Billing Code: 4910-60-W

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Part 195

Docket No. PHMSA-2007-28136

Pipeline Safety: Hazardous Liquid Pipelines Transporting Ethanol, Ethanol Blends, and other Biofuels

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), U.S. Department of Transportation (DOT).

ACTION: Notice of policy statement and request for comments.

SUMMARY:

The Department of Transportation (DOT), in coordination with the Department of Energy, Department of Agriculture, and others, is considering current and future transportation challenges posed by growing demand for ethanol and other biofuels and biofuel blends. Although pipelines have long been a primary mode for high volume transportation of gasoline and other petroleum products, most biofuels used in the U.S. today are transported exclusively by marine vessel, rail, and/or highway. In support of the President's energy agenda, DOT is prepared to facilitate pipeline options by sponsoring research and development, resolving technical issues, and, if necessary, clarifying safety standards.

The PHMSA is the DOT agency with regulatory authority over the safe and reliable transportation of hazardous materials by all modes, including pipelines. The PHMSA's Hazardous Materials Regulations govern the transportation of ethanol and other biofuels and

blends by rail, air, motor carrier, and barge. The PHMSA's Pipeline Safety Regulations cover the transportation by pipeline of all petroleum products, including gasoline blended with biofuel. In this Notice, PHMSA sets forth a formal determination (for purposes of 49 U.S.C. 60101(a)(4)(B)) that the transportation of unblended biofuels by pipeline is subject to the agency's jurisdiction and invites comments on the adequacy of existing regulatory definitions and standards.

This Notice also describes and invites comments on the agency's ongoing efforts to identify and address the short-, medium-, and long-term opportunities and challenges associated with transporting biofuels. The PHMSA is seeking comments on technical issues, adequacy of standards, and research and development needs associated with the transportation of biofuels by pipeline. We describe and invite comments on the agency's ongoing efforts to prepare communities and emergency responders to mitigate hazards associated with transportation involving new fuels.

DATES: Please submit comments by **[INSERT DATE 30 DAYS FOLLOWING DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Comments should reference Docket No. PHMSA-2007-28136 and may be submitted in the following ways:

- DOT Web Site: *http://dms.dot.gov*. To submit comments on the DOT electronic docket site, click "Comment/Submissions," click "Continue," fill in the requested information, click "Continue," enter your comment, then click "Submit."

- Fax: 1-202-493-2251.
- Mail: Docket: U.S. Department of Transportation, Docket Operations, M-30, Room W12-140, 1200 New Jersey Avenue, SE, Washington, DC 20590.
- Hand Delivery: U.S. Department of Transportation, Docket Operations, M-30, Room W12-140, 1200 New Jersey Avenue, SE, Washington, DC 20590 between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- E-Gov Web Site: *http://www.regulations.gov*. This site allows the public to enter comments on any **Federal Register** notice issued by any agency.

Instructions: Identify the docket number, PHMSA-2007-28136, at the beginning of your comments. Mail your comments and send two copies. To receive confirmation that PHMSA received your comments, include a self-addressed stamped postcard. Internet users may submit comments at *http://www.regulations.gov*, and may access all comments received by DOT at *http://dms.dot.gov* by performing a simple search for the docket number.

Note: The PHMSA posts all comments without changes or edits to *http://dms.dot.gov*, including any personal information provided.

Privacy Act Statement

Anyone can search the electronic form of all comments received in response to any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). DOT's complete Privacy Act

Statement was published in the **Federal Register** on April 11, 2000 (65 FR 19477), and is on the web at *http://dms.dot.gov*.

FOR FURTHER INFORMATION CONTACT: Joy Kadnar, Office of Pipeline Safety, 202-366-4595, or by e-mail at *joy.kadnar@dot.gov*; Larry White, Office of Chief Counsel, 202-366-4400, or by e-mail at *lawrence.white@dot.gov*; or Bob Richard, Office of Hazardous Materials Safety, 202-366-0656, or by e-mail at *bob.richard@dot.gov*.

