TESTIMONY

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Before the 116th United States Congress, House of Representatives, Committee on Homeland Security, Subcommittee on Cybersecurity, Infrastructure Protection and Innovation

Securing Our Nation's Chemical Facilities:
Stakeholder Perspectives on Improving the CFATS Program

Cannon House Office Building, Room 310
Tuesday, March 12, 2019

Thank you Chairman Richmond, Ranking Member Katko and distinguished members. My name is Michael Wilson, and I am the national director for occupational and environmental health at the BlueGreen Alliance. On behalf of my organization, our national labor and environmental partners, and the millions of members and supporters they represent, I want to thank you for convening the hearing today and for your continuing interest in chemical security.

The BlueGreen Alliance's 14 member organizations represent thousands of workers in industrial facilities, as well as teachers, health care workers, construction workers, scientists, and citizens in communities across the country. Each one of our partners' members wants to come home at the end of the day and live in a safe community.

As you contemplate changes to the Chemical Facility Anti-terrorism Standards (CFATS), we urge you to consider revisions that would motivate and require companies to meet three key objectives:

- Ensure a safe, effective emergency response to a major industrial chemical incident;
- Provide for meaningful worker participation in security planning and decision-making; and,
- Implement risk reduction measures to limit the attractiveness of chemical facilities as targets of opportunity.

I. CFATS meets a critical need in protecting communities and workers.

In the context of CFATS, the stakes for communities and workers could not be higher. When I was serving as chief scientist in the California Department of Industrial Relations (DIR), I worked with U.S. EPA Region IX on strategies to prioritize the risks posed by chemical facilities in our state. One of the ways we did this was by looking at the "worst-case scenario" numbers

that facilities submitted to EPA under the Risk Management Program (RMP) requirements. These numbers are estimates of the potential casualties that could result in the event of a catastrophic failure and loss of chemical containment at a facility.

We found a concerning number of chemical facilities in California that reported potential casualties in the hundreds of thousands and above. These numbers resulted from a combination of factors, including:

- The health hazards and physical properties of the chemicals used at the facility;
- The population density surrounding the facility; and,
- Local weather patterns, which might cause chemical vapors released from a facility to travel into nearby neighborhoods and beyond.

I invite you to envision the implications, for example, of a major release of chlorine, which expands in air about 400-times when it's released from its container. Chlorine vapors are three to four times heavier than air, so they're capable of traveling close to the ground for miles from their point of release. Chlorine vapors convert to acid when inhaled into the lungs, which can produce pulmonary edema and even death at concentrations greater then 400 parts per million in air, which is the equivalent of 0.04% chlorine in air. Children are more vulnerable to the effects of pulmonary edema due to their smaller airways.

As with chlorine, some of the most dangerous chemicals can produce life-threatening health effects even at very low exposure concentrations.

II. Case Study: The 2015 Torrance, California refinery explosion endangered the lives of thousands of residents.

We recently experienced a near miss in California from a chemical whose effects are somewhat similar to those of chlorine. In 2015, an explosion occurred in the electrostatic precipitator at the oil refinery in the City of Torrance, near Los Angeles. The explosion sent tons of industrial dust into Torrance up to a mile away from the refinery, and the heavy metal debris that was blown off of the structure nearly struck a tank that contained tens of thousands of pounds of hydrofluoric acid (HF).

Like chlorine, HF produces death through inhalation and pulmonary edema. The former Chair of the U.S. Chemical Safety Board, Vanessa Sutherland, noted in the CSB press release related to this incident that "hydrofluoric acid can pose a severe hazard to the population and environment if a release occurs. After HF acid vaporizes it condenses into small droplets that form a dense low-lying cloud that will travel along the ground for several miles and can cause severe damage to the respiratory system, skin, and bones of those who are exposed, potentially resulting in death."[i]

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Given that 330,000 residents, 71 schools, and eight hospitals are located within three miles of the refinery, the CSB concluded that the release had "the potential to cause serious injury or death to many community members."[ii] I invite you to contemplate thinking of Torrance as your place of residence in light of that statement.

