U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD

REGULATORY REPORT

CHEVRON RICHMOND REFINERY
PIPE RUPTURE AND FIRE

CHEVRON RICHMOND REFINERY #4 CRUDE UNIT

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Acronyms and Abbreviations

ALARA	As Low As Reasonably Achievable
ALARP	As Low As Reasonably Practicable
ALJ	Administrative Law Judge
ANPRM	Advance Notice of Proposed Rulemaking
APA	Administrative Procedure Act
API	American Petroleum Institute
ASARP	As Safe As Reasonably Practicable
AST	Aboveground Storage Tank
BSEE	Bureau of Safety and Environmental Enforcement
CA	Competent Authority
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CalARP	California Accidental Release Prevention
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Division of Occupational Safety and Health
CCHMP	Contra Costa Health Services' Hazardous Materials Program
CCPS	Center for Chemical Process Safety
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIMAH	Control of Industrial Major Accident Hazards
COMAH	Control of Major Accidents Hazards Regulations
CSB	U.S. Chemical Safety and Hazard Investigation Board
CSHO	Compliance Safety and Health Officer
CUPA	Certified Unified Program Agency
EA	Environment Agency
EPA	U.S. Environmental Protection Agency
ETC	Chevron Energy Technology Company
FSA	Formal Safety Assessment
FY	Fiscal Year
GAO	U.S. Government Accountability Office
HSC	California Health and Safety Code
HSE	Health and Safety Executive
HTHA	High Temperature Hydrogen Attack
ISO	Industrial Safety Ordinance
ISOM	Isomerization
LOHP	Labor Occupational Health Program

MOC	Management of Change
MOOC	Management of Organizational Change
NASA	National Aeronautics and Space Administration
NEP	National Emphasis Program
NOHSC	Australia National Occupational Health and Safety Commission
NOPSEMA	Australian National Offshore Petroleum Safety and Environmental Management Authority
NPRM	Notice of Proposed Rulemaking
NRC	U.S. Nuclear Regulatory Commission
OERI	Operational Excellence and Reliability Intelligence
OIAC	HSE Offshore Industry Advisory Committee
OIG	Office of Inspector General
OMB	Office of Management and Budget
OSHA	U.S. Occupational Safety and Health Administration
OSHAct	Occupational Safety and Health Act
PHA	Process Hazard Analysis
PHMSA	Department of Transportation, Pipeline and Hazardous Materials Safety Administration
PQV	Program Quality Verification
PSA	Petroleum Safety Authority
PSI	Process Safety Information
PSLA	Petroleum Submerged Lands Act
PSLG	Process Safety Leadership Group
PSM	Process Safety Management
RAGAGEP	Recognized and Generally Accepted Good Engineering Practices
RFI	Request for Information
RISC	Risk-Informed Safety Case
RISO	City of Richmond Industrial Safety Ordinance
RLOP	Richmond Lube Oil Plant
RMP	Risk Management Plan
RP	Recommended Practice
SEPA	Scottish Environmental Protection Agency
SFAIRP	So Far As Is Reasonably Practicable
SOP	Standard Operating Procedure
UK	United Kingdom
USCG	U.S. Coast Guard
USW	United Steelworkers Union
WIG	Workforce Involvement Group

1.0 Executive Summary

1.1 Incident Summary

On August 6, 2012, the Chevron U.S.A. Inc. Refinery in Richmond, California, ("the Chevron Richmond Refinery") experienced a catastrophic pipe failure in the #4 Crude Unit ("the crude unit"). The pipe, a 52-inch long carbon steel piping component of the #4 sidecut line, ruptured and released flammable, hydrocarbon process fluid, which partially vaporized into a large vapor cloud that engulfed 19 Chevron employees and ignited. All of the employees escaped, narrowly avoiding serious injury. The ignition of the flammable portion of the vapor cloud and subsequent continued burning of the hydrocarbon process fluid resulted in a large plume of particulates and vapor traveling across the Richmond, California area. Approximately 15,000 people from the surrounding area sought medical treatment due to the release.

1.2 Interim Report

The CSB released an Interim Report on the Chevron incident in April 2013 ("the Interim Report"), which highlighted technical findings and safety system deficiencies. Testing conducted on the ruptured pipe determined that it had experienced extreme thinning near the rupture location due to sulfidation corrosion.[1] Sulfidation corrosion is a damage mechanism that causes thinning in iron-containing materials, such as steel, due to the reaction between sulfur compounds and iron at temperatures ranging from 450 °F to 800 °F.[2] This damage mechanism[3] causes pipe walls to gradually thin over time, and is common in crude oil distillation[4] where naturally occurring sulfur and sulfur compounds found in crude oil feed, such as hydrogen sulfide,[5] are available to react with steel piping and equipment. The Interim Report noted that virtually all crude oil feeds contain sulfur compounds and, as a result, sulfidation corrosion is a damage mechanism present at every refinery that processes crude oil. Sulfidation corrosion can cause thinning to the point of pipe failure when not properly monitored and controlled.

