The Arkema Chemical Facility Incident: How the Regulation of Reactive Chemicals and the Incorporation of Climate Change Risks in Emergency Response Planning Could Mitigate and Prevent Future Accidental Chemical Releases

Lauren Mulhern*

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*J.D. Candidate, 2019, University of Colorado Law School. The author would like to thank her husband for his endless support and encouragement, her father-in-law for inspiring the topic of this Note, and the rest of her family for their support. Additional thanks to the *Colorado Natural Resources, Energy and Environmental Law Review* staff and editors for their efforts in preparing this Note for publication.

INTRODUCTION

From 2006 to 2016, 60 people died, 17,000 were injured, 500,000 were forced to evacuate their homes, and more than $2 billion in property damage occurred as a result of 15,000 incidents related to chemical plant

operation safety in the United States.[1] This Note examines several of the factors that contribute to high accident rates by examining the specific events at one chemical facility during a natural disaster.

Part I of this Note describes the events that occurred at the Arkema facility in Crosby, Texas in 2017. Massive amounts of water flowed into the facility when Hurricane Harvey hit the area, resulting in the release of reactive chemicals. Due to a power failure at the factory, these chemicals volatilized and were released into the atmosphere, potentially harming neighboring communities. Chemicals were also discharged into the flood waters causing adverse health effects when flood waters came in contact with the population. These contaminated waters left residual contamination in the community's groundwater and may continue to cause harm.

Part II details the significant gap in regulations with respect to reactive chemicals, like those released into the atmosphere at the Arkema facility. Recommendations are then given as to how to incorporate reactive chemical regulation into existing regulations promulgated by both the Environmental Protection Agency ("EPA") and the Occupational Health and Safety Administration ("OSHA"). The Arkema incident is discussed in terms of what may have happened had either of the recommendations been in place at the time of the incident.

Part III discusses current federal emergency planning regulations. Local Emergency Planning Committees and State Emergency Response Commissions are the keystone to advancing the safety of chemical facilities.[2] Recommendations are given to enhance the efforts of local emergency planning, in part by assessing the increased risks that climate change poses and the need to perform an accurate risk assessment in crafting emergency plans. These recommendations are then analyzed to evaluate what may have happened had they been implemented at the time of the incident at the Arkema facility.

Finally, the conclusion summarizes the multiple suggestions made throughout this Note and recommends that these proposals should be heeded.

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[1] Mathy Stanislaus, *Preventing and Better Preparing for Emergencies at Chemical Plants is Job One*, THE ENVTL. PROTECTION AGENCY: THE EPA BLOG (Feb. 25, 2016), https://blog.epa.gov/blog/2016/02/preparing-for-emergencies.

[2] *Id.*

I. THE CHEMICAL RELEASES AT THE ARKEMA FACILITY IN CROSBY, TEXAS

In 2016, Texas A&M's Process Safety Center evaluated over 2,500 chemical facilities in the Houston area to determine which facilities posed the greatest potential for harm should an emergency occur.[3] According to an investigation by the Houston Chronicle, of the 55 facilities with the highest potential for harm, 10 had chemicals ranked as "highly reactive."[4] The Arkema chemical manufacturing facility (the "Arkema facility"), one of the facilities with large quantities of highly reactive chemicals, was ranked at 22.[5] When Hurricane Harvey made landfall in the Houston metropolitan area in 2017, the Arkema facility and the community in Crosby became painfully aware of the dangers at the facility and the lack of emergency planning.[6]

From August 25–29, 2017,[7] Hurricane Harvey dumped 50 inches of rain on Crosby.[8] Days before the storm hit, residents of the State of Texas were warned of the incoming storm and its potential effects. On August 24, 2017, the National Hurricane Center ("NHC") issued an updated warning predicting extreme flooding with rainfall of 15 to 25 inches and

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[3] DR. M. SAM MANNAN, MARY K. O'CONNOR PROCESS SAFETY CTR., TEXAS A&M ENGINEERING EXPERIMENT STATION, RANKING OF CHEMICAL FACILITIES BASED ON THE POTENTIAL TO CAUSE HARM TO THE PUBLIC (2016).

[4] Susan Carroll & Matt Dempsey, *Chemical Breakdown: Part 4*, THE HOUSTON CHRONICLE (May 7, 2016), https://www.houstonchronicle.com/chemical-breakdown/4.

[5] MANNAN, *supra* note 3.

[6] The Chemical Safety Board, in the course of their investigation into the incident at the Arkema facility, has created a video depiction of how events unfolded at the facility over the several days of flooding. The video does not depict the chemical discharge into the flood waters that occurred on August 29, only the atmospheric release of the organic peroxides that took place August 31 through September 3. *Preliminary 2D Animation of Events Leading to 2017 Fire at Arkema Chemical Plant in Crosby, Texas*, U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD (Nov. 15, 2017), https://www.csb.gov/videos/preliminary-2d-animation-of-events-leading-to-2017-fire-at-arkema-chemical-plant-in-crosby-texas.

[7] *Major Hurricane Harvey – August 25-29, 2017*, NAT'L WEATHER SERV., (Oct. 24, 2017, 4:59 AM), https://www.weather.gov/crp/hurricane_harvey.

[8] According to a report by the National Hurricane Center, Hurricane Harvey was the most significant tropical cyclone rainfall event in US history in both scope and peak rainfall amounts. 40,000 people were forced to evacuate or seek refuge in shelters, over 300,000 structures were flooded, and 500,000 cars were damaged. ERIC S. BLAKE & DAVID A. ZELINSKY, NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT: HURRICANE HARVEY 6, 9 (2018); Emma Platoff, *As Lawsuits Over Texas Chemical Disaster Add Up, Advocates Blame Arkema and Rules Regulating It*, THE TEX. TRIB. (Mar. 30, 2018), https://www.texastribune.org/2018/03/30/arkema-disaster-harvey-regulations-texas-crosby.

isolated amounts of up to 35 inches, and suggested preparations for property and life to be completed by that night.[9] Arkema employees began hurricane preparations that day, including securing loose scaffolding, elevating portable equipment, and filling diesel tanks for backup generators and refrigerated trailers.[10] Three days later, the NHC predicted as much as 50 inches of rainfall in Crosby, a historic level.[11] Ultimately, eighty percent of the average annual rainfall fell on Crosby, Texas, within four days of landfall.[12]

When the city flooded, the Arkema facility was inundated with six feet of water, greater than that of a 500-year flooding event.[13] As the water began to rise, the "ride-out crew" shut off power to the refrigerators at the facility and began transporting some of the over 350,000 pounds of volatile organic peroxides stored in them to diesel-powered refrigerated trailers.[14] These chemicals, highly reactive at temperatures above a certain known temperature,[15] needed to be refrigerated or they would soon begin to volatilize, kick-starting a self-accelerating runaway reaction.[16] Although some of the organic peroxides were left in the refrigerated units regularly used by the Arkema facility because they were connected to generators that supplied backup power, as the floodwater levels began to reach the generators, the crew was forced to transport these chemicals to the trailers as well.[17] When the crew could no longer operate their vehicles to transport the chemicals because of the floodwaters, they were forced to transport over 2,100 containers by hand.[18] The power at the facility finally

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[9] NAT'L HURRICANE CTR., HURRICANE HARVEY DISCUSSION NUMBER 19 (2017).

