one-half times the weight of the article or group of articles. However, instead of determining the aggregate working load limit by simply adding up the working load limit of all the tiedowns being used, motor carriers would have to determine whether the tiedown is a direct or indirect tiedown, and make appropriate adjustments in the calculation. When direct tiedowns are used, the aggregate working load limit would be the sum of:

(1) One-half of the working load limit of each direct tiedown that is connected between the motor vehicle and the article or cargo; and

(2) The working load limit of each direct tiedown that is attached to the vehicle, passes through or around the cargo, or is attached to it, and again to the vehicle.

When indirect tiedowns are used, the aggregate working load limit of all indirect tiedowns would be the sum of the working load for each tiedown which goes from one part of the vehicle, over an article, to another part of the vehicle.

The FMCSA notes that this approach differs significantly from the current regulations, which do not distinguish between direct and indirect tiedowns. The agency believes the proposed change would require motor carriers to learn a new way of determining compliance with tiedown provision of the cargo securement rules. However, the change is not so great that it would be difficult to master the proposed rules. The agency requests comments on this issue.

Front End Structures on CMVs

Although the model regulations do not include a provision concerning front end structures (*i.e.,* headerboards) used as part of a cargo securement system, the FMCSA proposes to retain its current front-end structure rules for CMVs. The FMCSA would, however, revise its current rule (§ 393.106) by changing the applicability to cover CMVs transporting cargo that is in contact with the front-end structure of the vehicle. By contrast, the current rule establishes requirements for, and requires that vehicles be equipped with, front-end structures irrespective of whether the device is being used as part of a cargo securement system.

The current rules emphasize occupant protection rather than cargo securement. It is expected that cargo that is not braced against a front-end structure could shift forward, and the structure would prevent the load from penetrating the driver's compartment. While this concept may have merit for certain types of cargo, the FMCSA believes the best way to ensure driver safety is to have tougher standards to prevent the cargo from shifting forward. For example, if the vehicle is transporting metal coils, once the load begins to move forward, it is unlikely that a front-end structure would save the driver. The FMCSA requests comments on whether the agency should include revised front-end structure requirements in its cargo securement regulations.

Specific Securement Requirements by Commodity Type

The FMCSA would adopt detailed requirements for the securement of the following commodities: Logs; dressed lumber; metal coils; paper rolls; concrete pipe; intermodal containers; automobiles, light trucks and vans; heavy vehicles, equipment and machinery; flattened or crushed vehicles; roll-on/roll-off containers; and large boulders. During public meetings concerning the development of the model regulations, participants said that these commodities cause the most disagreement between industry and enforcement agencies as to what is required for proper securement.

The FMCSA notes that each of these commodities must be properly secured under the current performance-based cargo securement rules. However, with the exception of metal coils, there is no detailed guidance for motor carriers and enforcement officials. The agency believes that accidents may be prevented through the establishment of much more detailed rules that clearly spell out what is required to achieve the desired level of safety. The rules would eliminate confusion about what constitutes an acceptable cargo securement system.

Provisions of the Model Regulations That Are Not Being Adopted

Generally, the FMCSA would not adopt provisions of the model regulations that are inconsistent with the agency's approach to establishing performance-based rules. Two specific aspects of the model rules that were considered inconsistent are: (1) Requirements for specific types or grades of securement devices; and (2)

rules requiring tiedowns to be positioned at certain angles irrespective of the practicability of doing so.

Other Issues Under Consideration

There are a number of issues that were discussed during the development of the model regulations, and are included in the model regulations but are not included in the proposed rules. The FMCSA did not include proposed regulatory text concerning these issues because the agency does not believe there is sufficient accident data or information to adequately assess the costs and benefits at this time.

Prohibition on the Use of Unmarked Tiedowns

Among those issues, a prohibition on the use of unmarked tiedown devices was considered by participants in the harmonization group meetings. Many participants believe that it is important that all tiedown devices have a working load limit rating marked on the device, or some form of standardized marking which could be used to determine the working load limit. The FMCSA agrees with this principle.

The use of unmarked tiedowns would not be a cause for concern if all such tiedowns of the same size and general appearance were the same grade or strength. The FMCSA has no facts indicating that this is the case. While many manufacturers have some form of marking, others may choose, for whatever reason, not to mark their products. If unmarked tiedowns of varying grades are readily available, motor carriers could unknowingly violate the current rule and the proposed rule by failing to have an adequate number of securement devices. The consequences for a load such as metal coils could be fatal to other motorists.

The risks of such an accident could be greatly minimized by prohibiting motor carriers from using unmarked tiedowns. Before doing so, the FMCSA would have to quantify the potential economic burden on the motor carrier industry and those involved with the manufacture, sale, and distribution of unmarked securement devices. Since the FMCSA has no reliable information on the number of manufacturers, distributors, and retailers of unmarked tiedowns, the quality or strength of such devices, or the amount of these tiedowns currently in use by motor carriers and in retailers' stock, it would be inappropriate to propose a prohibition at this time. However, in view of the potential safety hazards of motor carriers misidentifying unmarked tiedowns, the FMCSA proposes that all unmarked welded steel chain be considered to have a working load limit equal to that of grade 30 proof coil, and other types of unmarked tiedowns be considered to have a working load limit equal to the lowest rating for that type in the table of working load limits. The FMCSA specifically requests comments on this issue.

Mandatory Rating and Marking of Anchor Points

Many of the participants in the harmonization group meetings believe it is important that anchor points on semitrailers and trailers be marked with a working load limit. Some believe that anchor points on certain semitrailers and trailers should be required to meet minimum strength requirements similar to Transport Canada's Canadian Motor Vehicle Safety Standard No. 905. While the FMCSA agrees with the principle of rating and marking anchor points, the agency does not believe it is appropriate to propose such requirements at this time. Although the TTMA has established a recommended practice, ''RP 47–99, Testing, Rating, and Labeling Platform and Van Trailers for Cargo Securement Capability'' June 1, 1999, concerning test procedures and general performance specifications for tiedown anchor points, front-end structures, and sidewall structures, the FMCSA does not have any information on the extent to which trailer manufacturers follow these recommendations. As the FMCSA gathers information about the extent to which manufacturers follow the recommended practices, the agency will consider incorporating by reference the TTMA's recommended practice. The agency would have to be certain that newly manufactured trailers satisfied the guidelines in the recommended practice and that motor carriers would not be prohibited from using suitable semitrailers and trailers solely on the basis that the vehicle lacked a rating and marking of the anchor points. Based on the anecdotal information available to date, the vast majority of cargo-securement related accidents do not involve problems with the anchor points. The majority of these accidents involve an inadequate number of tiedown devices, improper placement of the tiedowns, or other factors unrelated to the design or performance capability of the anchor points.

The agency requests comments on the marking and rating of anchor points and information from enforcement officials and others who are aware of accidents involving the failure of an anchor point.

Development of Training Program

The agencies and organizations participating in the North American Cargo Securement Program have established a Training and Education Committee responsible for developing a training package for motor carriers and enforcement officials to ensure that the model regulations now being considered for adoption throughout North America are understood by all affected parties. The training package would cover all of the requirements in the model regulations, and to some extent, best practices for securing cargo. The training materials would be used to help motor carriers better understand how to properly secure different types of cargo and to ensure they are aware of what is required. Enforcement officials could also use the training material to ensure that they have an understanding of the new requirements. It is anticipated that the training materials would be completed and available to the public from the FMCSA before the effective date of the final rule. The FMCSA would post publications on its website to assist individuals with Internet access. The FMCSA would also consider making copies of the training materials available through the U.S. Department of Commerce's National Technical Information Service.

Proposed Implementation Date

Depending on the comments received in response to this notice of proposed rulemaking, the FMCSA intends to publish a final rule in 2001 with an effective date as close as possible to July 1, 2001. This is the date that jurisdictions involved in the development of model regulations have agreed to use as a target for adoption of the new rules. The FMCSA believes this time frame is appropriate and would provide motor carriers and enforcement officials sufficient time to prepare for the transition from the current requirements to rules compatible with the model regulations. The agency requests comments on this issue.

Request for Comments

The FMCSA is requesting comments on all aspects of the proposed revision of the cargo securement regulations. Although the FMCSA's goal is to adopt most of the provisions in the North American Cargo Securement Standard Model Regulations, the agency does not intend to do so without considering all public comments. If the comments received indicate that certain portions of the proposal may need to be reconsidered or modified, the agency will take appropriate action. The agency

is concerned first and foremost with improving its cargo securement regulations for the purpose of preventing accidents, injuries, and fatalities.

The FMCSA believes its safety objectives can be achieved while harmonizing its cargo securement regulations with those of Canada and Mexico. Commenters are encouraged to compare the North American Cargo Securement Standard Model Regulations with the proposed regulatory language, and the current regulations, and provide the agency with any information they believe is relevant to this issue.

Rulemaking Analysis and Notices

Executive Order 12866 (Regulatory Planning and Review) and DOT Regulatory Policies and Procedures

The FMCSA has determined that this action is not a significant regulatory action within the meaning of Executive Order 12866 or within the meaning of Department of Transportation regulatory policies and procedures. Although the agency preliminarily determined at the ANPRM stage that this rulemaking is significant under Department of Transportation policies and procedures, the agency has held a number of public meetings, completed a review of the comments submitted in response to the ANPRM, and now believes the rulemaking is not DOT-significant.

