U.S. Department
of Transportation
Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Ave., S.E.
Washington, DC 20590

JUL 10 2007

The Honorable Mark Rosenker
Chairman
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594

Dear Chairman Rosenker:

This letter provides an update on Safety Recommendation H-98-27 issued by the National Transportation Safety Board to the Department of Transportation (DOT). Safety Recommendation H-98-27 was issued to DOT as a result of the Safety Board's investigation of the collision of a DOT MC-306 cargo tank semi-trailer and a private passenger car and subsequent fire in Yonkers, New York, on October 9, 1997. After completion of its investigation, the Safety Board recommended the Secretary of Transportation should:

Safety Recommendation H-98-27:

> Prohibit the carrying of hazardous materials in external piping of cargo tanks, such as loading lines that may be vulnerable to failure in an accident.

PHMSA Action:

On December 30, 2004, the Pipeline and Hazardous Materials Safety Administration (PHMSA) published a notice of proposed rulemaking (NPRM) entitled "Safety Requirements for External Product Piping on Cargo Tanks Transporting Flammable Liquids" under Docket HM-213B. In this NPRM, we proposed to amend the Hazardous Materials Regulations (HMR), 49 C.F.R. parts 171-180, to prohibit flammable liquids from being transported in unprotected piping (i.e., "wetlines") on all newly constructed and existing DOT specification cargo tank motor vehicles (CTMVs). The action was consistent with the current prohibition for all other hazardous liquids under § 173.33(e) of the HMR.

The NPRM proposed to require newly constructed CTMVs to meet the performance standard no later than two years after publication of a final rule and, for all existing CTMVs, no later than the date of their first five-year pressure test following the two-year transition period. The proposed rule would have excepted truck-mounted CTMVs (e.g., "straight trucks"), combustible liquids, and non-DOT specification CTMVs from the wetlines prohibition based on inherent safety features and risks posed.

We accepted comments in response to the NPRM until April 28, 2005. We received numerous comments on our original estimates of costs and benefits. Generally, they asserted that we underestimated the number of CMTVs affected and the cost of retrofits and over-estimated the number and severity of wetlines incidents. Commenters also questioned the effectiveness, reliability, efficiency, and functionality of currently available technology to purge lading from wetlines.

In response to the comments to the NPRM, we conducted an extensive data analysis. On the basis of the data analysis we revised the regulatory evaluation developed in support of the NPRM to more accurately account for the costs and benefits of installing systems for purging wetlines on the more than 27,000 CTMVs in service. The cost benefit analysis addressed the costs associated with requiring purging systems on new and existing CTMVs, on CTMVs manufactured on or after January 1, 2003 and on new CTMVs only. We concluded that further regulation would not produce the level of benefits originally expected and that the quantifiable benefits of the proposed regulatory approaches would not justify corresponding costs. A significant factor is the relatively few incidents that have resulted in fatalities or serious incidents. Accordingly, on June 7, 2006 PHMSA published a notice withdrawing the December 30, 2004 NPRM and terminating the rulemaking proceeding. Copies of the withdrawal notice and the cost benefit analysis are enclosed.

We are working with the tank truck industry to focus on identifying "best practices" for fueling operations, maintenance procedures, and safeguards measures to avoid wetlines incidents in the future. For example, we are partnering with National Tank Truck Carriers (NTTC) to initiate a review of all internal training programs to update employee training to improve wetlines handling procedures and worker safety knowledge focusing on wetlines safeguards, loading and unloading procedures, rollover prevention and proper maintenance procedures. We are also working with the Federal Motor Carrier Safety Administration to study cargo tanks, from design through operation, to enhance safety and prevent hazardous materials incidents. The objective of the study is to evaluate complementary approaches to reducing cargo tank incidents including vehicle design, redesigning the highways, deploying electronic stability aids, and improving the training of drivers.

We note that industry is taking action voluntarily to limit the safety risks associated with the transportation of flammable liquids in wetlines. One large gasoline distributor has installed purging systems on its CTMVs. Another large gasoline distributor has installed damage protection equipment on its CTMVs which could help to mitigate the consequences of a collision with an automobile or other vehicle. We will continue to encourage industry to address this issue voluntarily and will monitor the development of other technologies and changes in the costs of the current purging systems over time as the volume of sales and technology advancements may result in cost reductions that could affect the cost benefit formula.

Through cooperation, collaboration, and coordination with the cargo tank industry and the major emergency response organizations, PHMSA has developed a comprehensive national

wetlines outreach awareness program to enhance public safety and assist those who respond to transportation emergencies. We have partnered with the NTTC, the National Association of State Fire Marshals (NASFM), and the International Association of Fire Chiefs (IAFC) to develop an outreach awareness program to educate industry, first responders, and the public about the possible risks associated with unprotected wetlines. Our initial efforts have focused on educating first responders through publications developed and distributed by PHMSA, NTTC, NASFM and IAFC. For example, last year, PHMSA developed and published an informational brochure titled, "Wetlines Awareness for Emergency Responders" (copy enclosed). In addition, PHMSA plans to include wetlines safety information in presentations and awareness training for emergency services personnel delivered by the Hazardous Materials Safety Assistance Team.

The cargo tank industry historically has provided basic tank truck safety training to local emergency responders throughout the nation. PHMSA and NTTC will ask the industry to include wetlines awareness safety information when training local firefighters, police officers, and other responders. In addition, NASFM and IAFC will include wetlines awareness in training delivered at workshops and fire services training programs across the nation. The NASFM will also provide a wetlines training module for use by its national network of firefighter training officers. Finally, PHMSA will encourage wetlines awareness through existing hazardous materials preparedness and training grants.

We have been monitoring all cargo tank truck accidents closely to specifically focus those involving side impacts resulting in damage to wetlines. We are undertaking an extensive effort to work with the responder community to collect more comprehensive data on accidents we may be missing and learn more from investigating accidents in general. We plan to continue to monitor and conduct intensive analysis of the performance of external piping systems by reviewing incident data and conducting root cause analysis of CTMV incidents.

Based on our review of incident reports (Form 5800.1), media reports and other data sources, we are observing a significant reduction in these types of incidents and believe that this may be a result of improved outreach and better visibility of tank trucks due to the wide spread use of reflective tape that has significantly reduced impacts into the sides and rears of truck trailers. A study bythe National Highway Traffic Safety Administration (NHTSA) on "The Effectiveness of Retroreflective Tape on Heavy Trailers" (DOT HS 809 222) by Christina Morgan is available from the National Technical Information Service, Springfield, VA 22161 or through the NHTSAwebsite: ww.nhtsa.dot.gov/cars/rules/regrev/evaluate/809222.html.On the basis of our continued data analysis, voluntary actions by the industry and advancements and availability of technology solutions, we will reconsider the matter and initiate a rulemaking project if the data supports such an action or if the cost factors become more favorable based on technology advances or industry voluntary actions.

In order to allow us to continue to evaluate this matter more fully we request Safety Recommendation H-98-27 be classified as "Open -Acceptable". We appreciate your consideration in this matter.

If you have any questions, concerns, or comments, please feel free to contact me at 202-366-4433.

Sincerely,

Stacey Gerard
Assistant Administrator/Chief Safety Officer

Enclosures

(methylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione], C [3-(4-hydroxycyclohexyl)-6-(methylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione], D [3-cyclohexyl)-1-methyl-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione], and E [3-(4-hydroxycyclohexyl)-1-methyl-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione] (calculated as hexazinone) in the following commodities:

Commodity	Parts per million
Sugarcane, cane	0.6
Sugarcane, molasses	4.0

* * * * *

[FR Doc. E6–8827 Filed 6–6–06; 8:45 am]

BILLING CODE 6560–50–S

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[DA 06–1052; MB Docket No. 05–145, RM–11212]

Radio Broadcasting Services; Hermitage and Mercer, PA

AGENCY: Federal Communications Commission.

ACTION: Proposed rule, dismissal.

SUMMARY: This document dismisses a pending petition for rule making, as requested by Petitioner Cumulus Licensing LLC, licensee of Station WWIZ(FM), Mercer, Pennsylvania, which proposed to reallot Channel 280A from Mercer to Hermitage, Pennsylvania, and modify the license of WWIZ accordingly. The document therefore terminates the proceeding.

ADDRESSES: Federal Communications Commission, Washington, DC 20554.

FOR FURTHER INFORMATION CONTACT: Helen McLean, Media Bureau (202) 418–2738.

SUPPLEMENTARY INFORMATION: This is a synopsis of the Commission's Report and Order, MB Docket No. 05–145, adopted May 17, 2006, and released May 19, 2006. The full text of this Commission decision is available for inspection and copying during normal business hours in the FCC Reference Information Center (Room CY–A257), 445 12th Street, SW., Washington, DC This document may also be purchased from the Commission's duplicating contractors, Best Copy and Printing, Inc., 445 12th Street, SW, Room CY–B402, Washington, DC 20554, telephone 1–800–378–3160 or *http://www.BCPIWEB.com.*

This document is not subject to the Congressional Review Act. (The Commission, is, therefore, not required to submit a copy of this Report and Order to Government Accountability Office, pursuant to the Congressional Review Act, *see* 5 U.S.C. Section 801(a)(1)(A) since this proposed rule is dismissed, herein.)

Federal Communications Commission.

John A. Karousos,

Assistant Chief, Audio Division, Media Bureau.

[FR Doc. E6–8732 Filed 6–6–06; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Part 173

[Docket No. PHMSA–99–6223 (HM–213B)]

RIN 2137–AD36

Hazardous Materials: Safety Requirements for External Product Piping on Cargo Tanks Transporting Flammable Liquids

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Withdrawal of notice of proposed rulemaking.

SUMMARY: PHMSA is closing this rulemaking proceeding, having considered and declined to adopt proposals for further regulating the transportation of flammable liquids in the product piping on cargo tank motor vehicles. On the basis of public comments and additional data and analysis, PHMSA has concluded that further regulation would not produce the level of benefits we originally expected and that the quantifiable benefits of proposed regulatory approaches would not justify the corresponding costs. Although PHMSA is withdrawing its rulemaking proposal, the agency will develop and implement an outreach program to educate the industry, first responder community, and the public about potential risks associated with unprotected product pipelines on these vehicles and will continue to collect data and other information in order to address the issue further if warranted.

FOR FURTHER INFORMATION CONTACT: Ben Supko, Office of Hazardous Materials Standards, Pipeline and Hazardous Materials Safety Administration, telephone (202) 366–8553; or Michael Stevens, Office of Hazardous Materials Standards, Pipeline and Hazardous Materials Safety Administration, telephone (202) 366–8553.

SUPPLEMENTARY INFORMATION:

I. Background

On December 30, 2004 the Pipeline and Hazardous Materials Safety Administration (PHMSA, we) published a notice of proposed rulemaking (NPRM) (69 FR 78375) inviting comments on a proposal to amend the Hazardous Materials Regulations (HMR; 49 CFR parts 171–180) to prohibit the carriage of flammable liquids in the product piping (wetlines) on cargo tank motor vehicles (CTMVs), unless the CTMV is equipped with bottom damage protection devices. We proposed a quantity limit of one liter or less in each pipe. We did not propose a specific method for achieving this standard. The NPRM included an exception from the proposed requirements for truck-mounted (*e.g.*, straight truck) DOT specification CTMVs. We proposed to make the changes effective two years after the effective date of a final rule and to permit CTMV operators five years to phase in requirements applicable to existing CTMVs.

II. Comments on the NPRM

We received thirty sets of public comments on the NPRM from a variety of stakeholders, including industry associations, companies, governmental entities, individuals and members of Congress, as follows:

Commenter	Document number
Maurice R. Tetreault	RSPA–1999–6223–28
American Petroleum Institute (API)	RSPA–1999–6223–32
Georgia Department of Motor Vehicle Safety	RSPA–1999–6223–33
Southwest Research Institute	RSPA–1999–6223–34
David M. Lawler	RSPA–1999–6223–35
Dale L. Botkin	RSPA–1999–6223–37
Public Utilities Commission of Ohio	RSPA–1999–6223–38

Commenter	Document number
National Transportation Safety Board (NTSB)	RSPA–1999–6223–39
California Air Resources Board	RSPA–1999–6223–41
Magellan Midstream Partners, L.P.	RSPA–1999–6223–42
Laura E. Herman	RSPA–1999–6223–45
National Tank Truck Carriers, Inc. (NTTC)	RSPA–1999–6223–46
API	RSPA–1999–6223–47
Great Lakes Transport, LLC	RSPA–1999–6223–48
Anthony C. Pitfield	RSPA–1999–6223–49
The Dow Chemical Company (Dow)	RSPA–1999–6223–50
Truck Trailer Manufacturers Association (TTMA)	RSPA–1999–6223–51
Petroleum Marketers Association of America (PMAA)	RSPA–1999–6223–52
Dangerous Goods Advisory Council	RSPA–1999–6223–53
Saraguay Petroleum Corp (Saraguay Petroleum)	RSPA–1999–6223–54
Petroleum Transportation and Storage Association (PTSA)	RSPA–1999–6223–55
Baltimore Cargo Tank Services, Inc.	RSPA–1999–6223–56
American Trucking Associations (ATA)	RSPA–1999–6223–57
Cargo Tank Concepts, Ltd. (CTC)	RSPA–1999–6223–58
Minnesota Trucking Association	RSPA–1999–6223–59
Society of Independent Gasoline Marketers of America (SIGMA)	RSPA–1999–6223–60
Brenner Tank LLC	RSPA–1999–6223–61
Denny Rehberg, Member of Congress	RSPA–1999–6223–62
TTMA	RSPA–1999–6223–63
ATA	RSPA–1999–6223–64
The Honorable Thomas E. Petri	RSPA–1999–6223–65
The Honorable Conrad Burns	RSPA–1999–6223–66
The Honorable Michael Sodrel	RSPA–1999–6223–67

The comments are available for review through DOT's electronic Docket Management System (on the Web site *http://dms.dot.gov*).

Many of the commenters took issue with our original estimates of costs and benefits in the regulatory evaluation prepared in support of the NPRM. Generally, these commenters assert we underestimated the number of cargo tanks affected and the cost of retrofits and over-estimated the number and severity of wetlines incidents. Commenters also question the effectiveness, reliability, efficiency, and functionality of currently available technology to purge lading from wetlines.

III. Revised Regulatory Evaluation

Based on comments received in response to the NPRM, we re-evaluated the data and information concerning potential costs and benefits of regulatory alternatives to ensure that any final rule prohibiting the transportation of flammable liquids in unprotected wetlines would maximize the net benefit to society.

Our revised regulatory review included reassessment of the number of accidents involving wetlines and fatalities, injuries, and property damage resulting from those accidents. We also revised our estimate of the number of vehicles potentially affected by rulemaking action and the technology currently available to purge flammable liquids from wetlines to ascertain its effectiveness and practicability in the transportation environment. The following table summarizes the overall costs and benefits, calculated over a 20-year period using a seven percent discount rate, for the three options considered in the 2006 regulatory evaluation:

PRESENT VALUE COSTS AND BENEFITS OF RULE

Alternatives	P.V. total cost	P.V. total benefit	Benefit-cost ratio
Purging System on New Trucks	$23,847,613	$25,377,985	1.06
Purging System on Trucks Manufactured on or After January 1, 2002	35,968,401	38,902,738	1.08
Purging System on New and Existing Trucks	53,595,422	50,945,401	0.95

The revised regulatory evaluation assumes a total of 27,000 vehicles would be affected by a final rule, and the cost to install a purging system would be $1,600 per tank on newly manufactured CTMVs and $1,760 to retrofit existing CTMVs. We also assumed the average service life for a CTMV in flammable liquid service is 20 years; thus, five percent of the fleet would be retired each year.

In measuring the benefits of wetlines regulation, we considered avoided injuries, property damage, traffic delays, evacuations, emergency response, and environmental damage. These benefits are scaled to account for underreporting of wetlines incidents, particularly for the period prior to October 1998, when DOT incident reporting requirements were extended to intrastate operations.

In response to concerns expressed by commenters, we reexamined available data for each of the 190 incidents that had been attributed to wetlines in the original regulatory analysis, applying revised criteria to isolate those that, by virtue of their circumstances, could be verified as wetlines incidents. In 42 of these cases, we found that the incident-related injuries, property damage, and other costs could not be attributed to the risk associated with unprotected wetlines. For instance, the revised regulatory analysis excludes incidents in which both the wetline and the cargo tank were breached and does not include incidents involving spills of more than 50 gallons, unless a fire resulted from the spill. Using incident data reported to DOT from January 1, 1990 through December 31, 2001, we

identified 148 CTMV incidents involving wetlines. These incidents resulted in seven fatalities, three injuries, and over $7 million in property damage.

Because of commenters' questions and concerns about many of the assumptions used to develop the regulatory evaluation for the NPRM, we performed a sensitivity analysis to calculate the benefits and costs of the three identified options by changing the variables used, including the number of affected vehicles, the installation costs for a non-welded purging system, and the number of wetlines incidents. PHMSA concludes from the sensitivity analysis that the benefit-cost ratios for the new-construction-only option could range from a low of .73/1 (assuming the highest possible costs and lowest possible benefits) to a high of 1.20/1 (assuming the lowest possible costs and highest possible benefits). A complete discussion of the sensitivity analysis is included in the regulatory evaluation in the public docket for this proceeding.

For purposes of the analysis in the regulatory evaluation, we identified an on-truck purging system as the low-cost alternative for compliance with the performance standard at issue in this rulemaking proceeding. The purging system utilizes 5 psi of air pressure from the CTMV's compressed air tanks to purge the loading lines. The system routes the product from the lowest point in the piping to the tank shell through 0.5 inch braided stainless steel lines. Purging the loading lines on a four-compartment cargo tank takes six minutes.

The purging system represents the lowest cost, most efficient solution available for the elimination of wetlines. However, as noted above, many commenters question the effectiveness, reliability, efficiency, and functionality of purging systems. We agree with commenters that the current technology may cause problems unrelated to the wetlines issue it is designed to address. Although most of these problems may be corrected or avoided, we have determined that the benefits of imposing solutions through regulation would not justify the costs of such action.

Finally, we note that the industry is taking action voluntarily to limit the safety risks associated with the transportation of flammable liquids in unprotected wetlines. One large gasoline distributor has installed purging systems on its CTMVs. Another large gasoline distributor has installed damage protection equipment on its CTMVs that could help to mitigate the consequences of a collision with an automobile or other vehicle. We urge the regulated community to continue its efforts voluntarily to identify and implement measures to address this issue. We also plan to develop and implement an outreach program to educate the industry, first responder community, and the public about the potential risks associated with wetlines. We will continue to collect relevant information concerning wetlines incidents and technological developments affecting wetlines transportation.