[10] U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD, INVESTIGATION REPORT: ORGANIC PEROXIDE DECOMPENSATION, RELEASE, AND FIRE AT ARKEMA CROSBY FOLLOWING HURRICANE HARVEY FLOODING (2018).

[11] NAT'L HURRICANE CTR., TROPICAL STORM HARVEY ADVISORY NUMBER 29 (2017).

[12] INVESTIGATION REPORT, *supra* note 10, at 73.

[13] A 500-year flooding event is an amount of flooding that has a predicted 1-in-500 (0.2%) chance of occurring in a given year. A statistical technique called frequency analysis is used to estimate this probability using historical data. United States Geological Survey, *Floods: Recurrence Intervals and 100-Year Floods*, https://water.usgs.gov/edu/100yearflood.html; INVESTIGATION REPORT, *supra* note 10, at 61.

[14] INVESTIGATION REPORT, *supra* note 10, at 11, 36.

[15] Of the eleven types of organic peroxides stored at the Arkema Facility during the incident, the Self-Accelerating Decomposition Temperature, the lowest temperature at which an organic peroxide begins self-accelerating decomposition, for each product was between 23 and 113˚ F. *Id.* at 10, 20.

[16] *Id.* at 10, 19.

[17] *Id.* at 14, 37.

[18] *Id.* at 11.

failed early on August 28 when the transformers powering the facility were submerged by the floodwaters.[19]

That day, the ride-out crew alerted Arkema's corporate crisis team of the potential for the refrigerated trailers to lose power due to still rising floodwaters, and the crisis team alerted the Harris County emergency responders to the possibility of a release or fire.[20] The following morning, the crew noticed that one of the trailers had tipped over, likely due to the current of the floodwaters or because they were overloaded with organic peroxides. The crew predicted that at least one fire would start as the chemicals heated and decomposed.[21] At this point, the ride-out crew was evacuated by boat.[22] Monitoring data from some of the trailers was available remotely, and Arkema supplied that information to emergency responders.[23] However, this data was not particularly useful as the crew did not have time to definitively identify which organic peroxides were put in which trailers, and the decomposition temperature was different for each type of chemical.

Out of fear that the trailers would lose power and the organic peroxides stored would warm, react, and volatilize, releasing harmful vapor into the air, a 1.5-mile radius evacuation perimeter was established around the facility.[24] This radius was based on modeling done by emergency responders from the Federal Emergency Management Agency, the EPA, and the Harris County Fire Department, relying on the assumption that the trailers would combust.[25] The Arkema corporate crisis team was consulted as part of this process and they agreed that this perimeter would be sufficient.[26] Arkema issued a press release relaying the evacuation perimeter, and approximately 205 people were evacuated from their homes at this time.[27]

Arkema continued to hold regular meetings with the emergency responders to discuss site conditions and next steps.[28] Arkema provided a site map and a list of the products stored in the refrigerated trailers.[29] When responding to a high-water call just before midnight on August 30, two

19 *Id.*
20 *Id.* at 50.
21 *Id.* at 50–51.
22 *Id.* at 51.
23 *Id.* at 53.
24 *Id.* at 54.
25 *Id.*
26 *Id.*
27 *Id.*
28 *Id.* at 57.
29 *Id.*

police officers drove their car along Highway 90. Although Highway 90 was within the evacuation perimeter, it remained open because it was the only major throughway to transport personnel and equipment from Houston to Beaumont. The officers drove into what they described as a "large cloud of gas."[30] The gas engulfed and entered into their car and they began showing signs of contact with a chemical release.[31] The officers reported the incident, and three other officers came to check on them and were also exposed to the gas cloud.[32] The five total officers began evacuating the area and were exposed again to the gas cloud. At this point, all five were experiencing nausea and severe headaches and were taken to the emergency responder's command post.[33] EMTs were then called to assist the officers and they too drove through the gas cloud and began exhibiting signs of chemical exposure.[34] Ultimately, twenty-one emergency responders were taken to the hospital for medical evaluations related to exposure to the gas cloud.[35]

This first release was later determined, during the investigation by the Chemical Safety and Hazard Investigation Board ("CSB"), to be from one of the trailers without the capability for remote monitoring, and the emergency responders had no idea it had occurred.[36] Early during the morning of August 31, another trailer began to decompose and burn.[37] A high-altitude flyover conducted by the EPA later that afternoon found low levels of peroxides downwind of the trailer.[38]

On September 1, two more of the refrigerated trailers ignited.[39] The remaining six trailers were intentionally ignited on September 3 after complaints from residents that they were not able to check on their homes or gather their belongings.[40] Early on the morning of September 4, the evacuation order was lifted after air monitoring was conducted and found no readings above the baseline level.[41] The nine total explosions sent thousands of pounds of toxic chemicals into the air which mixed with the rain and wind of the storm resulting in ash, dust, and fine particulate matter

30 *Id.*
31 *Id.*
32 *Id.* at 59.
33 *Id.* at 60.
34 *Id.*
35 *Id.*
36 *Id.* at 117.
37 *Id.* at 60.
38 *Id.* at 61.
39 *Id.* at 62.
40 *Id.* at 66.
41 *Id.*

raining down throughout the area, both within and outside of the set perimeter.[42]

In addition to the release into the atmosphere, two days before the initial explosion on August 29, water exceeded the top of a secondary containment for wastewater tanks in the facility, and approximately 23,000 pounds of organic liquid overflowed into the floodwaters that were raging throughout the city.[43] At the time of the release, Arkema gave no information about the discharge to the public and there were no media reports on this aspect of the issue. Knowledge of this discharge was first reported when those exposed to the floodwaters filed a class action lawsuit against Arkema in October 2017.[44] The complaint alleged that the establishment of the 1.5-mile evacuation perimeter and the subsequent warning from Arkema was only related to the risk of explosion, not the chemical release into the surface waters.[45] It was further alleged that this perimeter was arbitrary and much of the damage occurred outside of the perimeter.[46]

The first responders and public not only allegedly inhaled contaminated air from the gaseous chemicals released when the organic peroxides volatilized, but also encountered dermal exposure through the contaminated flood waters.[47] One of those class members alleged to have been exposed to the flood waters, was trying to escape the evacuation area with his wife on their motorcycle after being informed by the National Guard that they must leave their home.[48] At no time were the couple warned of the contaminated flood waters, and it is not clear that the National Guard was even aware of the contamination.[49] When the motorcycle stalled, the man waded through the water while pushing the motorcycle, and soon cried out in pain as his legs began to burn when they touched the flood waters.[50] Once out of the water, the man was left with blisters, lesions, and burns.[51]

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[42] *Explosions and Black Smoke Reported at Chemical Plant*, N.Y. TIMES (Aug. 30, 2017), https://www.nytimes.com/2017/08/30/us/hurricane-harvey-flooding-houston.html.

