

Written Testimony Submitted by U.S. Chemical Safety Board Chairman Rafael Moure-Eraso to the Joint Committee: Senate Committee on Environment and Public Works and the Senate Committee on Health, Education, Labor, and Pensions hearing entitled, "Oversight of the Implementation of the President's Executive Order on Improving Chemical Facility Safety and Security"

The CSB is an independent federal agency that investigates major chemical accidents and hazards and develops safety recommendations to prevent their recurrence in the future. The Board is a non-regulatory, scientific, investigative agency. It has an annual budget of \$11.0 million and approximately 38 employees. In addition to investigations, safety studies, and recommendations, we do extensive outreach to companies and other organizations to inform them of our findings. Companies throughout the U.S. and the world use the reports, online videos, and recommendations developed by the CSB to help create what we hope are safer workplaces.

Congress frequently calls upon the CSB to investigate the root causes of some of the most complex and tragic industrial accidents across the country including the 2012 Chevron refinery fire in California and the 2014 chemical release in Charleston, West Virginia, that contaminated the drinking water supply for 300,000 residents. The CSB is also investigating a number of additional catastrophic accidents across the country including the fatal ammonium nitrate explosion in West, Texas, and the fatal explosion at the Williams Olefins facility in Geismar, Louisiana, both in 2013.

In January 2014 I authored a New York Times opinion article entitled "The Next Accident Awaits" where I noted that the current process safety regulatory system is in need of reform. Tragically there was not too much time spent waiting for the "next accident" – in November 2014 four workers were killed outside Houston in a large-scale toxic gas release from a DuPont pesticide plant. The CSB is now investigating this accident.

After the West explosion, President Obama issued an executive order requiring federal agencies to review safety rules at chemical facilities. I am encouraged by the leadership of the White House, OSHA, and EPA in taking the first steps towards reforming U.S. process safety management regulations. Today's joint committee hearing is an excellent opportunity to learn more about how the reform of existing process safety standards is moving forward. To date, both OSHA and the EPA have issued Requests For Information (RFI's), and may soon initiate rulemaking to revise the PSM standard and the RMP regulation. I support these efforts. The CSB submitted a comprehensive response to each RFI detailing needed improvements to the existing federal process safety management regulations.

The reality is that U.S. process safety management regulations have undergone no substantive improvements since their inception in the 1990's. Moreover other existing OSHA standards governing explosives like ammonium nitrate, flammable and combustible liquids, and hot work are even older, dating from the early 1970's, and are based on fire code guidance from the 1960's. These regulations have not been updated since, even as the voluntary fire codes have undergone many cycles of revision and improvement. The CSB has noted in its recent

investigations of major incidents that both the OSHA Process Safety Management (PSM) standard and the EPA Risk Management Plan (RMP) Program regulations appear to function primarily as reactive and activity-based regulatory schemes that require extensive rulemaking to modify, resulting in stagnation despite important lessons from accident investigations, advancing best practices, and changing technology.

More must be done to ensure that a comprehensive process safety management system is in place in the U.S. to protect worker safety, public health, and the environment. There must be greater emphasis from regulators and companies on preventing the occurrence of major chemical accidents through safer design and elimination of hazards.

The 2012 fire and explosion at the Chevron Refinery in Richmond, California, that sent approximately 15,000 residents to seek medical attention and endangered the lives of 19 workers was entirely preventable. Chevron's own employees had repeatedly notified company officials of the corrosion hazard (which ultimately caused the failure of a major pipe carrying hot hydrocarbons), but unfortunately this did not result in replacing the corroded piping with inherently safer, corrosion-resistant materials that were known to industry and recommended in voluntary practices.

This accident has set off a series of regulatory reforms in California, which can serve as a model for the modernization of process safety management at the federal level. California is taking important steps towards modernizing process safety management by funding additional PSM inspectors and by issuing draft process safety management regulations that address many of the attributes of a stronger regulatory system identified by the CSB's investigative reports. In October, California's legislature passed, and Gov. Jerry Brown signed, a sweeping law requiring the state's petroleum refineries to provide regulators with detailed information concerning extensive maintenance overhauls and repair operations – known in the industry as turnarounds. This important reform will help prevent accidents by ensuring that needed repairs will be more promptly conducted rather than deferred as we found in our Chevron investigation.

I commend California for taking action in the wake of the Chevron fire. In my view, had these new laws and regulations been in effect before August 2012, California's Division of Occupational Safety and Health, or Cal/OSHA, could have urged or required the safety improvements needed to prevent the accident.

To continue to advocate for further reforms, the CSB recently added the issue of federal process safety management reform and modernization to its Most Wanted Chemical Safety Improvements Program. The goal of adding this important issue to the CSB Most Wanted Program is the continuous improvement of process safety management in the U.S. through the implementation of key federal and state CSB process safety-related recommendations and lessons learned.

The CSB has found that current federal and state regulations do not focus enough on continuously reducing process risks. CSB investigations into serious accidents including the Tesoro explosion and fire in Anacortes, Washington, and the Chevron Refinery fire found that there was no requirement to reduce risks to a specific risk target such as "As Low As Reasonably

Practicable” (ALARP), which is the standard applied in Europe and elsewhere, where major accident rates are much lower. Similarly, there is no mechanism to ensure continuous safety improvement; no requirement to address the effectiveness of controls or to rank the effectiveness of preventive measures (also referred to as the hierarchy of controls); and no requirement to implement and document an inherently safer systems analysis in establishing safeguards for process hazards.