Background

Energy Policy and the Growing Demand for Biofuels. In August 2005, the President signed the Energy Policy Act of 2005, providing incentives for the development of renewable energy and establishing the foundation for the increased production and use of ethanol and other biofuels. Building on the Energy Policy Act's clean energy foundation, the President announced the Advanced Energy Initiative in the 2006 State of the Union Address. The Advanced Energy Initiative focuses on increasing research and development to encourage technological breakthroughs in the transportation and power sectors that will diversify our resource portfolio. Together, these initiatives will reduce U.S. reliance on foreign oil by increasing the use of renewable fuels, such as ethanol and other biofuels.

Today, nearly half of all U.S. gasoline contains some ethanol (mostly blended at the 10 percent level or lower). In 2006, the U.S. consumed roughly five billion gallons of biofuels (mostly ethanol); these five billion gallons were blended into roughly 65 billion gallons of gasoline.

Federal energy policy favors rapid growth in biofuels over the next decade. In his 2007 State of the Union Address, President Bush challenged the Nation to reduce consumption of oil by 20 percent over the next ten years. The President's 20-in-10 plan calls for expanding consumption of alternative fuels (including biofuels) from five billion gallons in 2007 to 35 billion gallons in 2017.

Transportation Requirements. In support of the 20-in-10 plan, DOT is stepping up efforts to identify and address transportation issues associated with increased use of biofuels. Because our national transportation system is fueled largely by refined petroleum products, the transition to higher concentration biofuel blends has implications for most DOT programs, including fuel efficiency and safety programs administered by DOT's National Highway Traffic Safety Administration.

This Notice focuses specifically on the movement of biofuels and biofuel blends as commodities in transportation and the need for safe, cost-effective transportation solutions. Most ethanol in use today is transported from production or import locations by highway, rail, and/or barge and blended with gasoline at or near the point of retail distribution. To sustain market growth needed to meet current targets, we believe that pipelines must be an option for high-volume transportation of biofuel products.

A large pipeline can transport roughly two million barrels of gasoline a day. By way of comparison, 9,375 large semi-truck tankers are required to transport two million barrels of product. It takes twenty-four 100-car unit trains extending three miles each, or ten 15-unit barge

tows, to transport two million barrels. Trucks, vessels, and trains consume diesel or other liquid fuels and also contribute to congestion in our Nation's freight and passenger transportation corridors. Further, as the National Transportation Safety Board has observed, pipeline transportation has a consistently lower accident rate than other modes.

Facilitating Transportation Solutions. Within the Federal Government, PHMSA has regulatory responsibility for the protection of people, property, and the environment from the risks of pipeline transportation. The agency carries out this responsibility through regulation, oversight, enforcement, emergency response preparation, and research and development, all targeted at reducing the likelihood and consequence of pipeline incidents. The PHMSA's Integrity Management regulations for hazardous liquid pipelines require operators to develop and implement comprehensive plans for addressing the range of risks facing their pipelines, taking account of all relevant risk variables, including the nature and properties of the particular hazardous materials moved.

The PHMSA is working with other Federal agencies and a broad enterprise of stakeholders – including industry, standards organizations, and emergency responders – to ensure that adequate design and operating standards for biofuel pipelines are in place or, if necessary, can be further developed in accordance with current pipeline data and technology. The American Petroleum Institute (API) and the Association of Oil Pipe Lines (AOPL) have provided PHMSA with information on their progress analyzing safety and integrity issues associated with biofuel pipelines and shared a proposed research agenda with PHMSA and other agencies. The PHMSA has begun a technical assessment with the Pipeline Research Council International on the

potential for ethanol induced stress corrosion cracking in existing pipeline infrastructure used to transport ethanol and various ethanol blended fuels. Using its authority under chapter 601 of the U.S. Code, PHMSA expanded its research and development efforts to focus on short-, medium- and long-term challenges of transporting biofuels in existing products pipelines and in dedicated biofuel pipelines.