III. GAO: Many companies have not complied with the requirements of CFATS.

While most companies no doubt operate their facilities responsibly, it's also reasonable to expect that companies might find it difficult—or at least time and resource intensive—to establish effective security measures that would protect against a deliberate act of industrial terrorism. Facility managers already face enormous demands to ensure that product moves safely in and out of the plant, so perhaps it's not a surprise that past GAO reports on the implementation of CFATS have found issues with facilities mis-reporting information to DHS (e.g., their "Distance of Concern") or failing to report to DHS at all.[iii]

The GAO did not speak directly to the notion of fraudulent reporting, but it highlighted the importance of supporting CFATS implementation with more direct oversight by DHS, including with enforcement actions and penalties as a matter of routine practice.

IV. Congress should make changes to CFATS in order to achieve at least three objectives.

I will now return to the three objectives noted above that we believe Congress should seek to achieve in revising CFATS:

Objective #1: Ensure a safe, effective emergency response to a major industrial chemical incident.

In the area of emergency planning and response, CFATS must ensure that facilities have put in place—and routinely test—an effective emergency response plan for a major chemical incident.

I'm familiar with the emergency response arena because I worked for 13 years as a professional firefighter, paramedic, and EMT, during which time I responded to about 10,000 emergency calls, including to industrial facilities with chemical releases and fires. I also served with the U.S. Coast Guard Reserve for seven years, and I was rostered for deployment for five years with FEMA Task Force 4, based out of the Oakland Fire Department, as part of FEMA's National Response System.

In responding to industrial incidents in the fire service, we typically had very little information about chemicals inside the building. There was a lot of uncertainty, and I don't think we fully appreciated how little we understood about the potential risks we were facing at these

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incidents. At one industrial fire that occurred late at night, we were preparing to force open a door when an explosion occurred inside the building and a 55-gallon drum burst through the roof, landing in a nearby parking lot.

On another occasion, a routine-sounding dispatch came in for "a worker experiencing chest pain" inside a vegetable processing plant, so when we arrived, we didn't feel the need to don our self-contained breathing apparatus (SCBA) to enter the building. Once we were deep inside the plant, however, we found that there were in fact several workers experiencing shortness of breath, chest pain, and nausea from a chlorine gas leak. We were no better protected than the workers we were attempting to help.

Planning and responding effectively to an industrial chemical release is more complicated than it might sound. It requires much more than what is currently required under CFATS, which simply gives authority to the secretary to share facility information with first responders in order to improve their "situational awareness" in responding to a chemical release.[iv]

While this CFATS requirement is marginally useful, it is far from sufficient. Even if the information is provided by facilities to the secretary and transmitted to fire departments, it's difficult for firefighters to apply the information in actual response planning. The information—in and of itself—will be of limited value without additional facility-specific information, coordination, and training. For fire departments, chemical information about a facility is essential, but it is not enough to execute a safe and effective emergency response.

To be useful to firefighters, information needs to be facility specific and continuously updated, and it needs to be part of a broader coordination, planning, and training effort between the facility and fire department. Firefighters need to train regularly with the facility in order to be capable of answering several questions in the event of a major chemical incident, including the following:

- The identity of the chemical involved in the release;
- The size of the release;
- The hazards and physical properties of the chemical;
- The physical lay-out of the plant, with points of access and egress;
- The plume size, behavior and direction;
- The possible health consequences of the release for the public;
- Safe operating distances for firefighters and evacuation distances for the public;
- Suppression, containment and extinguishment practices;
- The potential for escalation to nearby vessels or piping;
- Appropriate personal protective equipment; and
- On-scene conditions, including actions taken by the facility to contain and mitigate the release, numbers of persons injured or trapped, and other associated hazards.

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These types of questions can only be answered by knowledge and experience gained through:

- Curated, facility-specific chemical information, as well as information about the facility lay-out and structure;
- Regular planning and training with the facility;
- Appropriately trained hazardous materials personnel;
- Proper personal protective equipment;
- Effective mutual aid systems; and
- Continuous on plume modeling, evacuation management, and hazardous materials operations.

In short, an effective response requires much more than the transmission of chemical information to responders, as currently required—albeit indirectly—under CFATS.