[43] INVESTIGATION REPORT, *supra* note 10, at 52.

[44] Class Action Complaint, Shannan Wheeler v. Arkema France, No. 4:17-cv-02960, (D. Tex. Oct. 3, 2017).

[45] *Id.* at 2.

[46] *Id.* at 5.

[47] *Id.* at 4.

[48] *Id.* at 10–11.

[49] *Id.* at 11.

[50] *Id.*

[51] *Id.*

Dermal exposure from the release of the organic peroxides was also alleged weeks after the incident when one of the plaintiffs kicked up black ash and residue while mowing his lawn, which caused a scaly rash to develop on his skin.[52] Many other injuries were alleged by several classes of people throughout the complaint, from first responders, to those forced to evacuate, to those well outside the evacuation perimeter.[53] Many of those alleged to have been injured by the incident at Arkema suffered from headaches and respiratory difficulty but were never made aware of the health effects associated with exposure to the released chemicals.[54] Those in the Crosby area continued to be harmed long after the incident by the wells that were impacted by the contaminated flood waters.[55]

The events at the Arkema facility could have been demonstrably worse. While there were no reported fatalities, it is not at all clear that those exposed will not have serious health effects later in life. It is possible that the regulation of hazardous reactive chemicals could have mitigated some of the damage done during the flooding. Additionally, effective emergency planning could have allowed Arkema to establish a more accurate evacuation perimeter and would have forced the facility to make the public aware of the health effects associated with the release.

The remainder of this Note explains the current regulations imposed on the Arkema facility, and other facilities like it, with regard to those chemicals actually regulated and the emergency planning required. Recommendations are then put forward to amend these regulations to include those chemicals of the type that caused the explosions at Arkema and to require the incorporation of climate change effects in preparing for an emergency situation. Finally, the situation at Arkema is reexamined to determine what these recommendations may have changed in the handling of the situation in Crosby.

II. A GAP IN REGULATION: THE NEED TO REGULATE REACTIVE CHEMICALS

The Clean Air Act Amendments of 1990 ("CAAA") required the EPA and OSHA to promulgate regulations to prevent the accidental release of substances that could have serious effects on public health and the environment. The mandate required the promulgation of regulations to

52 *Id.* at 5.

53 *Id.* at 4–11.

54 *Id.* at 5, 7–9.

55 *Id.* at 3.

prevent the accidental release of reactive chemicals.[56] Parts of the CAAA mandate were taken up by both the EPA and OSHA. However, neither agency followed the mandate to fully regulate reactive chemicals.

This Part first explains what reactive chemicals are. Next, this Part gives an overview of OSHA's Process Safety Management Standard ("PSM Standard") and the incident at Arkema is again analyzed in this context, followed by recommendations to improve this program by incorporating reactive chemicals. Then, the Arkema disaster is revisited and evaluated in the context of how the recommendations to improve the RMP could have mitigated the disaster in Crosby. The same analysis is then completed for the EPA's Risk Management Program ("RMP").

A. What are Reactive Chemicals?

The core competency of the chemical manufacturing industry is safely conducting chemical reactions.[57] Uncontrolled reactions have the potential to generate heat, energy, and harmful gaseous byproducts under certain physical conditions, leading to explosions, fires, and toxic emissions.[58]

The National Fire Protection Association has produced a standard system for the identification of the hazards associated with certain chemicals.[59] The system defines and provides ratings for three types of hazardous properties; reactivity, toxicity, and flammability.[60] The reactivity hazard ranks the dangerousness of chemicals based on their reactive properties (i.e., their inherent instability at certain temperatures and pressures). However, the other two hazards, toxicity and flammability, are commonly thought of as the most hazardous properties of chemicals. This inaccurate mindset is reflected in the current regulations surrounding chemical safety.

According to government data, reactive chemical incidents in the United States killed at least one person every two months in the twenty-one years preceding 2001.[61] These incidents occur when chemicals are not kept at a stable temperature and pressure, and when correct processes are

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56 U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD, HAZARD INVESTIGATION: IMPROVING REACTIVE HAZARD MANAGEMENT 14 (2001).

57 *Id.* at 13.

58 *Id.*

59 NATIONAL FIRE PROTECTION ASS'N, NFPA 704: STANDARD FOR THE IDENTIFICATION OF THE HAZARDS OF MATERIALS FOR EMERGENCY RESPONSE (2017).

60 MANNAN, *supra* note 3, at 4; NATIONAL FIRE PROTECTION ASS'N, *supra* note 59.

61 The federal government stopped tracking these incidents after 2001. Carroll & Dempsey, *supra* note 4.

not followed.[62] In 2002, the CSB released the results from an investigation (the "2002 Report") that it had conducted on reactive chemical incidents, finding that 167 reactive chemical incidents had occurred over the previous two decades.[63]

The CSB, an independent federal agency, has been advocating for the federal regulation of reactive chemicals since the early 2000s.[64] The CSB called on OSHA to broaden the PSM Standard to include more processes that could lead to runaway reactions, as was originally required by the CAAA, and for the EPA to regulate reactive hazards under the RMP. Neither OSHA nor the EPA has followed these suggestions.[65] Though the federal government created the CSB for the purposes of informing policy choices, the CSB's recommendations have been quashed by industry groups. In particular, the chemical manufacturing industry does not wish to see the regulation of reactive chemicals due to the additional compliance costs. The following sections explain the PSM Standard and RMP in more detail and offer suggestions for amending them.

B. The Occupational Health and Safety Administration's Process Safety Management Standard

OSHA's PSM Standard was promulgated in response to the CAAA mandate. The PSM Standard contains requirements for the management of hazards associated with processes using highly hazardous chemicals.[66] The PSM regulates 130 toxic and some reactive chemicals found in certain facilities at numerical quantities above a set threshold.[67]

The crux of the PSM Standard is the process hazard analysis ("PHA"), which requires facilities to undergo an analysis of the dangers, consequences, and safeguards to be put into place in order to prevent a release of hazardous chemicals.[68] Facilities must comply with the requirements for the safe management of hazards associated with processes using, storing, manufacturing, handling, and transporting hazardous chemicals.[69] In addition, the standard mandates that the facility

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[62] *Id.*

[63] *Id.*

[64] U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD, *supra* note 56.

[65] Carroll & Dempsey, *supra* note 4.

[66] *Process Safety Management*, U.S. DEP'T OF LABOR, OCCUPATIONAL HEALTH AND SAFETY ADMIN. (2000), https://www.osha.gov/Publications/osha3132.html#problem.