IV. Conclusion

In the final analysis, we did not identify a cost-effective approach for addressing the risk of wetlines transportation through regulatory action. Based on the revised regulatory evaluation, we believe the benefits of a final rule prohibiting the transportation of flammable liquids in wetlines only on newly constructed CTMVs may slightly outweigh the costs. However, given the sensitivity of the benefit-cost determinations to variations in the data and the inherent margin for error in the overall analysis, it is possible, even for newly constructed CTMVs, the costs of a regulatory solution will outweigh potential benefits.

Accordingly, PHMSA is withdrawing the December 30, 2004 NPRM and terminating this rulemaking proceeding.

Issued in Washington, DC, on May 31, 2006, under authority delegated in 49 CFR part 1.

Brigham A. McCown,

Acting Administrator.

[FR Doc. E6–8782 Filed 6–6–06; 8:45 am]

BILLING CODE 4910–60–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 665

[I.D. 052506A]

RIN 0648–AT95

Fisheries in the Western Pacific; Omnibus Amendment for the Bottomfish and Seamount Groundfish Fisheries, Crustacean Fisheries, and Precious Coral Fisheries of the Western Pacific Region

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

ACTION: Notice of availability of FMP amendments; request for comments.

SUMMARY: NMFS announces that the Western Pacific Fishery Management Council (WPFMC) proposes to amend three fishery management plans (western Pacific omnibus amendment) to include fisheries in waters around the Commonwealth of the Northern Mariana Islands (CNMI) and Pacific Remote Island Areas (PRIA). These amendments would establish new permitting and reporting requirements for vessel operators targeting bottomfish species around the PRIA to improve understanding of the ecology of these species and the activities and harvests of the vessel operators that target them. It would also establish new permitting and reporting requirements for vessel operators targeting crustacean species and precious coral around the CNMI and PRIA.

DATES: Comments on the amendment must be received by August 7, 2006.

ADDRESSES: Comments on the western Pacific omnibus amendment, identified by 0648–AT95, should be sent to any of the following addresses:

- E-mail: *AT95Omnibus@noaa.gov.* Include in the subject line of the e-mail comment the following document identifier "AT95 Omnibus." Comments sent via e-mail, including all attachments, must not exceed a 5 megabyte file size.
- Federal e-Rulemaking portal: *www.regulations.gov.* Follow the instructions for submitting comments.
- Mail: William L. Robinson, Regional Administrator, NMFS, Pacific Islands Region (PIR), 1601 Kapiolani Boulevard, Suite 1110, Honolulu, HI 96814–4700.

Copies of the western Pacific omnibus amendment, the Environmental Assessment, and related analyses may be obtained from Kitty M. Simonds, Executive Director, WPFMC, 1164 Bishop Street, Suite 1400, Honolulu, HI 96813, or on the internet at *www.wpcouncil.org.*

FOR FURTHER INFORMATION CONTACT: Robert Harman, NMFS PIR, 808–944–2271.

SUPPLEMENTARY INFORMATION: The western Pacific omnibus amendment, developed by the WPFMC, has been submitted to NMFS for review under the Magnuson-Stevens Fishery Conservation and Management Act. This document announces that the amendment is available for public review and comment for 60 days. NMFS will consider public comments received during the comment period described above in determining whether to approve, partially approve, or disapprove the western Pacific omnibus amendment.

Regulatory Assessment and Regulatory Flexibility Analysis

Hazardous Materials: Safety Requirements for External Product Piping on Cargo Tanks Transporting Flammable Liquids [RSPA-99-6223 (HM-213B)]

May 2006

Prepared by
Office of Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration (PHMSA)
Department of Transportation

Regulatory Assessment

Hazardous Materials: Safety Requirements for External Product Piping on Cargo Tanks Transporting Flammable Liquids

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Regulatory Assessment

Hazardous Materials:

Safety Requirements for External Product Piping on Cargo Tanks

Transporting Flammable Liquids

EXECUTIVE SUMMARY

This regulatory assessment addresses a proposal to prohibit flammable liquids from being transported in unprotected product piping (wetlines) on Department of Transportation (DOT) specification cargo tank motor vehicles. At present, the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180) prohibit the retention of certain liquid hazardous materials in the external product piping of a DOT-specification cargo tank unless the cargo tank motor vehicle is equipped with bottom damage protection devices. However, this prohibition does not apply to flammable liquids or residues of other material that remain after the product piping is drained to the extent possible. This rule was proposed to reduce the likelihood of deaths, injuries, property damages, and other damages resulting from incidents involving spills of flammable material from unprotected wetlines.

For this rulemaking, we considered three alternatives:

(1) Do nothing;

(2) Prohibit the carriage of flammable liquids in wetlines on newly constructed cargo tank motor vehicles (CTMVs) only.

(3) Prohibit the carriage of flammable liquids in wetlines on all CTMVs manufactured on or after January 1, 2002.

(4) Prohibit the carriage of flammable liquids in wetlines on both existing and newly constructed CTMVs[1].

This assessment evaluates the costs and benefits associated with the performance standard in Alternatives 2, 3 and 4. The evaluation uses the costs and benefits of a purging system, which removes product from loading lines after loading is complete, to assess the overall costs and benefits of the proposal. This regulatory assessment compares the cost-benefit ratios of a non-welded purging system on new and existing CTMVs, on CTMVs manufactured on or after January 1, 2003 and on new CTMVs only. Table 1 below shows costs and benefits when using both a 7 and 3 percent discount rate.

Table 1: Present Value Costs and Benefits of Rule

Alternative	P.V. Total Benefits (3%)	P.V. Total Costs (3%)	Benefit-Cost Ratio (3%)	P.V. Total Benefits (7%)	P.V. Total Costs (7%)	Benefit-Cost Ratio (7%)
Purging System on New Trucks	$44,040,869	$36,516,611	1.20	$25,377,985	$23,847,613	1.06
Purging System on Trucks Manufactured on or After January 1, 2002	$64,471,092	$51,404,282	1.25	$38,902,738	$35,968,401	1.08
Purging System on New and Existing Trucks	$80,769,478	$72,771,443	1.11	$50,945,401	$53,595,422	0.95

The evaluation considers the non-welded purging system as the lowest cost alternative for meeting the requirements of the outcomes oriented NPRM. Owners of CTMVs may choose to install more expensive alternatives for various reasons in order to meet the requirements. For example, certain Class 3 hazardous materials are too corrosive or viscous to be purged out of wetlines. Examples of alternative technology that can meet the requirements of this rule are welded purging systems, retrofitting of loading racks and heavy-duty bottom damage protection devices. In assessing the costs of the final rule, this evaluation considers the costs of equipment, installation and labor, the potential losses of having the CTMV out of service for installation, and the weight penalty costs

[1] Although the alternative requiring a performance-based standard solely on existing CTMVs was not considered, its costs and benefits are represented throughout this evaluation for informational purposes and to assist the reader in assessing the benefits and costs of the alternatives.

arising from having the purging system occupy space in the CTMVs normally reserved for the transport of product. The benefits considered in this evaluation are avoided costs resulting from death, injury, property damage, environmental damage, and delays from traffic and commercial losses due to road closures associated with incidents. Sensitivity and break-even analyses are conducted on the calculations.

Regulatory Assessment

Hazardous Materials:

Safety Requirements for External Product Piping on Cargo Tanks

Transporting Flammable Liquids

INTRODUCTION

The Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180), at § 173.33(e), prohibit the retention of certain liquid hazardous materials in the external product piping (wetlines) of a DOT specification cargo tank, unless the cargo tank motor vehicle (CTMV) is equipped with bottom damage protection devices. The current prohibition applies to liquid hazardous materials in Divisions 5.1 (oxidizer), 5.2 (organic peroxide), 6.1 (toxic), and Class 8 (corrosive to skin only), but does not apply to Class 3 (flammable liquids) materials.

Wetlines are product piping located beneath the cargo tank on a CTMV used for loading and unloading the cargo tank. Typically, about 30-50 gallons of gasoline or other flammable liquid remain in the wetlines of a CTMV after loading. In a collision with another vehicle, the impact may fracture the piping and spray gasoline onto the other vehicle. If the gasoline ignites, a fire may rapidly engulf the passenger vehicle and its occupants. If it is not extinguished immediately, the fire could result in significant loss of life or damage to property or the environment.

An example of the potential severity of a wetlines accident is one that occurred on October 9, 1997, in Yonkers, New York. In that accident, an MC 306 CTMV containing 8,800 gallons of gasoline was struck broadside in the area of the piping manifold by a passenger vehicle. The initial impact fractured the cargo tank's product piping and released approximately 28 gallons of gasoline. The 62-year-old operator of the passenger vehicle survived the initial impact, but died from burns sustained in the fire that ignited immediately after the collision. The fire consumed the entire contents of the cargo tank,

destroying both vehicles and a highway bridge on the New York State Thruway.

On February 10, 2003, we published an advance notice of proposed rulemaking (ANPRM; 68 FR 6689) to solicit comments and information regarding methods to reduce the safety risks associated with the retention of lading in wetlines. The ANPRM described the regulatory history for the current requirements in § 173.33 and detailed our long-standing concern for the inherent safety risk presented by the carriage of flammable liquids in wetlines. In addition, the ANPRM asked commenters to address a number of issues to assist us in making a determination as to whether regulatory changes are needed, including the current state of technological development, practical alternatives that will protect the wetlines or eliminate the problem, the effectiveness of measures such as increased conspicuity or side guards, and current industry practices to minimize the potential safety problem posed by wetlines. The comments received in response to the ANPRM include data and information on wetlines accidents, costs of systems designed to eliminate product from wetlines, cargo tank population, cargo tank useful life, vehicle weight limits, and average distance traveled by a CTMV for deliveries. This data and information were considered in the regulatory evaluation.

In March 2004 we published a Notice of Proposed Rulemaking (NPRM) in which we estimated the costs and benefits of requiring both new and existing CTMVs to be equipped with non-welded purging systems. More comments were submitted from interested parties regarding alternative ways to meet the requirements of the proposed rule and the methodology used to calculate costs and benefits. The comments received in response to the NPRM are also incorporated into this evaluation.

To evaluate the benefits and costs of the proposal to prohibit the carriage of flammable liquids in wetlines, we identified several technologies that would permit operators of CTMVs to meet the proposed performance standard. The system used for this analysis is the lowest-cost system currently available – a purging system that can be installed on a CTMV without welding. A purging system evacuates the loading/unloading lines by forcing the flammable liquid out of the product lines and into the cargo tank body. After

loading is complete and the main cargo compartment valves are closed, the system introduces compressed air from an auxiliary tank through an air filter and regulator into the lines. The purge can be completed after the vehicle leaves the loading docks and will not create additional standing time for the CTMVs. This regulatory assessment compares the net benefits and costs of a non-welded purging system installed on new CTMVs, on all CTMVs manufactured on or after January 1, 2002 and on both new and existing CTMVs.

ASSUMPTIONS EMPLOYED FOR BENEFIT-COST ANALYSIS.

This benefit-cost analysis employs the following assumptions and estimates:

1. The analysis assumes a compliance date of January 1, 2008. The scope of the analysis is a 20-year period from the compliance date through December 31, 2027.

2. We estimate the average annual population of CTMVs that would be affected by this proposed rule to be 27,000 trucks. Each truck is assumed to make an average of 4.2 daily trips.

The CTMV population estimate is within the range of numerous population estimates submitted as comments to the NPRM by industries engaged in transporting flammable liquids and manufacturing cargo tanks. The majority of comments estimated the affected population to be between 25,000 and 30,000 CTMVs.

The estimate of 27,000 affected CTMVs is also consistent with consumption patterns of petroleum products, the most common types of flammable liquid transported on affected trucks. According to the Energy Information Administration, the amount of finished petroleum products supplied daily to end users other than jet fuel (which is mostly moved by pipeline directly to airports) in 2004 was 16,867,000 barrels. Using the EIA conversion factor for fuel oils of 42 gallons/barrel yields 708,414,000 gallons. These gallons need to be multiplied by the movement factor of 1.2 to account for shipment

between bulk and intermediate destinations before they arrive at the end users. This scaling yields consumption of 850,096,800 gallons per day. In addition, we know that 88% of finished petroleum products are transported in 8,000-gallon trucks. The remaining 12% are transported in 2,000-gallon trucks, which are the straight trucks exempted from this rule. Furthermore, approximately 12% of the 8,000-gallon trucks are out of service at a given time for maintenance purposes or as spare capacity.

Thus, of the 850,096,800 gallons of finished petroleum products, approximately 7.48 million gallons (748,085,184 gallons = 850,096,800 gallons x 0.88) are transported by the affected CTMVs. Since the average CTMV makes 4.2 trips per day[2], on average 22,264 CTMVs are required to transport finished petroleum products per year (22,264 = (748,085,184 gallons per year /4.2 trips per day)/ 8,000 gallons per truck)). An additional 2,672 CTMVs are out of service at a given time (2,672 trucks = 22,264 truck x 0.12). We estimate that approximately 1,247 CTMVs affected by this rule transport Class 3 liquids other than petroleum products such as certain resins, solvents and alcohols. Thus the total population of CTMVs needed to deliver the consumed gallons of Class 3 liquids is 26,183 (22,264 + 2,672 + 1,247). We use the more conservative estimate of 27,000 CTMVs to account for possible inefficiency or spare capacity in the industry.

3. We estimate the CTMVs affected by this proposed rule have an average useful life of 20 years.[3] A period of 20 years generally represents the expected useful life of all cargo tanks (e.g., full and semi-trailers in dedicated service of petroleum products, like gasoline) that are the subject of this regulatory assessment.

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[2] The estimate of 4.2 trips per day is derived from 2002 Vehicle Inventory Use Survey (VIUS) maintained by the U.S. Census Bureau. Data on the frequency and length of trip of non-straight tanker trucks that carry class 3 hazmat was analyzed to arrive at the estimate.
The VIUS reveals information about the use of trailer tanker trucks that are authorized to carry class 3 hazmat. It is a useful source for estimating the mileage, frequency of use and the age of vehicles. However, the VIUS is not a solid source for estimating a narrowly defined population of vehicles, such as the CTMVs affected by this rule for two reasons. Firstly, it only identifies that a truck is authorized to carry class 3 hazmat but not if the truck is actually being used for the purpose. Secondly, and most importantly, the VIUS clusters truck populations into single records and assigns scaling factors to account for possible under reporting.

[3] This estimate is based on the 2002 VIUS.

Comments received in response to the ANPRM generally agree that the expected useful life of a CTMV is about 20 years. This estimate is also consistent with data accumulated by the Federal Motor Carrier Safety Administration through its cargo tank inspection program.

4. The average CTMV has four compartments. On most CTMVs the wetlines hold between 30 and 50 gallons of liquid product.

5. Because the average useful life of a CTMV is estimated to be 20 years, we assume that an average of 1,350, or 5 percent, of the 27,000 CTMVs are retired each year, and an average of 1,350 new trucks are put into service each year.

6. Throughout the benefit-cost analysis, the population of CTMVs is divided into new and existing vehicles. New CTMVs are put into service on and after January 1, 2008. Existing CTMVs are put into service on or before December 31, 2007.

7. Existing CTMVs would have a 5-year period from January 1, 2008, to December 31, 2012, to comply with the proposed performance standard. Since each CTMV must undergo hydrostatic pressure testing and internal visual inspection at the minimum of every 5 years, the phase in period allows retrofitting during the scheduled inspection time and minimizes the costs of down time for installation of equipment. We estimate a total of 20,250 existing CTMVs will install a system during the phase-in period, an average of 4,050 per year [20,250 = 27,000 – (5 x 1,350)]. The remaining 6,750 CTMVs from the total population of 27,000 will be phased out over the 5-year period and replaced with new CTMVs.

8. The total cost of a purging system is the sum of the equipment costs, installation costs, maintenance costs, and costs of additional trips due to the added weight of the purging system. The equipment and installation costs are one-time costs; the maintenance and weight-related costs are recurring costs and calculated on an annual basis.

9. The cost analysis assumes that the owners of affected CTMVs will choose the lowest costing available technology to comply with the final rule. Based on information from vendors, PHMSA estimates the lowest cost alternative is a manual purging system. The basic equipment cost for a manually operated purging system will be $1,600 for the average CTMV and an additional $160 in hardware costs to retrofit a four-compartment cargo tank motor vehicle. Consequently, the expected basic system cost will be $1,760 for a non-welded retrofit, or $1,600 for new CTMVs.

PHMSA acknowledges that the most corrosive and viscous Class 3 liquids may not be removed through a purging system. However, CTMVs transporting such material comprise a very small subset of the total affected CTMV population. Thus, for the vast majority of CTMVs, which transport fuel oil and gasoline products the manual non-welded purging system would be the lowest cost alternative.

10. For the purpose of calculating costs and benefits, we assume a purging system is purchased and installed at the beginning of the year. Consequently, we calculate that the maintenance and weight-related penalty costs are incurred for the entire year's installation and that the benefits gained from the installation are gained for the entire year that the system is installed.

11. We assume the installation of a purging system will not cause owners/operators of new or existing trucks to lose profit during the time the truck is out of service for the installation. PHMSA assumes an owner of a new CTMV will have a purging system installed before the new tank is put into service. The 5-year period to install a purging system on an existing CTMV provides flexibility of scheduling so that an owner/operator can have the system installed during a normally scheduled period when the CTMV is out of service for inspection and testing.

12. We assume the average CTMV travels an average of 39 miles per trip and makes an average of 4.2 trips per day for seven days during an operating week, with newer CTMVs

traveling more miles per year and making more trips than older CTMVs. These estimates are derived from the 2002 Vehicle Inventory and Use Survey (VIUS) in which we analyzed trailer tanker trucks authorized to transport Class 3 hazardous material.

13. This evaluation assumes that past experiences with wetlines incidents can be extrapolated into the future. To estimate the benefits, or avoided costs of this rule, this evaluation uses the average annual number of deaths, number of injuries and cost of damage to surroundings that resulted from past wetlines incidents. PHMSA expects the purging system evaluated in this analysis will completely eliminate all fatalities, injuries and all damages to surroundings caused by wetline spills because it eliminates the flammable liquid that currently remains exposed in product piping once every CTMV is equipped with such a system.

14. PHMSA's Hazardous Materials Information System (HMIS) database was the principal source of information for incident analysis. This database is derived from the information submitted by carriers in Hazardous Materials Incident Reports (Form DOT F 5800.1). A Hazardous Materials Incident Report is required whenever there is any unintentional release of a flammable liquid from a package (including a wetline) during transportation. For purposes of this analysis, a wetlines incident is one in which the wetline is ruptured, flammable liquid is released, and the fatalities, injuries, and damages that result are directly attributable to the release of material from the wetline. Thus, we do not include incidents in which both the wetline and the cargo tank were breached; similarly, we do not include fatalities or injuries that resulted from an incident unless the fatality or injury resulted from a fire when the product released from the wetline ignited. We identified 148 incidents involving wetlines during the 12-year period from January 1, 1990, through December 31, 2001. (In a small number of these wetlines incidents, we could not identify whether the involved cargo tank was in the population that will be affected by this proposed rule. Nonetheless, we included the incident.) See the appendix for the list of incidents.