The PHMSA participates on various panels and working groups, including the DOT Biofuels Panel and the 20-in-10 Biofuels Working Group, and collaborates on biofuel activities with other agencies and organizations. To better understand the opportunities, challenges, and potential technical issues, PHMSA invited speakers to its February 2007 Research and Development Forum in New Orleans, Louisiana to discuss current standards and technical studies and to identify research and development gaps related to biofuel transportation by pipeline. As discussed more fully below, PHMSA has also partnered with the emergency response community to upgrade education and training efforts and develop optimal response techniques and procedures for responding to biofuel spill incidents.

1. Pipeline Research and Development—Invitation to Comment.

The PHMSA is targeting some of its research and development activity at advancing the most promising technologies for the safe operation of biofuel pipelines. The challenge is to identify and quantify any safety and reliability threats to biofuel pipelines and to remove or manage these threats through a risk-based, data driven integrity management approach.

Although pipelines are highly efficient, they have not been used on a widespread basis for transporting gasoline-ethanol blends. This is partially a function of unresolved technical and operational issues that would affect both the use of existing products pipelines and the prospect of building new, dedicated biofuel pipelines. These include metallurgical issues, such as internal corrosion and stress corrosion cracking, and operational issues, including the performance of seals, gaskets and internal coatings. The PHMSA expects these technical issues to be resolved through ongoing short-term technical assessments and longer-range research and development.

The risk of product contamination is also a significant factor. The PHMSA understands that the industry is concerned about the ability of transported gasoline-ethanol blends to meet the ASTM specification for gasoline, D 4814 – Standard Specification for Automotive Spark-Ignition Engine Fuel due to ethanol's sensitivity to water. The U.S. pipeline system is a "wet system" with moisture introduced from the transport of various products. Unless measures are undertaken to remove or control moisture in the system, ethanol and ethanol blends could potentially absorb water and arrive at destination off specification. Additionally, many pipeline segments may need to undergo preparatory cleaning to remove built up lacquers, gums, and deposits in the system. Otherwise, the solvency effect of ethanol could remove such deposits, potentially contaminating the ethanol and trailing products in the system.

These issues are challenging, but by no means insurmountable. Research and development focusing on metallurgical, operational, and maintenance issues should aid in their resolution and will build confidence in the use of pipelines as the primary carrier of large volumes of gasoline-ethanol blends. The PHMSA is reaching out to a broad enterprise of stakeholders to better

understand and help address all anticipated challenges to the transportation of biofuels and biofuel blends by pipeline. We will partner with other agencies, standards organizations, and private industry to coordinate research projects to avoid redundant efforts.

The research strategy put forward by API and AOPL, for example, suggests an approach that:

A. Identifies which blends can be moved in existing systems with little or no modification to the system;

B. Identifies which blends can be moved in existing systems with appreciable modifications; and

C. Identifies which blends cannot be practically moved in existing systems but could be moved in specially designed new transmission or short-haul distribution systems.

Research would be focused on the near-term operational and system integrity issues associated with transporting blends such as E10, E20 and E85 in existing petroleum products pipelines. Issues that need to be addressed include water pick-up, phase separation, material effects, solvent effects, the use of drag reducing agents, transmix injection and processing, and other ways operational processes may be affected.

The PHMSA encourages researchers to identify pipeline system modifications that address the unique risks associated with biofuels without rendering the pipeline unsuitable for transporting traditional energy commodities and identify those blends that cannot be practically transported in pipelines without a major overhaul. Additional research would focus on the potential for integrity threats, such as stress corrosion cracking, associated with the long-term use of existing pipeline infrastructure and dedicated biofuel pipelines. This research should lead to the

development of long-term mitigation strategies, design and operating specifications, and guidelines for the construction of new pipelines dedicated to ethanol or biofuel service.