[67] *Id.*

[68] *Id.*

[69] *PSM of Highly Hazardous Chemicals OSHA Fact Sheet*, U.S. DEP'T OF LABOR, OCCUPATIONAL HEALTH AND SAFETY ADMIN. (2002), https://www.osha.gov/OshDoc/data_General_Facts/highly-hazardous-chemicals-factsheet.pdf.

keep written operating procedures, have adequate employee training and participation, evaluate the integrity of critical mechanical equipment, and have processes for managing changing circumstances.[70]

Though the PSM Standard does regulate some reactive chemicals, it deals narrowly with process safety, evaluating only the safety procedures followed during the process of a controlled chemical reaction. Because some chemicals are self-reactive, no process or "extra step" is required for them to react. Self-reactive chemicals can be hazardous when they are not stored at the correct temperature and pressure, which can occur when they are stored, transported, or during a process-specific reaction. Although these hazards exist, the PSM Standard does not explicitly require an evaluation of the hazards associated with inadequate storage and transportation either before a process-specific reaction or during the reaction.

In an emergency situation, the storage of self-reactive chemicals becomes particularly dangerous. Because of the required temperature and pressure conditions, equipment failure can have disastrous consequences. An evaluation of proper storage and transportation of self-reactive chemicals should be required to analyze the dangers, consequences, and safeguards needed to prevent a release of hazardous chemicals, as is required by the PSM Standard. Additionally, the PSM Standard should evaluate the process-specific conditions that must be maintained for reactive chemicals. The inclusion of self-reactive chemicals in the PSM Standard would allow facilities to better prepare for emergency situations after assessing these types of hazards.

1. Recommendations to Revise the Process Safety Management Standard

Because of the narrow scope of the evaluation of reactive hazards under the PSM Standard, it should be revised by OSHA. The PSM Standard and PHA processes are very robust. Simply requiring the evaluation of reactive hazards in process-specific conditions—as well as in conditions where no process is required for the chemicals to react—would go a long way toward improving the safety management of these volatile compounds.

The CSB recommended these revisions to OSHA in its 2002 Report.[71] However, industry lobbyists continue to obstruct the incorporation of these types of hazards into the PSM Standard.

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[70] *Id.*

[71] U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD, *supra* note 56.

Specifically, the PSM Standard should be modified so that the PHA explicitly requires an evaluation of reactive hazards.[72] Just as with the EPA's RMP standard, discussed *infra*, monitoring and reporting should also be implemented to track reactive incidents. Finally, as part of the PSM, a new program should be implemented to define and record information on reactive incidents as a part of OSHA's incident investigations.[73] This information should then be used to measure progress in the prevention of reactive incidents giving rise to catastrophic releases.[74]

2. How the Recommended Changes to the Process Safety Management Standard Could Have Influenced the Events at the Arkema Facility

Though the PSM Standard, specifically the PHA element, has some redundancy with EPA's RMP standard, discussed *infra*, the PSM Standard is not only meant to assess the consequences of an accidental release and the steps needed to prevent it, but it is also designed to identify the consequences of improper or inadequate storage and handling of these products. Because the Arkema facility contained other products governed by the PSM Standard and PHA requirement, it did perform a voluntary PHA of the organic peroxides, though it was not required to. However, had the facility not contained these other hazardous chemicals, it is doubtful that the facility would have completed this analysis voluntarily. Had the Arkema facility been required to perform a PHA for their reactive chemicals, namely the organic peroxides that caused the explosions, it would have been required to analyze the storage and transport of these hazardous chemicals and create safe management practices for these materials.

The PHA would have also required the Arkema facility to evaluate the mechanical equipment that was necessary to keep the reactive chemicals at the critical temperature and pressure that was required for them to be kept safely contained. When the Arkema facility's generators failed due to the flood waters, the facility's emergency response plan was not adaptable enough and should have been crafted to handle and manage the changing circumstances. The PHA, had it regulated reactive chemicals as recommended by the CSB, would have required an evaluation and a process to manage these changing conditions caused by the flooding.

Finally, because of the reporting and monitoring requirements of the PSM Standard, the aftermath of the Arkema facility's reactive incident

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[72] *Id.* at 97.

[73] *Id.* at 98.

[74] *Id.*

would have been defined and recorded by OSHA's incident investigation team to be later incorporated into the hazard assessment required under the EPA's RMP standard. These two rules work in conjunction not only to prevent these incidents from occurring, but also so that facilities can learn from past mistakes and correct their previous deficiencies when creating new plans to respond to future incidents.

C. The Environmental Protection Agency's Accidental Release Prevention Requirements: Risk Management Program

In 1996, the EPA promulgated the Accidental Release Prevention Requirements ("ARPR"), similar to OSHA's PSM Standard, in response to the CAAA mandate.[75] The ARPR established new measures for public notification, emergency response, and reporting of accidental chemical releases.[76] As part of the ARPR, companies are required to develop RMPs that include a hazard assessment detailing the potential effects of an accidental release, a five-year accident history, and an evaluation of the worst-case and alternative accidental release scenarios.[77] Also required as part of the RMP is the development of a prevention program that includes safety precautions and maintenance, monitoring, and employee training, as well as an emergency response program that defines emergency health care, employee training measures, and procedures for informing the public and response agencies in the event of an accident.[78]

These standards were aimed at "reducing chemical risk at the local level."[79] The RMP is robust in its requirements for assessing hazards, preventing accidents, and developing emergency plans. However, of the 130 chemicals the EPA chose to regulate under the RMP, none were selected based on their hazardous reactive properties, as was required by the CAAA mandate.[80] Instead, the standards focused only on substances that are hazardous based on their toxicity and flammability characteristics.[81]

Due to the EPA's failure to regulate reactive chemicals under the RMP, facilities that contain hazardous quantities of reactive chemicals are

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[75] *Id.* at 14.

[76] *Id.*

[77] OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, ENVTL. PROT. AGENCY, *Clean Air Act Section 112(r): Accidental Release Prevention/Risk Management Plan Rule* 1 (2009), https://www.epa.gov/sites/production/files/2013-10/documents/caa112_rmp_factsheet.pdf.

[78] *Id.*

[79] *Id.*

[80] U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD, *supra* note 56, at 72.

[81] *Id.*

not required to follow the RMP for those chemicals. Facilities are not required to assess the hazards of a potential release of their reactive chemicals. An accident history is not required for incidents involving reactive chemicals. Safety precautions and maintenance, monitoring, and employee training are not required. Neither an emergency plan that details the health care required in the case of a release of reactive chemicals nor procedures for informing the public and response agencies in the event of an accidental release are required.

Instead, industry must rely on voluntary safety standards set by trade and professional organizations such as the Center for Chemical Process Safety.[82] Because of the lack of enforceability of these standards and the clear benefits that could result if facilities were required to comply with the robust RMP requirements for reactive chemicals, the EPA should revise the RMP to include these chemicals.