In practice, the emergency planning and response aspects of EPCRA and CFATS are similarly limited.

CFATS appears to be following the model of the federal Emergency Planning and Community Right-to-Know Act (EPCRA), which has been only marginally successful in improving emergency planning and response to major industrial incidents.

Congress passed EPCRA in 1986 in response to the Bhopal disaster and other U.S. industrial chemical accidents. It consists of three major elements: the Toxics Release Inventory (TRI); an emergency planning provision; and a citizen suit provision.

Under its *emergency planning* provisions, EPCRA requires facilities to provide chemical information to fire departments through Local Emergency Planning Committees (LEPCs) and State Emergency Response Commissions (SERCs)—or directly to fire departments—either by submitting copies of Material Safety Data Sheets (MSDS) or by providing a list of chemicals that are used and stored on site. EPCRA requires the LEPCs to update this information annually, and to develop annual emergency response plans to be used during a major chemical incident. It requires facilities (under section 311) to submit an annual Emergency and Hazardous Chemical Inventory Form with information on how and where chemicals are stored on site.[v]

EPCRA certainly improved industry transparency with regard to the production and release of hazardous chemicals, and it represents a step forward for emergency planning and response. Its contributions to improving actual emergency operations, however, have been constrained by a lack of resources on the part of LEPCs, limited capacity among fire departments to assimilate and act on chemical information, an outdated informational architecture and uneven enforcement by EPA.[vi]

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EPCRA's reliance on LEPCs is particularly problematic because the LEPCs are voluntary entities that in the great majority of cases simply do not have the capacity to receive and organize complex industrial chemical information and update and distribute emergency planning documents. I witnessed this when I served on the State Emergency Response Commission (SERC) in California, where I heard reports from the volunteer LEPC representatives and heard their complaints about the objectives they were expected to meet—without the resources necessary for doing so.

For fire departments, raw chemical information is of limited utility. Fire departments are not well suited to organizing, assimilating, and acting on raw chemical hazard information provided by facilities. To be useful, chemical information from facilities—at a minimum—needs to be curated and formatted, and tied to facility specific information, as noted above.

The CFATS emergency planning and response provisions could be significantly improved.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) identified emergency response deficiencies as a contributor to at least 14 major industrial chemical incidents. Most of the deficiencies occurred in the following areas:

- Training for emergency responders, including hazardous materials training;
- Emergency planning and community response plans and teams;
- Use of community notification systems;
- Use of an incident command system and the National Incident Management System;
- Conducting emergency response exercises;
- Sharing of information among facilities, emergency responders, and the community; and
- Communicating during emergencies.[vii]

Based on these findings, CFATS could improve its emergency planning and response provisions by requiring facilities to:

- Transmit specific types of chemical and facility information to fire departments and other public response agencies;
- Conduct regular planning meetings and training exercises with fire departments and other agencies;
- Conduct an assessment to understand the capacity of fire departments and other agencies to respond effectively to a major chemical incident; and
- Implement corrective actions to address gaps identified in the assessment.

These requirements would provide a foundation for improving the capacity of local fire departments and other agencies to respond effectively to a major chemical incident, intentional or otherwise.

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Alongside these improvements in CFATS, we believe there is a need for a comprehensive, national emergency response capacity study to identify at-risk communities and develop realistic response plans. Many communities—particularly those served by volunteer fire departments—have very limited capacity to respond to a major industrial chemical incident.

Objective #2: Provide for meaningful worker participation in security planning and decision-making.

CFATS section 2102(b)(2) on Employee Input requires that, "*to the greatest extent practicable, a facility's security vulnerability assessment and site security plan shall include input from at least one facility employee and, where applicable, one employee representative from the bargaining agent at that facility, each of whom possesses, in the determination of the facility's security officer, relevant knowledge, experience, training, or education as pertains to matters of site security.*"

This is an important aspect of CFATS, and it could be made more effective by including a more complete set of employee rights to participate in security decision-making, modeled California's 2017 process safety management (PSM) regulations for petroleum refineries, as follows:[viii]

- The right of employees to participate "throughout all phases" of CFATS decision-making, from design to implementation, training, evaluation, and maintenance;
- The right of employees to select their representatives who participate in management's CFATS decision-making processes;
- Access by employees to information relevant to CFATS decision-making, including information that might be subject to protection as a trade secret;
- The right of employees to anonymously report site security weaknesses; and
- The obligation of employers to maintain a record of all employee reports of site security weaknesses.