15. Benefits associated with the performance standard of the final rule are reductions in damages caused by wetlines incidents and spills. PHMSA does not require all of these damages to be reported. The Incident Report asks for the numbers of fatalities, hospitalized injuries, and non-hospitalized injuries, and estimates of product losses, carrier damages, public/private property damages, decontamination/cleanup costs, "other" costs, and numbers of people evacuated caused by the unintended release or threat of release of the hazardous material. The Incident Report does not ask for estimates of associated damages that include traffic delays, additional vehicle operating costs, commercial losses, environmental damages beyond those that may be included in decontamination/cleanup costs, emergency services beyond those that may be included in decontamination/cleanup costs, medical costs, rehabilitation costs, legal and court costs, insurance administration costs, and premature funeral costs. To estimate the total damage caused by the reported wetline spills, we estimate total associated damage and add it to the total reported damage.

16. Not all incidents involving hazardous materials are reported in HMIS. Because DOT hazardous material regulations applied only to interstate carriers until October 1998, HMIS is largely missing incidents involving intrastate carriers prior to this date. In addition, many incidents, especially those without fatalities or serious injuries, are simply not reported to PHMSA. Based on a comparison of incidents reported in HMIS to media and police reports, we estimate that an average of 24 percent of annual incidents were not reported in the database. The damages provided in Incident Reports are thus scaled by a factor of 1.32 (100/76) to account for the under-reporting.

17. DOT estimates that society is willing to pay $3 million to avoid a death; $2,287,556 to avoid a critical injury; $562,556 to avoid a severe injury; $172,556 to avoid a serious injury; $46,556 to avoid a moderate injury, and $6,000 to avoid a minor injury[4]. The form for the Hazardous Materials Incident Report does not list these five types of nonfatal injuries; instead, it lists hospitalized (major) and non-hospitalized (minor) injuries. For

[4] U.S. Department of Transportation, Office of the Secretary of Transportation. *Treatment of Value of Life and Injuries in Preparing Economic Evaluations: Revised Departmental Guidance.* January 29, 2002. http://ostpxweb.dot.gov/policy/Data/VSL02guid.pdf

this analysis, we assume hospitalized injuries are from serious to critical, and non-hospitalized injuries are minor to moderate. Consequently, we estimate that the amount society is willing to spend to avoid a hospitalized injury is $1,007,556 [$1,007,556 = ($2,287,556 + $562,556 + $172,556)/3] and the amount society is willing to spend to avoid a non-hospitalized injury is $26,278 [$26,278 = ($46,556 + $6,000)/2].

18. The costs and benefits associated with this rule are discounted to present value (2005 dollars). The Office of Management and Budget requires that all reported costs and benefits are to be discounted by 3 and 7 percent.

COSTS

ALTERNATIVE 1: NEW CARGO TANK MOTOR VEHICLES ONLY

Equipment and Installation Costs:

The average cost of a non-welded purging system is $1,600 per truck. Manufacturers of CTMVs will also incur additional labor costs in order to equip new CTMVs with a purging system. The additional labor cost of manufacturing CTMVs with non-welded purging systems will average $172.50 per truck, based on 10 hours at $17.25 per hour of labor.[5] Thus, the total cost of equipping each new CTMV with a non-welded purging system will be $1,772.50.

Other Installation-related Costs:

The purging system will be installed on CTMVs before they are placed into service. Thus, no downtime is associated with the installation of a purging system on new CTMVs. In addition, this analysis assumes that the lowest-cost non-welded system will be installed on the CTMVs, thus eliminating the risk of injury to welders.

[5] Bureau of Labor Statistics mean cost of production workers (Standard Occupation Classification Code 51-9199) in the "Motor Vehicle Body and Trailer Manufacturing" industry NAICS code 336200.

Maintenance Costs:

A purging system must be maintained. Since a manual purging system is simple and lacks moving parts, PHMSA assumes the average annual maintenance cost will be $3 per CTMV. This estimated cost was provided by an industry source.

Weight Penalty Costs:

A purging system is expected to add 12 pounds per compartment, or 48 pounds, to the average CTMV. This 48 pounds is equivalent in weight to 7.7 gallons of gasoline (7.7 gallons = 48 pounds/6.25 pounds per gallon).

CTMVs that would be affected by this rule haul products of different weights. For example, one gallon of gasoline, acetone, benzene, crude oil and pentane weigh 6.15, 6.60, 7.50, 6.94, and 5.20 pounds respectively. Since gasoline and fuel oils are the most common commodities transported by CTMVs affected by this rule, in this evaluation we assume the average product weight of a flammable liquid is 6.5 pounds per gallon.

Based on 2002 VIUS data, we estimate the "average weight" (vehicle weight plus cargo weight) of a trailer tanker carrying Class 3 hazmat, including the type of truck regulated by this rule, is 86,860 pounds, and the "average empty weight" of the CTMV is 29,629 pounds. These figures imply the average cargo (or payload) weight is 57,231 pounds (57,231 pounds = 86,860 pounds – 29,629 pounds). Based on VIUS, we also estimate the "maximum weight" (vehicle weight plus maximum cargo weight hauled) of a CTMV is 119,000 pounds, the maximum empty weight is 50,000 pounds and the maximum cargo hauled is 69,000 pounds (69,000 pounds = 119,000 pounds – 50,000 pounds). The difference between maximum and average cargo weight suggests that a CTMV typically carries a payload that is 11,769 pounds less than its maximum cargo weight. This difference suggests the 48 pounds added by a purging system will not affect most CTMVs. In addition, CTMVs deliver an amount of product specified by customers, which is often less than the maximum capacity of a tank. We thus assume only 25 percent of CTMVs will be affected by the weight penalty cost.

From the above, it follows that the average amount of product transported will be 8,805 gallons, and the maximum product transported will be 10,615 gallons, a difference of 1,810 gallons. Industry sources indicate that the average shipment of gasoline, the most common but also one of the lightest commodities transported, is 8,700 gallons. The higher estimates in VIUS capture other commonly transported and heavier commodities including fuels and crude oil.

Based on all commodities transported, PHMSA assumes that for 25 percent of annual trips a CTMV will carry 7.7 fewer gallons (7.7 gallons = 48 pounds/6.25 pounds per gallon). Although some of these gallons of product could be added to cargo transported at other times during the year, in this analysis, we assume they are not. We assume that the 25% of affected CTMVs with an installed purging system must make additional trips in order to transport the same volume of product as before.

Based on the VIUS data we calculate that the average trailer tanker that is authorized to carry Class 3 liquids makes 4.2 trips per day during a seven-day week and operates an average of 46 weeks per year. Thus, 27,000 CTMVs make approximately 36.5 million trips per year (36.5million = 27,000 trucks x 4.2 trips per day x 7 days per week x 46 weeks per year). 25 percent, or approximately 9.13 million, of these trips will transport 7.7 fewer gallons per trip if all CTMVs have a purging system installed. Over the year, the CTMVs will transport approximately 117.66 million fewer gallons of product (70,290,990 gallons = 9,127,700 trips x 7.7 gallons/trip). From the 2002 VIUS we also calculate that the average trip length is about 39 miles. To ship the same annual volume of product, trucks would have to make an additional 7,983 trips annually over approximately 311,337 additional miles (7,983 trips = 70,290,990 gallons/8,805 gallons per trip and 311,337 miles = 7,983 trips x 39 miles/trip).

The additional miles caused by the weight added by the purging system will cause owners of CTMVs to incur additional operating costs. Operating costs include the cost of vehicle depreciation, maintenance, tires, insurance fuel and labor. We estimate the average CTMV affected by this proposed rule operates at 5.4 miles per gallon, based on

2002 VIUS data. The average fuel cost will be $0.43 per mile based on the expectation that the average diesel price will be $2.34 per gallon[6] ($0.23/mile = $2.34/gallon x 1 gallon/5.4 miles). Maintenance costs include the cost of oil and grease, fluids, filters, inspections, licenses, and repairs. We estimate the average maintenance cost will be $0.105 per mile with an additional cost of $0.035 per mile for tires, the average depreciation cost is $0.08 per mile[7] and the average insurance cost will be no more than $0.0267 per mile[8]. The average per mile cost of labor for heavy-trucks is estimated as $0.40.[9] Total vehicle operating costs will thus be $1.0767 per mile ($1.0767 = $0.43 + $0.105 + $0.035 + $0.08 + $0.0267 + $0.40). Consequently, the additional 311,337 miles will increase annual costs by $335,216.55, an average of $12.45 per truck ($12.45/truck = $335,216.55/27,000 trucks).

Another source of costs is added risk from the extra miles driven by the operators of CTMVs. According to the National Highway Traffic Safety Administration's *Traffic Safety Facts, 2003*,[10] the fatality rate for occupants of large trucks was 0.33 fatalities per 100 million vehicle miles traveled (VMT) and the injury rate was 12 per 100 million VMT. The average CTMV will travel an additional 11.53 miles annually (11.53 miles = 311,337 miles/27,000 trucks). The expected cost of the additional 11.53 miles in terms of added fatalities will be $0.1141 per CTMV per year and the expected cost of the additional nonfatal injuries will be $0.851 per CTMV per year ($0.1141 per fatality = $3 million per fatality x 11.53 miles x 0.33 fatalities/100 million VMTs, and $0.851 per nonfatal injury = $615,044 per nonfatal injury[11] x 11.53 miles x 12 nonfatal injuries/100 million VMTs). The total annual cost associated with added fatal and nonfatal injuries is rounded up to $0.97 per truck.

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[6] Estimated price of 1 gallon of diesel fuel is the average weekly price of diesel for the time period between November 2004 and November 2005. Energy Information Administration. http://tonto.eia.doe.gov/oog/info/wohdp/diesel_detail_report.asp

[7] Barnes, Gary and Peter Langworthy. *The Per-mile Costs of Operating Automobiles and Trucks.* University of Minnesota, MN. June 2003.

[8] Robert F. Scott III, *An Analysis of the US Trucking Industry*, September 25, 1999.

[9] ibid

[10] U.S. Department of Transportation, National Highway and Traffic Safety Administration - http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/2003HTMLTSF/tbl9.htm

[11] See assumption 17. $615,044 is the average societal willingness to pay to avoid non-fatal injuries of various severities.

The total weight-related annual costs of a non-welded purging system will thus be $13.42 per CTMV ($13.42 = $12.45 + $0.97).

Total Cost of Purging System for New Cargo Tanks Only:

PHMSA estimates the total one-time cost of a non-welded purging system will be $1,772.50 per new CTMV. Total annual recurring costs will be $16.42 ($3 maintenance + $13.42 weight penalty). Table 2 below shows the present value calculation of costs incurred by new CTMVs. The calculations assume an equal number of CTMVs are retired each year over an average useful life of 20 years. A two-year transition period is also included in the calculations. The time frame is thus between 2008 and 2027. Costs are discounted at 7 percent and are assumed to occur at the beginning of each year. The PV of costs of this rule for new CTMVs only is $23,847,613.

Table 2: Present Value of the Total Cost of Non-welded Purging Systems on New CTMVs Only

Year	New Installs	One-time Cost	Total One-time Cost	Trucks with System	Annual Cost	Total Recur. Cost	Total Cost	Discount Factor	PV cost
2008	1,350	$1,772.5	$2,392,875	1,350	$16.42	$22,167	$2,415,042	1.225	$1,971,394
2009	1,350	$1,772.5	$2,392,875	2,700	$16.42	$44,334	$2,437,209	1.311	$1,859,335
2010	1,350	$1,772.5	$2,392,875	4,050	$16.42	$66,501	$2,459,376	1.403	$1,753,501
2011	1,350	$1,772.5	$2,392,875	5,400	$16.42	$88,668	$2,481,543	1.501	$1,653,557
2012	1,350	$1,772.5	$2,392,875	6,750	$16.42	$110,835	$2,503,710	1.606	$1,559,185
2013	1,350	$1,772.5	$2,392,875	8,100	$16.42	$133,002	$2,525,877	1.718	$1,470,083
2014	1,350	$1,772.5	$2,392,875	9,450	$16.42	$155,169	$2,548,044	1.838	$1,385,967
2015	1,350	$1,772.5	$2,392,875	10,800	$16.42	$177,336	$2,570,211	1.967	$1,306,565
2016	1,350	$1,772.5	$2,392,875	12,150	$16.42	$199,503	$2,592,378	2.105	$1,231,620
2017	1,350	$1,772.5	$2,392,875	13,500	$16.42	$221,670	$2,614,545	2.252	$1,160,889
2018	1,350	$1,772.5	$2,392,875	14,850	$16.42	$243,837	$2,636,712	2.410	$1,094,142
2019	1,350	$1,772.5	$2,392,875	16,200	$16.42	$266,004	$2,658,879	2.579	$1,031,159
2020	1,350	$1,772.5	$2,392,875	17,550	$16.42	$288,171	$2,681,046	2.759	$971,734
2021	1,350	$1,772.5	$2,392,875	18,900	$16.42	$310,338	$2,703,213	2.952	$915,672
2022	1,350	$1,772.5	$2,392,875	20,250	$16.42	$332,505	$2,725,380	3.159	$862,786
2023	1,350	$1,772.5	$2,392,875	21,600	$16.42	$354,672	$2,747,547	3.380	$812,900
2024	1,350	$1,772.5	$2,392,875	22,950	$16.42	$376,839	$2,769,714	3.617	$765,849
2025	1,350	$1,772.5	$2,392,875	24,300	$16.42	$399,006	$2,791,881	3.870	$721,475
2026	1,350	$1,772.5	$2,392,875	25,650	$16.42	$421,173	$2,814,048	4.141	$679,629
2027	1,350	$1,772.5	$2,392,875	27,000	$16.42	$443,340	$2,836,215	4.430	$640,171
Total	**27,000**		**$47,857,500**			**$4,655,070**	**$52,512,570**		**$23,847,613**

ALTERNATIVE 2: NEW AND EXISTING CTMVs

Equipment, Installation and Installation-Related Costs:

In addition to the $1,772.50 cost of equipment and labor, operators of existing CTMVs will need to spend $160 on parts in order to retrofit the tanks. This cost of parts is based on industry estimates of a $40 cost per compartment. An average CTMV affected by this rule has 4 compartments. The total cost for retrofitting existing CTMVs is thus $1,932.50.

We assume the installation of a purging system will not cause owners/operators of existing CTMVs to lose profit during the time the CTMV is out of service for the installation. The 5-year period to install a purging system on an existing CTMV provides flexibility of scheduling so that the system may be installed when the CTMV is out of service for mandated inspection and testing.

Maintenance Costs:

The same annual maintenance cost of $3 per truck will be incurred by existing CTMVs as new CTMVs.

Weight Penalty Costs:

The same weight penalty cost of $13.42 per truck will be incurred by existing CTMVs as new CTMVs.

Total Cost of Purging System for Existing CTMVs:

Over the 5-year compliance period, 6,750 of the 27,000 existing CTMVs will be retired and replaced with new CTMVs. We assume that the same number (4,050) of the remaining 20,250 CTMVs will install the purging system during each of the five compliance years. Table 3 below shows the calculations used to derive the PV cost of $29,747,809 that will be incurred by existing CTMVs to comply with this rule.

Table 3: Present Value Total Cost of Non-Welded Purging Systems on Existing CTMVs

Year	New Installs	One-time Cost	Total One-time Cost	Trucks with System	Annual Cost	Total Recur. Cost	Total Cost	Discount Factor	PV cost
2008	4,050	$1,932.5	$7,826,625	4,050	$16.42	$66,501	$7,893,126	1.225	$6,443,142
2009	4,050	$1,932.5	$7,826,625	8,100	$16.42	$133,002	$7,959,627	1.311	$6,072,361
2010	4,050	$1,932.5	$7,826,625	12,150	$16.42	$199,503	$8,026,128	1.403	$5,722,518
2011	4,050	$1,932.5	$7,826,625	16,200	$16.42	$266,004	$8,092,629	1.501	$5,392,460
2012	4,050	$1,932.5	$7,826,625	20,250	$16.42	$332,505	$8,159,130	1.606	$5,081,096
2013				18,900	$16.42	$310,338	$310,338	1.718	$180,620
2014				17,550	$16.42	$288,171	$288,171	1.838	$156,746
2015				16,200	$16.42	$266,004	$266,004	1.967	$135,223
2016				14,850	$16.42	$243,837	$243,837	2.105	$115,845
2017				13,500	$16.42	$221,670	$221,670	2.252	$98,424
2018				12,150	$16.42	$199,503	$199,503	2.410	$82,787
2019				10,800	$16.42	$177,336	$177,336	2.579	$68,774
2020				9,450	$16.42	$155,169	$155,169	2.759	$56,240
2021				8,100	$16.42	$133,002	$133,002	2.952	$45,052
2022				6,750	$16.42	$110,835	$110,835	3.159	$35,088
2023				5,400	$16.42	$88,668	$88,668	3.380	$26,234
2024				4,050	$16.42	$66,501	$66,501	3.617	$18,388
2025				2,700	$16.42	$44,334	$44,334	3.870	$11,457
2026				1,350	$16.42	$22,167	$22,167	4.141	$5,354
2027				0	$16.42	$0	$0	4.430	$0
Total	**20,250**		**39,133,125**			**3,325,050**			**$29,747,809**

Total Cost of Purging Systems for Both Existing and New CTMVs:

The total PV cost of the rule for both existing and new CTMVs is $53,595,422 ($23,847,613 for new CTMVs and $29,747,809 for existing CTMVs).

ALTERNATIVE 3: CTMVs MANUFACTURED ON OR AFTER JANUARY 1, 2002.

The third alternative shows the impact on total costs of requiring only new and relatively newer used CTMVs to comply with the rule. Used, but relatively new CTMVs still have a long expected life and thus pose the safety risks associated with wetlines for a longer time than older CTMVs that are approaching the end of their useful life.

Cost of Purging System for CTMVs Manufactured On or After January 1, 2002: By 2008, when the rule would apply, there would be 8,100 CTMVs manufactured between January 1, 2002 and December 31, 2007 (1,350 truck/year x 6 years). We assume all of these CTMVs will require retrofitting with the purging system and will not be manufactured with such a system.

The additional $160 one-time cost for parts required for retrofitting will thus need to be incurred by these CTMVs. The total one-time cost for these CTMVs will thus be $1,932.50 for equipment, parts and labor. Recurring annual costs will be $13.42 including maintenance and the weight penalty cost. Down time costs will not be borne by the owners of these CTMVs as they can install the purging system during the same time as the required inspection every five years.