The PHMSA recently issued a Broad Agency Announcement seeking white papers on research and development projects and coordinated programs to address issues associated with transportation of ethanol and biofuels by pipeline. The PHMSA is requesting information from pipeline operators, standards development bodies and organizations, trade associations, government agencies, other organizations, and the public regarding research and development, the adequacy of existing standards, and any other pertinent issues related to ethanol and other biofuels transportation by pipeline. Ultimately, the goal is to work with standards developing organizations to move this new knowledge into consensus standards.

2. Emergency Response—Invitation to Comment.

The PHMSA has a long-standing partnership with the emergency response community. We have taken steps to educate responders on hazard communication and identification, safe incident mitigation, and fire suppression measures for responding to spill incidents involving ethanol and other biofuels in transportation. Because of ethanol's characteristics, specific emergency response measures must be taken by pipeline operators and first responders in the event of a release, including the use of appropriate extinguishing agents and foams. The PHMSA has partnered with the National Association of State Fire Marshals (NASFM), the Renewable Fuels Association (RFA), the International Association of Fire Chiefs (IAFC), the National Fire Protection Association, the Independent Liquid Terminal Association (ILTA), the National Fire Protection Association (NFPA), Kidde Fire Fighting, and other organizations and individuals in

order to assist in educating first responders in fighting ethanol fires. The primary purpose of this coalition is to bring together key stakeholders to share information on various projects and efforts. A number of projects have been initiated that involve testing of various foams and other extinguishing agents, as well as the development of training materials for emergency responders.

In June 2006, PHMSA issued a Safety Alert to provide emergency responders with guidance on appropriate procedures for responding to incidents involving fuel mixtures containing ethanol (http://hazmat.dot.gov/E-85_042606.pdf). In addition, PHMSA provides Hazardous Material Emergency Preparedness Grants to emergency responders for planning and training, including training for responses to incidents involving ethanol-gasoline mixtures. To help emergency responders utilize the most effective emergency response procedures for incidents involving fuel mixtures containing ethanol (or "ethyl alcohol") and gasoline in various concentrations, PHMSA has proposed establishing a specific United Nations (UN) identification number and proper shipping name for ethanol-gasoline blended fuels with more than ten percent ethanol.

In August 2006, PHMSA published a Notice of Proposed Rulemaking, proposing to add a new entry "Ethanol and gasoline mixture or Ethanol and motor spirit or Ethanol and petrol mixture, with more than ten percent ethanol, 3, UN3475, II" to the Hazardous Materials Table (HMT). The PHMSA also proposed revising the entry for "Gasohol gasoline mixed with ethyl alcohol, with not more than 20 percent alcohol, 3, NA1203, II" to limit this entry to gasoline mixtures with no more than ten percent alcohol. The 2004 Emergency Response Guidebook (ERG2004) refers to Guide 127 (Flammable Liquids Polar/Water-Miscible) for response to incidents involving Alcohols, n.o.s., 3, UN1987, and Denatured alcohol, 3, NA1987. Guide 127 specifies

the use of alcohol resistant foam. In early 2008, PHMSA will publish and distribute an updated ERG. The updated ERG will include appropriate guidance for the initial response to incidents involving ethanol-gasoline mixtures and will also include information on pipeline markers.

The PHMSA encourages State fire marshals and other first responders to inform us about issues associated with emergency response for biofuel incidents including the need for studies of the effectiveness of response techniques and the development of educational materials. We are interested in comments relative to how mixtures of ethanol and gasoline varying between ten percent to 20 percent should be addressed and if additional research is needed to assess particular characteristics of these mixtures, how they should be described, and the appropriate response methods.

3. Oversight of Pipelines Transporting Biofuels and Biofuel Blends—Invitation to Comment.

Pursuant to the pipeline safety laws, 49 U.S.C. 60101 et seq., PHMSA has jurisdiction over the design, construction, operation and maintenance of pipelines transporting "hazardous liquids." By statute, the term "hazardous liquid" refers to "petroleum or a petroleum product" and "a substance the Secretary of Transportation decides may pose an unreasonable risk to life or property" when transported by pipeline in a liquid state. 49 U.S.C. 60101(a)(4). Under this authority, PHMSA previously has established safety standards for pipelines carrying petroleum, petroleum products, anhydrous ammonia, and carbon dioxide in a supercritical or dense vapor state.