Industry recognizes that employees can play an important role in improving industrial safety; this role would apply equally to industrial security.

In its *Guidelines for Risk Based Process Safety*, the process industry's Center for Chemical Process Safety (CCPS) lists "workforce involvement" as one of 20 management systems necessary to reduce process safety risks and prevent chemical accidents, pointing out that:[ix]

> *"…workers are potentially the most knowledgeable people with respect to the day-to-day details of operating the process and maintaining the equipment and facilities, and may be the sole source for some types of knowledge gained through their unique experiences. Workforce involvement provides management a formalized mechanism for tapping into this valuable expertise*."

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The CCPS defines "workforce involvement" as a "system for enabling the active participation of company and contractor workers in the design, development, implementation, and continuous improvement of the Risk Based Process Safety management system."[x] This same definition could be applied to the role of employees under CFATS.

The CCPS *Guidelines* were developed and reviewed by experts from many of the nation's leading chemical process companies, including Dow, DuPont, ExxonMobil, Chevron Energy Technology Company, 3M, Air Product and Chemicals Inc., Shell Chemical, BP, Olin Corporation, Bayer Material Science, and others.[xi]

The evidence suggests that the 2012 Richmond, California, Chevron refinery fire might have been prevented if managers had involved employee representatives in decision-making.

Evidence identified by the CSB points to a lack of employee participation in process safety decision-making as a key factor leading up to the 2102 Richmond, California, Chevron refinery fire, which endangered the lives of 19 worker and caused some 15,000 area residents to seek medical attention for symptoms related to exposure to smoke and fire gasses.

The CSB's interim report of that incident shows that the catastrophic pipe failure in the plant's crude unit would have been prevented if Chevron's managers had followed the recommendations of their own engineers. The fact that they did not resulted in part because Chevron employee representatives were excluded from management's decision-making process.

Over a period of several years leading up to the pipe failure and fire, the CSB found that Chevron's engineers issued at least six reports calling attention to the problem of sulfidation corrosion in the crude unit and recommending a more aggressive pipe inspection and monitoring program. As the CSB pointed out, Chevron's engineers made these recommendations against a backdrop of serious sulfidation corrosion incidents in the U.S. refinery sector, including at:

- Chevron's El Paso, Texas refinery (1988);
- Chevron's Pascagoula, Mississippi refinery (1988 and 1993);
- Chevron's Salt Lake City, Utah refinery (2002);
- Chevron's Richmond refinery (2007);
- The Silver Eagle refinery in Woods Cross, Utah (2009);
- The Regina Saskatchewan, Canada refinery (2011); and
- The BP Cherry Point, Washington refinery (2012).[xii]

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By 2009, Chevron's engineers warned of the potential for a catastrophic pipe failure, and still management chose not to act. The pipe finally failed in August 2012 in the area the engineers predicted it would, and 19 workers nearly lost their lives.

Had Chevron been required to involve employee representatives in management's pipe corrosion assessments, those representatives would likely have been aware of the engineers' reports, and they would almost certainly have requested that the engineers' recommendations be implemented. In taking those actions, the serious state of corrosion in the crude unit would have become apparent. This would likely have resulted in a shut down of the unit to replace damaged sections of pipe, thereby preventing the vapor cloud explosion that ultimately occurred in August 2012.

The same conditions would apply in the security context under CFATS. Employees possess unique knowledge and experience that can be crucial to ensuring an effective chemical security program.

The perspectives of rank-and-file employees are invaluable in site security decision-making, but only if they are given the right to meaningfully participate.

The requirement for employee input is critical to the success of CFATS. Experienced employees often have a deep understanding of the practical workings of a plant, and they can apply this experience in setting priorities and determining if a proposed security measure will function as intended. Employees have a direct stake in protecting the safety of the facility. As the CSB identified in the Richmond, California, Chevron fire, effective employee participation can improve the transparency and accountability of management decision-making, which can otherwise be skewed by production and financial pressures.