The Interim Report noted a number of causal safety system deficiencies that highlight regulatory gaps relating to major accident prevention at California petroleum refineries. For example, in conducting its process hazard analysis[6] (PHA) of the crude unit, which was required under California's Process Safety

[1] Carbon steel piping corrodes at a rate that is significantly faster than other materials of construction, such as high chromium steels, including stainless steel.
[2] For an electronic copy of the CSB Chevron Interim Report *see* http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf (accessed October 24. 2013).
[3] Piping damage mechanisms are any type of deterioration encountered in the refining and chemical process industry that can result in flaws/defects that can affect the integrity of piping (e.g. corrosion, cracking, erosion, dents, and other mechanical, physical or chemical impacts). *See* API 570. "Piping Inspection Code: In-Service Inspection, Rating, Repair, and Alteration of Piping Systems." 3rd ed., Section 3.1.1.5, November 2009.
[4] Distillation separates mixtures into broad categories of its components by heating the mixture in a distillation column where different products boil off and are recovered at different temperatures. *See* http://www.eia.gov/todayinenergy/detail.cfm?id=6970 (accessed April 4, 2013).
[5] Hydrogen sulfide is the most aggressive sulfur compound that causes sulfidation corrosion.
[6] A process hazard analysis (PHA) is a hazard evaluation to identify, evaluate, and control the hazards of a process. Facilities that process a threshold quantity of hazardous materials, such as the Chevron Richmond refinery, are required to conduct a process hazard analysis per the California Code of Regulations Title 8 Section 5189, Process

Management (PSM) standard,[7] Chevron did not conduct a rigorous review of corrosion and damage mechanisms present in the crude unit, and did not identify sulfidation corrosion as a hazard. As such, Chevron did not effectively address inherent safety or implement effective controls to prevent sulfidation corrosion, including those controls proposed by Chevron's technical group. Although both the California and federal PSM standards require that hazards be identified, evaluated, and controlled, there is no further discussion of how far to reduce risks, and there is no requirement to address the effectiveness of controls or to use the hierarchy of controls. Therefore, this type of analysis was not required to be conducted, and Chevron was never cited post-incident for failing to evaluate the effectiveness of safeguards.

In another example, despite internal recommendations to replace the entire #4 sidecut piping with an inherently safer, more corrosion-resistant material of construction through the Management of Change (MOC) process, incident investigations, technical reports, and employee recommendations, Chevron repeatedly failed to implement those proposed recommendations. Chevron's 2006 MOC analysis limited application of those recommendations to only a small section of the pipe. As a result, the portion of the pipe that failed on the August 6th incident remained in service until the incident. As there is no requirement to implement effective recommendations or control hazards under the MOC element, it is essentially an activity-based requirement. Chevron was not cited for narrowing the scope of the MOC, despite its disregard of internal recommendations. The CSB concluded in its Interim Report that Chevron did not regularly or rigorously apply inherently safer technology, which provides an opportunity for preventing major accidents, in its PHAs, MOCs, incident investigation recommendations, or during turnarounds.

The CSB made safety recommendations in the Interim Report to a number of entities, including the California State Legislature, the U.S. Environmental Protection Agency, and Contra Costa County. The Board recommended that the California State Legislature require California petroleum refineries to perform damage mechanism hazard reviews, to identify and report leading and lagging process safety indicators, to document recognized methodologies, rationale, and conclusions used to claim that safeguards intended to control hazards will be effective, and to document their inherently safer systems analysis and the hierarchy of controls in establishing safeguards for process hazards, with the goal of driving risk of major accidents to as low as reasonably practicable, or ALARP. These concepts, introduced in the Interim Report and highlighted in the recommendations, are the basic building blocks for the implementation of the safety case regime, a regulatory scheme that will be discussed in great detail in the following report.

The CSB concluded its Interim Report by highlighting additional issues that were still under investigation, including emergency planning and reporting, emergency response, safety culture, and regulatory oversight of petroleum refineries in California. The following report fulfills the CSB's commitment to examine whether the implementation of the safety case regulatory regime could be a more effective regulatory tool to achieve major accident prevention for California petroleum refineries. The reader will find additional issues, arguments, and counterarguments regarding the safety case regulatory regime addressed in Appendix C of this report.