The FMCSA received 10 comments to the public docket. While each docket comment is important to the agency, this small number of comments does not suggest a level of public interest that would warrant a ''significant'' classification. Also, based on the information currently available, the cost to the motor carrier industry for compliance with the proposed rules, and the cost to the States for adopting and enforcing the new requirements would be far less than the $100,000,000 threshold used as one of the factors in determining the significance of a rulemaking.

This rule would require that motor carriers operating in interstate commerce comply with improved cargo securement regulations based on the following: (1) The results of a multi-year comprehensive research program to evaluate current U.S. and Canadian cargo securement regulations; (2) the motor carrier industry's best practices; and (3) recommendations presented during a series of public meetings. Generally, the proposed revision would require motor carriers to change the way cargo securement devices are used to prevent certain articles from shifting on or within, or falling from, CMVs, and how calculations are done. In some instances, the proposed changes would require motor carriers to increase the number of tiedown devices used to secure certain types of cargoes.

The agency believes the vast majority of motor carriers have a sufficient supply of tiedown devices on board their vehicles at all times. The proposal would allow motor carriers to continue using those tiedowns provided the devices meet the applicable manufacturing standards currently incorporated by reference in § 393.102 (b).

Most of the costs associated with this rulemaking are believed to be associated with the training of drivers, motor carrier employees responsible for loading CMVs, and enforcement officials to ensure that they understand the requirements being considered. The FMCSA believes the proposed rule concerning the distinction between direct and indirect tiedowns under § 393.106 is the only portion of the rulemaking that differs significantly from the technical concepts in the current rules and the best practices of the motor carrier industry, such that training may be desirable for some individuals. It is more likely than not that compliance with the remainder of the proposed regulations could be achieved with much less training than may be necessary to master § 393.106. This is because the commodity-specific rules have been drafted to enable the reader to use the rules as step-by-step instructions for securing the commodity being transported.

With regard to costs to the States to train inspectors, the agency is working with its State and Provincial partners to develop training materials that could be used to minimize the costs for the enforcement community and the motor carrier industry. For States participating in the Motor Carrier Safety Assistance Program (MCSAP), training costs are considered an eligible expense. This means the States could receive Federal funds to help cover the costs of training their roadside inspectors. Therefore, based upon the information above, the agency estimates that the economic impact associated with this rulemaking action would be minimal and a full regulatory evaluation is not necessary.

Regulatory Flexibility Act

In compliance with the Regulatory Flexibility Act (5 U.S.C. 601–612), the FMCSA has considered the effects of this regulatory action on small entities and determined that this rule would affect a substantial number of small entities but would not have a significant impact on them.

Generally, the proposed revision would require motor carriers to change the way cargo securement devices are used to prevent certain articles from shifting on or within, or falling from CMVs. In some instances, the proposed changes would require motor carriers to increase the number of tiedown devices used to secure certain types of cargoes. However, the rulemaking would not require motor carriers to purchase new equipment.

The FMCSA believes the vast majority of motor carriers have a sufficient supply of tiedown devices on board their vehicles at all times. The agency believes the number of tiedowns on board and the strength of these devices are usually sufficient to secure whatever types of loads the motor carrier is transporting, or intends to transport. The cargo securement problems typically observed during roadside inspections of flatbed trailers are ones in which motor carriers do not use enough of the tiedowns that they already have on board their vehicles. In the case of van type trailers, the problem is that some motor carriers do not use any securement devices to prevent loads from shifting. Therefore, the FMCSA believes that motor carriers already have all the hardware they need to comply with the proposed changes. The challenge for motor carriers would be to learn how to properly use tiedown devices to further reduce the occurrence of cargo securement-related accidents.

Motor carriers are currently required to use tiedown devices that meet applicable manufacturing standards incorporated by reference in § 393.102(b). Under the proposed rulemaking, the agency would continue to require motor carriers to use only tiedown devices that meet manufacturing standards currently specified § 393.102(b). If the tiedowns are in safe and proper condition, and meet the applicable manufacturing standards, use of the devices would not be prohibited by this rulemaking.

As indicated above, additional costs could be associated with training of motor carrier employees responsible for loading CMVs, drivers, and enforcement officials to ensure that they understand the requirements being considered. The FMCSA believes the proposed rule concerning the distinction between direct and indirect tiedowns under § 393.106 is the only portion of the rulemaking that differs significantly from the technical concepts in the current rules and the best practices of the motor carrier industry, such that training may be desirable for some

individuals. It is more likely than not that compliance with the remainder of the proposed regulations could be achieved with much less training than may be necessary to master § 393.106. This is because the commodity-specific rules have been drafted to enable the reader to use the rules as step-by-step instructions for securing the commodity being transported.

For motor carriers that provide training for their drivers, the costs would vary with the number of hours for training, and the number of drivers being trained. At a minimum, training costs would include wages for the drivers. The FMCSA reviewed earnings information from the U.S. Department of Labor. The FMCSA used the ''Occupational Outlook Handbook,'' 2000–01 Edition, Bulletin 2520. The median hourly earnings of drivers of light and heavy trucks were $11.67 in 1998. The middle 50 percent earned between $8.80 and $15.57 an hour. The lowest 10 percent earned less than $6.51 and the highest 10 percent earned more than $19.14 an hour.

If a motor carrier provided one hour of training for 10 drivers in the middle 50 percent, the cost would be $155.70 (10 drivers × $15.57 an hour per driver × 1 hour) in wages for the drivers to attend training, plus the cost for the instructor and course materials. If the training for the same group of drivers was expanded to four hours the cost would be $622.80 (10 drivers × $15.57 an hour per driver × 4 hours) in wages for the drivers to attend training, plus the cost for the instructor, and course materials. If the drivers earned $20 an hour, the costs for the group of drivers to attend class for 4 hours would be $800. These examples indicate how the costs per motor carrier could vary greatly depending on the number of drivers to be trained, and the amount of training required.

The FMCSA cannot determine at this time the amount of training drivers and other motor carrier employees may need. However, the agency estimates that for a small entity employing 10 drivers the costs would not exceed $1,000 ($800 for drivers' wages + $200 for the instructor and course materials). The agency believes the economic impact on such motor carriers of these training costs would be minimal. The agency requests comments on this issue.

Accordingly, the FMCSA has considered the economic impacts of the requirements on small entities and certifies that this rule would not have a significant economic impact on a substantial number of small entities.

Executive Order 12372 (Intergovernmental Review)

Catalog of Federal Domestic Assistance Program Number 20.217, Motor Carrier Safety. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities do not apply to this program.

Paperwork Reduction Act

This action does not contain a collection of information requirement for the purposes of the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.*

National Environmental Policy Act

The agency has analyzed this rulemaking for the purpose of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and has determined under DOT Order 5610.1C (September 18, 1979) that this action does not require any environmental assessment.

Unfunded Mandates Reform Act of 1995

This rule does not impose an unfunded Federal mandate, as defined by the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1532 *et seq.*), that will result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more in any one year.

Executive Order 12988 (Civil Justice Reform)

This action meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

Executive Order 13045 (Protection of Children)

The FMCSA has analyzed this action under Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. This rule is not an economically significant rule and does not concern an environmental risk to health or safety that may disproportionately affect children.

Executive Order 12630 (Taking of Private Property)

This rule will not effect a taking of private property or otherwise have taking implications under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights.

Executive Order 13132 (Federalism)

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 13132, dated August 4, 1999, and it has been determined that this rulemaking does not have a substantial direct effect or sufficient federalism implications on States that would limit the policymaking discretion of the States. Nothing in this document directly preempts any State law or regulation. This final rule does not impose additional costs or burdens on the States.

List of Subjects

49 CFR Part 392

Highway safety, Motor carriers.

49 CFR Part 393

Highway safety, Motor carriers, Motor vehicle safety.

In consideration of the foregoing, the FMCSA proposes to amend title 49, Code of Federal Regulations, chapter III, as follows:

PART 392—[AMENDED]

1. The authority citation for part 392 is revised to read as follows:

Authority: 49 U.S.C. 31136, 31502; and 49 CFR 1.73.

2. Section 392.9 is revised to read as follows:

§ 392.9 Inspection of cargo, cargo securement devices and systems.

(a) *General.* A driver may not operate a commercial motor vehicle and a motor carrier may not require or permit a driver to operate a commercial motor vehicle unless—

(1) The commercial motor vehicle's cargo is properly distributed and adequately secured as specified in §§ 393.100 through 393.142 of this subchapter.

(2) The commercial motor vehicle's tailgate, tailboard, doors, tarpaulins, spare tire and other equipment used in its operation, and the means of fastening the commercial motor vehicle's cargo are secured; and

(3) The commercial motor vehicle's cargo or any other object does not obscure the driver's view ahead or to the right or left sides, interfere with the free movement of his/her arms or legs, prevent his/her free and ready access to accessories required for emergencies, or prevent the free and ready exit of any person from the commercial motor vehicle's cab or driver's compartment.

(b) *Drivers of trucks and truck tractors.* Except as provided in paragraph (b)(4) of this section, the driver of a truck or truck tractor must—

(1) Assure himself/herself that the provisions of paragraph (a) of this section have been complied with before he/she drives that commercial motor vehicle;

(2) Inspect the cargo and the devices used to secure the cargo within the first 50 miles after beginning a trip and cause any adjustments to be made to the cargo or load securement devices as necessary, including adding more securement devices, to ensure that cargo cannot shift on or within, or fall from the commercial motor vehicle; and

(3) Reexamine the commercial motor vehicle's cargo and its load securement devices periodically during the course of transportation and cause any adjustments to be made to the cargo or load securement devices as necessary, including adding more securement devices, to ensure that cargo cannot shift on or within, or fall from the commercial motor vehicle. A periodic reexamination and any necessary adjustments must be made—

(i) When the driver makes a change of his/her duty status; or

(ii) After the commercial motor vehicle has been driven for 3 hours; or

(iii) After the commercial motor vehicle has been driven for 150 miles, whichever occurs first.

