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Hydrogen Fluoride – A Toxic Chemical in Your Neighborhood?

by Sofia Plagakis

Across the nation, 167 industrial facilities currently store and use hydrogen fluoride, a dangerous and highly toxic gas, in their manufacturing processes. In the past 15 years, 129 incidents have occurred, causing 100 injuries and five deaths, a high accident rate given the number of facilities. Many of these facilities are located in densely populated areas, and a release of hydrogen fluoride could put millions in danger. However, safer alternatives to this toxic chemical are available. Find out if you live near one of these facilities with a [new map](#) by the Center for Effective Government.

What Is Hydrogen Fluoride?

Hydrogen fluoride, also referred to as hydrofluoric acid in its liquid form, is a dangerous chemical compound that is so corrosive, it can dissolve glass on contact. Hydrogen fluoride is most commonly used to make refrigerants, plastics, aluminum, weed killers, and semiconductors for computers. It is also used in oil extraction and oil refining processes.

While the total number of facilities that store hydrogen fluoride is relatively low, these facilities pose significant risks to the heavily populated communities they are often located near. The United

Steelworkers [estimates that at least 26 million people](#) live within the vulnerability zone of U.S. refineries with hydrogen fluoride. There are over 55,000 full-time employees at the 167 industrial facilities currently storing the chemical (this number does not include part-time workers or contractors), according to data from the U.S. Environmental Protection Agency (EPA).

The chemical causes a variety of serious health problems. Even at low levels of exposure, hydrofluoric acid can cause chemical burns and disrupt the nervous system. This means that the pain is not often felt immediately, which can delay treatment and allow the chemical to cause greater damage. Breathing in even small amounts of hydrogen fluoride can damage lung tissue and cause fluid build-up in the lungs, leading to chronic lung disease. Long-term exposure can cause visual impairment or total blindness. Exposure to high concentrations of hydrogen fluoride can cause heart attacks or even death.

Facilities with Hydrogen Fluoride

Under the Risk Management Plan program, facilities storing more than 1,000 pounds of hydrogen fluoride (with a concentration of 50 percent or greater) on-site are required to submit risk management plans to the EPA. Over the last 15 years, a total of 274 facilities have submitted risk management plans involving hydrogen fluoride. However, 107 of these facilities have "deregistered," presumably because the plant has closed or the amount of hydrogen fluoride used fell under the 1,000 pound requirement, leaving just 167 facilities currently reporting to the EPA.

At least 129 incidents occurred at 57 facilities storing hydrogen fluoride in the past 15 years, resulting in 100 injuries, five deaths, and nearly 100,000 people being evacuated from the facilities and surrounding communities.

Today, Texas has the most facilities with hydrogen fluoride at 22, followed by Pennsylvania and California, both with 14 facilities each. Texas facilities reported 32 incidents over the past 15 years. Louisiana facilities reported 22 incidents, and Pennsylvania facilities reported eight over the same time period.

Risks at Oil Refineries

Oil refineries account for 63 percent of all accidents at facilities with hydrogen fluoride. Oil refineries use hydrogen fluoride as a catalyst to spark a chemical reaction that produces high-octane gasoline. At the Alon USA refinery in Big Spring, TX, 11 incidents were directly related to hydrogen fluoride, the most of any facility. At the Placid Refining Co. in Port Allen, LA, 10 of the 19 incidents reported involved hydrogen fluoride.

An example of a refinery incident involving hydrogen fluoride occurred in 2009, when an [explosion at a Citgo refinery](#) occurred in Corpus Cristi, TX. The explosion caused a fire that burned for two days, severely injuring one worker. Citgo's water supply nearly ran out and sea water was pumped in to control the fire. The incident resulted in \$28 million in property damage and 18 OSHA violations but generated a penalty of only \$236,500.

In [a 2013 study](#), the United Steelworkers criticized the safety records of refineries, including those storing hydrogen fluoride. Their study looked at 23 refineries in 13 states that use hydrogen fluoride and found that they had been cited for 293 violations of OSHA's Process Safety Management (PSM) Standard from 2006 to February 2011 (this number does not include the BP refinery in Texas City, which had 593 violations; a 2005 disaster at the BP facility killed 15 workers). Moreover, three-quarters of the 23 refineries reported at least one incident or near-incident in the past three years, for a total of 131.

Of the 23 refineries surveyed, the United Steelworkers found that more than half reported that most safety systems (protocols put in place to safely store, handle, and respond to emergencies involving hydrogen fluoride) were "less than very effective." Two-thirds of the refineries were "less than very prepared" to distribute protective safety equipment to workers in the event of an emergency. Although the survey did not include questions on the number of workers, some respondents also noted that staffing levels were too low to ensure safe operation of processes involving hydrogen fluoride. Based on these findings, the study recommended several steps to make refineries safer, including educating workers and the public on the dangers of hydrogen fluoride, investigating safer alternatives, and ensuring sufficient staffing to respond to emergencies.

