



**ADVOCATES
FOR HIGHWAY
AND AUTO SAFETY**

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Federal Highway Administration
Office of the Chief Counsel HCC-10
Docket Section, Room 4232
U.S. Department of Transportation
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Washington, DC 20590

FHWA-97-2289-6

**Development of a North American Standard for Protection Against
Shifting or Falling Cargo: Advance Notice of Proposed
Rulemaking, 61 FR 54142 et seq., October 17, 1996**

Advocates for Highway and Auto Safety welcomes this opportunity to assist the Federal Highway Administration (FHWA) in advancing the agency's efforts towards the adoption of an improved system of commercial motor vehicle (CMV) cargo securement. Current regulations in Part 393 of 49 Code of Federal Regulations (CFR) are clearly inadequate for ensuring the avoidance of the catastrophic crashes that have occurred over the past several years involving the disengagement of very large, very heavy cargo from truck trailers.¹ Some of these crashes have been described in testimony and other materials provided to the U.S. Congress in a hearing held

¹Advocates is perplexed over the absence of any reference in this notice to the agency's recent rulemaking actions in Dockets Nos. MC-93-21 and MC-93-24 on establishing standards for, respectively, shifting and falling cargo in general and for securing intermodal cargo containers in particular. Docket No. MC-93-21 proposed standards for shifting and falling cargo on September 17, 1993, and was concluded with an amendment to 49 CFR Pt. 393 on July 6, 1994. 58 FR 48624 et seq.; 59 FR 34712 et seq. Docket No. MC-93-24 offered an Advance Notice of Proposed Rulemaking on August 23, 1993, but to date has had no further action. 58 FR 44485 et seq. Advocates believes that citation of these recent actions accompanied by a brief discussion would have benefitted interested parties planning responses to this docket.

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on July 27, 1993, by the House Public Works Committee's Subcommittee on Investigations and Oversight.²

However, it is clear from other evidence that the problem of inadequate cargo securement goes far beyond crashes consisting of wholesale failure of trailer securement devices and consequent release of massive, dangerous cargo. Many crashes of commercial vehicles can be traced directly to shifting cargo which dramatically changes vehicle rollover threshold, for example. Although in some instances these crashes are due to either poor maintenance and/or improper deployment of securement devices, in other instances they directly result from the failure of securement devices themselves because of inadequate strength, especially under the elevated dynamic loads created by crash deceleration.

The present agency regulation for CMV cargo securement, adopted pursuant to a final rule issued on July 6, 1994,³ cannot prevent cargo shift or guarantee adequate cargo retention under

²Truck 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). Anecdotal accounts of massive steel coils detaching from their flatbed trailers and crushing passenger vehicles and killing their occupants were adduced by witnesses, including Rep. Jack Quinn of New York and New York state police officials. In addition, a June 1993 New York state inspection showed 48 percent of vehicles recorded with improperly secured loads. A follow-up July 1993 inspection of 23 trucks resulted in 15 trucks found with improperly secured loads of steel or aluminum.

³Cf. footnote 1.

typical real-world operating conditions encountered every day by CMV drivers. This is particularly true of severe accident-avoidance maneuvers, especially those generating substantial lateral acceleration, and of moderate to severe crashes producing increases in both longitudinal and lateral gs often by one or more orders of magnitude. Although we commend the FHWA for changing its standard from one based on static breaking strength to a dynamic concept of working load limit (WLL) in response to a petition from the Commercial Vehicle Safety Alliance (CVSA), the central feature of this standard is the requirement that "the aggregate working load limit of the tiedown assemblies used to secure an article in any direction be at least one-half times the weight of the article secured." Id. at 34712. This criterion is only marginally acceptable under operating circumstances that do not involve any significant increases in the dynamic loads produced by trailer/cargo acceleration from either emergency accident avoidance maneuvers or even relatively low-speed crashes and, hence, it cannot serve as a genuine performance-based safety standard. Put simply, the requirements of 49 CFR Pt. 393 are seriously inadequate as an operational standard.

The FHWA adopted this standard in 1993 despite the warnings by Advocates in its comments to the docket of the proposed rule that it was clearly inadequate as a safety regulation. We emphasized that the agency failed to relate its proposed standard to real-

world crashes. The proposed standard was not based upon an engineering analysis of the forces involved either in crashes or even in severe accident-avoidance maneuvers and, therefore, it

may not be sufficient to prevent massive, potentially lethal articles from breaking loose . . . These demanding circumstances can occur with either virtually instantaneous deceleration (e.g., truck runs off road and strikes a large tree or culvert headwall) or with rollover. We think the agency must indicate whether its intent is to ensure that articles tied down to a flatbed, for example, will not break loose in catastrophic crashes. If the working load standard proposed is intended only for securing articles in transport conditions not involving crashes, then Advocates is not persuaded that a one-half working load limit standard is sufficient.