(4) The rules in this paragraph (b) do not apply to the driver of a sealed commercial motor vehicle who has been ordered not to open it to inspect its cargo or to the driver of a commercial motor vehicle that has been loaded in a manner that makes inspection of its cargo impracticable.

PART 393—[AMENDED]

3. Revise the authority citation for part 393 to read as follows:

Authority: Section 1041(b) of Pub. L. 102–240, 105 Stat. 1914, 1993 (1991); 49 U.S.C. 31136 and 31502; and 49 CFR 1.73.

4. Amend § 393.5 to add the following definitions in alphabetical order:

§ 393.5 Definitions.

* * * * *

Aggregate working load limit. The summation of the working load limits or restraining capacity of all devices used to secure an article on a vehicle.

* * * * *

Anchor point. Part of the structure, fitting or attachment on a vehicle or cargo to which a tiedown is attached.

* * * * *

Bell pipe concrete. Pipe whose flanged end is of larger diameter than its barrel.

Blocking. A structure, device or another substantial article placed against or around an article to prevent horizontal movement of the article.

Bracing. A structure, device, or another substantial article placed against an article to prevent it from tipping, that may also prevent it from shifting.

* * * * *

Direct tiedown. A tiedown that is intended to provide direct resistance to potential shift of an article.

* * * * *

Frame vehicle. A vehicle with skeletal structure fitted with one or more bunk units for transporting logs. A bunk unit consists of a U-shaped front and rear bunks that together cradle logs. The bunks are welded, gusseted or otherwise firmly fastened to the vehicle's main beams, and are an integral part of the vehicle.

Friction mat. A device placed between the deck of a vehicle and cargo, or between articles of cargo, intended to provide greater friction than exists naturally between these surfaces.

* * * * *

g. The acceleration due to gravity, 32.2 ft/sec^2 (9.823 m/sec^2).

* * * * *

Hook-lift container. A specialized container, primarily used to contain and transport materials in the waste, recycling, construction/demolition and scrap industries, which is used in conjunction with specialized vehicles, in which the container is loaded and unloaded onto a tilt frame body by an articulating hook-arm.

* * * * *

Indirect tiedown. A tiedown whose tension is intended to increase the pressure of an article or stack of articles on the deck of the vehicle.

Integral securement system. A system on certain roll-on/roll-off containers and hook-lift containers and their related transport vehicles in which compatible front and rear hold down devices are mated to provide securement of the complete vehicle and its cargo.

* * * * *

Longwood. All logs that are not shortwood, i.e., are over 4.9 m (16 feet) long. Such logs are usually described as long logs or treelength.

* * * * *

Rail vehicle. A vehicle whose skeletal structure is fitted with stakes at the front and rear to contain logs loaded crosswise.

* * * * *

Shortwood. All logs typically up to 4.9 m (16 feet) long. Such logs are often described as cut-up logs, cut-to-length logs, bolts or pulpwood. Shortwood may be loaded lengthwise or crosswise, though that loaded crosswise is usually no more than 2.6 m (102 inches) long.

* * * * *

Sided vehicle. A vehicle whose cargo compartment is enclosed on all four sides by walls of sufficient strength to contain cargo, where the walls may include latched openings for loading and unloading, and includes vans, dump bodies, and a sided intermodal container carried by a vehicle.

* * * * *

Tiedown. A combination of securing devices which forms an assembly that attaches cargo to, or restrains cargo on, a vehicle or trailer, and is attached to anchor point(s).

Tractor-pole trailer. A combination vehicle that carries logs lengthwise so that they form the body of the vehicle. The logs are supported by a bunk located on the rear of the tractor, and another bunk on the skeletal trailer. The tractor bunk may rotate about a vertical axis, and the trailer may have a fixed, scoping, or cabled reach, or other mechanical freedom, to allow it to turn.

* * * * *

Void filler. Material used to fill a void between articles of cargo and the structure of the vehicle that has sufficient strength to prevent movement of the articles of cargo.

* * * * *

Well. The depression formed between two cylindrical articles when they are laid with their eyes horizontal and parallel against each other.

* * * * *

Working load limit (WLL). The maximum load that may be applied to a component of a cargo securement system during normal service, usually assigned by the manufacturer of the component.

5. Subpart I of part 393 is revised to read as follows:

Subpart I—Protection Against Shifting and Falling Cargo

Sec.

§ 393.100 Which types of commercial motor vehicles are subject to the cargo securement standards of this subpart, and what general requirements apply?

(a) *Applicability.* The rules in this subpart are applicable to trucks, truck tractors, semitrailers, full trailers, and pole trailers.

(b) *Prevention against loss of load.* Each commercial motor vehicle must, when transporting cargo on public roads, be loaded and equipped, and the cargo secured, in accordance with this subpart to prevent the cargo from spilling or falling from the motor vehicle.

(c) *Prevention against shifting of load.* Cargo must be contained or secured in accordance with this subpart to prevent shifting upon or within the vehicle.

§ 393.102 What are the minimum performance criteria for cargo securement devices and systems?

(a) *Performance criteria.* Cargo securement devices and systems must be capable of withstanding the following three forces, applied separately:

(1) 0.8 g deceleration in the forward direction;

(2) 0.5 g deceleration in the rearward direction; and

(3) 0.5 g acceleration in a lateral direction.

(b) *Performance criteria for devices to prevent vertical movement of loads that are not contained within the structure of the vehicle.* Securement systems must provide a downward force equivalent to at least 20 percent of the weight of the cargo if the cargo is not fully contained within the structure of the vehicle.

(c) *Prohibition on exceeding working load limits.* Cargo securement devices and systems must be designed, installed, and maintained to ensure that the maximum forces acting on the devices or systems do not exceed the working load limit for the devices under the conditions listed in paragraphs (a) and (b) of this section.

§ 393.104 What standards must cargo securement devices and systems meet in order to satisfy the requirements of this subpart?

(a) *General.* All devices and systems used to secure cargo to or within a vehicle must be capable of meeting the performance requirements of § 393.102.

(b) *Prohibition on the use of damaged securement devices.* All vehicle structures, systems, parts, and components used to secure cargo must be in proper working order when used to perform that function and must not have any visible damage, including but not limited to, cracks, cuts, and deformation.

(c) *Vehicle structures and anchor points.* Vehicle structures, floors, walls, decks, tiedown anchor points, headerboards, bulkheads, stakes, posts and associated mounting pockets used to contain or secure cargo must be strong enough to meet the performance criteria of § 393.102.

(d) *Tiedown assemblies.* Tiedown assemblies (including chains, wire rope, steel strapping, synthetic webbing, and cordage) and other attachment or fastening devices used to secure cargo to, or in, commercial motor vehicles must conform to the following applicable standards:

An assembly component of . . .	Must conform to . . .
(1) Steel strapping [1] [2]	Standard Specification for Strapping, Flat Steel and Seals, American Society for Testing and Materials (ASTM) D3953–91, 1991.[4]
(2) Chain	National Association of Chain Manufacturers' Welded Steel Chain Specifications, May 1, 1996.[4]
(3) Webbing	Web Sling and Tiedown Association's Recommended Standard Specification for Synthetic Webbing Tiedowns, 1991.[4]
(4) Wire rope [3]	Wire Rope Technical Board's Wire Rope Users Manual, 2nd rope Edition, November 1985.[4]
(5) Cordage	Cordage Institute rope standard: (i) PETRS–2, Polyester Fiber Rope, 3-Strand and 8-Strand Constructions, January 1993; [4] (ii) PPRS–2, Polypropylene Fiber Rope, 3-Strand and 8-Strand Constructions, August 1992; [4] (iii) CRS–1, Polyester/Polypropylene Composite Rope Specifications, 3-Strand and 8-Strand Standard Construction, May 1979; [4] (iv) NRS–1, Nylon Rope Specifications, 3-Strand and 8-Strand Standard Construction, May 1979; [4] and (v) C–1, Double Braided Nylon Rope Specifications DBN, January 1984.[4]

[1] Steel strapping not marked by the manufacturer with a working load limit will be considered to have a working load limit equal to one-fourth of the breaking strength listed in ASTM D3953–91.

[2] Steel strapping 25.4 mm (1 inch) or wider must have at least two pairs of crimps in each seal and, when an end-over-end lap joint is formed, must be sealed with at least two seals.

[3] Wire rope which is not marked by the manufacturer with a working load limit shall be considered to have a working load limit equal to one-fourth of the nominal strength listed in the manual.

[4] See § 393.7(b) for information on the incorporation by reference and availability of this document.

§ 393.106 What are the general requirements for securing cargo against shifting or falling?

(a) *General.* The rules in this section are applicable to the transportation of all types of cargo, except commodities in bulk that lack structure or fixed shape (e.g., liquids, gases, grain, liquid concrete, sand, gravel, aggregates) and are transported in a tank, hopper, box or similar device that forms part of the structure of a commercial motor vehicle. The rules in this section apply to the cargo types covered by the commodity-specific rules of § 393.122 through § 393.142. The commodity-specific rules take precedence over the general requirements of this section when

additional requirements are given for a commodity listed in those sections.