Safer Alternatives and Better Guidelines

Oil refineries and other industries using hydrogen fluoride can eliminate the risks by switching to safer alternatives. The [United Steelworkers](#), who represent most of the workers in these facilities, have advocated for a phase-out of the existing production method that uses hydrogen fluoride and a shift to the far safer solid acid catalyst as a way to produce high-octane fuel.

Companies have resisted the switch, citing the cost of converting a refinery. A shift to a solid acid catalyst is estimated to cost between \$50 million and \$150 million per facility. However, given the enormous revenues and profits being reported by the [largest oil companies](#) (ExxonMobil, Shell, Chevron, BP, and ConocoPhillips), these conversion costs could be easily managed. For ExxonMobil, converting its four refineries from hydrogen fluoride to a safer alternative would cost just 1.3 percent of its 2012 profits – using the higher estimate of \$150 million per facility.

In other industrial processes where an alternative is not yet available, [advocates propose](#) decreasing the concentration of hydrofluoric acid solutions used in manufacturing processes. When concentrations of the chemical are above 50 percent, hydrogen fluoride can create a "toxic plume" when an explosion occurs; this does not happen when the concentration level is below 50 percent. The Intel Corporation, for example, only uses solutions at concentrations below 50 percent to manufacture semiconductors. Other electronics manufacturing plants could adopt these standards, too.

Conclusion

Safer alternatives to hydrogen fluoride exist for use in oil and gas refineries. However, it seems most companies will not adopt these safer alternatives voluntarily, despite the fact that millions of residents could be harmed by explosions. The Center for Effective Government continues to urge the EPA to use its authority to issue new guidance on the regulation of hydrogen fluoride and hundreds of other toxic

chemicals stored at facilities situated near residential communities. Concerned citizens should [examine our map of these facilities](#) to see if their communities are at risk and advocate for safer alternatives. You can also [make your voices heard](#) by signing a petition asking the EPA to issue new guidelines.

E-Gov Spotlight: Centralized Product Recall Portal Needs Significant Improvements

by Peter Thomas

E-Gov Spotlights: Given the importance of websites and online tools to inform the public about major issues and government activities, the Center for Effective Government is publishing an ongoing series of articles to evaluate government's use of online technology. Each article explores the purpose of an agency's site or tool, its strengths and weaknesses, and offers recommendations on how their efforts might be enhanced.

The idea behind the U.S. government-run website [Recalls.gov](#) represents the best, most practical qualities of the Internet: to help consumers with valuable, timely, up-to-date recall information. Spanning six federal agencies, Recalls.gov aims to be a 'one-stop shop' for consumers concerned about the safety of the products they buy for themselves and their families. It is supposed to make finding recall information easy and efficient. However, the intentions of Recalls.gov are severely hampered by poor implementation, resulting in an unusable, inconvenient website.

Recalls.gov

Established in October 2003, Recalls.gov was designed to help protect consumers by providing a central location for information on a wide range of defective and potentially harmful products that have been recalled. The U.S. Consumer Product Safety Commission (CPSC) manages the site but is only one of six participating federal agencies. The other agencies include the Food and Drug Administration, Environmental Protection Agency, National Highway Traffic Safety Administration, Department of Health and Human Services, and the U.S. Coast Guard. By spanning several federal agencies, the site intends to make it easier for people to find information about a recall since they may not know which federal agency oversees what products.

Using the Site

Recalls.gov offers two approaches to locate recall information. First, users are offered general browse and search tools on the left of the main screen. The "Recent Recalls" button takes users to real-time lists of the latest recall information, organized by product type. If a person had heard about a recall on the news but missed the details, this tool would give them quick access to the latest recall information. The "Search for Recalls" button takes users to a page with six different search forms, divided by agency, where a user can search for particular recalls.

Users can also sign up for e-mail alerts on recall announcements from four of the six participating agencies. This allows the user to customize their e-mail alerts, especially if they are only interested in one or two types of products and don't require updates from all Recalls.gov agencies. However, it seems users would have to sign up for every alert from each agency rather than being able to tailor the alerts they are interested in receiving. For instance, if a user were interested in receiving any recall notifications on the car he or she drives, the person would still have to subscribe to recall alerts for all vehicles, rather than just those for his or her car make or model. Some of the agencies, such as the CPSC, do offer some such customization, but users have to go to their websites to access these options.