1. Recommendations to Revise the Accidental Release Prevention Requirements and the Risk Management Program

To greater enhance the safety of chemical facilities around the country, the EPA should evaluate and include reactive chemicals as those regulated under the RMP. This would allow reactive hazards and reactive incidents to be assessed at the facility level in the existing reporting, prevention, and planning requirements. This is not a novel idea. In the 2002 Report, the CSB recommended that the ARPR be amended "to explicitly cover catastrophic reactive hazards that have the potential to seriously impact the public."[83] In the 2018 CSB investigation into the incident at Arkema, the CSB reiterated this recommendation to the EPA.[84]

In revising the RMP, incidents resulting from self-reactive chemicals as well as process-specific reactions must be included in those hazards assessed.[85] If self-reactive chemicals are not included in the assessed hazards, it is likely that the hazards associated with chemicals like those involved in the explosions at Arkema would not be evaluated.

In 2017, the EPA did take steps to amend the RMP specifically geared toward the emergency response program requirement.[86] However, the intent was not to revise the program to include reactive chemicals. Instead, the final rule was meant to strengthen disclosure and coordination between local officials in the event of a chemical release.[87] These amendments to

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82 *Id.* at 15, 87.

83 *Id.* at 24.

84 INVESTIGATION REPORT, *supra* note 10, at 126.

85 U.S. CHEM. SAFETY AND HAZARD INVESTIGATION BOARD, *supra* note 56, at 24.

86 40 C.F.R. § 68.10 (2018).

87 Exec. Order No. 13,650, 80 Fed. Reg. 34936 (June 18, 2015).

the RMP are discussed further, *infra*, in the context of developing emergency response plans with the risks of climate change in mind. Though the enactment of these amendments has been postponed by the Trump administration,[88] this Note discusses why they should be implemented as soon as possible and should not be disregarded.

2. How the Recommended Changes to the Accidental Release Prevention Requirements and Risk Management Program Would Have Influenced the Events at the Arkema Facility

The releases at the Arkema facility were caused by the self-reaction of organic peroxides as they began to reach room temperature after the facility lost power and refrigeration was no longer available. Had the revisions to the EPA's RMP been implemented as recommended, a hazard assessment detailing the potential effects of an accidental release of reactive chemicals, a five-year accident history, and an evaluation of the worst-case and alternative accidental release scenarios would have been required for the reactive hazards located at the facility. The Arkema facility would have had to evaluate a worst-case scenario in which reactive chemicals were released. This would have required Arkema to assess potential equipment malfunctions due to flooding, and prepare better alternatives to either keep the power running with generators that were in a safer location, or transport the chemicals to an alternative location.

If the RMP included reactive chemicals, Arkema would have also been required to develop a prevention program for the release of reactive chemicals, including the development of safety precautions and maintenance, monitoring, and employee training measures. The obvious benefit to requiring this prevention program for the accidental release of reactive chemicals at the facility would have been an increased awareness for the employees of the facility. When the Arkema facility flooded, employee lives were put in danger when many were forced to evacuate. However, others were put in even greater danger, as employees that were part of the ride-out crew were required to stay behind and transport the already warming organic peroxides. Employee training, combined with the RMP's requirement to develop an emergency response program, would have created a safer environment for the employees as they would have been better prepared for the situation.

Additionally, the requirement of an emergency response program would have generated greater disclosure to emergency responders as to the types of chemicals located at the facility and the health effects that they posed. The emergency response program not only requires procedures for

[88] This action was subsequently deemed arbitrary and capricious and was overturned by the D.C. Court of Appeals. *See infra* note 144.

informing the public and response agencies of an accident but also, in conjunction with the hazard assessment requirement, would have required the Arkema facility to assess what perimeter radius would have been appropriate for evacuation prior to an accident actually occurring.

As alleged by the first responders in their suit against the Arkema facility, the 1.5-mile evacuation perimeter was not large enough to prevent damage to both human health and property.[89] In fact, after the event, fine particulate matter levels were elevated in Westlake, Louisiana, 100 miles west and downwind of the Arkema facility.[90] This suggests that the impacted area and population was much greater than the 1.5-mile perimeter around the facility.[91] This is not to say that Arkema should have called for the evacuation within 100 miles, but it is clear that the 1.5-mile perimeter was insufficient and arbitrary.

The first responders' class action complaint alleges that the "1.5 mile perimeter was not far enough to adequately protect either the first responders or those living beyond the perimeter who were not evacuated."[92] Had these reactive chemicals been regulated and an emergency response program required, the actual hazards would have likely been assessed with more scrutiny and the evacuation perimeter would have likely been much larger. As the plaintiffs in the class action suit against Arkema alleged, the "foreseeable risks of harm posed could have been reduced or avoided by reasonable instructions or warnings when it became clear that toxins had been released into the environment."[93] Unfortunately, Arkema's emergency response preparation was not rigorous enough to guard against these foreseeable and predictable outcomes because it was not required to follow the stringent guidelines of the RMP standard for the reactive chemicals produced and stored there.

Had the Arkema facility been required to follow the PSM and RMP standards, there still would not likely have been rigorous enough evaluation requirements to account for the flooding that occurred in Crosby. The next Part explains how increased risks from climate change must be incorporated into emergency planning and how EPA's flood guidance, in particular, must become more robust.

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89 Class Action Complaint, *supra* note 44, at 3

90 Annmarie G. Carlton, *Federal Science Matters: We All Live Downwind of a Harvey-Arkema Disaster*, 51 ENVTL. SCI. & TECH. 10930 (2017).

91 *Id.*

92 Class Action Complaint, *supra* note 44, at 3.

93 *Id.*

III. RISKS IN DEVELOPING EMERGENCY RESPONSE PLANS

On November 15, 2017, as part of its ongoing investigation into the incident at the Arkema facility, the CSB released a statement urging emergency planners, regulators, and companies to reassess their emergency preparedness in the face of high intensity hurricanes and floods.[94] Due to more frequent severe weather events, the CSB recommended assessing past assumptions about the severity of flooding.[95]

As climate change continues to pose increased risks, emergency planners, both at the local and state government level and at individual chemical facilities, must craft their emergency response plans while taking these more frequent and intense weather risks into account. When developing a risk assessment for a particular facility, it is not enough to look at historical data about local weather events and their impacts. Modern emergency planning requires a precautionary approach.

This Part first examines the need for an accurate risk assessment in developing an emergency response plan. Next, the primary statute for prescribing emergency response plan requirements, the Emergency Planning and Community Right-to-Know Act ("EPCRA"), is described and recommendations are made for modifying it to better cope with climate change risks. The EPA's RMP is then reevaluated, specifically with regard to the emergency response program requirement. Finally, the Arkema disaster is reexamined to evaluate how the incorporation of climate change risk factors into Arkema's and the local and state emergency response commissions' emergency response plans could have mitigated the incident at the Arkema facility in 2017.