(b) *Minimum strength of cargo securement devices and systems.* The aggregate working load limit of tiedowns used to secure an article or group of articles against movement must be at least one-half times the weight of the article or group of articles.

(1) *Direct tiedowns.* The aggregate working load limit of all direct tiedowns used to restrain an article or articles is the sum of:

(i) One-half of the working load limit of each direct tiedown that is connected between the motor vehicle and the article of cargo; and

(ii) The working load limit of each direct tiedown that is attached to the vehicle, passes through or around the cargo, or is attached to it, and again attached to the vehicle.

(2) *Indirect tiedowns.* The aggregate working load limit of all indirect tiedowns used to restrain an article or articles is the sum of the working load limit for each tiedown which goes from one part of the vehicle, over an article, to another part of the vehicle.

§ 393.108 How is the working load limit of a tiedown determined?

(a) The working load limits of tiedowns may be determined by using either the tiedown manufacturer's markings or by using the tables in this section. The working load limits listed in the tables are to be used when the tiedown material is not marked by the manufacturer with the working load limit. Tiedown materials which are marked by the manufacturer with working load limits that differ from the tables, shall be considered to have a working load limit equal to the value for which they are marked.

(b) Synthetic cordage (e.g., nylon, polypropylene, polyester) which is not marked or labeled to enable identification of its composition or working load limit shall be considered to have a working load limit equal to that for polypropylene fiber rope.

(c) Welded steel chain which is not marked or labeled to enable identification of its grade or working load limit shall be considered to have a working load limit equal to that for grade 30 proof coil chain.

(d)(1) Wire rope which is not marked by the manufacturer with a working load limit shall be considered to have a working load limit equal to one-fourth of the nominal strength listed in the Wire Rope Users Manual.

(2) Wire which is not marked or labeled to enable identification of its construction type shall be considered to have a working load limit equal to that for 6 × 37, fiber core wire rope.

TABLES TO § 393.108

[Working Load Limits (WLL)]

Chain

Size mm (inches)	WLL in kg (pounds)				
	Grade 30 proof coil	Grade 43 high test	Grade 70 transport	Grade 80 alloy	Grade 100 alloy
1. 7 (¼)	580 (1,300)	1,180 (2,600)	1,430 (3,150)	1,570 (3,500)	
2. 8 (5⁄16)	860 (1,900)	1,770 (3,900)	2,130 (4,700)	2,000 (4,500)	2,600 (5,700)
3. 10 (⅜)	1,200 (2,650)	2,450 (5,400)	2,990 (6,600)	3,200 (7,100)	4,000 (8,800)
4. 11 (7⁄16)	1,680 (3,700)	3,270 (7,200)	3,970 (8,750)		
5. 13 (½)	2,030 (4,500)	4,170 (9,200)	5,130 (11,300)	5,400 (12,000)	6,800 (15,000)
6. 16 (⅝)	3,130 (6,900)	5,910 (13,000)	7,170 (15,800)	8,200 (18,100)	10,300 (22,600)
Chain Mark Examples:					
Example 1	PC	HT		T	
Example 2	3	4	7	8	10
Example 3	30	40	70	80	100

Synthetic Webbing

Width mm (inches)	WLL kg (pounds)
45 (1 ¾)	790 (1,750)
50 (2)	910 (2,000)
75 (3)	1,360 (3,000)
100 (4)	1,810 (4,000)

Wire Rope (6 × 37, Fiber Core)

Diameter mm (inches)	WLL kg (pounds)
7 (¼)	640 (1,400)
8 (5⁄16)	950 (2,100)
10 (⅜)	1,360 (3,000)
11 (7⁄16)	1,860 (4,100)
13 (½)	2,400 (5,300)
16 (⅝)	3,770 (8,300)
20 (¾)	4,940 (10,900)
22 (⅞)	7,300 (16,100)
25 (1)	9,480 (20,900)

Manila Rope

Diameter mm (inches)	WLL kg (pounds)
10 (⅜)	90 (205)
11 (7⁄16)	120 (265)
13 (½)	150 (315)
16 (⅝)	210 (465)
20 (¾)	290 (640)
25 (1)	480 (1,050)

Polypropylene Fiber Rope WLL (3–Strand and 8–Strand Constructions)

Diameter mm (inches)	WLL kg (pounds)
10 (⅜)	180 (400)
11 (7⁄16)	240 (525)
13 (½)	280 (625)
16 (⅝)	420 (925)
20 (¾)	580 (1,275)
25 (1)	950 (2,100)

Polyester Fiber Rope WLL (3–Strand and 8–Strand Constructions)

Diameter mm (inches)	WLL kg (pounds)
10 (⅜)	250 (555)
11 (7⁄16)	340 (750)
13 (½)	440 (960)
16 (⅝)	680 (1,500)
20 (¾)	850 (1,880)
25 (1)	1,500 (3,300)

Nylon Rope

Diameter mm (inches)	WLL kg (pounds)
10 (⅜)	130 (278)
11 (7⁄16)	190 (410)
13 (½)	240 (525)
16 (⅝)	420 (935)
20 (¾)	640 (1,420)
25 (1)	1,140 (2,520)

Double Braided Nylon Rope

Diameter mm (inches)	WLL kg (pounds)
10 (⅜)	150 (336)
11 (7⁄16)	230 (502)
13 (½)	300 (655)
16 (⅝)	510 (1,130)
20 (¾)	830 (1,840)
25 (1)	1,470 (3,250)

Steel Strapping

Width × thickness mm (inches)	WLL kg (pounds)

31.7 × .74 (1¼ × 0.029)	540 (1,190)
31.7 × .79 (1¼ × 0.031)	540 (1,190)
31.7 × .89 (1¼ × 0.035)	540 (1,190)
31.7 × 1.12 (1¼ × 0.044)	770 (1,690)
31.7 × 1.27 (1¼ × 0.05)	770 (1,690)
31.7 × 1.5 (1¼ × 0.057)	870 (1,925)
50.8 × 1.12 (2 × 0.044)	1,200 (2,650)
50.8 × 1.27 (2 × 0.05)	1,200 (2,650)

§ 393.110 What else do I have to do to determine the minimum number of tiedowns?

(a) In addition to the requirements of § 393.106, the minimum number of tiedowns required to secure an article or group of articles against movement depends on whether indirect or direct tiedowns are used and the length of the article(s) being secured.

(b) When an article is not blocked or positioned to prevent movement in the forward direction by a headerboard, bulkhead, other cargo that is positioned to prevent movement, or other appropriate blocking devices, it must be secured by at least:

(1) One tiedown for articles 5 feet (1.52 meters) or less in length, and 1,100 pounds (500 kg) or less in weight;

(2) Two tiedowns if the article is:

(i) 5 feet (1.52 meters) or less in length and more than 1,100 pounds (500 kg) in weight; or

(ii) Longer than 5 feet (1.52 meters) but less than or equal to 10 feet (3.04 meters) in length, irrespective of the weight.

(3) Two tiedowns if the article is longer than 10 feet (3.04 meters), and one additional tiedown for every 10 feet (3.04 meters) of article length, or fraction thereof, beyond the first 10 feet (3.04 meters) of length.

§ 393.112 What is the strength required for load binders and associated hardware?

The strength of load binders and hardware that are part of, or used in conjunction with, a tiedown assembly must be equal to, or greater than, the minimum strength specified for that tiedown assembly in § 393.106.

§ 393.114 What is the minimum strength of an attachment point on a vehicle?

The strength of a hook, bolt, weld, or other connector attaching the tiedown assembly to the commercial motor vehicle and the place and means of mounting the connector must be equal to, or greater than, the minimum strength required by § 393.106 for that tiedown assembly.

§ 393.116 What is the minimum strength for a winch or fastening device?

A winch or other fastening device mounted on a commercial motor vehicle and used in conjunction with a tiedown assembly must have a combined strength equal to or greater than the strength of the tiedown assembly.

§ 393.118 Must a tiedown be adjustable?

A tiedown assembly, associated connectors, and attachment devices must be designed, constructed, and maintained so the driver of an in-transit commercial motor vehicle can tighten them. However, this section does not apply to the use of steel strapping.

§ 393.120 What are the requirements for front end structures used as part of a cargo securement system?

(a) *Applicability.* The rules in this section are applicable to commercial motor vehicles transporting cargo that is in contact with the front end structure of the vehicle. The front end structure on these cargo-carrying vehicles must meet the performance requirements of this section.

(b) *Height and width.* (1) The front end structure must extend either to a height of 4 feet above the floor of the vehicle or to a height at which it blocks forward movement of any item of cargo being carried on the vehicle, whichever is lower.

(2) The front end structure must have a width which is at least equal to the width of the vehicle or which blocks forward movement of any item of cargo being transported on the vehicle, whichever is narrower.

(c) *Strength.* The front end structure must be capable of withstanding the following horizontal forward static load:

(1) For a front end structure less than 6 feet in height, a horizontal forward static load equal to one-half (0.5) of the weight of the cargo being transported on the vehicle uniformly distributed over the entire portion of the front end structure that is within 4 feet above the vehicle's floor or that is at or below a height above the vehicle's floor at which it blocks forward movement of any item of the vehicle's cargo, whichever is less; or

(2) For a front end structure 6 feet in height or higher, a horizontal forward static load equal to four-tenths (0.4) of the weight of the cargo being transported on the vehicle uniformly distributed over the entire front end structure.