The site allows users to select a consumer product category from a bar along the top of the website. The site offers seven categories: Consumer Products, Motor Vehicles, Boats, Food, Medicine, Cosmetics, and Environmental Products. Most of the category buttons take users to summary information that explains the scope of each issue and links to additional information on agencies' websites. For example, the Environmental Products category includes recalls of pesticides and fungicides, as well as vehicle emission testing results, and the links take users to EPA pages describing what pesticides are and providing information on vehicle emission recalls.

The site also allows users to download a Recalls.gov app for cell phones for individuals interested in accessing recall information while on the go, perhaps while shopping. The site provides a 'how-to' tutorial, explaining correct installation of the app on Android devices.

Strengths

The greatest strength of Recalls.gov is its subject matter. Given the plethora of recall information handled by the federal government, a centralized location for consumers to easily access such information is a great public good.

Parts of the website are easy to use. For instance, signing up for e-mail alerts and downloading the mobile app are quite easy. Both are accessible from the main page and are clearly labeled.

The site should also be commended for providing an option to switch to a Spanish version. Federal agencies are well aware that a sizable portion of the public does not speak English, and providing language alternatives is the only way to truly make this consumer information public.

Weaknesses

Unfortunately, Recalls.gov suffers from major problems with its user interface and layout. The site is overly fragmented both in its layout and its tools. For instance, when accessing the "Recent Recalls" section, the user is left staring at nine different text-heavy boxes, divided by agency and product type. With small font sizes and hard-to-understand text, the consumer who doesn't know which agency to look at or where to find the product sought is at a loss. The site would be much better with a single, real-time feed with search and browse tools to help users more quickly locate the most relevant recent recalls.

The site's search functionality does not help users locate recall information easily. The main search tool has six different search boxes, forcing users to search agencies one at a time. The search results reflect a query of the agency's general website, rather than a limited search of recall data. And there is no search capability at all for the "Recent Recalls" section. A central search form should be set up that allows the user to search recall data from all six agencies, with the option of narrowing the search by product type, agency, or time frame.

The product categories navigation option fails to provide helpful filters on Recalls.gov and instead quickly shifts users to agency pages. Users cannot easily locate recall information from these category pages. Instead, the consumer is left to go from "door to door" between agencies. The category pages should be reworked to provide information on recalls in general; history or statistics; laws, rules, regulations governing the recall process; or even how a product gets recalled. The pages should also provide feeds of recent recalls of related products and information on how to file product complaints.

The mobile application receives consistently bad user reviews on the Google Play store. Complaints repeat phrases like "not working at all" and "absolutely useless." Reworking the application to function effectively should be a major goal.

Finally, the site lacks standard tools to assist users such as a sitemap and FAQ or help section. The Spanish version of the site also appears to be less organized and somewhat truncated compared to the English version. These fundamental tools and functions need to either be added or fixed for users to get the full benefit of the site.

Conclusion

Even with the site's many flaws, Recalls.gov's solid foundation and lofty potential make it worth investing the time and effort into addressing its shortcomings. The potential benefits of a centralized recall website to consumers are obvious.

As the site administrator, CPSC should carry out a major interface upgrade and add in substantive changes. Initial efforts should focus on establishing a more efficient, user-friendly site design. This would include establishing a sitemap for easy navigation, an FAQ to address common consumer concerns, and more accessible agency contact information. Forms to submit questions, information regarding faulty products, or even discussion boards could serve to facilitate greater website functionality and interactivity.

The site also needs substantive changes. Most importantly, it should have more information from each agency immediately available on the site itself instead of requiring users to leave the site and go to agency websites. Either the information needs to be added to Recalls.gov, or the agencies need to structure it such that Recalls.gov can pull the information from datafeeds. This will be critical to making Recalls.gov and its mobile application more functional and easy to use.

Coal Ash Waste Standards Inch Forward, But Industry Opposition Strong

by Katie Greenhaw

This December will mark the fifth anniversary of a massive spill of coal ash in Tennessee that destroyed three houses and damaged more than 40 others. This event sparked intensified calls for the regulation of coal ash, a waste by-product produced when coal is burned. Federal efforts to deal with the problem of coal ash have progressed slowly, but agency action on the issue may be gaining momentum in light of recent policy developments. Meanwhile, coal industry proponents in Congress are revamping legislative efforts to thwart national protections against coal waste.

The Push for Stronger Federal Standards

New calls for the regulation of coal ash began in 2008 after an embankment holding 1.1 billion gallons of wet coal ash ruptured at the Tennessee Valley Authority's Kingston plant, releasing 5.4 million cubic yards of coal ash sludge that buried a community and severely contaminated a nearby river. Coal ash can contain arsenic, lead, chromium, and other heavy metals, all of which poison humans. Roughly five times more coal ash sludge engulfed the area around Kingston, TN than oil spilled into the Gulf of Mexico during the BP oil spill disaster.