In practice, however, employees and their representatives will not normally be invited to participate with any real authority in management's decision-making committees, including those focused on plant security. At a minimum—including with a unionized workforce—employees need regulatory authority to obtain a seat at the table. For employee participation to be meaningful, however, that authority must provide much more than the basic right to participate; it must provide for the following seven elements:

- Allow employees to select their representatives, either through their collective bargaining agent, where present, or by a credible process established by the employer;
- Ensure employee participation throughout all phases of site security decision-making, not simply as a final "rubber stamp" to management's proposals;
- Provide for ongoing participation in the implementation and maintenance of security measures;
- Provide for participation in the training and evaluation of site security measures;

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- Provide a means for anonymous reporting of site security problems, and an obligation of owners or operators to maintain a record of such reports;
- Provide a means for confidential input by employees to regulators during CFATS audits and inspections; and
- Provide a means to document the extent to which employee input has been received and integrated into plant security measures.

The 2017 California PSM regulations include employee participation rights that require the first five of the elements noted above, while also providing for the right of employees to refuse unsafe work, request that a process be shut down, and—for operators—actually shut down a refinery process.

Objective #3: Implement risk reduction measures to limit the attractiveness of chemical facilities as targets of opportunity.

CFATS is a risk management—rather than risk reduction—framework; that is, it assumes that industrial chemical hazards cannot be reduced or eliminated, and that those hazards must therefore be "surrounded" by layers of security in order to reduce the risk of a major release initiated by a motivated actor.

There is evidence, however, that CFATS is motivating some companies to voluntarily implement risk reduction strategies. DHS reports that thousands of high-risk facilities have chosen to meet their chemical security obligations not only through traditional security measures, but also by risk reduction strategies that include:

- Consolidating chemicals from multiple sites into one or two sites;
- Replacing a hazardous chemical with a less hazardous one;
- Reducing the total quantity of a chemical held onsite; or
- Switching to a less concentrated form of the chemical.[xiii]

Assuming DHS is confident in the veracity of these claims—and is taking steps to validate them—these approaches represent progress toward reducing industrial chemical risks at CFATS-regulated facilities.

CFATS could do more to improve industrial resilience against a motivated actor by further encouraging or requiring facilities to investigate—and implement to the extent feasible—approaches such as these, which minimize, substitute, moderate, or simplify the chemicals and/or processes they have on site.

This approach is recommended by the industry's Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE) in the context of process safety, but it is equally applicable in the security context: [xiv]

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- To *minimize* a hazard, the facility could use smaller quantities of a hazardous chemical.
- To *substitute* a hazard, the facility could replace a hazardous chemical with a less toxic or less flammable one, or it could use a less concentrated form of the chemical.
- To *moderate* a process, the facility could operate a process under less hazardous conditions, such as by running a process closer to ambient temperature and pressure.
- To *simplify* a process, the facility could introduce design changes to eliminate unnecessary complexity, and to make operating errors less likely, as well as more forgiving if errors do occur.

By reducing the hazard severity of chemicals and/or processes used at a facility, these measures can limit the attractiveness of the facility as a target of opportunity. This approach was developed by many of the nation's leading process companies, including Dow, DuPont, Eli Lilly, Rohm and Haas, Honeywell, Braskem, Shering Plough, and Nova, and they were peer-reviewed by process safety experts from academia, industry and government.[xv]

California's 2017 PSM regulations for petroleum refineries could serve as a model for implementing risk reduction provisions into CFATS.[xvi]

V. Congress should take action to strengthen CFATS.

It is essential that Congress take action to protect workers, communities, and the nation's industrial infrastructure from the threat of an intentional attack. The findings of the GAO illustrate that the CFATS program is making progress in meeting this objective, and that more can and must be done. The BlueGreen Alliance recommends that Congress improve the effectiveness of CFATS by making revisions that will motivate and require companies to meet three critical objectives:

- Ensure a safe, effective emergency response to a major industrial chemical incident;
- Provide for meaningful worker participation in security planning and decision-making; and
- Implement risk reduction measures to limit the attractiveness of chemical facilities as targets of opportunity.