Safety Management of Acutely Hazardous Materials (1992). PHAs are also required by the California Accidental Release Prevention Program and the federal EPA Risk Management Program.

[7] Under 8 CCR §5189 (e). https://www.dir.ca.gov/title8/5189.html (accessed September 25, 2013).

1.3 Background

Although both the federal and California PSM standards, respectively, were intended to be goal-setting or performance-based,[8,9] in practice they appear to function primarily as reactive and activity-based[10] regulatory schemes that require extensive rulemaking to modify. As a result, the federal and California PSM standards have become static in the face of advancing best practices and technology, with the emphasis placed on the completion of a task or activity rather than achievement of continuous risk reduction.[11] Many regions around the world such as the UK, Australia, and Norway have acknowledged similar deficiencies and have implemented regulatory regimes consisting of both prescriptive[12] and goal-setting elements that require duty holders[13] to demonstrate to the regulator through rigorous reviews and audits that they have reduced risks to as low as reasonably practicable, or ALARP. This is referred to as the safety case regulatory regime.[14] The safety case regulatory regime is a rigorous prescriptive and goal-setting regulatory approach applied globally both onshore and offshore. It is highlighted by its adaptability and requirements for continuous improvement in risk reduction for high hazard industrial facilities. A written case for safety, known as the safety case report, is generated by the duty holder and is generally rigorously reviewed, audited, and enforced by highly technically competent inspectors with skill sets familiar to those employed by the industries they oversee. Despite this global shift, the US has persisted in the use of a more activity-based regulatory scheme that lacks the ability to adapt to advancing technology and recently developed industry standards, and which has failed to adequately engage companies and their employees in continuous improvement and risk reduction with similarly-skilled inspectors.

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[8] Also referred to as performance-based regulations, goal-setting regulatory requirements and acceptance criteria are specified and industry must document that their specific solutions meet such requirements, e.g. in terms of acceptable risk levels.

[9] *See* Preamble to Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents. Section III. Summary and Explanation of the Final Rule (March 4, 1992). https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=PREAMBLES&p_id=1041 (accessed August 13, 2013).

[10] Activity-based standards and regulations require the mere completion of an activity and do not focus on the effectiveness of major accident prevention or risk reduction.

[11] As will be discussed below, certain sections of the PSM standard have elements of a performance-based regulatory approach.

[12] A prescriptive regulation or standard describes the specific means or activity-based actions to be taken for hazard abatement and compliance. Performance or goal-based regulations, on the other hand, state the objective to be obtained (such as risk reduction or hazard abatement) without describing the specific means of obtaining that objective.

[13] Duty holders are considered to be "those who create and/or have the greatest control of the risks associated with a particular activity. Those who create the risks at the workplace are responsible for controlling them." HSE. *Planning to do business in the UK offshore oil and gas industry? What you should know about health and safety;* October 2011; p 2. These entities may include operators, contractors, and subcontractors. http://www.hse.gov.uk/offshore/guidance/entrants.pdf (accessed June 5, 2013).

[14] Norway's offshore regulatory regime is not referred to as the safety case regime, but it does contain many of the same elements as the safety case regime, with some differences in style, substances, and implementation.

1.4 Key Findings

Technical

1. In the ten years prior to the incident, highly knowledgeable and experienced Chevron technical staff repeatedly recommended that inspectors perform 100 percent component inspections on high temperature carbon steel piping susceptible to sulfidation corrosion. These recommendations were not implemented by Chevron management.[15]

2. Chevron technical staff recommended implementing inherently safer designs through the MOC process, incident investigations, technical reports, and past recommendations from employees. However, Chevron failed to implement proposed inherently safer recommendations prior to the incident. For example, an inspection recommendation to upgrade piping to 9-Chrome was made, but the MOC to implement the recommendation narrowed the scope, allowing the 52-inch component that failed to remain in service.

3. In January 2007, a failure due to sulfidation corrosion caused a fire in the Chevron Richmond Refinery crude unit, initiating a shelter-in-place for the surrounding community. A carbon steel piping spool[16] failed catastrophically during operation. Chevron informed Contra Costa Health Services' Hazardous Materials Program[17] in a letter that the crude unit piping metallurgy had been upgraded following this incident as an inherently safer solution. However, this upgrade was limited to only the immediate piping spool that had failed. The inherently safer, more corrosion resistant metallurgy was not implemented more broadly in the crude unit as a result of this incident.