Table 5 below shows the costs for CTMVs manufactured on or after January 1, 2002. We assume that an equal number of existing CTMVs manufactured after 2002 will install a purging system during each of the five years. The 1,350 trucks manufactured in 2002 will be retired by 2022, with 1,350 more trucks retired in each additional year. The PV cost of the rule for CTMVs manufactured on or after January 1, 2002 is $12,120,788.

Table 5: Present Value Total Cost of Non-Welded Purging System for CTMVs Manufactured Between 2002 and 2007.

Year	New Installs	One-time Cost	Total One-time Cost	Trucks with System	Annual Cost	Total Recur. Cost	Total Cost	Discount Factor	PV cost
2008	1,620	$1,932.5	$3,130,650	1,620	$16.42	$26,600	$3,157,250	1.225	$2,577,257
2009	1,620	$1,932.5	$3,130,650	3,240	$16.42	$53,201	$3,183,851	1.311	$2,428,945
2010	1,620	$1,932.5	$3,130,650	4,860	$16.42	$79,801	$3,210,451	1.403	$2,289,007
2011	1,620	$1,932.5	$3,130,650	6,480	$16.42	$106,402	$3,237,052	1.501	$2,156,984

2012	1,620	$1,932.5	$3,130,650	8,100	$16.42	$133,002	$3,263,652	1.606	$2,032,438
2013				8,100	$16.42	$133,002	$133,002	1.718	$77,408
2014				8,100	$16.42	$133,002	$133,002	1.838	$72,344
2015				8,100	$16.42	$133,002	$133,002	1.967	$67,611
2016				8,100	$16.42	$133,002	$133,002	2.105	$63,188
2017				8,100	$16.42	$133,002	$133,002	2.252	$59,054
2018				8,100	$16.42	$133,002	$133,002	2.410	$55,191
2019				8,100	$16.42	$133,002	$133,002	2.579	$51,580
2020				8,100	$16.42	$133,002	$133,002	2.759	$48,206
2021				8,100	$16.42	$133,002	$133,002	2.952	$45,052
2022				6,750	$16.42	$110,835	$110,835	3.159	$35,088
2023				5,400	$16.42	$88,668	$88,668	3.380	$26,234
2024				4,050	$16.42	$66,501	$66,501	3.617	$18,388
2025				2,700	$16.42	$44,334	$44,334	3.870	$11,457
2026				1,350	$16.42	$22,167	$22,167	4.141	$5,354
2027				0	$16.42	$0	$0	4.430	$0
Total	**8,100**		**15,653,250**			**1,928,529**			**$12,120,788**

Total Cost for New CTMVs and CTMVs Manufactured on or After January 1, 2002:

The total cost of the rule for new CTMVs and used by relatively new CTMVs is $35,968,401 ($23,847,613 for new CTMVs and $12,120,788 for those manufactured on or after January 1, 2002).

BENEFITS

The benefits of this rule are avoided costs of incidents associated with wetlines. Wetlines are located on the bottom of CTMVs affected by this rule at the same height level as many personal vehicles. They can carry between 30-50 gallons of flammable liquids. When wetlines are damaged as a result of a collision or accident, the flammable product is released. In certain incidents, the only costs associated with the release of product are the value of the lost product and clean-up costs. However, in other incidents the product ignites causing further damage to the cargo tank and the surrounding environment, further loss of product, and in certain cases injury or death from the resulting fire.

The incidents that can be attributed to wetlines are thus of two types. One type of incident involves damage to a wetline and a loss of product of no more than 50 gallons (the maximum carried by wetlines) without a fire. The second type of incident involves initial release of product from a damaged wetline. The product causes a fire resulting in greater costs. In other words, the fire would not result if the wetline did not contain flammable product as no other part of the tanker truck containing liquid had been damaged in the incident.

Some incidents involving the release of hazardous materials, including flammable and combustible liquids, are reported to the Hazardous Materials Information System (HMIS). However, HMIS did not include incidents involving intrastate motor carriers until 1998. Some incidents are also simply not reported to the system. Also, the forms used for reporting do not capture all the costs associated with incidents.

For these reasons, the NPRM identified wetlines incidents in HMIS and compared them to costs reported in the media and police reports. This comparison resulted in the estimate that 24% of incidents and costs are underreported in the HMIS. This analysis evaluates the reported costs first. Second, we estimate associated costs not captured in the incident reporting forms.

Incidents identified as wetlines incidents in this analysis indicate a breach of the external product piping resulting in a spill of 50 gallons or less or a spill of more than 50 gallons caused by a fire resulting from the initial release of product from a wetline. Incidents identified in the NPRM between the years 1990 to 2000 as those with a spill of more than 50 gallons but no fire were excluded from this analysis as such incidents imply that there was further damage to the tank causing the release of more product than the maximum amount that can be held by the wetlines.

Additional incidents identified in the HMIS were added for the second half of 2001 not covered in the NPRM. These incidents clearly indicate a breach of the external product

piping and were not compared to media or police reports. A total of 148 incidents were identified for the 12-year period between 1990 and 2001.

Avoided Costs from Reported Incidents

Reported Fatalities and Injuries

For purposes of this analysis, we identified seven fatalities resulting from wetlines incidents occurring during the 12-year period from January 1, 1990, through December 31, 2001[12]. The total cost of the 7 fatalities is $21 million at $3 million per fatality. This fatality rate, of 7 deaths per 12 years, represents a cost to society of $1.75 million ($1.75 million = $3 million x 7/12). Consequently, eliminating seven-twelfths of a fatality will produce a benefit of $1.75 million per year.

During the same period, there were zero hospitalized and three non-hospitalized injuries caused by wetlines, for an average of 0.25 non-hospitalized injuries per year. The total cost of the three injuries is $78,834. Eliminating these three injuries will produce annual benefits of $6,569.50 in avoided minor injuries ($26,278 x 0.25 injuries/year). The total benefit to society of eliminating wetlines fatalities and nonfatal injuries will be $1,756,569.50 annually ($1,756,569.50 = $1,750,000 + $6,569.50).

Product Loss

During the 12-year period from 1990 through 2001, the total amount of product spilled from incidents where wetline spills caused damage was 10,824.53 gallons, an average of 902 gallons per year. Some incidents reported a range of gallons lost. For these incidents, we assumed the median loss. Gallons lost from further damage to the tank caused when product released from a wetline caught fire are included in these calculations. The average amount lost per incident is 73.1 gallons (10,824.53/148). The majority of the incidents involved gasoline or other petroleum products, but a few incidents involved

[12] One incident, which occurred on August 2, 2000, in Altoona, Pennsylvania, was reported to PHMSA; however, the report incorrectly stated that no fatalities or injuries resulted from the incident. A newspaper review of incidents provided by a commenter to the February 10, 2003 ANPRM included information on the fatal injury.

other highly hazardous products such as acetone or xylene (see the appendix for complete list of incidents).

The total reported loss of product is $12,841.55 or $1,070.13 per year. The loss per incident is $86.77. Consequently, eliminating this loss of product will produce $1,070.13 in annual benefits.

Decontamination/Cleanup Cost of Reported Incidents

Decontamination/cleanup cost (cleanup cost) is the sum of the costs of stopping the spread of a spill and removing and disposing of spilled materials. Cleanup costs can include removal of the truck and soil and groundwater remediation. Of the 148 wetline incidents, only 67 report a clean up-cost, 57 report a cost of zero, and 24 do not report any clean up cost. For certain spills, the product was simply allowed to evaporate and the clean up cost was thus actually zero. However, most other incidents involved spills that are not consistent with zero clean up cost and included a written description of a clean up being performed by the driver, customer or other personnel. Consequently, we estimate cleanup costs for the incidents that did not give positive estimates.

Among the 67 reports that contained an estimate of cleanup cost greater than zero, the cleanup cost ranged from $3 to $10,000, and cleanup cost per gallon spilled varied from $0.40 to $3,846. The average cleanup cost was $1,102.66 per incident or $96.08 per gallon spilled; the median was $400 per incident or $75 per gallon spilled[13]. We use the average rate of $96.08 per gallon spilled to estimate the cleanup cost for incidents with reports that did not estimate positive cleanup cost.

PHMSA estimates the total cleanup cost for the 148 incidents where wetline spills caused damages is $1,039,876.72 (10,823.03 gallons x $96.08 per gallon) or an average of

[13] The 2001 Battelle report, *Comparative Risks of Hazardous Materials and Non-Hazardous Materials Truck Shipment Accidents/Incidents*, prepared for the Federal Motor Carrier Safety Administration, cites a New York State Department of Environmental Conservation study that estimates cleanup costs for small trucks at $6,717 and $13,437 for large trucks, both in 1996 dollars. These costs apply only to the removal of the truck from the scene.

$86,656.40 per year. Consequently, the benefit of preventing contamination from wetline spills is $86,656.40 per year.

Carrier Damage

Over the 12-year period from 1990 through 2001, we estimate the total carrier damage was $660,131 for incidents involving wetlines. A few incidents resulted in the total destruction of a CTMV from a fire. However, the initial fire resulted from product being released from wetlines and this rule would eliminate such releases. The average annual benefit from preventing carrier damage from wetline incidents is $55,010.92.

Public/Private Property Damage of Reported Incidents

Public and private property damage includes damage to roads, guideposts, bridges, automobiles, utility lines, and other property. The most frequent type of private/public property damage caused by a spill is damage to roads. Petroleum products, such as gasoline and diesel fuel, can penetrate pavement and soften it. A gasoline spill softens asphalt pavement very quickly. Often a detergent solution is used to clean the contaminated areas of pavement, and we expect the cost to clean a contaminated area of pavement is included in the reported and estimated decontamination/cleanup cost. In some cases, however, damaged areas of pavement have to be removed and patched; in the worst cases, the entire depth of pavement has to be removed and replaced. In addition, intense heat damages roads. Fourteen (9.5 percent) of the 148 wetlines incidents involved fires of various sizes.

During the 12-year period of analysis, 24 incident reports include a positive dollar value for property damage. Two other reports indicate damage but do not estimate a dollar value. Twenty-three reports mark property damage as unknown or left blank although 3 of them involved a fire and the remaining 99 reports show zero as the cost. For the 24 reports that reported positive estimates of public/private damage, the total cost was $161,410, the average was $6,725.42 per incident and $13,450.83 per year. We used this average cost per incident to estimate public/private property damage for the 23 incidents

when the category was left blank or the damage was reported to be unknown. The cost for these incidents is $154,684.66.

One of the two reports that described damage, but did not give an estimate, was on the incident in Yonkers, New York, described in the introduction to this document. We used the National Transportation Safety Board's $7 million estimate of the public/private property damage from the Yonkers incident provided by its investigation of the accident. The second incident that described public/private damage involved damage to a guide pole. We estimate the cost to replace the guide pole would be $2,000.

We estimate total public/property damage for wetlines incidents was $7,318,095 ($7 million for Yonkers, $2,000 for the guide pole, $161,410 for reported incidents and $154,684.66 for incidents where property damage was unknown). Consequently, we estimate the average annual benefit of avoiding property damage caused by wetlines incidents to be $609,841.25. While this estimate is greatly affected by the Yonkers accident, we believe it is conservative because it is difficult to believe that there was no property damage in the remaining 102 incidents.

Evacuation Cost of Reported Incidents

A total of 317 people were evacuated during the 12-year period, for an average of 26.42 people per year.

Evacuation costs are difficult to estimate because they are strongly dependent on the duration and location of the evacuation. An incident in a rural area would likely result in fewer people being evacuated than the same incident in an urban residential area. An incident in an industrial or commercial area would likely result in more business disruptions than the same incident in an agricultural area. An evacuation that lasts one hour would have less impact than an evacuation that lasts for 48 hours.

According to a November 1990 report for the Environmental Protection Agency (EPA) by Industrial Economics, Inc., the total cost associated with an evacuation is estimated at

$27 to $48 per person. In 2005 dollars[14], this cost would range from $36.7 to $65.25. According to a 2001 report by Battelle, *Comparative Risks of Hazardous Materials and Non-Hazardous Truck Shipment Accidents/Incidents*, the Nuclear Regulatory Commission estimates an evacuation cost of $600 to $1,800 per person and the Federal Railroad Administration uses an estimate of $1,000 per day to estimate the impacts of railroad evacuations. Implicit in all of these estimates is location and time. We assume the average cost of an evacuation is $65.25 per person, which is the highest figure in the range used by the EPA. We estimate the total cost of evacuation is $20,684.25 (317 people x $65.25/person) and the average annual evacuation cost due to wetlines spills is $1,723.69 ($20,684.25/12 years).

Other Reported Cost of Reported Incidents

The Hazardous Materials Incident Report includes a category of damages called "Other." The total "other" reported costs are $20,915.00, or an annual average of $1,742.92.

Total Reported Damages of Reported Incidents

The total reported damage is the sum of the fatalities, injuries, total product loss, cleanup cost, carrier damages, private and public property damages, evacuation costs and other costs caused by reported wetlines incidents. The annual reported damages or the annual reported benefits of this rule are $2,512,614.40 ($1,756,569.50 for fatalities and injuries + $1,070.13 for product loss + $86,656 for cleanup costs + $55,010.92 for carrier damages + $609,841.25 for private/public property damage + $1,723.68 for evacuation costs + $1,742.92 for other reported costs).

Purging System Reportable Benefits: New Cargo Tanks Only

Over a 20-year period, purging systems are expected to reduce fatalities, injuries, and property damages caused by wetlines by 100 percent because the systems would eliminate the product that currently remains in loading/unloading pipes. Consequently, if every CTMV were to be equipped with a purging system, total damage due to fatalities

[14] GDP deflator taken from *Budget of the United States Government, Fiscal Year 2006.* http://www.whitehouse.gov/omb/budget/fy2006/pdf/hist.pdf

and nonfatal injuries caused by wetlines would decrease from $1,756,569.50 per year to zero, and total reported property damage caused by wetlines would decrease from $756,044.90 per year to zero, a total annual reported benefit of $2,512,614.40.

Each year 1,350 existing CTMVs are replaced with new trucks. In the first year 1,350 new trucks (or 5 percent of the population) would be equipped with a system; the second year 2,700 new trucks (or 10 percent) would be equipped with a system; and so on, until the entire population would be equipped with a system by the twentieth year. Over the 20-year period of analysis, the present value of total reported benefit of the performance standard will be $9,667,615 if a purging system is installed on new tank trucks only. Present values are discounted by 7 percent and calculations are shown in Table 6 below.

Table 6: Present Value of Total Reported Benefits of A Non-Welded Purging System on New CTMVs Only

Year	Trucks With System	% Trucks with System	Value of Avoided Fatalities & Injuries	Value of Avoided Damages	Total Value of Avoided Harm and Damages	% of Total Damages Avoided	Discount Factor	PV Benefits
2008	1,350	5%	$1,756,569.50	$756,044.90	$2,512,614	$125,631	1.23	$102,552.09
2009	2,700	10.0%	$1,756,569.50	$756,044.90	$2,512,614	$251,261	1.31	$191,686.15
2010	4,050	15.0%	$1,756,569.50	$756,044.90	$2,512,614	$376,892	1.40	$268,718.90
2011	5,400	20.0%	$1,756,569.50	$756,044.90	$2,512,614	$502,523	1.50	$334,852.21
2012	6,750	25.0%	$1,756,569.50	$756,044.90	$2,512,614	$628,154	1.61	$391,182.49
2013	8,100	30.0%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	1.72	$438,709.34
2014	9,450	35.0%	$1,756,569.50	$756,044.90	$2,512,614	$879,415	1.84	$478,343.51
2015	10,800	40.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,005,046	1.97	$510,914.30
2016	12,150	45.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,130,676	2.10	$537,176.25
2017	13,500	50.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,256,307	2.25	$557,815.42
2018	14,850	55.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,381,938	2.41	$573,455.11
2019	16,200	60.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,507,569	2.58	$584,661.11
2020	17,550	65.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,633,199	2.76	$591,946.61
2021	18,900	70.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,758,830	2.95	$595,776.60
2022	20,250	75.0%	$1,756,569.50	$756,044.90	$2,512,614	$1,884,461	3.16	$596,572.03
2023	21,600	80.0%	$1,756,569.50	$756,044.90	$2,512,614	$2,010,092	3.38	$594,713.55
2024	22,950	85.0%	$1,756,569.50	$756,044.90	$2,512,614	$2,135,722	3.62	$590,545.00
2025	24,300	90.0%	$1,756,569.50	$756,044.90	$2,512,614	$2,261,353	3.87	$584,376.58
2026	25,650	95.0%	$1,756,569.50	$756,044.90	$2,512,614	$2,386,984	4.14	$576,487.80
2027	27,000	100.0%	$1,756,569.50	$756,044.90	$2,512,614	$2,512,614	4.43	$567,130.15
Total			**$35,131,390**	**$15,120,898**	**$50,252,288**	**$26,382,451**		**$9,667,615**

Purging System Reportable Benefits: New and Existing Cargo Tanks

The calculations used to derive the benefits associated with retrofitting existing CTMVs are shown in Table 7 below. Existing CTMVs are given a 5-year compliance period for retrofitting. By December 31, 2012, at the end of this phase-in period 6,750 new trucks and 20,250 existing trucks would be in service (6,750 = 1,350 trucks/year x 5 years and 20,250 = 27,000 total trucks – 6,750 new trucks). Consequently, we assume an average of 4,050 existing trucks installs a new system during each of the 5 phase-in years. Fifteen percent of the 27,000 tank trucks (or 4,050 existing trucks) will have an installed system during the first year of the phase-in period, 30% by the second year (or 8,100 existing trucks), 45% the third year, 60% by the fourth year, and 75% of the total population (or

20,250 existing trucks) by the end of the phase-in period. During this 5-year phase-in period, five percent or 1,350 of the existing tank trucks will be retired each year. When the phase-in period is over, 1,350 existing trucks with an installed system will also be withdrawn from service annually.

Over the 20-year period of analysis, the present value of total reported benefit of the performance standard will be $9,739,778 discounted by 7 percent, if a purging system is installed on existing CTMVs.

The total present value benefit of having both new and existing CTMVs install the non-welded purging system is $19,407,393 ($9,667,615 + $9,739,778).