* * * * *

Advocates is concerned about the complete lack of data and other information to support the agency's proposal. * * * Without an adequate rulemaking record, including reliable data on how well current statically tested tiedown assemblies perform under actual operating conditions, including heavy truck crashes, as well as the actual operating performance of the agency's working load limit proposal, the FHWA runs the risk of adopting an arbitrary standard without demonstrable support in the rulemaking record. This can be regarded as capricious agency action.⁴

Nevertheless, the FHWA adopted the proposed standard on July 6, 1993, without an adequate foundation in the rulemaking record. Moreover, the agency failed to respond in this final rule to Advocates' arguments on the lack of data and engineering analyses of dynamic forces to support the proposed regulation.

The present Advance Notice of Proposed Rulemaking (ANPRM) has described a research program that has been undertaken since 1993 to

⁴Comments of Advocates for Highway and Auto Safety, October 28, 1993, to FHWA Docket No. MC-93-21, Notice of Proposed Rulemaking, 58 FR 48624 et seq. (September 17, 1993).

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evaluate current regulations and industry practices with the aim of recommending preliminary cargo securement guidelines. This effort was organized by the Canadian Council of Motor Transport Administrators and the Ontario Ministry of Transportation, and has been expanded to include trucking industry representatives and federal, state, and provincial government representatives from the U.S. and Canada. U.S. government representation consists of personnel from the FHWA and from the Commercial Vehicle Safety Alliance (CVSA), the latter composed of both industry and government representatives from the U.S., Canada, and Mexico. 61 FR 54142-54143. At the present time, this trilateral effort to produce an internationally harmonized cargo securement standard has consisted of a smaller drafting group charged with developing an outline of the standard within a larger harmonization group which, in turn, according to the FHWA, "would review major portions of this outline as it is completed by the drafting group." Id. at 54143. The agency also has vouchsafed open membership in the larger harmonization group to ensure full participation in the development of guidelines and, in particular, for the purpose of identifying and considering the concerns of both safety advocacy groups and the general public. Id.

Advocates applauds the agency's promotion of such open participation, which we consider as crucially important to both the quality and the credibility of any guidelines produced by this

trilateral effort. Accordingly, we ask that our organization be permitted to join the harmonization group as soon as feasible so that a private sector, not-for-profit safety perspective can be part of the pre-rulemaking deliberative process.⁵

With regard to the initial draft report published in November 1993 by the Ontario Ministry of Transportation entitled, "A Proposal for Research to Provide a Technical Basis for a Revised National Standard on Load Security for Heavy Trucks," (Ontario Proposal) Advocates has reviewed this document and has no essential objections to most of the research protocol dealing with such aspects as securement attachment points, securement device types, blocking, cradles, and other technical and material elements of the investigative methodology.

However, we are concerned with the thrust of preliminary considerations on the direction and achievements of this research effort that are addressed at the start of the Ontario Proposal and in the minutes of the Load Security Research Technical Advisory Committee (Advisory Committee minutes) held on August 16-17, 1993. In general, both documents appear to incline towards static surrogates rather than dynamic measures for generating research

⁵We think it is necessary to emphasize here that inclusion of a not-for-profit, consumer/insurance health and safety coalition in this group, especially in the membership of the drafting group, is belated. The group drafting the guidelines for review by the entire harmonization group could have benefitted from the input of a non-governmental safety advocacy organization drawn from outside the trucking industry.

results. More importantly, the Ontario Proposal appears to have a lack of willingness to generate guidelines that will meet the needs of cargo securement under severe accident-avoidance and crash conditions.

In the Advisory Committee minutes,

It was noted for the most part all the friction co-efficients [sic] would be generated using static test procedures. It was suggested by Mr. Woodroffe some effort should be made to generate data based on dynamic testing. A verbal presentation was provided on a test procedure which would allow for dynamic factors to be included in some of the friction co-efficients. It was **agreed** Mr. Woodroffe would submit a test plan for incorporation into the overall test program.

Advisory Committee minutes, p. 9 (emphasis of the last sentence in the original). However, the minutes also show that dynamic tests will consist of braking and evasive maneuvers, not of crash-equivalent dynamic forces. These tests for the most part will demonstrate dynamic responses of truck and cargo in the range of 0.6 to 1 g, what is termed at points in the introductory part of the Ontario Proposal as forces encountered under "normal operating conditions" (p. 13) or under "normal emergency," i.e., non-crash conditions (p. 7).

No accident-avoidance maneuver, regardless of its severity, can provide accurate indication of the crash forces, especially frontal crash longitudinal and lateral impact loads, generated by collisions and rollovers of large commercial vehicles, that are suffered by cargo that is secured to a flatbed trailer.