The PHMSA considers all biofuel-gasoline blends to be "petroleum products," within the meaning of 49 CFR § 195.2, regardless of their relative biofuel/gasoline content. Accordingly, any pipeline used to transport such blends, whether in batches or in dedicated infrastructure, would be subject to PHMSA's existing standards for hazardous liquid pipelines. Under those standards, the pipeline operator is responsible for establishing that any material moved in the pipeline "is chemically compatible with both the pipeline, including all components, and any other commodity that it may come into contact with while in the pipeline." (49 CFR § 195.4).

Unblended ethanol and other biofuels produced by biological fermentation and vegetable- and animal-oil based biodiesel products are not "petroleum products," as we have defined that term (49 CFR § 195.2). However, based on their physical properties, these substances clearly meet the alternative definition of "hazardous liquid" under 49 U.S.C. § 60101(a)(4)(B). Ethanol is a highly flammable liquid with explosive limits in the range of 3.5 percent to 19 percent in air and a flash point of 54 degrees Fahrenheit. (By comparison, the explosive range for natural gas varies between five and 15 percent in air. Substances with a flash point lower than 100 degrees Fahrenheit are considered flammable.) The flash point of an ethanol-water mixture increases as ethanol is diluted with water. The flash point of an 80 percent ethanol/water mix is about 75 degrees Fahrenheit, and for 70 percent ethanol-water mix is about 84 degrees Fahrenheit. Ethanol vapors are also combustible, heavier than air, and may form an explosive mixture when combined with air. Similar to highly volatile liquids, ethanol vapors may travel considerable distances to sources of ignition and flash back. Pure or highly concentrated ethanol (E-85) may permanently damage living tissue on contact. Exposure to ethanol vapors in high concentrations or for prolonged periods is harmful to human health. In concentrations greater than 50 percent,

ethanol can cause local dehydration and lesions. Absorption, which occurs swiftly from the gastrointestinal tract, causes euphoria, with subsequent dizziness, inebriation, paralysis, diminished reflex, excitability, cyanosis, narcosis and respiratory paralysis.

For these reasons, ethanol and other biofuels are substances that may pose "unreasonable risks to life or property," within the meaning of 49 U.S.C. § 60101(a)(4)(B)). Accordingly, these materials constitute "hazardous liquids" for purposes of the pipeline safety laws and regulations.

The PHMSA is considering whether it is necessary to amend the definition of hazardous liquid in 49 CFR § 195.2 to expressly include ethanol and biofuels. Such an amendment would confirm that the transportation of pure ethanol or biofuels by dedicated biofuel pipelines is subject to Part 195. If biofuels will always be denatured by blending them with petroleum products prior to transporting them by pipeline, however, amending this regulatory definition may be unnecessary. Accordingly, PHMSA invites comments on whether we should amend 49 CFR Part 195 to expressly include (non-blended) ethanol and biofuels in the definition of hazardous liquid. The PHMSA also seeks comments on whether any of the existing requirements for hazardous liquid pipelines in Part 195 should not apply to ethanol and biofuel pipelines and if not, why not. Additionally, we invite comments on whether there is a need for any requirements to specifically address pipelines transporting ethanol and biofuels.

After PHMSA reviews any comments and other information received in response to this notice, we will announce any additional activities PHMSA plans to undertake or coordinate in these areas. If we determine, after reviewing the comments, that Part 195 should be amended to

address the transportation of biofuel or biofuel-gasoline blends, we will publish any proposed amendment for public comment in accordance with the Administrative Procedures Act.

Authority: 49 U.S.C. 60101 et seq.

Issued in Washington, DC on 31 July 2007.

Thomas J. Barrett,

Administrator.