Table 7: Present Value Total Reported Benefits of Non-Welded Purging System on Existing CTMVs

Year	Trucks With System	% Trucks with System	Value of Avoided Fatalities & Injuries	Value of Avoided Damages	Total Value of Avoided Harm and Damages	% of Total Damages Avoided	Discount Factor	PV Benefits
2008	4,050	15%	$1,756,569.50	$756,044.90	$2,512,614	$376,892	1.23	$307,656.27
2009	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	1.31	$575,058.45
2010	12,150	45%	$1,756,569.50	$756,044.90	$2,512,614	$1,130,676	1.40	$806,156.70
2011	16,200	60%	$1,756,569.50	$756,044.90	$2,512,614	$1,507,569	1.50	$1,004,556.64
2012	20,250	75%	$1,756,569.50	$756,044.90	$2,512,614	$1,884,461	1.61	$1,173,547.48
2013	18,900	70%	$1,756,569.50	$756,044.90	$2,512,614	$1,758,830	1.72	$1,023,655.12
2014	17,550	65%	$1,756,569.50	$756,044.90	$2,512,614	$1,633,199	1.84	$888,352.24
2015	16,200	60%	$1,756,569.50	$756,044.90	$2,512,614	$1,507,569	1.97	$766,371.45
2016	14,850	55%	$1,756,569.50	$756,044.90	$2,512,614	$1,381,938	2.10	$656,548.75
2017	13,500	50%	$1,756,569.50	$756,044.90	$2,512,614	$1,256,307	2.25	$557,815.42
2018	12,150	45%	$1,756,569.50	$756,044.90	$2,512,614	$1,130,676	2.41	$469,190.54
2019	10,800	40%	$1,756,569.50	$756,044.90	$2,512,614	$1,005,046	2.58	$389,774.07
2020	9,450	35%	$1,756,569.50	$756,044.90	$2,512,614	$879,415	2.76	$318,740.48
2021	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.95	$255,332.83
2022	6,750	25%	$1,756,569.50	$756,044.90	$2,512,614	$628,154	3.16	$198,857.34
2023	5,400	20%	$1,756,569.50	$756,044.90	$2,512,614	$502,523	3.38	$148,678.39
2024	4,050	15%	$1,756,569.50	$756,044.90	$2,512,614	$376,892	3.62	$104,213.82
2025	2,700	10%	$1,756,569.50	$756,044.90	$2,512,614	$251,261	3.87	$64,930.73
2026	1,350	5%	$1,756,569.50	$756,044.90	$2,512,614	$125,631	4.14	$30,341.46
2027	0	0%	$1,756,569.50	$756,044.90	$2,512,614		4.43	
Total			**$35,131,390**	**$15,120,898**	**$50,252,288**	**$18,844,608**		**$9,739,778**

Purging System Reportable Benefits:

CTMVs Manufactured on or After January 1, 2002

By 2008, when the rule would apply, there would be 8,100 CTMVs manufactured between January 1, 2002 and December 31, 2007 (1,350 truck/year x 6 years). We assume that these trucks will also install over a 5-year phase-in period. Thus in 2008, 1,620 "newer" tanks or six percent of the total truck population of 27,000 will have installed the purging system, in 2009 3,240 trucks or 12% of the population will have installed the purging system and so on. The trucks manufactured between January 1, 2002 and December 31, 2007 will start being retired at the rate of 1,350 per year starting with the year 2022. Thus in 2022, there will be only 6,750 out of the 8,100 trucks manufactured between these dates and 20,250 new CTMVs.

Table 8 below shows the calculations of reported present value benefits for trucks manufactured between January 1, 2002 and December 31, 2007. The total present value of these benefits is $5,152,186.

The total present value of having all CTMVs manufactured on or after January 1, 2002 installed is $14,819,801 ($9,667,615 CTMVs manufactured after 01/01/2008 + $5,152,186 CTMVs manufactured between 01/01/2002 and 12/31/2007).

Table 8: Present Value Reported Benefits of Non-Welded Purging System on CTMVs Manufactured Between 2002 and 2007.

Year	Trucks With System	% Trucks with System	Value of Avoided Fatalities & Injuries	Value of Avoided Damages	Total Value of Avoided Harm and Damages	% of Total Damages Avoided	Discount Factor	PV Benefits
2008	1,620	6%	$1,756,569.50	$756,044.90	$2,512,614	$150,757	1.23	$123,062.51
2009	3,240	12%	$1,756,569.50	$756,044.90	$2,512,614	$301,514	1.31	$230,023.38
2010	4,860	18%	$1,756,569.50	$756,044.90	$2,512,614	$452,271	1.40	$322,462.68
2011	6,480	24%	$1,756,569.50	$756,044.90	$2,512,614	$603,027	1.50	$401,822.66
2012	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	1.61	$469,418.99
2013	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	1.72	$438,709.34
2014	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	1.84	$410,008.73
2015	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	1.97	$383,185.73
2016	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.10	$358,117.50
2017	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.25	$334,689.25
2018	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.41	$312,793.69
2019	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.58	$292,330.56
2020	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.76	$273,206.13
2021	8,100	30%	$1,756,569.50	$756,044.90	$2,512,614	$753,784	2.95	$255,332.83
2022	6,750	25%	$1,756,569.50	$756,044.90	$2,512,614	$628,154	3.16	$198,857.34
2023	5,400	20%	$1,756,569.50	$756,044.90	$2,512,614	$502,523	3.38	$148,678.39
2024	4,050	15%	$1,756,569.50	$756,044.90	$2,512,614	$376,892	3.62	$104,213.82
2025	2,700	10%	$1,756,569.50	$756,044.90	$2,512,614	$251,261	3.87	$64,930.73
2026	1,350	5%	$1,756,569.50	$756,044.90	$2,512,614	$125,631	4.14	$30,341.46
2027	0	0%	$1,756,569.50	$756,044.90	$2,512,614		4.43	
Total			**$35,131,390**	**$15,120,898**	**$50,252,288**	**$10,929,873**		**$5,152,186**

Associated Damages Caused by Wetlines That are not Reported to PHMSA

The damages caused by wetlines incidents are greater than what is reported in Incident Reports submitted to PHMSA. Associated damages caused by wetlines incidents include the costs of traffic delays, additional vehicle operating expenses, commercial losses beyond those that may be included in evacuation costs, environmental damage, and emergency services beyond those that may be included in decontamination/cleanup costs (Associated damages also include medical and rehabilitation costs, legal and court costs,

insurance administration costs, and premature funeral costs. We do not attempt to quantify them here). These associated damages are not reported to PHMSA; however, they are part of the true costs of the wetlines incidents that are reported. Associated damages are difficult to estimate; however, high profile incidents, such as the Yonkers, New York incident, provide insight into some of these associated damages. At best, we can provide a range of values for these associated damages that are informed by empirical and other evidence.

A rule to prohibit the transportation of flammable liquids in wetlines unless the CTMV is equipped with bottom damage protection would reduce the likelihood of an explosion and fire in the event of a crash. It would, however, have no effect on the likelihood of a crash. Therefore, the benefits of such a rule are the difference in harm between a crash that does not result in a fire and one that does.

Because of the difficulty in estimating associated benefits, some of the estimates for the benefits discussed in this section may be over- or understated. For example, the estimate derived for traffic delays is extrapolated from information about delays associated with several wetlines incidents, including the incident in Yonkers that destroyed an overpass section of the New York State Thruway and incidents in Mesa, Arizona; and Chatham, Ohio, that resulted in lengthy highway closures. For purposes of this analysis, we assume that these delays are directly attributable to the release of the hazardous materials as a result of the accidents in question. However, it is also true that traffic delays result from accidents that are not related to hazardous materials or where a hazardous material is not released from its packaging during an accident. We did not try to identify the incremental costs associated with traffic delays resulting from the hazardous materials spill over and above the costs for delays that may have resulted had the hazardous material not been released For this reason, these costs may be overstated. It is however reasonable to assume that most, if not all, the costs related to traffic delays resulting from wetlines accidents are directly attributable to the release of hazardous materials. Such delays would not have been as severe if a hazardous material were not involved or had

not been released. In the Yonkers incident, for example, the overpass section would not have been destroyed had the hazardous material not been released and ignited.

Traffic Delays

Parties not directly involved in a wetlines incident may be delayed by traffic congestion or road closures caused by the incident. For example, the October 9, 1997 incident in Yonkers, New York, resulted in large traffic delays because damage to the wetlines caused a fire that destroyed an overpass on a section of the New York State Thruway.

According to the New York Department of Transportation, an average of 43,300 motorists traveled that section of the Thruway on a daily basis in 1991 and an average of 78,700 motorists traveled that section on a daily basis in 1998. Assuming a linear trend from 1991 to 1998, an average of 73,643 motorists traveled that section of the Thruway each day in 1997.

According to a New York Thruway Authority representative, long delays occurred within the first 24 hours of the October 9th incident, but delays decreased to 5 minutes after a temporary bridge was installed one week after the incident. Assuming the average delay was 0.5 hours (30 minutes) per motorist for the first 24 hours after the incident, the first 24 hours resulted in 36,822 hours of traffic delay beyond normal congestion (36,822 hours = 73,643 motorists x 0.5 hours/motorist). Then assuming the average delay from Day 2 through Day 7 was 0.25 hours (15 minutes); the next 6 days resulted in 110,465 hours of traffic delay (110,465 hours = 73,643 motorists/day x 6 days x 0.25 hours/motorist). Finally if the average delay was 0.0833 hours (5 minutes) for the following 5 months, there were an additional 933,323 hours of traffic delay beyond normal congestion (933,323 hours = 73,643 motorists/day x 0.08333 hours/motorist x 365 days/12 months per year x 5 months). The total traffic delay for the Yonkers incident would be 1,080,610 hours (1,080,610 = 36,822 + 110,465 + 933,323).

Table 9 below shows the value of 1hour of time travel for various vehicles in 1995 dollars according to the Federal Highway Administration's Highway Economic Requirements System (HERS)[15]. The table also shows the values in 2005 dollars using the GDP deflator from the U.S. Federal Budget for fiscal year 2006.

Table 9: Value of One Hour of Travel Time by Vehicle Type

Vehicle Type	Value of 1 hour of travel (1995 dollars)	Value of 1 hour of travel (2005 dollars)
small auto	15.71	18.82
med. Auto	15.75	18.87
4-tire truck	17.84	21.38
6-tire truck	19.98	23.94
3-4 axle truck	23.66	28.35
4-axle combo	25.49	30.24
5-axle combo	25.24	30.54

A representative from the New York Thruway Authority estimated that 30 percent of the motorists in that section of the Thruway are combination trucks. Consequently, we estimate that 30 percent of the motorists are combination trucks and the remaining 70 percent are cars. The value of one hour of travel for a car is assumed to be the average for small and medium autos, or $18.85 per hour and the value of one hour of travel for combination trucks is assumed to be average for 4-axle and 5-axle combination trucks or $30.39 per hour. The total value of additional travel time resulting from the traffic delays would be $14,258,648.95 for cars and $9,851,921.37 for combination trucks ($14,258,648.95 = $18.85 per hour x 1,080,610 hours x 0.70 and $9,851,921.37 = $30.39 x 1,080,610 x 0.30). The total value of additional travel time caused by the Yonkers incident was $24,110,570.32.

Other wetlines incidents during the 12-year period of analysis caused traffic delays. On April 13, 1996, in Mesa, Arizona, an exit ramp for a major highway was closed to traffic; and in Chatham, Ohio, a rural roadway was closed to traffic on January 3, 1996. It is

[15] Federal Highway Administration. *Highway Economics Requirements System Technical Report.* November, 2003.

reasonable to expect that other wetlines incidents involved partial or full road closures. According to a 2001 Battelle report, 75 percent of hazardous materials incidents in California and 60 to 100 percent of hazardous materials incidents elsewhere resulted in partial or full road closures.[16] A major incident is one that blocks two or more lanes of a freeway for two hours or more. A major incident has an average duration of 3 hours 39 minutes and has an average of 2,800 vehicle-hours of delay on freeways around it; and a common incident has an average duration of 1 hour with an average delay of 1,200 vehicle hours (Battelle; Recker et al., 1988). A major incident lasting 10 to 12 hours causes a vehicle-hour delay of 30,000 to 40,000 (Battelle; Recker et al., 1988). At a unit cost of delay at $15 per hour that was estimated by Battelle, a common incident produces a traffic delay costing $18,000, the average major incident a delay costing $42,000, and a major incident lasting 10 to 12 hours a delay costing $450,000 to $600,000.

The Yonkers incident, which involved a fatality, caused traffic delays for months in a high-use area, which is reflected in the large traffic delay cost of $24,110,570.32. There were five other incidents that involved a fatal injury (there were two fatalities in one of the incidents) and two incidents that involved nonfatal injuries during the 12-year period. We assume that the incidents involving nonfatal injuries are average major incidents and those involving fatalities are major incidents lasting 10 hours. The total traffic delay cost from these seven major incidents involving a fatality or injury was thus $2,334,000 ($2,334,000 = {$450,000 x 5} + {$42,000 x 2}).

We estimate there were an average of 5 common incidents each year, and the annual traffic delay cost for the common incidents was $90,000 ($90,000 = $18,000 x 5).

The total traffic delay cost caused by wetlines spills from 1990 through 2001 is estimated to be $27,524,570.32 ($27,524,570.32 = $24,110,570.32 for Yonkers + $2,334,000 for incidents with fatalities or injuries + $1,080,000 for 5 common incidents each year). We

[16] Battelle, 2001. *Comparative Risks of Hazardous Materials and Non-Hazardous Materials Truck Ship Accidents/Incidents.*

estimate the average annual cost of traffic delays caused by wetlines spills is $2,293,714 ($2,293,714 = $27,524,570.32/12).

Additional Vehicle Operating Expenses

The detours off the New York State Thruway resulted in more miles driven and higher motor vehicle operating costs. Motor vehicle operating cost is a mileage-dependent cost of running motor vehicles on the highway, including expenses of fuel, tires, engine oil, maintenance, and that portion of vehicle depreciation attributable to highway mileage traveled. According to the October 15, 1997 issue of *The New York Times*, traffic was diverted off the Thruway for about 0.5 miles southbound and for 1.3 miles northbound until a temporary bridge was in place. We assume half of the 73,643 motorists per day drove an additional 0.5 miles and the other half drove an additional 1.3 miles.

Consequently, we calculate that they traveled an additional 18,411 southbound miles and an additional northbound 47,868 miles, for a total of 66,279 additional miles per day. We estimate the daily cost of the additional miles for trucks was $21,408.78 ($21,408.78 = 66,279 miles x 0.3 x $1.0767/mile) and the daily cost of the additional miles for cars was $22,501.72 ($22,501.72 = 66,279 miles x 0.7 x $0.485/mile). (The cost per mile per truck is $1.0767, which is the same cost we used when estimating the cost of the additional miles after a purging system is installed. The cost per mile per car is $.485, which is currently the cost estimate used by the Internal Revenue Service[17].) The total daily cost of the additional miles in today's dollars to trucks and cars was $43,910.5. Over a 7-day period, the total additional operating expenses attributable to the wetlines spill in the Yonkers incident was $307,373.50.

We assume the ratio of additional operating expenses caused by the Yonkers wetlines spill to additional operating expenses caused by the other wetlines spills is the same as the ratio of cost of traffic delays caused by the Yonkers wetlines spill to cost of traffic delays caused by other wetlines spills. Traffic delays caused by the Yonkers wetlines

[17] *IRS Increases Mileage Rate Until Dec, 31, 2005.* http://www.irs.gov/newsroom/article/0,,id=147423,00.html

spill cost $24,110,570.32, and the traffic delays caused by other (non-Yonkers) wetlines spills cost $3,414,000 ($2,334,000 + $1,080,000). The ratio of costs of traffic delays caused by the Yonkers wetlines spill to those delays caused by non-Yonkers wetlines spills is 7.06 to 1. (The combined cost of the non-Yonkers incidents is 14.16 percent of the cost of the Yonkers incident (14.16% = {$3,414,000/$24,110,570.32} x 100). Consequently, we estimate the total additional operating expenses due to the non-Yonkers wetlines spills is $43,537.32 ($27,937 = $307,373.50/7.06). The total additional operating expenses caused by wetlines spills is estimated to be $350,910.82 ($350,910.82 = $307,373.50 + $43,537.32). The annual average associated benefit of avoided additional operating costs from wetline incidents is thus estimated to be $29,242.

Commercial Losses Beyond Those Included in Evacuation Costs

Commercial losses can occur beyond those that may be included in temporary evacuation costs. The Hazardous Materials Incident Report does not ask a carrier to estimate the number of businesses that are affected by the incident; however, it does request that the carrier identify the land use at the incident site. Land use categories are industrial, commercial, residential, agricultural, and undeveloped. During this analysis, the land use information was available starting with the year 1993. 103 incidents occurred between 1993 and 2001. Of these incidents, 54.4% occurred in commercial zones, 16.5% in industrial, 14.6% in undeveloped, 7.8% in unknown zones, 3.9% in agricultural and 2.9% in residential. Since the majority of the incidents occurred in commercial zones, we establish possible scenarios of commercial losses to estimate average business losses resulting form an average wetline incident.

Although we do not have empirical evidence of commercial losses due to wetlines incidents, there is other evidence, such as newspaper accounts. Reconstruction of a New York Thruway bridge due to the Yonkers wetlines spill required land restrictions and closures on Central Park Avenue, which runs underneath the structure. It took 4.5 months for a permanent bridge to be completed. According to the October 15, 1997, issue of *The New York Times*, merchants along Central Park Avenue were negatively

affected by the incident and one restaurant manager estimated a decline in business of 75 percent.

We suspect that the vast majority of the merchants adversely affected by the Yonkers incident were in the limited service restaurant industry (NAICS 722211). According to the 2002 *Economic Census*, there were 174,104 year-round establishments in this industry with combined annual sales of $94.698 billion dollars, an average of $543,916 annual sales per establishment. We offer three broad scenarios of commercial losses for a 4.5-month period, the time it took to replace the bridge. The first scenario assumes the average establishment lost 50 percent of its sales, the second scenario 25 percent, and the third scenario 10 percent. Within each scenario are estimates of combined commercial losses for 10 to 30 establishments. In the first scenario, if 10 of the establishments affected by the Yonkers incident were average establishments in the limited service restaurant industry, and average sales were down 50 percent for 4.5 months, they would have lost $1,019,842.50 ($1,019,842.50 = $543,916 x 0.5 x 0.375 years x 10 establishments). If 20 establishments were affected, the combined commercial loss would have been $2,039,685 and so on (see Table 10). We assume that the ratio of commercial losses in the Yonkers incident to commercial losses in all other wetline spill incidents is the same as the ratio of traffic delay costs in the Yonkers incident to traffic delay costs in all other wetline spill incidents. Thus, if the total commercial loss caused by the Yonkers incident were 7.06 times higher than the total commercial loss caused to all other incidents, the total commercial loss for the non-Yonkers incidents would have been $144,453.61 for 10 establishments and $288,907.22 for 20 ($144,453.61 = $1,019,842.5/7.06). See Table 8. We estimate the average annual commercial loss due to wetlines spills ranges from $19,404.94 to $291,074.03. Consequently, we estimate the median commercial loss due to wetlines spills is $97,024.68, and use this figure in our estimate of total associated damage.