4. Chevron and Chevron ETC metallurgists, materials engineers, and piping inspectors had expertise regarding sulfidation corrosion. However, they had limited practical influence to implement their recommendations. They did not participate in the most recent crude unit PHA, and they did not affect decisions concerning control of sulfidation corrosion during the crude unit turnaround process.[18]

5. The 2009 crude unit PHA did not identify corrosion as a potential cause of a leak or rupture in piping. The PHA cited non-specific, judgment-based qualitative safeguards to reduce risk, such as: utilizing metallurgy to minimize corrosion, having effective maintenance and inspection programs, and providing pipe wall corrosion allowances.[19] The effectiveness of these safeguards was neither evaluated nor documented; instead the safeguards were merely listed in the PHA. Had the adequacy of these safeguards

[15] These recommendations are discussed in detail in paragraphs 44 through 51 of the Chevron Interim Report.
[16] A piping spool is a small, removable section of piping. In some cases, a piping spool is installed or removed in order to provide a temporary connection or complete disconnection between two piping circuits.
[17] Contra Costa Health Services' Hazardous Materials program is designed to respond to emergencies and monitor hazardous materials within Contra Costa County. *See* http://cchealth.org/hazmat/ (accessed April 17, 2013).
[18] The turnaround process includes both the planning stage prior to the shutdown and the activities staged during the shutdown.
[19] Corrosion allowance refers to extra wall thickness added as a safety factor to the design of a piece of equipment beyond that needed solely for mechanical considerations such as design temperature and pressure. This extra thickness is provided to accommodate for expected loss of wall thickness due to corrosion over the life of the equipment.

been verified, improved safeguards intended to protect against sulfidation-induced failure of carbon steel piping could have been recommended.

Regulatory

6. Following the August 6th incident, California's Division of Occupational Safety and Health (Cal/OSHA) inspected the Chevron facility and issued citations. Only one citation was related to PHAs; and it was not associated with evaluating the effectiveness of safeguards. Rather, the emphasis was that Chevron's PHA did not adequately account for hazards caused by other units associated with the crude unit. Had the California PSM standard required documentation of the effectiveness of safeguards, Chevron would have been obligated to conduct this analysis and Cal/OSHA inspectors could rely on the regulation for support during inspections.

7. There is a significant discrepancy in the compensation between the California regulators and the Chevron Richmond Refinery personnel they interact with. The California regulators also lack the technical staff with the necessary skills, knowledge, and experience to provide sufficient direct oversight of petroleum refineries in California.

8. The CSB has noted a considerable problem with significant and deadly incidents at petroleum refineries over the last decade. In 2012 alone, the CSB tracked 125 significant process safety tincidents at US petroleum refineries. Seventeen of these took place in California.

9. Under the existing regulatory regimes for onshore petroleum refineries in the US and California, such as the PSM and RMP programs, there is no requirement to reduce risks to ALARP. For example, under both PSM and RMP an employer must "control" hazards when conducting a process hazard analysis (PHA) of a covered process. However, there is no requirement to address the effectiveness of the controls or the hierarchy of controls. Thus, a PHA that meets the regulatory requirements may inadequately identify or mitigate major hazard risk. In addition, there is no requirement to submit PHAs to the regulator, and the regulator is not responsible for assessing the quality of the PHA or the proposed safeguards.

10. In the last decade, the CSB has made a number of process-safety related recommendations to OSHA and EPA in its investigation reports and studies (e.g. Motiva, BP Texas City, and Reactive Hazards). However, none of the regulatory recommendations have been implemented, and there have been no substantive changes made to the PSM and RMP regulations to improve the prevention of major accidents.

11. Available data from Norway and the United Kingdom (UK) shows a reduction in hydrocarbon releases offshore under the safety case regulatory regime.[20]

12. Regulatory approaches similar to the safety case regulatory regime, which require risk reduction to ALARP or equivalent, have been implemented in the nuclear sector by the Nuclear Regulatory Commission (NRC) and the aerospace sector by NASA.

[20] Norway's indicator data is discussed in Section 4.5. The UK data is discussed in Appendix C.

13. Independent studies of the safety case in the UK have identified improvements to safety performance from the safety case regulatory regime and a variety of stakeholders, including major oil companies, have shown support of the safety case.[21]

1.5 Regulatory Conclusions

The existing regulatory regimes for onshore petroleum refineries in the US and California:

1. Rely on a safety and environmental management system framework that is primarily activity-based rather than goal-based risk reduction to as low as reasonably practicable (ALARP) or equivalent.

2. Are static, unable to adapt to innovation and advances in the management of major hazard risks.

3. Place the burden on the regulator to verify compliance with the regulations rather than shifting the burden to industries by requiring duty holders to effectively manage the risks they create and ensure regulator acceptance of their plans for controlling those risks.