(d) *Penetration resistance.* The front end structure must be designed, constructed, and maintained so that it is capable of resisting penetration by any item of cargo that contacts it when the vehicle decelerates at a rate of 20 feet per second, per second. The front end structure must have no aperture large enough to permit any item of cargo in contact with the structure to pass through it.

(e) *Substitute devices.* The requirements of this section may be met by the use of devices performing the same functions as a front end structure, if the devices are at least as strong as, and provide protection against shifting cargo at least equal to, a front end structure which conforms to those requirements.

Specific Securement Requirements by Commodity Type

§ 393. 122 What are the rules for securing logs?

(a) *Applicability.* The rules in this section are applicable to the transportation of logs that are unitized by banding or other comparable means. Loads that consist of no more than four processed logs may be transported in accordance with the general cargo securement rules of §§ 393.100 through 393.120. Firewood, stumps, log debris and other such short logs must be transported in a vehicle or container enclosed on both sides, front, and rear and of adequate strength to contain them. Longer logs may also be so loaded. This section applies to transportation of all other logs. A stack of logs that is composed of both shortwood and longwood must be treated as shortwood.

(b) *Components of a securement system.* (1) Logs must be transported on a vehicle designed and built, or adapted, for the transportation of logs. Any such vehicle must be fitted with bunks, bolsters, stakes or standards, or other equivalent means, that cradle the logs and prevent them from rolling.

(2) All vehicle components involved in securement of logs must be designed and built to withstand all anticipated operational forces without failure, accidental release or permanent deformation. Stakes or standards that are not permanently attached to the vehicle must be secured in a manner that prevents unintentional separation from the vehicle in transit.

(3) Tiedowns must be used in combination with the stabilization provided by bunks, stakes and bolsters to secure the load.

(c) *Use of securement system.* (1) Logs must be solidly packed, and the outer

bottom logs must be in contact with and resting solidly against the bunks, bolsters, or stakes.

(2) Each outside log must touch at least two bunks, bolsters, or stakes, but if one end does not actually touch a stake, it must rest on other logs in a stable manner and must extend beyond the end of the stake.

(3) The center of the highest outside log on each side or end must be below the top of each stake.

(4) Each log that is not held in place by contact with other logs or the stakes must be held in place by an indirect tiedown. Additional tiedowns or securement devices must be used when the condition of the wood results in such low friction between logs that they are likely to slip upon each other.

(d) *Frame vehicle(s).* (1) Shortwood loaded lengthwise must be cradled in a bunk unit, and must be secured to the vehicle by at least two indirect tiedowns.

(2) Longwood must be cradled in two or more bunks, and must be secured to the vehicle by at least two indirect tiedowns at locations along the load that provide effective securement.

(3) The aggregate working load limit for all tiedowns securing a stack of logs must be no less than one-sixth the weight of the stack of logs.

(4) Shortwood loaded crosswise must be secured in the same manner as required for rail trucks and trailers.

(e) *Rail vehicle(s).* (1) Logs in the bottom tier of shortwood loaded crosswise must be supported by vehicle structure within 30 cm (12 inches) of each end.

(2) One stack of shortwood loaded crosswise must be secured with at least two indirect tiedowns. These must attach to the vehicle frame at the front and rear of the load, and must cross the load lengthwise.

(3) Where two indirect tiedowns are used, they must be positioned about one-third of the logs' length in from each end of the logs.

(4) A rail vehicle over 10 m (33 feet) long must be fitted with center stakes to divide it into two sections about equal in length. Where a vehicle is so divided, each tiedown must secure the highest log on each side of the center stake, and must be fastened below these logs. It may be fixed at each end and tensioned from the middle, or fixed in the middle and tensioned from each end, or may pass through a pulley or equivalent in the middle and be tensioned from one end.

(5) Any structure or stake that is subjected to an upward force when the tiedowns are tensioned must be anchored to resist that force.

(6) If two stacks of shortwood can fit side-by-side within the allowable width, they may be so loaded, provided:

(i) There is no space between the two stacks of logs;

(ii) The outside of each stack is raised at least 2.5 cm (1 in) within 10 cm (4 in) of the end of the logs or the side of the vehicle;

(iii) The highest log is no more than 2.44 m (8 ft) above the deck; and

(iv) At least one tiedown is used lengthwise across each stack of logs .

(f) *Flatbed vehicle(s).* (1) Shortwood loaded crosswise must be secured in the same manner as required for rail vehicle(s).

(2) Shortwood loaded lengthwise must be contained by stakes.

(3) Each stack of logs must be secured by at least two indirect tiedowns. However, if all logs in any stack are blocked in the front by a headboard strong enough to restrain the load, or another stack of logs, and blocked in the rear by another stack of logs or vehicle end structure, the stack may be secured with one tiedown. If one tiedown is used, it must be about midway between the stakes.

(4) Longwood loaded lengthwise must be contained by stakes.

(5) The aggregate working load limit for all tiedowns must be no less than one-sixth the weight of the stack logs.

(6) Each outside log must be secured by at least two indirect tiedowns.

(g) *Securement of logs transported on pole trailers.* (1) The load must be secured by at least one tiedown at each bunk, or alternatively, by at least two tiedowns used as wrappers that encircle the entire load at locations along the load that provide effective securement.

(2) The front and rear wrappers must be at least 3.04 meters (10 feet) apart.

(3) Large diameter single and double log loads must be immobilized with chock blocks or other equivalent means to prevent shifting.

(4) Large diameter logs that rise above stakes must be secured to the underlying load with at least two additional wrappers.

§ 393.124 What are the rules for securing dressed lumber or similar building products?

(a) *Applicability.* The rules in this section apply to the transportation of bundles of dressed lumber, packaged lumber, building products such as plywood, gypsum board or other materials of similar shape. Lumber or building products which are not bundled or packaged must be treated as loose items and transported in accordance with §§ 393.100 through 393.120 of this subpart. For the purpose of this section, ''bundle'' refers to packages of lumber, building materials or similar products which are unitized for securement as a single item of cargo.

(b) *Securement of bundles transported using no more than one tier.* (1) Bundles must be placed side by side in direct contact with each other, or a means must be provided to prevent bundles shifting towards each other.

(2) Bundles carried on one tier must be secured in accordance with the general provisions of §§ 393.100 through 393.120.

(c) *Securement of bundles transported using more than one tier.* Bundles carried in more than one tier must be either:

(1) Blocked against lateral movement by stakes on the sides of the vehicle and secured by indirect tiedowns laid out over the top tier, as outlined in the general provisions of §§ 393.100 through 393.120; or

(2) Restrained from lateral movement by blocking or high friction devices between tiers and secured by indirect tiedowns laid out over the top tier, as outlined in the general provisions of §§ 393.100 through 393.120; or

(3) Placed directly on top of other bundles or on spacers and secured in accordance with the following:

(i) The length of spacers between bundles must provide support to all pieces in the bottom row of the bundle.

(ii) The width of individual spacers must be greater than the height.

(iii) If spacers are comprised of layers of material, the layers must be unitized or fastened together in a manner which ensures that the spacer performs as a single piece of material.

(iv) The arrangement of the tiedowns for the bundles must be:

(A) Secured by indirect tiedowns over the second tier of bundles, or at a height of 1.85 m (6 ft) above the trailer deck, whichever is greater. If the top tiers are less than 1.85 m (6 ft) above the trailer deck, they may be secured in accordance with the general provisions of §§ 393.100 through 393.120; and

(B) Secured by indirect tiedowns over the top tier of bundles, in accordance with the general provisions of §§ 393.100 through 393.120 with a minimum of two indirect tiedowns for bundle(s) longer than 1.52 m (5 ft); or

(C) Secured by indirect tiedowns laid out over each tier of bundles, in accordance with §§ 393.100 through 393.120 using a minimum of two indirect tiedowns over each top bundle(s) longer than 1.52 m (5 ft), in all other circumstances.

§ 393.126 What are the rules for securing metal coils?

(a) *Applicability.* The rules in this section apply to the transportation of one or more metal coils which, individually or together, weigh 2268 kg (5000 pounds) or more. Shipments of metal coils that weigh less than 2268 kg (5000 pounds) may be secured in accordance with the provisions of §§ 393.100 through 393.120.

(b) *Coils with eyes vertical on a flatbed vehicle, in a sided vehicle or intermodal container with anchor points*—(1) *An individual coil.* Tiedowns must be arranged in a manner to prevent the coils from tipping in the forward, rearward, and lateral directions. The restraint system must include the following:

(i) At least one indirect tiedown attached diagonally from the left side of the vehicle or intermodal container (near the forwardmost part of the coil), across the eye of the coil, to the right side of the vehicle or intermodal container (near the rearmost part of the coil);

(ii) At least one indirect tiedown attached diagonally from the right side of the vehicle or intermodal container (near the forward-most part of the coil), across the eye of the coil, to the left side of the vehicle or intermodal container (near the rearmost part of the coil);

(iii) At least one indirect tiedown attached transversely over the eye of the coil; and

(iv) Either blocking and bracing, friction mats or direct tiedowns must be used to prevent longitudinal movement in the forward direction.