Table 10: Scenarios of Commercial Losses

Average Annual Sales Per Establishment	# of Estab.	Years Of Losses	Yonkers Comb. Comm. Losses	Fraction Yonkers to Non-Yonkers	Non-Yonkers Comb. Comm. Losses	Total Commercial Losses	Annual Total Commercial Losses
When 50 percent of sales are lost							
$543,916	10	0.375	$1,019,843	7.06	$144,454	$1,164,296	$97,025
$543,916	20	0.375	$2,039,685	7.06	$288,907	$2,328,592	$194,049
$543,916	30	0.375	$3,059,528	7.06	$433,361	$3,492,888	$291,074
When 25 percent of sales are lost							
$543,916	10	0.375	$509,921	7.06	$72,227	$582,148	$48,512
$543,916	20	0.375	$1,019,843	7.06	$144,454	$1,164,296	$97,025
$543,916	30	0.375	$1,529,764	7.06	$216,680	$1,746,444	$145,537
When 10 percent of sales are lost							
$543,916	10	0.375	$203,969	7.06	$28,891	$232,859	$19,405
$543,916	20	0.375	$407,937	7.06	$57,781	$465,718	$38,810
$543,916	30	0.375	$611,906	7.06	$86,672	$698,578	$58,215

Environmental/Natural Resources Damage

Environmental/natural resources damage can be measured as losses from property devaluation, agricultural production losses, and/or ecosystem deterioration or loss of habitat that exceed the direct cost of clean up. Only one of the 148 wetlines incident reports included environmental damages; however, news accounts of the incidents suggest the number could be higher.

The one incident with reported environmental damages involved a 30-gallon gasoline spill. Many of the wetline incidents involved spills of product onto pavement and thus did not cause environmental damage. However, the true cost of environmental damage from wetline spills would depend on the location of the spill, the type and quantity of product spilled, and if the incident caused a fire.

In its 2001 report, Battelle stated it surveyed legal cases involving environmental damage settlements and found the average settlement price was $3,792 per acre. We use this average price to estimate environmental damages.

Battelle estimated that a spill of 3,031 gallons would cover an area of at least 0.21 acres if the spill were one centimeter thick on a dirt surface, or conservatively, up to 0.70 acres. That is equivalent to a 14,333-gallon spill covering one acre, or conservatively, to a 4,330-gallon spill covering one acre. We estimate the total environmental damage from the one wetline incident ranged from $7.94 to $26.27 ($7.94 = 30 gallons x {1 acre/14,333 gallons} x {$3,792/1 acre} and $19,630 = 30 gallons x {1 acre/4,330 gallons} x {$3,792/1 acre}). Consequently, we estimate the annual environmental damage from wetlines ranges from $0.66 to $2.19; however, these figures are likely to underestimate the actual environmental damage caused by wetline spills. We use the average of the two values, which is $1.43 annually, in our estimate of total associated damage.

Emergency Services

Many of the incident reports stated that a local fire department responded to the spill. Both fire and police departments were on the scene for major incidents, and in some cases, emergency medical personnel and/or state environmental officials responded as well. Carriers do not estimate costs incurred by emergency responders to PHMSA.

The number of emergency responders varies with the size, type, and location of a spill. For example, the Boston Fire Department has a 4-tiered hazardous materials response system. Petrochemical spills less than 10 gallons are in Level 0, spills from 10 to 50 gallons are in Level 1, and spills over 50 gallons or report of a chemical fire or other hazardous conditions are in Level 2. Level 3 spills require the use of special chemical protective suits and equipment. One engine, one ladder, and a district chief respond to Level 0 spills. Level 0 respondents with a special unit and hazardous materials/title III inspector respond to Level 1 spills. The Level 1 group and a hazardous materials team (one engine, one ladder) safety chief and mobile command post respond to Level 2 spills:

and the Level 2 group with a hazardous materials/Title III officer and deputy chief respond to Level 3 incidents.[18]

A fire department's responsibility is to contain a spill, not clean it up. However, in many areas, a local fire department or department of public works will perform or assist in the cleanup, as shown by reports of incidents involving wetline spills. We have already included the total cost to fire departments and other public agencies that performed or assisted in cleanups in our estimate of total reported cleanup cost. Below we estimate the total cost to fire departments that respond to spills, but do not clean them up.

We estimate that the average local fire department that responds to a spill of less than 10 gallons, with no fire, will incur a cost of $615, based on conversations with officials from fire departments ($615 = 2 trucks x $100 per hour per truck x 1.5 hours + 7 personnel x $30/hour x 1.5 hours = $300 for trucks and $315 for labor). (These costs do not include any materials, such as boom pads, that would be used in a cleanup.) The cost to the same local fire department to respond to a 10- to 50-gallon spill, with no fire, will be $1,232 (1,232 = 2 trucks x $100 per hour/truck x 3 hours + 7 personnel x $30/hour x 3 hours). Larger spills or a fire increase the cost to emergency responders. First, equipment and labor costs increase because two more trucks and seven more personnel respond to a larger spill, and hours on site increase. Consequently, we estimate the cost to respond to spills over 50 gallons is $8,200 ($8,200 = 4 trucks x $100/hour x 10 hours + 14 personnel x $30/hour x 10 hours). Second, chemicals are used to fight a fire. Foam to fight a gasoline fire costs $60 to $65 per gallon, and $1,000 is likely to be spent in chemicals to fight a fire from a gasoline spill of 25 to 50 gallons, based on fire departments' estimates. From that, we estimate 16 gallons of foam are necessary to fight a fire involving a 50-gallon spill, a rate of 0.32 gallons of foam per gallon spilled (16 gallons = $1,000/$62.5 per gallon).

[18] Parker, Richard. *Hazardous Material Response.* *http://www.ci.boston.ma.us/bfd/divisions/hazmat_response.htm*

67 of the incidents with wetline spills reported cleanup costs. Those 67 spills were not cleaned up by local fire departments based on the incident reports. Consequently, we estimate the costs to fire departments that responded to the 67 incidents are not included in reported cleanup costs. 33 of these incidents involved spills of less than 10 gallons, 29 involved spills between 10 and 50 gallons and 5 incidents involved a fire with 191 gallons spilled during the incidents with fires. We estimate the total cost to fire departments that responded to those 67 spills from 1990 through 2001 was $100,843 ((33 x $615) + (29 x $1,232) + (5 x $8,200) + (191 gallons product x 0.32 gallons foam/gallon product x $62.5/gallon foam). The annual cost of emergency response for wetline spills is thus $8,403.58.

Emergency responders face risks of fatal and nonfatal injuries. According to a Federal Emergency and Management Administration preliminary report, there were 96,990 petrochemical incidents from 1986 through 1990 (*Firefighter Safety Study: Review of the Adequacy of Response Information on Hazardous Materials*, October 1992). The rate of firefighter injury was 9.1 per 1,000 incidents and the firefighter fatality rate was 2.5 per 100,000 incidents[19] (FEMA). From 1990 through 2001 there were 148 wetlines incidents. We assume that firefighters responded to 80 percent (or 118) of these incidents. Consequently, we estimate that 1.0738 firefighter nonfatal injuries and 0.00295 fatalities were associated with wetlines incidents (1.0738 = {9.1 x 118}/1,000 and 0.00295 = {2.5 x 118}/100,000). The amount that society is willing to spend to avoid 1.0738 nonfatal firefighter injuries is $660,435 when the cost to avoid a nonfatal injury is $615,044, and the amount that it is willing to spend to avoid 0.00295 firefighter fatalities is $8,850 when the cost to avoid a death is $3 million. The total cost to avoid firefighter fatalities and nonfatal injuries is $669,285, an average of $55,773.75 per year ($55,773.75 = $862,606/12).

We estimate the total annual cost of wetlines spills to emergency responders, less cleanup costs, would be $64,177.33 ($100,519 = $8,403.58 + $55,773.75).

[19] Federal Emergency and Management Administration. *Firefighter Safety Study: Review of the Adequacy of Response Information on Hazardous Materials*, October 1992.

Total Non-Reported Damage

We estimate the total associated damage caused by wetlines spills is $2,484,159.44 annually ($1,647,801 = $2,293,714.00 for traffic delays + $29,242.00 additional vehicle operating expenses + $97,024.68 commercial losses + $1.43 for environmental damage + $64,177.33 for services of emergency responders and the additional risk of injuries and fatalities to emergency responders).

Purging System Associated Benefits: New Cargo Tanks

A purging system is expected to reduce associated damages caused by wetlines by 100 percent. We estimate that over the 20-year period of analysis the present value total associated benefit of a purging system on new cargo tanks will be $9,558,131 when discounted 7 percent. Table 11 below show the calculations used to derive at this estimate.

Table 11: Present Value Total Associated Benefits of Non-welded Purging System on New CTMVs

Year	Trucks With System	% Trucks with System	Value of Avoided Associated Damages	Associated Damages Avoided	Discount Factor	PV Benefits
2008	1,350	5%	$2,484,159.44	$124,208	1.23	$101,390.70
2009	2,700	10.0%	$2,484,159.44	$248,416	1.31	$189,515.33
2010	4,050	15.0%	$2,484,159.44	$372,624	1.40	$265,675.70
2011	5,400	20.0%	$2,484,159.44	$496,832	1.50	$331,060.07
2012	6,750	25.0%	$2,484,159.44	$621,040	1.61	$386,752.41
2013	8,100	30.0%	$2,484,159.44	$745,248	1.72	$433,741.02
2014	9,450	35.0%	$2,484,159.44	$869,456	1.84	$472,926.35
2015	10,800	40.0%	$2,484,159.44	$993,664	1.97	$505,128.28
2016	12,150	45.0%	$2,484,159.44	$1,117,872	2.10	$531,092.81
2017	13,500	50.0%	$2,484,159.44	$1,242,080	2.25	$551,498.25
2018	14,850	55.0%	$2,484,159.44	$1,366,288	2.41	$566,960.82
2019	16,200	60.0%	$2,484,159.44	$1,490,496	2.58	$578,039.92
2020	17,550	65.0%	$2,484,159.44	$1,614,704	2.76	$585,242.91
2021	18,900	70.0%	$2,484,159.44	$1,738,912	2.95	$589,029.52
2022	20,250	75.0%	$2,484,159.44	$1,863,120	3.16	$589,815.95
2023	21,600	80.0%	$2,484,159.44	$1,987,328	3.38	$587,978.51
2024	22,950	85.0%	$2,484,159.44	$2,111,536	3.62	$583,857.17
2025	24,300	90.0%	$2,484,159.44	$2,235,743	3.87	$577,758.60
2026	25,650	95.0%	$2,484,159.44	$2,359,951	4.14	$569,959.16
2027	27,000	100.0%	$2,484,159.44	$2,484,159	4.43	$560,707.49
Total			**$49,683,189**	**$26,083,674**		**$9,558,131**

Purging System Associated Benefits: New and Existing Cargo Tanks

The total associated benefit of this alternative is the benefit of installing a non-welded purging system on existing CTMVs added to the benefit of installing a system on new CTMVs.

We estimate that over the 20-year period of analysis the present value total associated benefits of a purging system on existing cargo tanks is $9,629,477 when discounted by 7 percent. Table 12 below shows the calculations used to arrive at this estimate.

Consequently, over the 20-year period of analysis the present value total associated benefit of a purging system on new and existing cargo tanks is $19,187,608 when discounted by 7 percent ($9,558,131 + $9,629,477).

Table 12: Present Value Total Associated Benefits of Non-Welded Purging Systems on Existing CTMVs

Year	Trucks With System	% Trucks with System	Value of Avoided Associated Damages	Associated Damages Avoided	Discount Factor	PV Benefits
2008	4,050	15%	$2,484,159.44	$372,624	1.23	$304,172.11
2009	8,100	30%	$2,484,159.44	$745,248	1.31	$568,546.00
2010	12,150	45%	$2,484,159.44	$1,117,872	1.40	$797,027.11
2011	16,200	60%	$2,484,159.44	$1,490,496	1.50	$993,180.20
2012	20,250	75%	$2,484,159.44	$1,863,120	1.61	$1,160,257.24
2013	18,900	70%	$2,484,159.44	$1,738,912	1.72	$1,012,062.39
2014	17,550	65%	$2,484,159.44	$1,614,704	1.84	$878,291.79
2015	16,200	60%	$2,484,159.44	$1,490,496	1.97	$757,692.42
2016	14,850	55%	$2,484,159.44	$1,366,288	2.10	$649,113.44
2017	13,500	50%	$2,484,159.44	$1,242,080	2.25	$551,498.25
2018	12,150	45%	$2,484,159.44	$1,117,872	2.41	$463,877.03
2019	10,800	40%	$2,484,159.44	$993,664	2.58	$385,359.94
2020	9,450	35%	$2,484,159.44	$869,456	2.76	$315,130.80
2021	8,100	30%	$2,484,159.44	$745,248	2.95	$252,441.22
2022	6,750	25%	$2,484,159.44	$621,040	3.16	$196,605.32
2023	5,400	20%	$2,484,159.44	$496,832	3.38	$146,994.63
2024	4,050	15%	$2,484,159.44	$372,624	3.62	$103,033.62
2025	2,700	10%	$2,484,159.44	$248,416	3.87	$64,195.40
2026	1,350	5%	$2,484,159.44	$124,208	4.14	$29,997.85
2027	0	0%	$2,484,159.44	$0	4.43	$0.00
Total			**$49,683,189**	**$18,631,196**		**$9,629,477**

Purging System Associated Benefits: Cargo Tank Motor Vehicles Manufactured on or After January 1, 2002

The present value associated benefits of cargo tanks manufactured on or after January 1, 2002 is the sum the benefits for new cargo tanks manufactured on or after January 1,

2008 and existing tanks at the time the rule would go into effect. The existing tanks are those manufactured between January 1, 2002 and December 31, 2007.

This alternative is evaluated in order to demonstrate the effect of the rule on an approach that would require only partial retrofitting. Only the newest of the existing CTMVs would be required to purge or protect wetlines. Many of the benefits are captured in this alternative since these CTMVs will operate for the majority of their useful life with a purging system. At the same time, the oldest CTMVs, with shorter remaining useful lives, do not have to incur the costs of retrofitting.

We estimate that over the 20-year period of analysis the present value total associated benefit of a purging system on existing cargo tanks manufactured between January 1, 2002 and December 31, 2007 is $5,093,839 when discounted by 7 percent. Table 13 below shows the calculations used to arrive at this estimate.

Thus, the present a value total associated benefit of purging systems on all CTMVs manufactured on or after January 1, 2002 is $14,651,970 when discounted by 7 percent ($9,558,131 + $5,093,839).

Table 13: Present Value Total Associated Benefit of Non-Welded Purging Systems on CTMVs Manufactured Between January 1, 2002 and December 31, 2007.

Year	Trucks With System	% Trucks with System	Value of Avoided Associated Damages	Avoided Associated Damages	Discount Factor	PV Benefit
2008	1,620	6%	$2,484,159.44	$149,050	1.23	$121,668.84
2009	3,240	12%	$2,484,159.44	$298,099	1.31	$227,418.40
2010	4,860	18%	$2,484,159.44	$447,149	1.40	$318,810.84
2011	6,480	24%	$2,484,159.44	$596,198	1.50	$397,272.08
2012	8,100	30%	$2,484,159.44	$745,248	1.61	$464,102.90
2013	8,100	30%	$2,484,159.44	$745,248	1.72	$433,741.02
2014	8,100	30%	$2,484,159.44	$745,248	1.84	$405,365.44
2015	8,100	30%	$2,484,159.44	$745,248	1.97	$378,846.21
2016	8,100	30%	$2,484,159.44	$745,248	2.10	$354,061.88
2017	8,100	30%	$2,484,159.44	$745,248	2.25	$330,898.95
2018	8,100	30%	$2,484,159.44	$745,248	2.41	$309,251.36
2019	8,100	30%	$2,484,159.44	$745,248	2.58	$289,019.96
2020	8,100	30%	$2,484,159.44	$745,248	2.76	$270,112.11
2021	8,100	30%	$2,484,159.44	$745,248	2.95	$252,441.22
2022	6,750	25%	$2,484,159.44	$621,040	3.16	$196,605.32
2023	5,400	20%	$2,484,159.44	$496,832	3.38	$146,994.63
2024	4,050	15%	$2,484,159.44	$372,624	3.62	$103,033.62
2025	2,700	10%	$2,484,159.44	$248,416	3.87	$64,195.40
2026	1,350	5%	$2,484,159.44	$124,208	4.14	$29,997.85
2027	0	0%	$2,484,159.44	$0	4.43	$0.00
Total			**$49,683,189**	**$10,806,094**		**$5,093,838**

Present Value Total Benefit Scaled for Under-Reporting

A review of major newspapers from October 1, 1998 through December 31, 2001, shows consistent under-reporting of incidents involving CTMVs hauling flammable liquids. An average of 24 percent of the quarterly reportable incidents were included in major newspapers and not found in HMIS. Our findings are consistent with information provided by a commenter to the ANPRM, who also performed a newspaper review to identify unreported incidents. This commenter's review spanned the period from 1990 to the end of 2001. For the first 9-1/2 years, this commenter identified only 10 highly probable wet lines incidents. However, the commenter found 14 such incidents during the period following a 1999 report on the NBC Dateline program on wetlines. This

discrepancy suggests that a significant number of wetlines incidents may have been unreported or misrepresented until nationwide publicity highlighted the issue for operators and the general public. The National Transportation Safety Board, in its report on the wetlines safety problem, also concludes that the HMIS system may not include all loading line failures during accidents.

Present value total benefits are the sum of present value total reported benefit plus the present value total associated benefit from reported incidents. Based on the estimated level (24 percent) of under-reporting, this sum is multiplied by 1.32 (1.32 = 100/76) to yield an estimate of the total benefit of the performance standard. The calculations are presented in Table 14 below.

Table 14: Present Value Total Benefit of Alternatives Scaled for Under-reporting.

Alternative	P.V. Reported Benefit	P.V. Associated Benefit	Reported & Associated	Scaling Factor	P.V. Total Benefits
Purging System on New Trucks	$9,667,615	$9,558,131	$19,225,746	1.32	**$25,377,985**
Purging System on Trucks Manufactured on or After January 1, 2002	$14,819,801	$14,651,970	$29,471,771	1.32	**$38,902,738**
Purging System on New and Existing Trucks	$19,407,393	$19,187,608	$38,595,001	1.32	**$50,945,401**

Net Cost and Benefit-Cost Ratio of Alternatives

Table 15 below shows present value costs and benefits discounted by 7 percent and the benefit-cost ratios of all alternatives considered in this analysis.

The alternative with the lowest present value cost is to have a non-welded purging system installed on new CTMVs only. The net present value of benefits is highest when some of the least aged existing CTMVs are required to retrofit their wetlines with a purging system. The benefits of protecting wetlines are larger in this scenario because these CTMVs still have a service life of about 15 years.