A. An Accurate Risk Assessment is the Key to Developing an Emergency Response Plan

The first step in developing an emergency response plan is to complete a detailed risk assessment.[96] The risk assessment should include, but should not be limited to, an evaluation of the dangerous processes that occur in the facility, the inherent risks in the storage of chemicals on-site, and, most relevant to climate change risks, an assessment of natural

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94 Jeff Johnson, *The Chemical Industry Must Plan Better for Severe Weather, U.S. Chemical Safety Board Says*, Chem. & Eng'g News (Nov. 17, 2017), at 14.

95 *Id.*

96 Cecile Fisher, *When Disasters Strike: Planning and Preparing for Emergencies*, EHS TODAY (Oct. 11, 2017), http://www.ehstoday.com/emergency-management/when-disasters-strike-planning-and-preparing-emergencies.

disasters that could occur in the area and the possible magnitude of those disasters in the era of increased climate change risks.[97]

Once the risks have been determined, facility owners must use the risk assessment evaluation to develop an emergency response plan. Risks that have a low probability of occurrence should not be disregarded for that reason alone. Instead, factors such as the severity of the consequences, should the event occur, must be given ample weight.[98] In the context of climate change, a low probability of a major disaster occurring doesn't necessarily mean that the event should be disregarded because an event of the same magnitude has never occurred before.

Employees should be engaged in both the risk assessment and the emergency response plan development process, as they know the facility well and have the training to understand the effects on the facility of a natural disaster.[99] Employees are often on the front lines of emergency response, making them likely to be the first exposed. If employees are involved in developing the emergency plan, they will have deep knowledge of how to respond, escape, and protect themselves and the surrounding community.

Risk assessments should not sit static after they are completed. Risks are ever-evolving, especially in the face of climate change, and a dynamic risk assessment allows for flexibility in recognizing new and expanding risks. Additionally, facilities must highlight high-risk areas on their facility maps.[100] Emergency responders should know exactly where various hazardous chemicals are stored so that responders are fully aware of the situation and do not waste time trying to find the source of the danger in the event of an emergency.[101]

An adequate emergency response plan is useless without community preparation and adequate notice to local emergency responders. The necessary statutes and rules must be in place so that communication between the chemical facilities and the appropriate emergency response commissions is consistent and adequate.

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97 *Id.*

98 *See id.*

99 *Id.*

100 *Id.*

101 *Id.*

B. The Requirements of the Emergency Planning and Community Right-to-Know Act

EPCRA requires governors to designate a State Emergency Response Commission ("SERC") for their state.[102] Each SERC must divide the state into emergency planning districts and appoint Local Emergency Planning Committees ("LEPC") for each district.[103] SERCs and LEPCs must disclose any report received from a facility to the public.[104] There are over 400,000 facilities regulated under EPCRA, as compared to the 12,500 regulated directly by the EPA through the PSM program, discussed *supra*.[105]

Each LEPC must create and annually update Emergency Response Plans ("ERPs") for any facility within the district that handles "extremely hazardous substances" ("EHSs") at quantities above a set threshold.[106] The ERP must contain information for community officials and first responders to use when an accident occurs and EHSs are released. Hydrogen peroxides above a certain threshold are considered EHSs, however, many other reactive chemicals, including organic peroxides, are not considered EHSs.[107]

ERPs must identify facilities and transportation routes of extremely hazardous substances, describe emergency response procedures, on- and off-site, and designate a community coordinator and facility coordinator to implement the plan.[108] Emergency notification procedures must be outlined and the ERP must describe how to determine the probable affected area and population by any accidental release and outline evacuation plans.[109] Finally, the ERP must describe local emergency equipment and facilities and the persons responsible for them, provide a training program for emergency responders, and provide methods and schedules for exercising emergency response plans.[110]

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[102] 42 U.S.C. § 11001(a) (2018).

[103] 42 U.S.C. § 11001(b)-(c).

[104] 42 U.S.C. § 11021(c)(2).

[105] Mathy Stanislaus, *EPA Continues Support for Local Preparedness/Prevention Activities*, ENVTL. PROTECTION AGENCY: THE EPA BLOG (Oct. 21, 2015), https://blog.epa.gov/blog/2015/10/epa-continues-support-for-local-preparedness prevention-activities.

[106] 42 U.S.C. § 11002(b)(1).

[107] 40 C.F.R. pt. 355 app. A (2018).

[108] 42 U.S.C. § 11003(c).

[109] *Id.*

[110] *Id.*

Each chemical facility within a district must provide the LEPC with the information necessary to implement and develop an ERP.[111] Additionally, the facility must designate an emergency coordinator to keep the LEPC informed of any relevant changes at the facility.[112] There are no requirements for the LEPC or the facility providing the information to the LEPC to consult with employees or to account for and disclose all risks associated with the facility, no matter the degree of probability.

Under EPCRA, facilities are also required to immediately notify the LEPC and the SERC in the event of a release of a "hazardous substance" into the environment above a set threshold.[113] Hazardous substances that require notification include EHSs as well as 700 other hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").[114] These other hazardous substances include many reactive chemicals, including organic peroxides. Thus, while full scale ERPs are not required for reactive chemicals, there are some procedures for notifying the public when they are released.

The facility must also submit a written follow-up notice to the SERC and LEPC as soon as practicable after the release of a hazardous substance.[115] This follow-up must include updated information and detail the actual response actions taken and advice regarding medical attention necessary for employees and community members who were exposed.

Several revisions could be made to EPCRA to better encompass reactive chemical incidents as well as other types of chemical incidents, like those that occurred at the Arkema facility. EPCRA should first be amended so that the ERP provision covers more hazardous substances, not just EHSs. Second, EPCRA's ERP provision should be amended so that climate change risks are considered.

1. Recommendations to Revise the Emergency Planning and Community Right-to-Know Act

The ERP requirement should be amended to include the 700 other hazardous substances regulated under CERCLA and the emergency release notification requirements, in addition to EHSs. The ERP would then incorporate reactive chemicals above a set threshold quantity that are known to be hazardous when released into the atmosphere. If incorporated, the ERPs would be required to identify facilities and transportation routes where hazardous reactive chemicals are located. Additionally, SERCs,

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111 42 U.S.C. § 11003(d)(3).

112 42 U.S.C. § 11003(d)(1)–(2).

113 42 U.S.C. § 11004(a)(1)–(b)(1).

114 42 U.S.C. § 11004(a)(1)–(3) (2018); 42 U.S.C. § 9601(14).

115 42 U.S.C. § 11004(c).

LEPCs, and facilities would be required to describe emergency response procedures for responding to accidents involving reactive chemicals. The ERP would describe how to accurately determine the probable affected area and population in the event of a reactive chemical release, and it would be required to outline evacuation plans. Finally, training for emergency responders would be required to respond to these incidents more effectively.

The second amendment would require ERP drafters to robustly evaluate the risks of climate change. This evaluation must start at the facility level. Because each facility provides the LEPC with the necessary information to implement and develop an ERP, the facility must be able to evaluate all risks, no matter how remote. This type of information may not be easily accessible to individual facilities; therefore, communication must be enhanced between LEPCs and SERCs who have access to more resources regarding increased climate-related events and risks in their community and state.