The historical record and the findings of the CSB illustrate that a major industrial chemical release, fire, or explosion caused by a motivated actor could devastate the lives of workers, families, and entire communities. We urge you to use the reauthorization of CFATS as an opportunity to strengthen the program. The result will be improved security for our nation's process facilities, safer workplaces and communities, and a more resilient industrial infrastructure.

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Chairman Richmond, Ranking Member Katko, and distinguished members, thank you again for granting me the opportunity to appear at today's hearing.

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[i] U.S. Chemical Safety and Hazard Investigation Board (CSB), *U.S. Chemical Safety Board Finds Multiple Safety Deficiencies Led to February 2015 Explosion and Serious Near Miss at the Exxon Mobil Refinery in Torrance, California.* January 13, 2016. Available online: https://www.csb.gov/us-chemical-safety-board-finds-multiple-safety-deficiencies-led-to-february-2015-explosion-and-serious-near-miss-at-the-exxon-mobil-refinery-in-torrance-california/.

[ii] Ibid.

[iii] U.S. Government Accountability Office (GAO), Nathan Anderson, Acting Director, Homeland Security and Justice, Testimony before the Committee on Homeland Security, House of Representatives. *Critical infrastructure protection: Progress and Challenges in DHS's Management of Its Chemical Facility Security Program.* GAO-19-402T. February 27, 2019. Available online: https://www.gao.gov/assets/700/697117.pdf.

[iv] Public Law 113-254, Protecting and Securing Chemical Facilities from Terrorist Attacks Act of 2014, Title XXI—Chemical Facility Anti-Terrorism Standards. 6 USC 621, Section 2103, Protection and Sharing of Information, at (b) *Sharing of Information with States and Local Governments,* and at (c) *Sharing of Information with First Responders.* December 18, 2014. Available online: https://www.govinfo.gov/app/details/PLAW-113publ254.

[v] U.S. Environmental Protection Agency (EPA), "Emergency Planning and Community Right-to-Know Act (EPCRA) Hazardous Chemical Inventory Reporting Requirements." Available online: https://www.epa.gov/epcra/epcra-sections-311-312.

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[vii] U.S. CSB, *Drivers of Critical Chemical Safety Change: Emergency Planning and Response (Preparedness*. Available online: https://www.csb.gov/recommendations/emergency-response-/.

[viii] California Occupational Safety and Health Standards Board, California Code of Regulations (CCR) Title 8, General Industry Safety Orders (GISO) §5189.1, *Process Safety Management for Petroleum Refineries*. 2017. Available online:https://www.dir.ca.gov/title8/5189_1.html. A description of the purpose and necessity for each PSM element is provided in DIR's *Initial Statement of Reasons.* Available online: http://www.dir.ca.gov/OSHSB/documents/Process-Safety-Management-for-Petroleum-Refineriess-ISOR.pdf.

[ix] Center for Chemical Process Safety (CCPS) and American Institute of Chemical Engineers, *Guidelines for Risk Based Process Safety.* Wiley and Sons. (p. 124). 2007.

[x] Ibid. (p. 124).

[xi] Ibid.. (Preface).

[xii] U.S. CSB, *Interim Investigation Report.* Chevron Richmond Refinery Fire of August 6, 2012. (pp. 24-27). Available online: https://www.csb.gov/chevron-refinery-fire/.

[xiii] Suzanne E. Spaulding, DHS Under Secretary, Correspondence to the Honorable Bennie G. Thompson, ranking member, Committee on Homeland Security. January 11, 2017. See Addendum at page 6, item 12.

[xiv] CCPS and American Institute of Chemical Engineers, *Inherently Safer Chemical Processes: A Life Cycle Approach, Second Edition.* 2009. Wiley and Sons. (p. 27).

[xv] Ibid. (Preface)

[xvi] California Occupational Safety and Health Standards Board, California Code of Regulations (CCR) Title 8, General Industry Safety Orders (GISO) §5189.1, *Process Safety Management for Petroleum Refineries*. 2009. Available online: https://www.dir.ca.gov/title8/5189_1.html.

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