Table 15: Net Present Value Costs and Benefit-Cost Ratios of Purging System Alternatives

Alternative	P.V. Total Costs	P.V. Total Benefits	P.V. Net Costs	Benefit-Cost Ratio
Purging System on New Trucks	$23,847,613	$25,377,985	$1,530,371	1.06
Purging System on Trucks Manufactured on or After January 1, 2002	$35,968,401	$38,902,738	$2,934,336	1.08
Purging System on New and Existing Trucks	$53,595,422	$50,945,401	-$2,650,021	0.95

SENSITVITY ANALYSIS

In this section, we show the impact on present value total costs, present value total benefits and the benefit-cost ratio of changes in selected assumptions and values. Costs and benefits are shown discounted by both 3 and 7 percent. The baseline costs, benefits and benefit-cost ratio are shown in Table 1 at the beginning of the report.

(1) CTMV Population

In the following table we assume the affected CTMV population is 29,700 instead of 27,000, or 10% higher. All other assumptions are held constant.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$26,232,375	$25,297,034	0.96	$40,168,272	$43,900,387	1.09
Manufactured After 1/1/2002	$39,565,241	$38,778,645	0.98	$56,544,710	$64,265,442	1.14
New and Existing	$58,954,965	$50,782,896	0.86	$80,048,588	$80,511,840	1.01

(2) Cost of Equipment Installation

In the following table we assume the cost of the system installed to comply with this rule will be 10% higher than the baseline assumption. Thus, it will be $1,949.75

($1,772.50 x 1.1) for new CTMVs and $2,125.75 ($1,932.50 x 1.1) for existing CTMVs. All other assumptions are held constant.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$26,061,794	$25,297,034	0.97	$39,872,246	$43,900,387	1.10
Manufactured After 1/1/2002	$39,303,752	$38,778,645	0.99	$56,111,361	$64,265,442	1.15
New and Existing	$58,612,530	$50,782,896	0.87	$79,505,687	$80,511,840	1.01

(3) No Weight Penalty Costs

In this scenario we assume that this rule does not create weight penalty costs. This scenario is plausible if the owner of CTMV chooses to install equipment that does not occupy room in the tank or if CTMVs do not fill-up to capacity. All other assumptions are unchanged.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$22,453,463	$25,297,034	1.13	$34,097,206	$43,900,387	1.29
Manufactured After 1/1/2002	$33,831,262	$38,778,645	1.15	$47,862,534	$64,265,442	1.34
New and Existing	$50,796,714	$50,782,896	1.00	$68,334,336	$80,511,840	1.18

(4) No Under-Reporting

In this scenario we assume that all wetline incidents are reported accurately to PHMSA and do not scale reported and associated benefits by 1.32. All other assumptions are unchanged.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$23,847,613	$19,225,746	0.81	$36,516,611	$33,364,294	0.91
Manufactured After 1/1/2002	$35,968,401	$29,471,770	0.82	$51,404,282	$48,841,736	0.95
New and Existing	$53,595,422	$38,595,001	0.72	$72,771,443	$61,188,999	0.84

(5) Fatalities and Injuries

In the following table we assume that one more fatality, one more hospitalized injury and one more non-hospitalized injury occurred. Thus, the following table shows present values of costs and benefits if 8 fatalities, 1 hospitalized and 4 non-hospitalized injuries occurred during the twelve-year period of analysis. All other assumptions are held constant.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$23,847,613	$26,998,866	1.13	$36,516,611	$46,853,741	1.28
Manufactured After 1/1/2002	$35,968,401	$41,387,438	1.15	$51,404,282	$68,588,834	1.33
New and Existing	$53,595,422	$54,199,263	1.01	$72,771,443	$85,928,192	1.18

(6) Reported Damages

The following table shows the impact of a 10% increase in reported damages including carrier damage, private and public property damage, loss of product, clean-up costs, evacuation costs and other reported costs. Thus, reported damages are assumed to be $831,649.39 ($756,044.90 x 1.1). All other values are held constant.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$23,847,613	$25,679,795	1.08	$36,516,611	$44,564,629	1.22
Manufactured After 1/1/2002	$35,968,401	$39,365,391	1.09	$51,404,282	$65,237,821	1.27
New and Existing	$53,595,422	$51,551,275	0.96	$72,771,443	$81,730,037	1.12

(7) Associated Damages

The following table shows the impact of a 10% increase in associated or non-reported damages including costs of traffic delays, additional vehicle operating expenses, commercial losses, environmental damage, and emergency response costs. Thus, associated damages are assumed to be $2,732,575.38 ($2,484,159.44 x 1.1). All other values are held constant.

Alternative	P.V. Total Cost (7%)	P.V. Total Benefit (7%)	Benefit-Cost Ratio (7%)	P.V. Total Cost (3%)	P.V. Total Benefit (3%)	Benefit-Cost Ratio (3%)
New Only	$23,847,613	$26,554,683	1.11	$36,516,611	$46,082,907	1.26
Manufactured After 1/1/2002	$35,968,401	$40,706,535	1.13	$51,404,282	$67,460,416	1.31
New and Existing	$53,595,422	$53,307,581	0.99	$72,771,443	$84,514,508	1.16

BREAK-EVEN ANALYSIS

In this section, we show the values that selected costs, benefits and assumptions would need to equal in order for the net cost to equal zero or for the benefit-cost ratio to equal one. Costs and benefits are discounted by 3 and 7 percent.

(1) CTMV Population

The following table shows the number of CTMVs that can be affected by this rule for the benefits to equal the costs for the three alternatives.

Alternative	Discounted by 3%	Discounted by 7%
New CTMVs Only	32,463	28,642
CTMVs Manufactured After 1/1/2002	33,761	29,112
New and Existing CTMVs	29,857	25,558

(2) System Cost

The following tables show how much the one time cost of equipment, parts and installation labor would need to be per CTMV for the benefits to equal the costs. The costs for new and existing CTMVs differ because existing CTMVs may require additional parts for retrofitting.

This rule evaluated the lowest-cost equipment, the non-welded manual purging system that is currently available to satisfy the requirements of this rule. A welded system is more expensive and increases the risk of fatalities and injuries to welders. Automated purging systems create higher maintenance costs. The availability of lower cost measures however can produce the same safety benefits at a lower cost.

System Costs for New CTMVs

Alternative	Discounted by 3%	Discounted by 7%
New CTMVs Only	$2,161.05	$1,888.26
CTMVs Manufactured After 1/1/2002	$2,451.78	$1,997.37
New and Existing CTMVs	$2,182.09	$1,548.73

System Costs for Existing CTMVs

Alternative	Discounted by 3%	Discounted by 7%
CTMVs Manufactured After 1/1/2002	$3,765.80	$2,416.28
New and Existing CTMVs	$2,377.62	$1,738.76

(3) Percent of Incidents Not Reported

The following table shows the percentage of wetline incidents that would have to be not reported to PHMSA in order for the benefits of this rule to equal the costs, assuming that all the average reported costs per incident and per year would still hold.

Alternative	Discounted by 3%	Discounted by 7%
New CTMVs Only	9%	19%
CTMVs Manufactured After 1/1/2002	5%	18%
New and Existing CTMVs	16%	28%

(4) Fatalities and Injuries

The table below shows the number of fatalities that would have to occur in a 12-year period in order for the benefits of this rule to equal to the costs. Injuries are assumed to equal the baseline assumption of 0 hospitalized and 3 non-hospitalized injuries.

Fatalities

Alternative	Discounted by 3%	Discounted by 7%
New CTMVs Only	6	4
CTMVs Manufactured After 1/1/2002	6	3
New and Existing CTMVs	8	5

4 hospitalized injuries would have to occur over a 12-year period for benefits to exceed costs when existing CTMVs require a retrofit and benefits and costs are discounted by 7 percent (the only scenario where net benefits are negative under baseline assumptions).

Even if wetline incidents do not cause any non-hospitalized injuries over a 12-year period, benefits would still exceed costs in all scenarios, except if a complete retrofit is required on all CTMVs and net benefits are discounted by 7 percent. In this scenario, 130 non-hospitalized injuries would have to occur over a 12-year period for benefits to exceed the costs.

(5) Reported Damages

The following table shows the annual average reported damages that are required for the costs of this rule to equal its benefits. Reported damages include carrier damage, private and public property damage, loss of product, clean-up costs, evacuation costs and other reported costs. This analysis assumes that associated damages, and all other values, remain unchanged.

Alternative	Discounted by 3%	Discounted by 7%
New CTMVs Only	N/A	$469,749
CTMVs Manufactured After 1/1/2002	N/A	$393,935
New and Existing CTMVs	$275,656	$1,032,783

Even if no damages were reported in the wetline incidents, the benefits of this rule would still exceed its costs if only new CTMVs, or all CTMVs manufactured after January 1, 2002 are required to install a purging system and net benefits are discounted by 3 percent.

(6) Associated Damages

The following table shows the required associated damages for the benefits of this rule to equal its costs under alternative scenarios. Associated or non-reported damages include the costs of traffic delays, additional vehicle operating expenses, commercial losses, environmental damage, and emergency response costs. Reported damages, and all other assumptions, are held constant.

Alternative	Discounted by 3%	Discounted by 7%
New CTMVs Only	$1,643,733	$2,197,864
CTMVs Manufactured After 1/1/2002	$1,484,177	$2,122,049
New and Existing CTMVs	$2,003,770	$2,760,897

REGULATORY FLEXIBILITY ANALYSIS

Impact of regulation on small businesses

The proposal to prohibit the transportation of flammable liquids in wetlines would affect entities that own DOT-specification CTMVs that haul flammable liquids, have wetlines as part of a vapor recovery system, and are not straight trucks. We reviewed the 148 wetlines incidents from January 1, 1990, through December 31, 2001, to determine the primary industries of the firms that would be affected by this proposed rule. The majority of incidents involved firms transporting petroleum products such as gasoline and fuel oil. The owners of CTMVs engaged in transporting these products can be either manufacturers of the products, wholesalers or specialized transport companies. However, all owners of non-straight tanker trucks used for transporting flammable liquids are affected by the rule, whether they were involved in an incident or not. All the industries potentially affected by this rule as identified by wetline incidents, the number of establishments in the industry and the number of small business establishments are listed in table 16 below. At the same time, not every firm in the affected industries will own the type of CTMV affected by this rule. Thus, the number of small businesses shown in table 16 is a ceiling estimate.

We used the Small Business Administration's (SBA) Size Standards by NAICS Industry to determine which firms are considered small in each industry. For example, according to the Size Standards, a small business in any one of the sub-industries within Specialized Freight Trucking (NAICS 4842) has annual receipts up to $21.5 million dollars, and a small business in Petroleum Refineries has up to 1,500 employees.

We then used the *2002 Economic Census* of the U.S. Census Bureau to estimate the number of establishments and the number of small businesses establishments within each industry. Census does not provide data on the number of firms for all industries but it does provide the number of business establishments for all industries. Thus, the number of establishments slightly exceeds the number of businesses. Census also disaggregates the number of establishments only by the number of employees and not by revenue.

Since the percent of establishments that are small in industries defined by the number of employees ranges from 92 to 100 percent, we assume that 95 percent of establishments are small within industries whose size standards are based on revenues.

Table 16: Estimated Number of Small Businesses in Industries That Can Own CTMVs for Flammable Liquid Transport

		SBA Size Standard					
NAICS	Industry	Revenue	Employees	Establish-ments	Employees	# Small Establish-ments	% Small
211111	Crude Petroleum and Natural Gas Extraction		500	7,178	100,333	7,160	99.75%
213112	Support Activities for Oil and Gas Operations	$6M		6,297	106,118	6,265	99.49%
324110	Petroleum Refineries		1,500	199	65,448	185+	92.96%+
325193	Ethyl Alcohol Manufacturing		1,000	69	1,592	69	100.00%
325191	Gum and Wood Chemical Manufacturing (Acetone)		500	52	2,261	52	100.00%
325211	Plastic Materials and Resins Manufacturing		750	688	61,632	647-654	95.06%
325212	Synthetic Rubber Manufacturing		1,000	157	12,172	157	100.00%
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing		500	468	24,597	463	98.93%
4842201	Hazardous Materials Trucking (Except Waste), Local	$21.5M		1,604	20,335	1,524	95.00%
4842301	Hazardous Materials Trucking (Except Waste), Long-Distance	$21.5M		1,449	16,559	1,377	95.00%
4226902	Other Chemical and Allied Products Wholesalers (Excluding Gases)		500	10,465	110,583	9,942	95.00%
422710	Petroleum Bulk Stations and Terminals		500	7,690	102,489	7,306	95.00%
422720	Petroleum & Petro. Products Wholesalers, Exc. Blk Sta. & Ter.		500	3,607	35,340	3,427	95.00%
4471	Gasoline Stations	$7.5M-$23M		120,902	922,781	114,857	95.00%
454311	Heating Oil Dealers	$6M		4,681	51,246	4,447	95.00%
454319	Other Fuel Oil Dealers	$6M		230	591	219	95.00%
Total				**165,736**	**1,634,077**	**157,263**	

Note: Ranges or floor estimates with plus signs are provided for some categories because Census size categories do not match SBA size standards for certain industries.

We estimate there are 157,263 small business establishments in the 16 affected industries. However, not all of these businesses own a CTMV, as the entire estimated population of CTMVs affected by this rule is 27,000. 36 percent of the firms involved in wetlines incidents were small businesses. Assuming 36 percent is equal to the percent of small businesses that own affected CTMVs, and that, in the extreme, each firm that owns a CTMV has only one truck in its fleet, at most there would be 9,720 small businesses (9,720 = 27,000 x 0.36). These 9,720 small businesses represent 6.2 percent of the small business establishments in the 16 industries.

Gasoline is the most common commodity transported in the type of non-straight CTMVs affected by this rule. It is also the most common commodity involved in wetline incidents. The number of small businesses that transport gasoline and other products in CTMVs regulated by this rule is greater than 6.2 percent. We therefore initially assume that the number of small businesses that transport products in the regulated CTMVs may be substantial.

The percentage of small businesses involved in wetlines incidents from 1990 through 2001 (36 percent) is much smaller than the percentages of small businesses in the above industries. We expect this difference because larger firms tend to own and operate more CTMVs. More trucks increase the odds that a firm is involved in an incident.

Another difference between the percentage of small businesses involved in wetlines incidents and the percentage of small businesses in the 16 industries is due to the exclusion of straight trucks from this proposed rule. According to the Petroleum Marketers Association of America (PMAA), a federation that represents small, independent petroleum marketers nationwide that sell almost half of the consumed gasoline, over 60 percent of the diesel fuel, and approximately 85 percent of the home heating oil consumed in this country annually, its members typically have only straight trucks in their fleets. Thus, we assume small businesses tend to own single-unit trucks.

We estimate that 49 percent of all CTMVs that transport flammable liquids are exempted from this proposed rule because we exempt straight trucks. Consequently, many small businesses that transport flammable liquids will not be impacted by this proposed rule because they own straight trucks.

The 2002 VIUS also reveals that smaller businesses tend to purchase older trucks than larger businesses. Small businesses will thus be affected to a greater extent by a requirement to retrofit of existing trucks than by a rule affecting new CTMVs only. See Table 17 below.

Table 17: New v Used CTMV Purchases by Fleet Size

Trucks in Fleet Other Than Purchased Truck	0	1-5	6-10	11-20	21-50
% Buying Used	23.1%	46.2%	23.1%	7.7%	0.0%
% Buying New	25.0%	28.6%	14.3%	28.6%	3.6%

We estimate the median annual revenue of the small businesses that were involved in wetlines incidents from 1990 through 2001 is currently $15 million, with a range from $750,000 to $75 million. The smallest 5 percent of these small businesses had annual sales less than $1 million, and the smallest 15 percent had annual sales no greater than $2.5 million. If a purging system were installed on an existing CTMVs - the type more often purchased by small businesses - a small business with one used truck, would pay a one-time cost of $1,932.50 for equipment and installation plus an annually recurring cost of $16.42 for maintenance and added miles; the highest annual cost would represent 0.3 percent of the smallest median annual revenue of the small firms (0.3 = 100 x $1,949/$750,000). If the profit margin for the small firms is only 3 percent, the annual cost would represent 8.7 percent of annual profit the first year, but less than 0.1 percent of annual profit in subsequent years [8.7 = 100 x $1,949/(0.03 x $750,000), and less than 0.1 = 100 x $16.42/(0.03 x $750,000)]. At the least, 9,720 would be affected by this rule. Consequently, we expect a rule to prohibit the transportation of flammable liquids in wetlines unless the cargo tank is equipped with bottom damage protection could have a significant impact on a substantial number of small entities.

PAPERWORK REDUCTION ACT ANALYSIS

This rule does not require additional paperwork.