4. Do not effectively incorporate lessons learned from major accidents; nor do they have the regulatory authority to require duty holders to address newly-identified safety issues as a result of such incidents.

5. Do not effectively collect or promote industry use of major accident performance indicators to drive industry to reduce risks to ALARP.

6. Do not require the use or implementation of inherently safer systems analysis or hierarchy of controls.

7. Do not effectively involve the workforce in hazard analysis and prevention of major accidents.

8. Do not provide the regulator with the authority to accept or reject a company's hazard analysis, risk assessment, or proposed safeguards; and

9. Do not employ the requisite number of staff with the technical skills, knowledge, and experience to provide sufficient direct safety oversight of petroleum refineries.

[21] *See* Sections 2.0, 3.2.12, and 3.2.2.3. Also *see* FAQ 4.

1.6 Recommendations

As a result of the findings and conclusions of this report, the CSB makes recommendations, summarized below, to the following recipients:

California State Legislature, Governor of California

Develop and implement a step-by-step plan to establish a more rigorous safety management regulatory framework for petroleum refineries in the state of California based on the principles of the "safety case" framework.

Occupational Safety and Health Administration

As part of your response to Executive Order 13650, develop questions and evaluate issues raised from the findings and conclusions in this report concerning the safety case regime.

Section 7.0 details the recommendations.

2.0 Introduction

Despite the fact that the nation's roughly 150 petroleum refineries represent only a small fraction of the thousands of industrial and chemical facilities that exist in the US, the CSB has seen a great number of serious and deadly incidents at refineries over the last decade.

In March 2005, the BP Texas City Refinery suffered one of the worst industrial accidents in recent US history, when overfill of a distillation column resulted in an explosion and fire that led to 15 fatalities, another 180 injuries, and the issuance of a shelter-in-place order that required 43,000 people to remain indoors. Houses were damaged as far as three-quarters of a mile away from the refinery. In a 2006 statement, former CSB Chairwoman Carolyn Merritt said that while BP did make some safety improvements before the March 2005 explosion, "the focus of many of these initiatives was on improving procedural compliance and reducing occupational injury rates, while catastrophic safety risks remained…"[22]

In November 2009, an explosion at the Silver Eagle Refinery damaged over 100 homes in a nearby subdivision in Woods Cross, Utah. At a public meeting to discuss the incident, former CSB Chairman John Bresland called on refineries to improve their safety performance, stating:

> The frequency of accidents in US refineries is very troubling. These accidents cost lives, inflict serious injuries and can harm communities. They also earn scrutiny from government regulators; in the past few weeks a refinery in Texas drew the largest OSHA fine in history, more than US $80 million, for alleged process safety violations. I call on all refineries to redouble their commitment to safer operations and safer communities. The current rate of accidents in refineries is not sustainable and it is not acceptable.[23]

On the five-year anniversary of the BP Texas City explosion in March 2010, Chairman Bresland continued to relay his concern regarding refinery safety, noting that "refinery accidents…continue to occur with dismaying frequency…[and] will only stop when every refinery has made the financial and human commitment to sound process safety management."[24] Yet just ten days later, seven workers were fatally injured at the Tesoro refinery in Anacortes, Washington, following the catastrophic failure of a heat exchanger. Again, Chairman Bresland pointed out the alarming frequency of refinery incidents, stating that "if the aviation industry had the same number and types of incidents as the refining industry, I don't think people would be flying too much."[25] In 2012 alone, the CSB tracked 125 significant[26] process safety incidents at US petroleum refineries, which are listed in Appendix A. Seventeen of these took

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[22] Scrutiny Finds BP Safety Troubles. http://usatoday30.usatoday.com/money/industries/energy/2006-10-30-bp-blast-findings_x.htm (accessed September 5, 2013).
[23] US Refineries Commitment to Safety Called Into Question. http://www.engineerlive.com/content/22354 (accessed September 5, 2013).
[24] http://www.csb.gov/statement-from-csb-chairman-john-bresland-on-5th-anniversary-of-fatal-bp-texas-city-2005-explosion/?pg=18 (accessed September 5, 2013).
[25] Refinery Tragedies All Too Common. *See* http://seattletimes.com/html/localnews/2011518449_safetysunday04m.html (accessed September 5, 2013)
[26] These incidents were reported to the Department of Energy and/or the National Response Center and examined by the CSB's Incident Screening Department.

place in California, including a major release of 8,614 pounds of highly toxic hydrogen sulfide at the Chevron Richmond Refinery on August 2, 2012, just four days prior to the incident.