The CSB investigation reports on these incidents noted that there should be an increased role for workers and worker representatives in process safety management and that similar to recent actions in California, where the force of specialized refinery safety inspectors was tripled, the regulator must have the tools and technically competent personnel to conduct preventative inspections and audits.

We have often heard the argument that the major accidents of recent years are the result of mistakes by what some have called “outlier” companies. Most recently, this argument has been floated in industry comments responding to OSHA and EPA’s requests for information on safety regulatory reform. Small companies like West Fertilizer in Texas and Freedom Industries – the small terminal operator whose leak contaminated West Virginians’ drinking water – are unaware of rules and good practices, are not members of national trade associations or subscribers to their voluntary programs, and generally fly beneath the regulatory radar – so the argument goes. One trade association, in its comments, went so far as to say that the massive explosion at BP’s Texas City refinery in 2005 was an “outlier” event, even though this was at the time the third largest oil refinery in the country, owned by one of the world’s largest and most technically sophisticated corporations.

There should be no mistake – process safety disasters are not limited to any so-called outliers. These disasters – *which no one wants to occur* – are the result of many factors affecting large and small companies alike. These include: weak or obsolete regulatory standards, inadequate regulatory resources and staffing, overly permissive industry standards, and a lack of safe design requirements and risk reduction targets.

The most recent example is the tragic chemical accident at the major DuPont chemical plant in La Porte, Texas, just east of Houston. On November 15, 2014, there was a release of methyl mercaptan, a highly toxic and volatile liquid, which DuPont itself has estimated at 23,000 pounds – a very significant quantity. Odors of the chemical were reportedly discernible many miles from the plant. Four workers – including operators and would-be rescuers – perished inside the methomyl-production building where the release originated.

DuPont is certainly no “outlier.” In fact, DuPont has long been regarded as one of industry’s leading lights in safety, and it markets its safety programs to other companies. What happened last month, however, was the fifth release incident at a DuPont facility that the CSB has investigated since 2010, and three of these had associated fatalities. While the CSB investigation remains underway in La Porte, some preliminary facts are already emerging.

The incident occurred following an unplanned shutdown of the methomyl unit due to inadvertent water dilution of a chemical storage tank several days earlier. Efforts were underway

to restart the process, but problems occurred including plugged supply piping leading from the methyl mercaptan storage tank. As efforts were underway to troubleshoot these problems, it is likely that methyl mercaptan (and possibly other toxic chemicals) inadvertently entered the interconnected process vent system inside the building. The release occurred through a valve that was opened as part of a routine effort to drain liquid from the vent system in order to relieve pressure inside. We found that this vent system had a history of periodic issues with unwanted liquid build-up, and the valve in question was typically drained directly into the work area inside the building, rather than into a closed system. In addition, our investigators have found that the building's ventilation fans were not in service, and that the company did not effectively implement good safety practices requiring personnel to wear appropriate personal protective equipment (PPE) that was present at the facility. Appropriate PPE would include equipment, such as supplied air respirators, for workers performing potentially hazardous tasks inside the building.

In summary, this was a complex process-related accident with tragic results. It gives rise to a number of design and organizational safety concerns. Its occurrence – taken along with other major accidents afflicting large and small corporations – underscores the need for some systemic reforms. It would be a serious and tragic mistake to consider each of these accidents as just another isolated event, reflecting only the limited practices of a small group of people operating outside regulatory scrutiny. If it can happen at DuPont, I would submit it can happen anywhere.

In June 2013 I testified before the Senate EPW Committee on the CSB's ongoing investigation into the West, Texas, ammonium nitrate (AN) explosion that tragically killed 15 people and caused hundreds of injuries, and devastated much of the town including homes, schools, businesses, and health care facilities. The explosion followed an intense fire that consumed a wooden storage building that held tons of fertilizer ammonium nitrate in wooden bins. At that time I noted the existing patchwork of U.S. safety standards and guidance for such facilities: a patchwork that has many large holes, including allowing the use of combustible wooden buildings and wooden storage bins, few requirements for sprinklers (there were none at West), and no federal, state, or local rules restricting the storage of large amounts of ammonium nitrate near homes, schools and hospitals.

Voluntary guidance provided by the Agricultural Retailers Association and The Fertilizer Institute as well as an ammonium nitrate safety advisory issued in August 2013 by OSHA, EPA, and ATF are definitely positive steps in addressing the hazards associated with the storage of AN. But they are not enough by themselves. It is sobering to reflect that nearly two years after the West disaster, very little if anything has changed in terms of federal, state, or local requirements for ammonium nitrate handling and storage. These practices still lag behind the ammonium nitrate safety practices of other countries, as well as the good practice guidance of the U.S. explosives industry, which has advocated commonsense safeguards like noncombustible storage buildings and sprinkler systems to prevent fires that can sensitize ammonium nitrate to explosion. Meanwhile fires continue to occur threatening ammonium nitrate stored in wooden buildings, such as a recent fire at a fertilizer distributor in Athens, Texas, that mercifully did not cause an explosion in the middle of that town.

Industry and government have increased their efforts to prevent major chemical accidents. But CSB investigations show that much more needs to be done to assure that future tragedies will be avoided – the opportunity for meaningful reform is now. Thank you for the opportunity to submit written testimony for this important hearing today.