Furthermore, there are no clear indications in the Ontario Proposal

that extrapolations of data from such accident-avoidance actions with low gs will be made to demonstrate the needs of cargo securement under severe accident-avoidance conditions. See Advisory Committee minutes, pp. 12-13. Advocates regards such extrapolation, at a minimum, to be essential and, more desirably, that controlled crash tests be carried out under the protocol of NCHRP 350 or cognate criteria for heavy vehicle impacts, such as those used by NHTSA and non-government research institutions, for example, by the Texas Transportation Institute and by the University of Michigan Transportation Research Institute. Absent such crash tests, the testing regime must at least extrapolate collected data to severe crash levels. although this will be an imperfect exercise. These extrapolated data must be matched against computer simulations of modelled real-world severe crashes. The goal should be a system of cargo securement ensuring that cargo remains attached to the truck in all but the most unusual, devastating crashes.⁶

The Ontario 1993 proposal also evinces skepticism in accommodating the more severe loads suffered by CMVs and secured cargo in crashes:

It is possible to generate longitudinal loads in excess of 20 g if a truck runs head-on into another truck of similar mass or a bridge abutment. It appears unreasonable to expect a

⁶These are crashes in which impact forces are so great that the collisions result in the destruction of the tractor and trailer.

load security system to contain the load in such a case when the truck itself will be totally destroyed. A crash into a smaller or lighter vehicle, or into a guard rail or barrier wall at a shallow angle, will generate a combination of longitudinal and lateral loads, and the truck may not even suffer serious damage. These loads will be considerably less than for the head-on brick wall collision, perhaps in a range of 3 to 8 g, but are still substantial. A rollover will also generate a combination of longitudinal and lateral loads, and again these are very difficult to estimate.⁷

Ontario Proposal, p. 15. To its credit, however, the Ontario Proposal acknowledges that "[f]rom a safety point of view, the load must * * * remain substantially with the vehicle." Id. However, a reluctance to embrace this unavoidable need appears in the next sentence: "It clearly will be a difficult problem to set this as a requirement of a load security standard." Id. Advocates agrees that this is a difficult problem, but it is a challenge that must be met by any proposed guidelines and any subsequent regulatory proposal put forward by the FHWA. In particular, this need is paramount for hazardous materials (hazmat) transport. In our comments to the 1993 FHWA docket proposing the amendment of 49 CFR Pt. 393 by substituting a new WLL standard, we emphasized the failure of the agency to address the much higher standard needed to

⁷For rollover, Advocates recommends that the harmonization group and the FHWA explore the test protocol constructed by the University of Michigan Transportation Research Institute (UMTRI) in a report to NHTSA forming part of the agency's investigation of minimum safety performance criteria for commercial vehicles. This consists in the main of a reliance on a combination of lane change/evasive maneuver tests and tilt-table measurements. See Heavy Vehicle Size and Weight -- Test Procedures for Minimum Safety Performance Standards, Final Report, UMTRI, DOT HS 807 855, April 1992.

ensure that hazmat cargo remain secured under the most demanding crash conditions.

We are also puzzled by the lack of distinction by the agency between hazardous and non-hazardous cargo. There may be a need to consider the establishment of different standards for the working load standards for assemblies that secure objects that are dangerous to other vehicles on the road simply because of their mass and weight, and the standards governing the assemblies used to secure such items as portable fuel tanks and cylinders containing dangerous gases.⁸

However, neither the FHWA nor the Ontario Proposal have considered the specific needs of cargo securement for transporting various types of hazmat. Advocates regards the formulation of guidelines that meet the needs of, respectively, hazmat and non-hazmat cargo securement under the enormous loads generated by truck crashes as crucial to the safety needs of the travelling public.

The larger issue at stake here, however, is whether and to what extent both the completed research study and the initiative of the FHWA will meet the unmistakable need to set a general securement standard which is considerably more demanding than simply moderate-speed impacts with barriers at shallow angles.⁹ The prospective standard must accommodate a variety of crash types, especially rollovers and trailer detachment collisions, that are

⁸Advocates' comments to FHWA Docket No. MC-93-21, op. cit., p. 3.

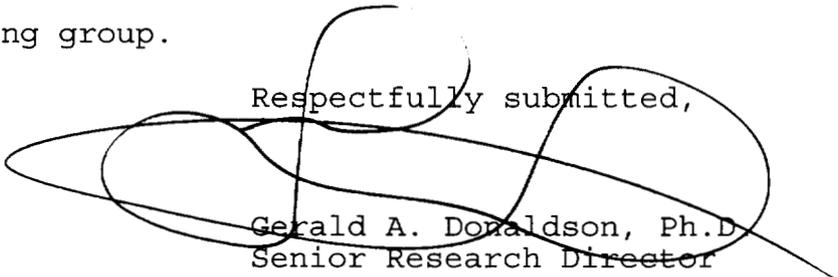
⁹Given the framework for discussion laid down by the preliminary considerations of the 1993 Ontario proposal, this means a standard for securement under a variety of real-world crash conditions that establishes a response to loads above about 8 gs but below 20 gs.

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severe, but arguably below the level of complete catastrophic destruction of the truck and trailer. A rulemaking proposal that fails to propose cargo securement methods that ensure cargo retention and avoidance of dangerous cargo shifting under serious, but foreseeable, crash and severe accident-avoidance conditions will fail to achieve credibility with the American public and their representatives.

Advocates looks forward to service on the harmonization group and inclusion in the drafting group.

Respectfully submitted,



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