(2) *Coils grouped in rows.* For vehicles transporting coils which are grouped and loaded side by side in a transverse or longitudinal row, the coils must be secured by the following:

(i) At least one direct tiedown attached to the front of the row of coils, restraining against forward motion, and whenever practicable, making an angle no more than 45 degrees with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container;

(ii) At least one direct tiedown attached to the rear of the row of coils, restraining against rearward motion, and whenever practicable, making an angle no more than 45 degrees with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container;

(iii) At least one indirect tiedown over the top of each coil or transverse row of coils, restraining against vertical motion. Indirect tiedowns going over the top of a coil(s) must be as close as practicable to the eye of the coil and positioned to prevent the tiedown from slipping or becoming unintentionally unfastened while the vehicle is in transit; and

(iv) Direct tiedowns, blocking or bracing must be arranged to prevent shifting or tipping in the forward, rearward and lateral directions.

(c) *Coils with eyes crosswise on a flatbed vehicle, in a sided vehicle or intermodal container with anchor points*—(1) *An individual coil.* The coil must be secured by the following:

(i) A means (*e.g.,* timbers, chocks or wedges, a cradle, etc.) to prevent the coil from rolling. The means of preventing rolling must support the coil off the deck, and must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit. If timbers, chocks or wedges are used, they must be held in place by coil bunks or similar devices to prevent them from coming loose. The use of nailed blocking or cleats as the sole means to secure timbers, chocks or wedges, or a nailed wood cradle, is prohibited;

(ii) At least one direct tiedown through its eye, restricting against forward motion, and whenever practicable, making an angle no more than 45 degrees with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container; and

(iii) At least one direct tiedown through its eye, restricting against rearward motion, and whenever practicable, making an angle no more than 45 degrees with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container.

(2) *Prohibition on crossing of chains when coils are transported with eyes crosswise.* Attaching direct tiedowns diagonally through the eye of a coil to form an X-pattern when viewed from above the vehicle is prohibited.

(d) *Coils with eyes lengthwise on a flatbed vehicle, in a sided vehicle or intermodal container with anchor points*—(1) *An individual coil—option 1.* The coil must be secured by:

(i) A means (*e.g.,* timbers, chocks or wedges, a cradle, etc.) to prevent the coil from rolling. The means of preventing rolling must support the coil off the deck, and must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit. If timbers, chocks or wedges are used, they must be held in place by coil bunks or similar devices to prevent them from coming loose. The use of nailed blocking or cleats as the sole means to secure timbers, chocks or wedges, or a nailed wood cradle, is prohibited;

(ii) At least one direct tiedown attached diagonally through its eye from the left side of the vehicle or intermodal container (near the forward-most part of the coil), to the right side of the vehicle or intermodal container (near the rearmost part of the coil), making an angle no more than 45 degrees, whenever practicable, with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container;

(iii) At least one direct tiedown attached diagonally through its eye, from the right side of the vehicle or intermodal container (near the forward-most part of the coil), to the left side of the vehicle or intermodal container (near the rearmost part of the coil), making an angle no more than 45 degrees, whenever practicable, with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container;

(iv) At least one indirect tiedown transversely over the top of the coil; and

(v) Either blocking, or friction mats to prevent longitudinal movement in the forward direction.

(2) *An individual coil—option 2.* The coil must be secured by:

(i) A means (*e.g.,* timbers, chocks or wedges, a cradle, etc.) to prevent the coil from rolling. The means of preventing rolling must support the coil off the deck, and must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit. If timbers, chocks or wedges are used, they must be held in place by coil bunks or similar devices to prevent them from coming loose. The use of nailed blocking or cleats as the sole means to secure timbers, chocks or wedges, or a nailed wood cradle, is prohibited;

(ii) At least one direct tiedown attached straight through its eye from the left side of the vehicle or intermodal container (near the forward-most part of the coil), to the left side of the vehicle or intermodal container (near the rearmost part of the coil), and, whenever practicable, making an angle no more than 45 degrees with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container;

(iii) At least one direct tiedown attached straight through its eye, from the right side of the vehicle or intermodal container (near the forward-most part of the coil), to the right side of the vehicle or intermodal container (near the rearmost part of the coil), and whenever practicable, making an angle no more than 45 degrees with the floor of the vehicle or intermodal container when viewed from the side of the vehicle or container;

(iv) At least one indirect tiedown transversely over the top of the coil; and

(v) Either blocking, or friction mats to prevent longitudinal movement in the forward direction.

(3) *An individual coil—option 3.* The coil must be secured by:

(i) A means (e.g., timbers, chocks or wedges, a cradle, etc.) to prevent the coil from rolling. The means of preventing rolling must support the coil off the deck, and must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit. If timbers, chocks or wedges are used, they must be held in place by coil bunks or similar devices to prevent them from coming loose. The use of nailed blocking or cleats as the sole means to secure timbers, chocks or wedges, or a nailed wood cradle, is prohibited;

(ii) At least one indirect tiedown over the top of the coil, located near the forward-most part of the coil;

(iii) At least one indirect tiedown over the top of the coil located near the rearmost part of the coil; and

(iv) Either blocking or friction mats to prevent longitudinal movement in the forward direction.

(4) *Rows of coils.* A transverse row of coils having approximately equal outside diameters must be secured with:

(i) A means (e.g., timbers, chocks or wedges, a cradle, etc.) to prevent each coil in the row of coils from rolling. The means of preventing rolling must support each coil off the deck, and must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit. If timbers, chocks or wedges are used, they must be held in place by coil bunks or similar devices to prevent them from coming loose. The use of nailed blocking or cleats as the sole means to secure timbers, chocks or wedges, or a nailed wood cradle, is prohibited;

(ii) At least two indirect tiedowns over the top of each coil or transverse row; and

(iii) Either blocking, bracing or friction mats to prevent longitudinal movement in the forward direction for each coil.

(e) *Coils in a sided vehicle or intermodal container without anchor points.* Metal coils transported in a vehicle with sides or an intermodal container without anchor points must be loaded in a manner to prevent shifting and tipping. The coils must be secured to prevent lateral and longitudinal movement and tipping by the use of friction mats, or a system of blocking and bracing or tiedowns, and either blocking and bracing.

§ 393.128 What are the rules for securing paper rolls?

(a) *Applicability.* The rules in this section apply to shipments of paper rolls which, individually or together, weigh 2268 kg (5000 lb) or more. Shipments of paper rolls that weigh less than 2268 kg (5000 lb), and paper rolls that are unitized on a pallet, may either be secured in accordance with the rules in this section or the requirements of §§ 393.100 through 393.120.

(b) *Rules for paper rolls loaded with eyes vertical in a sided vehicle.* (1) Paper rolls must be placed tightly against the walls of the vehicle, other paper rolls, or other cargo, to prevent movement during transit.

(2) If there are not enough paper rolls in the shipment to reach the walls of the vehicle, lateral movement must be prevented by filling the void, blocking, bracing, tiedowns or friction mats. The paper rolls may also be banded together.

(3) When any void behind a group of paper rolls, including that at the rear of the vehicle, exceeds the diameter of the paper rolls, rearward movement must be prevented by friction mats, blocking, bracing, tiedowns, or banding to other rolls.

(4)(i) If a paper roll is not prevented from tipping or falling sideways or rearwards by vehicle structure or other cargo, and its width is more than 2 times its diameter, it must be prevented from tipping or falling by banding it to other rolls, bracing, or tiedowns.

(ii) If the forwardmost roll(s) in a group of paper rolls is not prevented from tipping or falling forwards by vehicle structure or other cargo and it is restrained against forward movement by friction mat(s) alone, and its width is more than 1.75 times its diameter, it must be prevented from tipping or falling forwards by banding it to other rolls, bracing, or tiedowns.

(iii) Otherwise, when a paper roll or the forwardmost roll in groups of rolls that are not prevented from tipping or falling forwards by vehicle structure or other cargo and its width exceeds 1.25 times its diameter it must be prevented from tipping or falling by banding to other rolls, bracing or tiedowns.

(5) If paper rolls are banded together, the rolls must be placed tightly against each other to form a stable group. The bands must be applied tightly, and must be secured so that they cannot fall off the rolls or to the deck.

(6) A friction mat used to provide the principal securement for a paper roll must protrude from beneath the roll in the direction in which it is providing that securement.

(c) *Rules for split loads of paper rolls loaded with eyes vertical in a sided vehicle.* (1) If a paper roll in a split load is not prevented from forward movement by vehicle structure or other cargo, it must be prevented from forward movement by filling the open space, or by blocking, bracing, tiedowns, friction mats, or some combination of these.

(2) A friction mat used to provide the principal securement for a paper roll must protrude from beneath the roll in the direction in which it is providing that securement.

(d) *Rules for stacked loads of paper rolls loaded with eyes vertical in a sided vehicle.* (1) Paper rolls must not be loaded on a layer of paper rolls beneath unless that layer extends to the front of the vehicle.

(2) Paper rolls in the second and subsequent layers must be prevented from forward, rearward or lateral movement by means as allowed for the bottom layer, or by use of a blocking roll from a lower layer.

(3) The blocking roll must be at least 50 mm (2 in) taller than other rolls, or must be raised at least 38 mm (1.5 in) using dunnage.

(4) A roll in the rearmost row of any layer must not be raised using dunnage.

(e) *Rules for securing paper rolls loaded with eyes crosswise in a sided vehicle.* (1) The paper rolls must be prevented from rolling or shifting longitudinally by contact with vehicle structure or other cargo, by chocks, wedges or blocking and bracing of adequate size, or by tiedowns.