2. How the Recommended Changes to the Emergency Planning and Community Right-to-Know Act Would Have Influenced the Events at the Arkema Facility

a. Amending the Emergency Planning and Community Right-to-Know Act to Include Reactive Chemicals

A number of disclosures would have been required prior to the incident at the Arkema facility had EPCRA included reactive chemicals in the ERP requirement. First, the location of the organic peroxides in the facility would have been disclosed to the SERC and LEPC, and thereby to the emergency responders. Emergency notification procedures would have also been required, including procedures for informing the public about the probable affected area and effected population. If the Arkema facility was required to disclose this information prior to the incident, the SERC and LEPC may have been able to discover that the 1.5-mile evacuation perimeter was insufficient to effectively control the situation. Additionally, there likely would have been requirements for the disclosure of the chemicals that were discharged into the floodwaters in the surrounding area and the health effects of the discharge.

Though it is likely that these recommendations could have helped mitigate the incident, it is also true that Arkema did not exactly follow the requirements of EPCRA already in place. For example, Arkema was obligated to disclose to the public that the organic peroxides released were considered hazardous pollutants under CERCLA. In fact, Arkema stated to the public that the potential for the organic peroxides to explode was "real," but they explained that the community was not in "imminent

danger."[116] On September 3, days after the first explosions, Arkema representatives made a statement explaining that they were taking measures to safely ignite the remaining trailers.[117] Arkema stated that "[t]hese measures do not pose any risk to the community."[118]

None of Arkema's official statements disclosed the amount of chemicals released, the health risks of breathing in the fumes, or that at least one hazardous substance was located at the facility. Arkema did not follow the current requirements of EPCRA, let alone take a precautionary approach to developing a plan and communicating it with the community.

b. Amending the Emergency Planning and Community Right-to-Know Act to Assess the Risks of Climate Change in Preparing the Emergency Response Plan

Prior to even completing the CSB investigation and report, the Chair of the CSB stated that Arkema did do emergency planning, but it just was not enough.[119] It is clear that the Arkema facility could have done more to account for the flooding. First, the backup generators at the facility were located two feet above the floor.[120] Some might say that Arkema clearly planned for flooding because six feet of flood waters was unexpected. However, the facility area had flooded up to four feet before and the area where the organic peroxides were stored was located within a 100-year floodplain.[121] Even accounting for historical incidents in the area, Arkema's generators would not have been at a sufficient height to prevent water from inundating them. Arkema should have been prepared for the increased flooding experienced at the facility. The generators were also located at a low point on the facility grounds and it was not unreasonable to think that the flood waters could reach six feet there.

Second, the refrigerated trailers—the backup for the backup generators—were also located in a low-lying area on the facility grounds. When Arkema realized they, too, may be inundated by water, they drove the trailers to the highest point on the facility grounds. However, it only

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[116] *Status of Plant in Crosby, Texas*, ARKEMA INNOVATIVE CHEMISTRY (Aug. 29, 2017), https://www.arkema.com/en/media/news/news-details/Status-of-Plant-in-Crosby-Texas.

[117] *Update on Arkema Inc. Crosby Plant*, ARKEMA INNOVATIVE CHEMISTRY (Sept. 3, 2017), http://www.arkema-americas.com/export/shared/.content/media/downloads/news-attachments/non-global/en/press-release/2017/20170903-update-arkema-crosby-site.pdf.

[118] *Id.*

[119] Johnson, *supra* note 94.

[120] Reese Dunklin, *Agency: Texas Chemical Plant Unprepared for Hurricane Harvey*, BUS. INSIDER (Nov. 15, 2017, 1:17PM), https://www.businessinsider.com/ap-agency-texas-chemical-plant-unprepared-for-hurricane-harvey-2017-11.

[121] INVESTIGATION REPORT, *supra* note 10, at 10, 103.

took three feet of water to reach the fuel lines of the truck, causing them to fail and power to be lost.

Arkema did not assess the risk of flooding based on scenarios that occurred over hundreds of years.[122] Instead, employees at the facility based their flooding expectations on their memories of previous rain events and how they affected the facility.[123] In its report, the CSB stated that this reliance on personal experience was an unreliable method of risk evaluation because high-consequence, low-frequency events were not fully captured.[124] Chemical facilities across the country must take a precautionary approach to evaluating the risks of their facilities and they must consider what may happen if a low-risk event occurs and causes great harm.

C. 2017 Rule to Modify the EPA's Risk Management Program's Emergency Response Planning Requirements

The EPA's RMP, discussed in detail *supra*, requires facilities to create an emergency response program that defines emergency health care, employee training measures, and procedures for informing the public and response agencies in the event of an accident.[125] If the recommendations are incorporated as suggested in Part III, reactive chemicals would be included in the evaluation of risks in creating the RMP. Several amendments can also be made to the emergency response program provision of the RMP to enhance communication between SERCs and LEPCs, not only in the initial emergency response planning phase but also when an actual emergency occurs.

The Obama administration attempted to bolster the emergency response planning requirements of the EPA's RMP after a chemical incident at the West Fertilizer Company in West, Texas. On April 17, 2013, a fire and explosion occurred at the fertilizer facility which killed fifteen people and injured 260.[126] More than 350 buildings were damaged by the explosion.[127] Fertilizer grade ammonium nitrate detonated as a result of a fire causing the explosion.[128] The CSB concluded in its January

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[122] *Id.* at 121.

[123] *Id.*

[124] *Id.*

[125] *Clean Air Act Section 112(r): Accidental Release Prevention / Risk Management Plan Rule, supra* note 77, at 1.

[126] Ronald J. Willey, West Fertilizer Company Fire and Explosion: A Summary of the U.S. Chemical Safety And Hazard Investigation Board Report, 49 J. OF LOSS PREVENTION IN THE PROCESS INDUSTRIES 133 (June 23, 2017).

[127] *Id.*

[128] *Id.*

2016 investigative report that the West Volunteer Fire Department had not conducted pre-incident planning or response training at the facility, did not take the recommended incident response action at the scene of the fire prior to the explosion, and did not have proper training in hazardous material response.[129]

Following the fatal accident, President Obama issued Executive Order 13650 ("EO") on August 1, 2013.[130] The EO directed executive agencies to strengthen community planning and preparedness, enhance Federal agency coordination and information sharing, and modernize policies, regulations, and standards.[131]

After the EO was issued, the EPA, OSHA, and the Department of Homeland Security held public meetings around the country to listen to facility owners, emergency responders, and those living close to chemical facilities.[132] It was clear that better communication between emergency responders and facilities as well as more disclosure to the public was needed.[133]

The Obama administration's EPA promulgated a rule (the "2017 Rule") amending the RMP in furtherance of the directives under the EO which was to go into effect on March 14, 2017.[134] The 2017 Rule sought to improve community planning and preparedness through the RMP in an attempt to address the failures of EPCRA in this area and to create more robust LEPCs. It required improved communication and coordination between chemical facilities and emergency planners and responders, including annual meetings and exercises.[135] The emergency response program outlined in the 2017 Rule required emergency health care planning, employee training procedures, and methods for informing the public, including local responders, in the event of an incident.[136] Further, the 2017 Rule required the consideration of safer technologies and alternatives by requiring the assessment of Inherently Safer Technologies and Designs in OSHA's PSM hazards assessment requirement, discussed

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129 *Id.* at 135.