Of the 15 major accidents that the CSB is currently investigating, six occurred in petroleum refineries. These include two separate explosions at the Silver Eagle refinery in Woods Cross, Utah, which resulted in injuries and offsite consequences, the heat exchanger rupture at the Tesoro refinery in Anacortes, Washington, which resulted in seven fatalities, and a series of equipment failures at CITGO's refinery in Corpus Christi, Texas, involving highly toxic hydrogen fluoride. The U.S. Environmental Protection Agency (EPA) has also documented 234 recordable accidents at petroleum refineries between 2000 and 2010, which is more than any other industry, including the much larger sector of chemical manufacturing, which EPA documented as having 218 recordable accidents.[27]

The CSB tracked 125 significant petroleum refinery incidents in the US in 2012.

The CSB concludes that the continuing occurrence of refinery accidents demonstrates the pressing need to examine the current regulatory structure in place in the US and, in light of the Chevron incident, in the state of California for petroleum refineries. There have been a number of positive developments in the wake of the Chevron incident that demonstrate California's prime opportunity to lead the nation in implementing changes to improve safety and health in the refining industry. In the Fall of 2012 following the Chevron incident, California Governor Jerry Brown created the California Interagency Working Group on Refinery Safety ("the working group"), charged with improving cooperation among agencies, including the U.S. Environmental Protection Agency (EPA), Cal EPA, California's Division of Occupational Safety and Health (Cal/OSHA), and Contra Costa County, with the goal of improving safety at California's petroleum refineries and preventing major accidents.

The working group began its initiative by commissioning the Labor Occupational Health Program[28] (LOHP) to conduct "listening panels" throughout California, enabling community members to meet with working group members to discuss their concerns surrounding refineries. LOHP convened a series of meetings and conference calls with labor unions, community-based organizations, fire agencies, and environmental health groups between November 6, 2012, and March 18, 2013. Dr. Michael P. Wilson, the Director of LOHP, documented his findings and recommendations regarding refinery safety in a summary report entitled *Refinery Safety in California: Labor, Community and Fire Agency Views*, which was released on June 4, 2013.[29] In the report, Dr. Wilson quoted Swiss Re's finding that the US has experienced financial losses from refinery incidents that are three times that of industry counterparts in countries within the "EU cluster,"[30] a gap which continues to grow due in part to the US refining

[27] Matthiessen, Craig. EPA Risk Management Program: An Overview of the EPA Risk Management Program and Inherently Safer Processes. *NAS-MIC Bayer Public Meeting Power Point Presentation;* May 24, 2011; p 20.
[28] LOHP is a public service program for the Center for Occupational and Environmental Health at UC Berkeley's School of Public Health. LOHP seeks "to reduce occupational injury, illness and death by protecting the health and safety of workers worldwide." For more information, *see* http://www.lohp.org/ (accessed July 8, 2013).
[29] Dr. Wilson released an initial draft of the summary report on March 27, 2013. He then released a revised copy of the summary report on June 4, 2013. *See* http://www.lohp.org/projects/refinery_safety.html (accessed July 8, 2013).
[30] The countries in the EU cluster are all of Europe, Singapore, South Korea, Japan, Saudi Arabia, Gulf States and Egypt.

industry's "pushing…mode of operation", its "compliance-driven focus on safety", and "a 'detached' workforce…."[31]

Dr. Wilson reiterated a number of the findings contained in the CSB's Interim Report on the Chevron incident, including the "striking lack of attention on the part of the Richmond Chevron refinery to maintenance and metallurgy upgrades…," and the Chevron Richmond Refinery's failure to implement a recommended 100% component inspection program for high-risk piping. He also stated that California's refineries are able to operate without demonstrating competence in health, safety, and environmental performance to a regulatory agency or to the public, and as such recommended that California establish a regulatory approach similar to that of the safety case regulatory regime, a rigorous prescriptive[32] and goal-setting[33] regulatory regime used widely by other regions throughout the world such as the United Kingdom (UK) and Australia to regulate high hazard industrial facilities. It is highlighted by its adaptability and requirements for continuous improvements in risk reduction, and shifts the burden to the industry to demonstrate its competence in health and safety to the regulator. The regime is overseen by highly competent, well-funded regulators that rigorously audit facilities for compliance with the written safety case report and good industry practice.

On July 11, 2013, the working group released a draft report entitled *Improving Public and Worker Safety at Oil Refineries*,[34] which the CSB has recognized as an important step forward in improving petroleum refinery safety and environmental performance both in California and nationally. The report outlined the process of adopting several of the CSB's recommendations from its Interim Report on the Chevron incident, including requiring refineries to implement inherently safer systems and conduct damage mechanism hazard reviews. Furthermore, the report announced the creation of an Interagency Refinery Task Force within the California Environmental Protection Agency (Cal/EPA) by September 1, 2013, aimed at facilitating information sharing and improving coordination of oversight and enforcement activities among regulatory agencies. The CSB also welcomed the report's recommendation for California to study the safety case regulatory approach.