(2) Chocks, wedges or blocking must be held securely in place by some means in addition to friction, so they cannot become unintentionally unfastened or loose while the vehicle is in transit.

(3) The rearmost roll must not be secured using the rear doors of the vehicle or intermodal container, or by blocking held in place by those doors.

(4) If there is more than a total of 203 mm (8 in) of space between the ends of a paper roll, or a row of rolls, and the walls of the vehicle, void fillers, blocking, bracing, friction mats, or tiedowns must be used to prevent the roll from shifting towards either wall.

(f) *Rules for stacked loads of paper rolls loaded with eyes horizontal and crosswise in a sided vehicle.* (1) Rolls must not be loaded in a second layer unless the bottom layer extends to the front of the vehicle.

(2) Rolls must not be loaded in a higher layer unless all wells in the layer beneath are filled.

(3) The foremost roll in each upper layer, or any roll with an empty well in front of it, must be secured against forward movement by:

(i) Banding it to other rolls, or

(ii) Blocking against an adequately secured eye-vertical blocking roll resting on the floor of the vehicle which is at least 1.5 times taller than the diameter of the roll being blocked, or

(iii) Placing it in a well formed by two rolls on the lower row whose diameter is equal to or greater than that of the roll on the upper row.

(4) The rearmost roll in each upper layer must be secured by banding it to other rolls if it is located in either of the last two wells formed by the rearmost rolls in the layer below.

(5) Rolls must be secured against lateral movement by the same means allowed for the bottom layer when there is more than a total of 203 mm (8 in) of space between the ends of a paper roll, or a row of rolls, and the walls of the vehicle.

(g) *Paper rolls loaded with the eyes lengthwise in a sided vehicle.* (1) Each roll must be prevented from forward movement by contact with vehicle structure, other cargo, blocking or tiedowns.

(2) Each roll must be prevented from rearward movement by contact with other cargo, blocking, friction mats or tiedowns.

(3) The paper rolls must be prevented from rolling or shifting laterally by contact with the wall of the vehicle or other cargo, or by chocks, wedges or blocking of adequate size.

(4) Chocks, wedges or blocking must be held securely in place by some means in addition to friction, so they cannot become unintentionally unfastened or loose while the vehicle is in transit.

(h) *Rules for stacked loads paper rolls loaded with the eyes lengthwise in a sided vehicle.* (1) Rolls must not be loaded in a higher layer if another roll will fit in the layer beneath.

(2) An upper layer must be formed by placing paper rolls in the wells formed by the rolls beneath.

(3) A roll in an upper layer must be secured against forward and rearward movement by any of the means allowed for the bottom layer, by use of a blocking roll, or by banding to other rolls.

(i) *Paper rolls loaded on a flatbed vehicle or in a curtain-sided vehicle*—(1) *Paper rolls with eyes vertical or with eyes lengthwise.* (i) The paper rolls must be loaded and secured as described for a sided vehicle, and the entire load must be secured by tiedowns in accordance with the requirements of §§ 393.100 through 393.120.

(ii) Stacked loads of paper rolls with eyes vertical are prohibited.

(2) *Paper rolls with eyes crosswise.* (i) The paper rolls must be prevented from rolling or shifting longitudinally by contact with vehicle structure or other cargo, by chocks, wedges or blocking and bracing of adequate size, or by tiedowns.

(ii) Chocks, wedges or blocking must be held securely in place by some means in addition to friction so that they cannot become unintentionally unfastened or loose while the vehicle is in transit.

(iii) Transverse or longitudinal tiedowns must be used to prevent lateral movement.

§ 393.130 What are the rules for securing concrete pipe?

(a) *Applicability.* (1) The rules in this section apply to the transportation of concrete pipe on flatbed trailers and vehicles, and lowboy trailers.

(2) Concrete pipe bundled tightly together into a single rigid article that has no tendency to roll, and concrete pipe loaded in a sided vehicle or container must be secured in accordance with the provisions of §§ 393.100 through 393.120.

(b) *Aggregate working load limits for tiedowns.* The aggregate working load limit of all tiedowns on any group of pipe must not be less than half the total weight of all pipe in the group.

(c) *Blocking.* (1) Blocking may be one or more pieces placed symmetrically about the center of a pipe.

(2) One piece must extend at least half the distance from the center to each end of the pipe, and two pieces must be placed on the opposite side, one at each end of the pipe.

(3) Blocking must be placed firmly against the pipe, and must be secured to prevent it moving out from under the pipe.

(4) Timber blocking must have minimum dimensions of at least 10×15 cm (4×6 in).

(d) *Arranging the load*—(1) *Pipe of different diameter.* If pipe of more than one diameter are loaded on a vehicle, groups must be formed that consist of pipe of only one size, and each group must be separately secured.

(2) *Arranging a bottom tier.* The bottom tier must be arranged to cover the full length of the vehicle, or as a partial tier in one group or two groups.

(3) *Arranging an upper tier.* Pipe must be placed only in the wells formed by adjacent pipes in the tier beneath. An upper tier must not be started unless all wells in the tier beneath are filled.

(4) *Arranging the top tier.* The top tier must be arranged as a complete tier, a partial tier in one group, or a partial tier in two groups.

(5) *Arranging bell pipe.* (i) Bell pipe must be loaded on at least two longitudinal spacers of sufficient height to ensure that the bell is clear of the deck.

(ii) Bell pipe loaded in one tier must have the bells alternating on opposite sides of the vehicle.

(iii) The ends of consecutive pipe must be staggered, if possible, within the allowable width, otherwise they must be aligned.

(iv) Bell pipe loaded in more than one tier must have the bells of the bottom tier all on the same side of the vehicle.

(v) Pipe in every upper tier must be loaded with bells on the opposite side of the vehicle to the bells of the tier below.

(vi) If the second tier is not complete, pipe in the bottom tier which do not support a pipe above must have their bells alternating on opposite sides of the vehicle.

(e) *Securing pipe with an inside diameter up to 1,143 mm (45 in)*—(1) *Stabilizing the bottom tier.* (i) The bottom tier must be contained longitudinally at each end by blocking, vehicle end structure, stakes, a locked pipe unloader, or other equivalent means.

(ii) Other pipe in the bottom tier may also be held in place by blocks and/or wedges.

(iii) Every pipe in the bottom tier must also be held firmly in contact with the adjacent pipe by direct tiedowns though the front and rear pipes.

(iv) The direct tiedown on the front pipe of the bottom tier must run aft at an angle not more than 45 degrees with the horizontal, whenever practicable.

(v) The direct tiedown on the rear pipe of the bottom tier must run forward at an angle not more than 45 degrees with the horizontal, whenever practicable.

(2) *Use of tiedowns.* (i) Direct tiedowns through the pipe must be chains.

(ii) Longitudinal indirect tiedowns may be chain or wire rope.

(iii) Pipe may be secured individually with a direct tiedown through the pipe.

(iv) A direct tiedown through a pipe in an upper tier is considered to secure all those pipe beneath on which that tiedown causes pressure.

(v) If each pipe is not secured individually with a tiedown, then:

(A) Two indirect tiedowns must be placed longitudinally over the group of pipes; and

(B) One transverse tiedown (direct or indirect) must be used for every 3.0 m (10 ft) of load length. The transverse tiedowns may be placed through a pipe, or over both longitudinal tiedowns between two pipes on the top tier.

(vi) If the first pipe of a group in the top tier is not at the front of the tier beneath, it must be secured by an additional direct tiedown that runs rearward at an angle not more than 45 degrees to the horizontal, whenever practicable. This direct tiedown must pass either through the front pipe of the upper tier, or outside it and over both longitudinal indirect tiedowns.

(vii) If the last pipe of a group in the top tier is not at the rear of the tier beneath, it must be secured by an additional direct tiedown that runs forward at an angle not more than 45 degrees to the horizontal, whenever practicable. This tiedown must pass either through the rear pipe of the upper tier or outside it and over both longitudinal tiedowns.

(f) *Securing large pipe, with an inside diameter over 1143 mm (45 in).* (1) The front pipe and the rear pipe must be secured by blocking or wedges.

(2) The blocking or wedges must be pushed firmly under the pipe.

(3) Each pipe must be secured by tiedowns through the pipe.

(4) Direct tiedowns are required through each pipe in the front half of the load, which includes the middle one if there are an odd number, and must run rearward at an angle not more than 45 degrees with the horizontal, whenever practicable.

(5) Direct tiedowns are required through each pipe in the rear half of the load, and must run forward at an angle not more than 45 degrees with the horizontal, whenever practicable, to hold each pipe firmly in contact with adjacent pipe.

(6) If the front or rear pipe is not also in contact with vehicle end structure, stakes, a locked pipe unloader, or other equivalent means, at least two direct tiedowns must be used through that pipe.

(g) *Conditions of low friction.* Ice must be removed from concrete pipe before it is loaded.

§ 393.132 What are the rules for securing intermodal containers?

(a) *Applicability.* The rules in this section apply to the transportation of intermodal containers. Cargo contained within an intermodal container must be secured in accordance with the provisions of §§ 393.100 through 393.120 or, if applicable, the commodity specific rules of this part.

(b) *Rules for transporting intermodal containers on container chassis vehicle(s).* (1) The intermodal container must be secured to the container chassis with securement devices or integral locking devices that cannot unintentionally become unfastened while the vehicle is in transit.

(2) The securement devices must restrain the container from moving more than 1.27 cm (½ in) forward, more than 1.27 cm (½ in) aft, more than 1.27 cm (½ in) to the right, more than 1.27 cm (½ in) to the left, or more than 2.54 cm (1 in) vertically.