130 Exec. Order No. 13,650, 80 Fed. Reg. 34936.

131 *Id.*

132 Jordan Barab, *EPA "Reconsiders" Whether to Protect Communities Surrounding Chemical Plants*, CONFINED SPACE (June 14, 2017), http://jordanbarab.com/confinedspace/2017/06/14/epa-reconsiders-protecting-communities.

133 *Id.*

134 40 C.F.R. § 68.10 (2018).

135 40 C.F.R. § 68.93.

136 40 C.F.R. § 68.95.

supra.[137] Third-party audits and root cause analysis of incidents were also required to make the hazard assessment more robust.[138]

In trying to supplement for the shortcomings of EPCRA, the RMP, and the PSM, the 2017 Rule also tried to improve public access to the information gathered as part of the RMP in order for the public to better prepare for an emergency situation.[139] It did this by requiring facilities to provide emergency responders "any other information that local emergency planning and response organizations identify as relevant to local emergency planning" upon request of an LEPC.[140] The chemical manufacturing industry, for the most part, is opposed to community involvement in the emergency planning process and public knowledge of the inherent risks of their facilities.[141] This industry relies on the argument that information about the contents of their facilities increases security risks and the risks of terrorism.[142] For these reasons, industry sought to, and successfully accomplished, delay of the 2017 Rule. Advocacy by an amalgam of coalitions, lobbying groups, several states,[143] and the industry convinced the Trump Administration's EPA to stay the 2017 Rule until at least February 19, 2019.[144]

The stay of the 2017 Rule had implications for all chemical facilities, including the Arkema facility. The Arkema facility was a member of the industry groups that opposed the implementation of the 2017 Rule. Arkema objected to the independent audit requirements of the 2017 Rule, as well as the safer technology requirements, and the facility expressed concern over the requirement to share information with the public.[145] However, had the 2017 Rule been implemented, some of the impacts of the Arkema incident may have been avoided.

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137 Stanislaus, *supra* note 1.

138 *Id.*

139 40 C.F.R. § 68.210.

140 40 C.F.R. § 68.93

141 Barab, *supra* note 132.

142 *Id.*

143 Scott Pruitt, Administrator of the EPA when the 2017 Rule was delayed, was the Attorney General for the State of Oklahoma, one of those states involved in opposing the 2017 Rule.

144 On August 17, 2018, the D.C. Court of appeals held that the EPA did "not engage in reasoned decisionmaking, [and] its promulgation of the Delay Rule is arbitrary and capricious." Air Alliance Houston, et al. v. EPA and Andrew Wheeler, No. 17-1155, slip op. at 36 (D.C. Cir. Aug. 17, 2018).

145 Elena Craft, *EPA Safeguards and the Arkema Chemical Plant Disaster – Information You Should Know*, ENVTL. DEF. FUND (Aug. 31, 2017), http://blogs.edf.org/climate411/2017/08/31/epa-safeguards-and-the-arkema-chemical-plant-disaster-information-you-should-know.

1. How the Stay of the 2017 Rule Influenced the Events at the Arkema Facility

If the 2017 Rule had been implemented, facilities would have been required to share any information requested by the LEPC to identify risks. The Houston Area LEPC may have been able to obtain sufficient information to plan for the type of emergency witnessed at the Arkema facility. Even though the 2017 Rule did not directly regulate reactive chemicals, LEPCs still would have been able to request information related to the reactive chemicals stored at the Arkema facility if it deemed that the information was relevant.

However, even if the 2017 Rule were in place, it may not be likely that local LEPCs in Texas would have shared this type of information with the public or requested it at all out of fear of being required to share it with the public. Texas is adamantly opposed to releasing information to the public that may place the facility in danger of being a target for terrorism. In fact, Texas has evaded other public disclosure requirements of EPCRA using this excuse.[146]

The annual meetings and exercises by emergency responders required by the 2017 Rule undoubtedly would have mitigated some of the impacts of the Arkema facility disaster.

CONCLUSION

To summarize, many recommendations and amendments can be made to incorporate reactive chemicals and climate change risks into

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[146] Under Texas's Homeland Security Act, any information collected, assembled, or maintained by or for the State is considered confidential if the information is "more than likely to assist in the construction or assembly of an explosive weapon or a chemical, biological, radiological, or nuclear weapon of mass destruction." TEX GOV'T CODE ANN. § 418.178(b)(1) (2003). Additionally, information that indicates the specific location of chemicals, biological agents, toxins, or radioactive materials that are more than likely to be used in the construction of these weapons is also considered confidential. TEX. GOVT. CODE ANN. § 418.178(b)(2) (2013). In 2014, Greg Abbott, then the Attorney General for the State of Texas, issued an opinion interpreting the Texas Homeland Security Act to exclude certain information required to be disclosed under EPCRA from public disclosure. Op. Tex. Att'y Gen., OR2014-14876 (Aug. 22, 2014). Abbott concluded that EPCRA does not preempt state or local law, and, therefore, Texas law governs whether the information should be disclosed. *Id*. at 1. He recognized the public's "legitimate interest" in obtaining information concerning the storage of hazardous substances in their communities. *Id*. However, Abbott concluded that he must follow Texas law, which did not allow him to take into consideration the public's interest. *Id.*

statutes and rules already in place to regulate chemical facility safety and emergency response planning. By requiring the incorporation of reactive chemicals into the EPA's RMP and OSHA's PSM Standard, as well as EPCRA's ERP requirements, the effects of many chemical incidents may be mitigated, if not prevented altogether.

Were the revisions suggested by this Note implemented prior to the incident at the Arkema facility, the emergency response plan for the facility would have been more robust. Ideally, were the reactive organic peroxides regulated as they could have been under the RMP and PSM Standards, Arkema would have been responsible for assessing the risks in their facility associated with the thousands of pounds of reactive chemicals located at the Crosby facility. First responders and community members would have had more information about what they were encountering and may not have had to encounter these hazardous chemicals at all.

Requiring assessment of climate change risks is a recommendation that could be incorporated into many existing environmental statutes outside of the chemical facility safety context. As our climate continues to change and weather events become more severe, it is sensible to try to predict how these events may make many undertakings riskier.

The incident at the Arkema facility, though it may not have been completely avoidable, could have resulted in less injury and damage to both people, the community, and the property surrounding the facility if these recommendations had been followed. The federal government and individual facilities have an obligation to assess all possible risks and to make sure that these facilities are as safe as possible.