In addition to the work being done by the working group, the California State Legislature approved a 2013-2014 state budget bill (AP 110) that allows the California Department of Industrial Relations to charge state petroleum refineries a "fee" by March 31, 2014, to help pay for at least 15 new positions in

[31] Wilson, Michael P. *Refinery Safety in California: Labor, Community and Fire Agency Views;* Summary Report for Office of Governor Jerry Brown, Interagency Task Force on Refinery Safety; March 27, 2013, Revised June 4, 2013; pp 5 and 6. *Citing* Zirngast, Ernst. (June 6, 2006). *Selective U/W in Oil-Petro Segment: Loss Burden in Different Regions, USA vs. Rest of the World, History of Selective U/W, Cause of Losses.* Technical report-DRAFT-EXTRACT. Risk Engineering Services, Swiss Re. http://www.lohp.org/projects/refinery_safety.html (accessed July 8, 2013).

[32] A prescriptive regulation or standard describes the specific means or activity-based actions to be taken for hazard abatement and compliance. Performance or goal-based regulations, on the other hand, state the objective to be obtained (such as risk reduction or hazard abatement) without describing the specific means of obtaining that objective.

[33] Also referred to as performance-based regulations, goal-setting regulatory requirements and acceptance criteria are specified and industry must document that their specific solutions meet such requirements, e.g. in terms of acceptable risk levels.

[34] *See* http://www.calepa.ca.gov/Publications/Reports/2013/Refineries.PDF (accessed September 25, 2013).

Cal/OSHA's Process Safety Unit, which enforces the California Process Safety Management (PSM) standard throughout the state.[35]

The Chevron incident also spurred the formation of the City of Richmond's Collaborative on Refinery Safety and Community Health ("the collaborative"), which was launched on January 30, 2013, and is led by Dr. Wilson. The collaborative, whose members include the United Steelworkers[36] (USW) Local 5, the USW International, Communities for a Better Environment,[37] and LOHP,[38] was launched after a preliminary exploratory meeting held on January 23, 2013, which was convened by LOHP and attended by CSB Board Members and the CSB Chevron Investigation Team. The collaborative advocates for community and worker safety, better transparency, and environmental health, and has already made recommendations to the working group to improve emissions reporting and require more thorough assessments of pipe corrosion damage at oil refineries.[39]

On October 10, 2013, the collaborative formally responded in a memo to the July 2013 draft report issued by the Interagency Working Group on Refinery Safety (*Improving Public and Worker Safety at Oil Refineries*). In the memo, the collaborative stated its support for the working group's findings and recommendations. The collaborative also issued its own recommendations and highlighted 12 principles as being important to the development of effective regulatory policy in California. These principles include linking regulatory non-compliance to an operator's license to operate and integrating meaningful participation in decision-making by workers and communities.[40] The collaborative also noted in the memo that it supported "shifting the 'burden of proof' of safety from public agencies to the industry, as is required in the 'Safety Case' approach…"[41]

The CSB noted in its Chevron Interim Report the important role of transparency between industry and the public in improving health and safety for the facility and the surrounding communities. Following the Chevron incident the collaborative, worker representatives, regulators, and governmental bodies played a key role in driving transparency, accountability, and improved risk reduction during the decision-making process related to crude unit piping repairs. The CSB recommended to the California State Legislature in the Interim Report to establish a multi-agency process safety regulatory program for all California petroleum refineries to further improve public accountability and transparency by establishing a system to

[35] *See* http://www.caltax.org/homepage/062113_Legislature_Approves.html (accessed July 9, 2013).
[36] The USW is the largest industrial union in North America and has approximately 1.2 million active and retired members in the US, Canada, and the Caribbean. For more information *see* http://www.usw.org/ (accessed July 17, 2013).
[37] Communities for a Better Environment is an "environmental justice organization[s]" in California which has the mission of "build[ing] people's power in California's communities of color and low income communities to achieve environmental health and justice by preventing and reducing pollution and building green, health and sustainable communities and environments." *See* http://www.cbecal.org/about/mission-vision/ (accessed August 14, 2013).
[38] Other members of the collaborative include the BlueGreen Alliance (a coalition of labor unions and environmental groups that advocate for a green economy and safer workplaces), the National Resources Defense Council, and the Asian Pacific Environmental Network.
[39] *See* http://richmondconfidential.org/2013/02/20/labor-and-environmental-groups-join-forces-on-refinery-issues/ (accessed July 9, 2013).
[40] Refinery Action Collaborative. *Initial Response of the Collaborative to the Findings & Recommendations of The July 2013 Draft Report of the Interagency Working Group on Refinery Safety, Governor Jerry Brown.* October 10, 2013; p 10.
[41] *Ibid* at 7.