(3) The front and rear of the container must be secured independently.

(c) *Rules for transporting intermodal containers on vehicles other than container chassis vehicle(s).* (1) All lower corners of the intermodal container must rest upon the vehicle, or the corners must be supported by a structure capable of bearing the weight of the container and that support structure must be independently secured to the motor vehicle.

(2) All lower corners of intermodal containers must be secured to the vehicle by chains, wire rope, or integral locking devices.

(3) The front and rear of the container must be secured independently.

(4) Each chain, wire rope, or integral locking device must be attached to the container in a manner that prevents it from being unintentionally unfastened while the vehicle is in transit.

§ 393.134 What are the rules for securing automobiles, light trucks and vans?

(a) *Applicability.* The rules in this section apply to the transportation of automobiles, light trucks, and vans which individually weigh 4,500 kg. (10,000 lb) or less. Vehicles which are heavier than 4,500 kg (10,000 lb) must be secured in accordance with the provisions of § 393.136 of this part.

(b) Automobiles, light trucks, and vans must be restrained at both the front and rear to prevent lateral, forward, rearward, and vertical movement using a minimum of two direct tiedowns.

(c) Direct tiedowns that are designed to be affixed to the structure of the automobile, light truck, or van shall use the mounting points on those vehicles that have been specifically designed for that purpose.

(d) Direct tiedowns that are designed to fit over or around the wheels of an automobile, light truck, or van shall provide restraint in the lateral, longitudinal and vertical directions.

(e) Edge protectors are not required for synthetic webbing at points where the webbing comes in contact with the tires.

§ 393.136 What are the rules for securing heavy vehicles, equipment and machinery?

(a) *Applicability.* The rules in this section apply to the transportation of heavy vehicles, equipment and machinery which operate on wheels or tracks, such as front end loaders, bulldozers, tractors, and power shovels and which individually weigh 4,536 kg (10,000 lb.) or more. Vehicles, equipment and machinery which is lighter than 4,536 kg (10,000 lb.) may also be secured in accordance with the provisions of this section, with § 393.134, or in accordance with the provisions of §§ 393.100 through 393.120.

(b) *Preparation of equipment being transported.* (1) Accessory equipment, such as hydraulic shovels, must be completely lowered and secured to the vehicle.

(2) The parking brake on the equipment being transported must be engaged, where applicable.

(3) Articulated vehicles shall be restrained in a manner that prevents articulation while in transit.

(c) *Rules for transporting heavy vehicles, equipment or machinery with crawler tracks or wheels.* (1) Heavy equipment or machinery with crawler tracks must be restrained against movement in the lateral, forward, rearward, and vertical direction using a minimum of four direct tiedowns.

(2) The direct tiedown must be affixed at the front and rear of the vehicle, or mounting points on the vehicle that have been specifically designed for that purpose.

§ 393.138 What are the rules for securing flattened or crushed vehicles?

(a) *Applicability.* The rules in this section apply to the transportation of vehicles such as automobiles, light trucks, and vans which have been flattened or crushed.

(b) *General requirements.* Flattened or crushed vehicles must be transported so that:

(1) The cargo does not shift upon the transport vehicle while in transit; and

(2) Loose parts from the flattened vehicles do not become dislodged and fall from the transport vehicle.

(c) *Prohibition on the use of synthetic webbing.* The use of synthetic webbing to secure flattened or crushed vehicles is prohibited.

(d) *Securement of flattened or crushed vehicles.* Flattened or crushed vehicles must be transported on vehicles which have:

(1) Containment walls or comparable means on four sides which extend to the full height of the load and which block against movement of the cargo in the forward, rearward and lateral directions; or

(2)(i) Containment walls or comparable means on three sides which extend to the full height of the load and

which block against movement of the cargo in the forward, rearward and the lateral direction for which there is no containment wall or comparable means, and

(ii) A minimum of two indirect tiedowns are required per vehicle stack; or

(3)(i) Containment walls on two sides which extend to the full height of the load and which block against movement of the cargo in the forward and rearward directions, and

(ii) Three indirect tiedowns are required per vehicle stack; or

(4) A minimum of four indirect tiedowns per vehicle stack.

(e) *Containment of loose parts.* (1) Measures must be taken to ensure that loose parts from flattened or crushed vehicles do not fall from the transport vehicle while in transit.

(2) Vehicles used to transport flattened or crushed vehicles must be equipped with a means to prevent loose parts from falling from all four sides of the vehicle which extends to the full height of the cargo.

(3) The means used to contain loose parts may consist of structural walls, sides or sideboards, or suitable covering material, alone or in combinations.

(4) The use of synthetic material for containment of loose parts is permitted.

§ 393.140 What are the rules for securing roll-on/roll-off and hook lift containers?

(a) *Applicability.* The rules in this section apply to the transportation of roll-on/roll-off and hook lift containers.

(b) *General requirements.* Any container carried on a vehicle which is not equipped with an integral securement system must be:

(1) Blocked against forward movement by the lifting device, stops, a combination of both or other suitable restraint mechanism;

(2) Secured to the front of the vehicle by the lifting device or other suitable restraint against lateral and vertical movement;

(3) Secured to the rear of the vehicle with at least one of the following mechanisms:

(i) One indirect tiedown that secures the side rails of the vehicle chassis to and the container chassis at the same time;

(ii) Two tiedowns installed lengthwise, each securing one side of the container to one of the vehicle's side rails; or

(iii) Two hooks, or an equivalent mechanism, securing both sides of the container to the vehicle chassis at least as effectively as the tiedowns in the two previous items.

(4) The mechanisms used to secure the rear end of a roll-on/roll off or hook lift container must be installed no more than two meters (6 ft 7 in) from the rear of the container.

(5) In the event that one or more of the front stops or lifting devices are missing, damaged or not compatible, additional manually installed tiedowns must be used to secure the container to the vehicle, providing the same level of securement as the missing, damaged or incompatible components.

§ 393.142 What are the rules for securing large boulders?

(a) *Applicability.* (1) The rules in this section are applicable to the transportation of any large piece of natural, irregularly shaped rock weighing in excess of 5,000 kg (11,000 lb.) or with a volume in excess of 2 cubic-meters on an open vehicle, or in a vehicle whose sides are not designed and rated to contain such cargo.

(2) Pieces of rock weighing more than 100 kg (220 lb.), but less than 5,000 kg (11,000 lb.) must be secured, either in accordance with this section, or in accordance with the provisions of §§ 393.100 through 393.120, including:

(i) Rock contained within a vehicle which is designed to carry such cargo; or

(ii) Secured individually by tiedowns, provided each piece can be stabilized and adequately secured.

(3) Rock which has been formed or cut to a shape and which provides a stable base for securement must also be secured, either in accordance with the provisions of this section, or in accordance with the provisions of §§ 393.100 through 393.120.

(b) *Rules concerning positioning of boulders on the vehicle.* (1) Each boulder must be placed with its flattest and/or largest side down.

(2) Each boulder must be supported on at least two pieces of hard wood blocking at least 10 cm × 10 cm (4 inches × 4 inches) side dimensions extending the full width of the boulder.

(3) Hardwood blocking pieces must be placed as symmetrically as possible under the boulder and should support at least three-fourths of the length of the boulder.

(4) If the flattest side of a boulder is rounded or partially rounded, so that the boulder may roll, it must be placed in a crib made of hardwood timber fixed to the deck of the vehicle so that the boulder rests on both the deck and the timber, with at least three well-separated points of contact that prevent its tendency to roll in any direction.

(5) If a boulder is tapered, the narrowest end must point towards the front of the vehicle.

(c) *Rules concerning the use of tiedowns.* (1) Only chain may be used as tiedowns to secure large boulders.

(2) Indirect tiedowns which are in direct contact with the boulder should, where possible, be located in valleys or notches across the top of the boulder, and must be arranged to prevent sliding across the rock surface.

(d) *Options for arranging tiedowns.* There are three arrangements of tiedowns that may be used, depending upon the shape of the boulder:

(1) *Cubic shaped boulder.* (i) The boulder must be secured individually with at least two chain tiedowns placed transversely across the vehicle.

(ii) The aggregate working load limit of the tiedowns must be at least half the weight of the boulder.

(iii) The tiedowns must be placed as closely as possible to the wood blocking used to support the boulder.

(2) *Irregular shaped boulder—with stable base.* (i) The boulder must be secured individually with at least two chain tiedowns forming an ''X'' pattern over the boulder.

(ii) The aggregate working load limit of the tiedowns must be at least half the weight of the boulder.

(iii) The tiedowns must pass over the center of the boulder and must be attached to each other at the intersection by a shackle or other connecting device.

(3) *Irregular shaped boulder—with unstable base.* Each boulder must be secured by a combination of chain tiedowns as follows:

(i) One chain must surround the top of the boulder (at a point between one-half and two-thirds of its height). The working load limit of the chain must be at least half the weight of the boulder.

(ii) Four chains must be attached to the surrounding chain and the vehicle to form a blocking mechanism which prevents any horizontal movement. Each chain must have a working load limit of at least one-fourth the weight of the boulder. Whenever practicable, the angle of the chains must not exceed 45 degrees from the horizontal.

Issued on: December 8, 2000.

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Acting Assistant Administrator.

[FR Doc. 00–31919 Filed 12–15–00; 8:45 am]

BILLING CODE 4910–EX–P