Appendix: Wetline Incidents and Reported Damages

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
1990														
15-Jan	Ashland, KY	Petro. Naptha	15	0	0	0	15	2,000	0	NR*	0	600	No	
1-Feb	Port Wentworth, GA	Fuel Oil	30	0	0	0	30	N/A	0	N/A	0	14,000	No	
21-Mar	Virginia Beach, VA	Gasoline	3	0	0	0	10	Unknown	Unknown	0	0	Unknown	No	
24-Mar	Seat Pleasant, MD	Gasoline	30	0	0	0	35	Unknown	2,000	N/A	0	5,000	No	
27-Apr	Baton Rouge, LA	Gasoline	33	0	0	0	24	NR*	NR*	NR*	0	5,115	No	
1-Jun	Maple Grove, MN	Gasoline	15	0	0	0	15	0	0	NR*	NR*	12,000	No	
11-Jun	Milwaukee, WI	Fuel Oil	39	0	0	0	39	NR*	N/A	NR*	0	20,000	Yes	
24-Jul	Lebanon, NH	Fuel Aviation	20	0	0	0	50	N/A	150	N/A	0	2,500	No	
2-Aug	Cleveland, OH	Petro. Naptha	0.13	0	0	0	0	0	N/A	0	0	5,000	No	
11-Oct	Pittsburgh, PA	Gasoline	30	0	0	0	45	2,534	NR*	NR*	0	3,000	No	
11-Nov	Ringwood, OK	Crude Oil Petro	5	0	0	0	5	145	0	NR*	0	0	No	
16-Nov	Bradley, TN	Styrene Monmr	0.004	0	0	0	0	N/A	0	0	0	0	No	
6-Dec	Myerstown, PA	Gasoline	100	0	0	0	140	500	200	N/A	0	110,000	Yes	
7-Dec	Phoenix, AZ	Fuel Oil	2	0	0	0	3	10	0	N/A	0	50	No	

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
21-Dec	Willow Grove, PA	Gasoline	20	0	0	0	NR*	0	0	3000	NR*	NR*	Yes	
1991														
9-Jan	Phoenix, AZ	Gasoline	1	0	0	0	0	0	0	0	0	0	Yes	
12-Jan	Alexandria, MN	Gasoline	12	0	0	0	9	170	NR*	NR*	0	2,300	No	
26-Jan	Washington, DC	Gasoline	20	0	0	0	25	NR*	NR*	NR*	0	1,000	No	
29-Jan	Warwick, RI	Gasoline	2	0	0	0	2	765	0	NR*	0	0	No	
30-Jan	Gastonia, NC	Ethyl Alcohol	2	0	0	0	2	0	0	0	0	0	No	
22-Mar	Palatka, FL	Fuel Oil	20	0	0	0	25	0	1,976	NR*	NR*	25	No	
17-Apr	Mountain View, CA	Gasoline	5	0	0	0	25	25	0	N/A	0	0	No	
29-Apr	Indianapolis, IN	Gasoline	20	0	0	0	25	428	N/A	250	0	250	No	
6-May	Laurens, SC	Fuel Oil	10	0	0	0	0	0	0	0	0	0	No	
28-May	Silver Spring, MD	Gasoline	2.5	0	0	0	2.5	NR*	0	NR*	0	1,200	No	
5-Jul	Jupiter, FL	Gasoline	10	0	0	0	10	4	0	0	0	0	No	
20-Aug	Hancock, MD	Flammable Liq	0.03	0	0	0	0	0	0	0	0	0	No	
28-Aug	Murrysville, PA	Fuel Oil	0.25	0	0	0	0	0	0	0	0	2,943	No	
25-Oct	Endicott, NY	Xylenes	0.06	0	0	0	0	0	0	0	0	0	No	
1-Nov	Amarillo, TX	Gasoline	10	0	0	0	10	56	0	0	0	3,000	No	
14-Nov	Massilon, OH	Gasoline	6.5	0	0	0	7	NR*	4,500	NR*	0	920	No	
30-Nov	Saint Marys, GA	Gasoline	10	0	0	0	13	0	0	0	0	300	No	
1992														
9-Jan	Decatur, GA	Gasoline	0.5	0	0	0	0	0	0	0	0	0	No	

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
4-Feb	Fort Lauderdale, FL	Gasoline	5	0	0	0	5	0	1,000	0	NR*	800	No	
7-Feb	Glencoe, KY	Paint rel. mater	15	0	0	0	50	0	4,000	0	0	4,700	No	
25-Apr	Houston, TX	Gasoline	15	0	0	0	15	0	0	N/A	0	4,000	No	
28-Apr	Louisville, KY	Combust. Liq	0.06	0	0	0	N/A	N/A	N/A	N/A	0	N/A	No	
28-Apr	South Gate, CA	Gasoline	2	0	0	0	1	150	250	NR*	0	4,000	No	
29-Apr	Cincinnati, OH	Paint rel. mater	7	0	0	0	7	0	0	100	0	0	No	
12-Jun	Detroit, MI	Gasoline	5	0	0	0	5	100	0	0	0	0	No	
16-Aug	Santa Barbara, CA	Gasoline	5	0	0	0	5	0	0	0	0	250	No	
28-Sep	LaCrosse, IN	Fuel Oil, #2	49	0	0	0	50	668	44,434	0	0	76,950	Yes	
8-Oct	Hubbard, OH	Naphtha Petro	0.13	0	0	0	1	300	N/A	N/A	0	N/A	No	
18-Oct	Montbello, CA	Gasoline	10	0	0	0	10	0	0	0	0	1,000	No	
22-Nov	Long Beach, CA	Gasoline	26	1	0	0	0	0	0	0	0	0	Yes	
1993														
11-Jan	Huntington, WV	Fuel Oil	10	0	0	0	10	50	500	NR*	0	1,000	No	Industrial
11-Feb	Lincolnton, GA	Fuel Oil, #2	20	0	0	0	18	5,500	0	0	0	0	No	Agricultural
30-Apr	Athens, OH	Gasoline	10	0	0	0	10	5,000	15,000	N/A	300	5,000	No	Residential
26-Sep	Wampum, PA	Flammable Liq	0.03	0	0	0	0	0	0	0	0	0	No	Industrial
3-Dec	Albuquergue, NM	Gasoline	5	0	0	0	5	0	0	0	0	1,500	No	Commercial
1994														
28-Jan	Cass Lake, MN	Gasoline	20	0	0	1	20	0	0	0	0	2,000	No	Commercial

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
1-Mar	Dallas, TX	Gasoline	10	0	0	0	10	NR*	N/A	N/A	0	0	No	Unknown
23-May	Terre Haute, IN	Fuel Aviation	18	0	0	0	108	150	0	0	0	1,000	No	Industrial
12-Aug	Little Rock, AR	Gasoline	20	NR*	NR*	NR*	NR*	NR*	NR*	NR*	0	NR*	No	Undeveloped
1-Oct	Houston, TX	Gasoline	38	1	0	0	50	5,000	10,000	NR*	5	40,000	*Yes*	Commercial
13-Nov	New Castle, DE	Naphtha Petro	0.5	0	0	0	0	0	0	0	0	0	No	Undeveloped
6-Dec	Baptist, LA	Styrene Monmr	1	0	0	0	0	0	0	N/A	0	0	No	Undeveloped
28-Dec	Phoenix, AZ	Gasoline	0.25	0	0	0	0	0	0	0	0	0	No	Commercial
1995														
5-Jan	Brick, NJ	Gasoline	40	0	0	0	50	900	0	0	0	0	No	Commercial
9-Mar	Van Horn, TX	Petroleum Dist	2	0	0	0	10	24	0	0	0	0	No	Industrial
13-Mar	Portland, OR	Fuel Oil	1	0	0	0	1	100	0	0	0	0	No	Commercial
14-May	Near Lake Station, IN	Petro Dist.	0.1	0	0	0	5	0	0	0	0	3,500	No	Unknown
5-Jun	Pueblo, CO	Gasoline	18	0	0	0	15	0	0	0	0	500	No	Commercial
25-Jul	Lebanon, OH	Fuel Aviation	10	0	0	0	10	400	0	0	0	0	No	Unknown
1-Aug	Rapides, LA	Flammable Liq	0.13	0	0	0	5	5	0	0	0	0	No	Industrial
26-Aug	Old Bridge, NJ	Gasoline	3	0	0	0	3	470	200	0	0	4,000	No	Commercial
12-Sep	Cincinnati, OH	Tol./MetEtKet	0.13	0	0	0	N/A	500	N/A	N/A	0	N/A	No	Industrial
30-Sep	Metairie, LA	Gasoline	2	0	0	0	2	Unknown	0	0	10	0	No	Commercial
5-Oct	Cheyenne Wells, CO	Crude Oil Petro	12.5	0	0	0	7	48	NR*	NR*	0	NR*	No	Commercial
1996														
3-Jan	Chatham, OH	Gasoline	2	0	0	0	0	0	0	0	2	0	No	Residential
15-Feb	Mankato, MN	Gasoline	10	0	0	0	10	30	0	0	0	150	No	Commercial

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
13-Apr	Mesa, AZ	Gasoline	20	0	0	0	23	0	0	0	0	5900	No	Industrial
18-Apr	Lebanon, IN	Combust. Liq.	0.13	0	0	0	5	0	0	0	0	0	No	Commercial
30-Apr	Lebanon Junction, KY	Furan	2.5	0	0	0	50	1,000	0	0	0	0	No	Commercial
1-Jul	Buffalo, NY	Gasoline	2	0	0	0	N/A	N/A	N/A	N/A	0	N/A	No	Commercial
12-Jul	Sulphur, LA	Combust. Liq.	0.25	0	0	0	0	0	0	0	0	0	No	Unknown
15-Jul	Somers Point, NJ	Gasoline	25	0	0	0	25	5,177	0	0	0	21,380	No	Unknown
18-Jul	Baker, LA	Flammable Liq	9	0	0	0	N/A	2,141	N/A	1,000	NR*	N/A	No	Commercial
1-Sep	Grand Junction, CO	Gasoline	20	0	0	0	20	0	2,200	0	0	6,000	No	Commercial
5-Sep	Cheektowaga, NY	Acetone	0.5	0	0	0	0	0	0	0	0	0	No	Undeveloped
11-Sep	Strafford, MO	Methyl Methac	1	0	0	0	0	575	0	0	0	0	No	Undeveloped
2-Oct	Ramah, LA	Crude Oil Petro	40	0	0	0	20	10,000	0	0	0	35,000	No	Undeveloped
19-Oct	New Brighton, MN	Gasoline	3	0	0	0	0	0	0	0	0	0	No	Commercial
29-Oct	Otsego, MN	Gasoline	3	0	0	0	3	20	0	10,000	NR*	2,500	No	Agricultural
13-Nov	Lewistown, PA	Flammable Liq	1	0	0	0	0	55	0	0	0	0	No	Commercial
14-Dec	Livermore, CA	Gasoline	5	0	0	0	6	300	1,000	N/A	0	2,000	No	Commercial
1997														
18-Feb	Baton Rouge, LA	Vinyl Toluene	0.3	0	0	0	0	0	0	0	0	0	No	Industrial
28-Apr	Bordentown, NJ	Ethanol	0.13	0	0	0	0	25	0	0	0	0	No	Commercial
8-May	St Peters, MO	Flammable Liq	1	0	0	0	0	0	0	0	0	0	No	Industrial

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
31-May	Shawnee Mission, KS	Gasoline	10	0	0	0	10	0	0	0	0	1,000	No	Commercial
7-Jun	Charlotte, NC	Gasoline	15	0	0	0	15	Not Yet Deter.	0	0	0	0	No	Commercial
9-Oct	Yonkers, NY	Gasoline	9,200.00	1	0	0	11,000	NR*	highway bridge dam.	NR*	0	totaled	Yes	Commercial
3-Nov	Lordsburg, NM	Fuel Oil	3	0	0	0	0	0	0	0	0	5,000	No	Undeveloped
14-Nov	Hallandale, FL	Gasoline	20	0	0	0	20	1,500	0	0	0	20	No	Commercial
8-Dec	Little Rock, AR	Sodium Methyl	1	0	0	0	0	0	0	0	0	0	No	Commercial
28-Dec	Eyota, MN	Gasoline	17.5	0	0	0	17.5	600	2,500	0	0	1,200	Na	Agricultural
1998														
8-Jan	Ridgeway, VA	Fuel Oil	10	0	0	0	12	1,000	15,000	NR*	N/A	2,500	No	Commercial
12-Jan	Lafayette, LA	Pentanes	1.25	0	0	0	0	200	0	500	0	0	No	Undeveloped
30-Jan	Columbia, MO	Gasoline	35	0	0	0	21	0	0	0	0	12,856	No	Commercial
5-Feb	Corbin, KY	Methyl Ethyl K	12.5	0	0	0	0	100	0	700	0	0	No	Commercial
17-Mar	Ruther Glen, VA	Isopropenylben	2	0	0	0	0	200	0	0	0	0	No	Commercial
20-Mar	Shreveport, LA	Diesel Fuel	15	0	0	0	7	NR*	NR*	NR*	NR*	1,888	No	Commercial
6-May	Newark, NJ	Gasoline	10	0	0	0	0	600	0	NR*	0	3,500	No	Commercial
2-Jun	Atlanta, GA	Fuel Oil	25	0	0	0	50	200	0	0	0	0	No	Commercial
27-Jun	Valley, AL	Gasoline	15	0	0	0	0	NR*	0	0	0	NR*	No	Commercial
1-Jul	Minnehaha Springs, WV	Gasoline	10	0	0	0	10	100	15,000	NR*	0	8,000	No	Agricultural
6-Aug	Queens, NY	Gasoline	10	0	0	0	10	NR*	0	NR*	NR*	500	No	Commercial
16-Aug	Refugio, TX	Crude Oil Petro	3	0	0	0	0	0	0	0	0	0	No	Commercial
9-Sep	Newtown, CT	Gasoline	20	0	0	0	NR*	NR*	guide pole	NR*	0	manifolds	Yes	Residential

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
13-Sep	Cusseta, AL	Combust. Liq.	1	0	0	0	10	3,080	0	5200	0	0	No	Commercial
20-Oct	Mission Viejo, CA	Gasoline	1	0	0	0	1	20	Unknown	N/A	0	2,000	No	Commercial
12-Dec	North Charleston, SC	Gasoline	10	0	0	0	10	0	0	0	0	0	No	Commercial
24-Dec	Jacksonville, FL	Gasoline	6	0	0	0	6	1,000	0	0	0	8,000	No	Commercial
1999														
11-Jan	Maybrook, VA	Fuel Oil	10	0	0	0	20	1,000	10,000	NR*	0	3,000	No	Undeveloped
15-Feb	Liberty, OH	Fuel Oil	30	0	0	0	20	3,184	unknown	NR*	NR*	1,434	No	Unknown
5-Mar	Tampa, FL	Gasoline	4	0	0	0	2	NR*	0	0	0	NR*	No	Undeveloped
15-Apr	Geismar, LA	Benzene	10	0	0	0	20	1,500	0	0	0	0	No	Commercial
27-Apr	Livermore, CA	Butylacrylate	0.03	0	0	0	0	0	0	165	0	0	No	Undeveloped
7-May	Houston, TX	Flammable Liq	0.001	0	0	0	0	1,000	0	0	0	0	No	Industrial
4-Aug	High Point, NC	Esters	1	0	0	0	0	100	0	NR*	0	0	No	Industrial
9-Sep	Denver, CO	Fuel Aviation	10	0	0	0	50	0	1,000	0	0	9,500	No	Unknown
26-Oct	Barkeyville, PA	Gasoline	2	0	0	0	2.3	3	none	N/A	none	6,000	No	Undeveloped
12-Nov	Hammond, IN	Gasoline	20	2	0	0	20	N/A	unknown	NR*	0	70,000	Yes	Commercial
16-Nov	Baltimore, MD	Fuel Oil	2	0	0	0	2	25	N/A	N/A	none	N/A	No	Undeveloped
16-Nov	Selinsgrove, PA	Petro. Distill.	1	0	0	0	0	0	0	0	0	0	No	Industrial
22-Nov	Hammond, IN	Gasoline	0	0	0	2	0	5,000	5,000	NR*	0	0	Yes	Commercial
9-Dec	Kalamazoo, MI	N-Propanol	1	0	0	0	0	0	0	0	0	0		Industrial

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
2000														
30-Jan	Big Otter, WV	Xylenes	0.008	0	0	0	0	0	0	0	N/A	1,500 - 2,000	No	Undeveloped
24-Feb	El Cajon, CA	Gasoline	2	0	0	0	2	20	0	0	None	0	No	Commercial
26-Apr	Kermit, TX	Crude Oil Petro	4	0	0	0	2.75	Minimal	None	N/A	None	100	No	Undeveloped
11-May	Denton, TX	Flammable Liq	3	0	0	0	0	1,000	0	NR*	0	0	No	Commercial
15-May	Fort Lauderdale, FL	Gasoline	25	0	0	0	0	0	0	0	0	0	No	Industrial
2-Aug	Altoona, PA	Gasoline	45	1	0	0	150	0	unknown	NR*	0	76,900	Yes	Industrial
16-Aug	Baltimore, MD	Gasoline	15	0	0	0	7	1,200	500	NR*	0	200	No	Commercial
30-Aug	Chalmette, LA	Flammable Liq	20	0	0	0	0	0	0	0	0	0	No	Industrial
30-Aug	Sweetwater, FL	Gasoline	5	0	0	0	5	0	0	0	0	0	No	Commercial
29-Sep	Philadelphia, PA	Gasoline	25	0	0	0	37	0	0	0	0	0	No	Commercial
3-Oct	South Gate, CA	Diesel Fuel	20	0	0	0	25	3,500	0	NR*	0	2,000	No	Commercial
2001														
12-Jan	Edinburgh, TX	Fuel Oil	15	0	0	0	0	1,260	0	0	0	undeterm	No	Unknown
10-Feb	Tampa, FL	Gasoline	0.13	0	0	0	0.5	11	0	0	0	0	No	Commercial
26-Feb	Springfield, MA	Gasoline	4	0	0	0	6	1,000	0	0	0	0	Yes	Commercial
28-Apr	Miami, FL	Gasoline	20	0	0	0	0	0	0	0	0	0	No	Commercial
7-Jul	Mount Vernon, WA	Fuel Oil	10	0	0	0	16	100	5,000	0	0	3,000	No	Commercial
11-Jul	Detroit, MI	Gasoline	25	1	0	0	20	0	20,000	0	0	25,000	Yes	Commercial
16-Sep	Baytown, TX	Petro. Dist.	1.5	0	0	0	0	50	0	NR*	0	0	No	Commercial

Date	Incident Location	Commodity	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Cost	People Evacuated	Carrier Damage	Fire	Land Use
3-Nov	Bay Ridge, NY	Gasoline	5	0	0	0	8	0	0	0	0	700	No	Commercial
29-Nov	Canton, MI	Gasoline	10	0	0	0	10	0	0	0	0	3500	Yes	Industrial
15-Dec	St. Petersburg, FL	Gasoline	25	0	0	0	NR*	0	0	0	0	0	No	Commercial

* Not reported in incident report.

Year	Incidents	Gallons Spilled	Fatalities	Major Injuries	Minor Injuries	Product Lost in $	Cleanup Cost	Property Damage	Other Costs	People Evacuated	Carrier Damage	Fires
Total 1990	15	342.13	0	0	0	411.00	5,189.00	2,350.00	3,000.00	0.00	177,265.00	3
Total 1991	17	131	0	0	0	156	1,448	6,476	250	0	11,938	1
Total 1992	13	140	1	0	0	149	1,218	49,684	100	0	91,700	2
Total 1993	5	45	0	0	0	43	10,550	15,500	0	300	7,500	0
Total 1994	8	108	1	0	1	188	5,150	10,000	0	5	43,000	1
Total 1995	11	89	0	0	0	108	2,447	200	0	10	8,000	0
Total 1996	17	144	0	0	0	162	19,298	3,200	11,000	2	72,930	0
Total 1997	10	9,268	1	0	0	11,063	2,125	2,500	0	0	7,220	1
Total 1998	17	187	0	0	0	137	6,500	30,000	6,400	0	39,244	1
Total 1999	14	91	2	0	2	136	11,812	16,000	165	0	89,934	2
Total 2000	11	164	1	0	0	229	5,720	500	0	0	79,200	1
Total 2001	10	116	1	0	0	61	2,421	25,000	0	0	32,200	2
GRAND TOTAL		10,824.53	7.00	0.00	3.00	$12,841.55	$73,878.00	$161,410.00	$20,915.00	317.00	$660,131.00	14.00
Total incidents	148											
Annual Average		902.04	0.58	0.00	0.25	$1,070.13	$6,156.50	$13,450.83	$1,742.92	26.42	$55,010.92	1.17