In 2010, the U.S. Environmental Protection Agency (EPA) proposed [two options for regulating coal ash](#):

- The first option would designate coal ash as a hazardous waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA), requiring special handling, transportation, and disposal, and would closely monitor any potential reuse. This option would be the most protective of Americans' health and the environment.
- The second would regulate coal ash under RCRA Subtitle D – an option that would limit EPA's responsibility and authority over coal ash management.

Both [options](#) would require that surface impoundments of coal ash have protective liners, mandate groundwater monitoring for landfills, and provide for corrective action when contamination is found (though the corrective action requirements are more extensive under the first option).

More than three years later, EPA has yet to finalize national requirements for coal ash disposal. The agency's most recent [Unified Agenda](#) indicated that the action was in the "prerule stage" and provided no timeline for completing a final rule. Seeing that little progress had been made, environmental groups [filed](#) a lawsuit in 2012 to compel EPA to complete a review of the regulations applying to coal ash and issue necessary revisions.

Court Decision Forces Steps Forward

On Oct. 29, the U.S. District Court for the District of Columbia issued a [memorandum opinion](#) ordering EPA to submit a plan for finalizing the coal ash rulemaking process it began in 2010. Judge Reggie Walton agreed with environmental and public health groups' argument that EPA has a non-discretionary duty to review and, if necessary, revise RCRA waste regulations, including the solid waste regulations under Subtitle D concerning coal ash, at least every three years.

The order does not specify a deadline for completing the review, but requires EPA to propose its own schedule for complying with the review requirements. By Dec. 29, EPA must "file a written submission with this Court setting forth a proposed deadline for its compliance with [EPA's] obligation to review and revise if necessary its Subtitle D regulations concerning coal ash, along with its legal justification for its proposed deadline."

Although experts [caution](#) that a court order will not guarantee action, the environmental groups involved in the suit were pleased with the decision, [stating](#), "The decision by this federal court to put the EPA on a schedule for finalizing federal coal ash regulations is a victory for the communities and neighborhoods living next to these toxic sites. Federal protection is long overdue."

New Evidence of the Need for Federal Rules

A [report](#) released Nov. 7 by the Environmental Integrity Project (EIP) shows that TVA ponds and landfills have contaminated groundwater around all eleven of its coal-fired power plants. The contamination around the plants included pollutants associated with coal ash, including arsenic, boron, and sulfate. While TVA [notes](#) that it is taking steps to prevent future damage from coal ash, the report recommends that TVA develop a comprehensive plan to strengthen groundwater monitoring and remediate the contamination caused by decades of mismanagement, and emphasizes the importance of new federal standards to ensure all electric utilities modernize their coal ash disposal practices. The recommendations conclude, "EPA must finalize its coal ash disposal regulations, and in those regulations must require rigorous [monitoring] requirements [after facilities close], clean-up requirements, and groundwater protections."

The report follows a number of previous [studies](#) documenting the dangers of coal ash but serves as a timely reminder of the importance of finalizing comprehensive federal coal ash pollution and disposal standards.

Coal Industry Allies in Congress Continue Attacks on Coal Pollution Standards

In July, the House of Representatives passed the latest version of familiar legislation that would impede EPA's ability to regulate coal ash as a hazardous waste. [According](#) to opponents of the bill, [H.R. 2218](#) removes EPA's "authority to establish safeguards for the disposal of toxic ash, yet fails to establish adequate protective standards that states must enforce."

More recently, the House Natural Resources Committee advanced legislation to prevent a different agency from issuing new standards addressing coal mine waste. On Nov. 14, the committee [approved](#)

[H.R. 2824](#), the Preventing Government Waste and Protecting Coal Mining Jobs in America Act, which would amend the Surface Mining Control and Reclamation Act and require states to implement a 2008 Bush administration rule that removed restrictions on dumping coal waste near streams.

The House majority is [expected](#) to attach this and similar anti-environmental measures as policy riders to funding bills and other must-pass legislation, as it has done in [recent years](#).

The stakes are high for environmentalists and residents living near coal ash production and storage operations. The U.S. generates roughly 140 million tons of coal ash every year, about half of which is kept in storage ponds and landfills. Many of these storage locations have received "high hazard potential" ratings, yet there is still no comprehensive federal policy for controlling the storage and disposal of coal ash waste. And, as EIP's recent report illustrates, poorly managed coal ash waste can contaminate groundwater and cause long-lasting harm to the environment and nearby residents exposed to the toxins.

EPA should establish a schedule for completing its review of outdated regulations, as directed by the recent court order, and swiftly finalize a new rule to provide a minimum health and safety standard for coal ash disposal. Continued inaction leaves the public at risk and provides anti-environmental interests with more opportunities to restrict the agency's authority to prevent another disaster like the spill at TVA's Kingston plant.



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