report to the regulator methodologies, findings, conclusions, and corrective actions related to refinery mechanical integrity inspection and repair work arising from California petroleum refinery PHAs, turnarounds, and maintenance-related shutdowns. This system would require reporting of information such as damage mechanism hazard reviews, establish procedures for greater workforce and public participation, and provide mechanisms for federal, state, and local agency operational coordination, sharing of data, and joint accident prevention activities. California is actively working to implement this recommendation through the creation of the Interagency Refinery Task Force mentioned above.

The positive and productive developments that have taken place in the wake of the Chevron incident strongly suggest that California has a unique opportunity to implement changes to improve safety and health in the refining industry that can serve as a model to the rest of the country.

It is also important to note that a growing dialogue has emerged throughout the US surrounding the need to improve the regulation of hazardous materials and processes in the US, to which the CSB has been an important contributor. The CSB first examined the safety case in its 2002 investigation report entitled *Improving Reactive Hazard Management*[42] as a potentially effective alternative framework for the regulation of reactive hazards. The CSB noted that successful implementation of this "comprehensive" regulatory approach required a competent and experienced regulator. In December 2010, the CSB held a public hearing in Washington, DC on the Regulatory Approaches to Offshore Oil and Gas Safety, where internationally recognized experts in industrial safety and accident analysis provided important testimony on managing risks offshore.[43] Much of this testimony supported the implementation of the safety case as a model for regulating major hazards, both onshore and off. For example, a Shell Oil Company representative testified that the company had been using the safety case globally since 2002, and noted that the most valuable aspect of that type of regulatory regime was the need to demonstrate that major hazards have been managed using effective barriers[44] and controls. In July 2012, the CSB held an additional public hearing on Safety Performance Indicators.[45] A number of international regulators testified on the regulator's ability under the safety case to drive continuous improvement in the oil and gas industry. Finally, on July 25, 2013, the CSB held a public meeting to discuss the U.S. Occupational Safety and Health Administration's (OSHA) failure to implement a number of key CSB safety recommendations made to OSHA in the last decade to revise and improve its Process Safety Management (PSM) standard and to issue a new combustible dust standard.

On January 18, 2011, President Obama issued Executive Order 13563,[46] which called for improvements in the nation's regulatory system to promote predictability and reduce uncertainty and to use the best,

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[42] A full copy of the report is available at http://www.csb.gov/improving-reactive-hazard-management/ (accessed July 10, 2013).

[43] For a copy of the transcript from the CSB Public Hearing on the Regulatory Approaches to Offshore Oil and Gas Safety, *see* http://www.csb.gov/assets/1/19/Transcript_of_Public_Meeting_12_15_2010.pdf (accessed August 14, 2013).

[44] A barrier is a "technical, operational and/or organizational element[] which individually or collectively reduce[s] opportunities for specific error, hazard or accident to occur, or which limits its harm/drawbacks." Petroleum Safety Authority. *Safety Status & Signals, 2012-2012;* 2013; p 31.

[45] For the proceedings of the CSB Public Hearing on Safety Performance Indicators *see* http://www.csb.gov/events/csb-public-hearing-safety-performance-indicators/ (accessed August 14, 2013).

[46] Exec. Order No. 13563, 76 Fed. Reg. 14 (January 21, 2011). http://www.archives.gov/federal-register/executive-orders/2011.html (accessed July 10, 2013).

most innovative, and least burdensome tools for achieving regulatory ends. Specifically, it directed that agencies review existing and proposed standards and regulations to ensure they effectively protect "public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation."[47] Finally, the order emphasized that to the extent feasible, regulations and standards should specify performance objectives rather than the behavior or manner of compliance that regulated entities must adopt, and be adopted through a process that involves public participation. As a result of this Executive Order, OSHA, the Bureau of Safety and Environmental Enforcement (BSEE), the U.S. Environmental Protection Agency (EPA), the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), and the U.S. Coast Guard (USCG) solicited views from the public and stakeholders regarding opportunities to address improving efficiency and effectiveness of safety and environmental regulations and standards in the oil and gas industry.[48] These five agencies then convened an expert forum[49] in September 2012 in Texas City, Texas, to explore the benefits of implementing goal or performance-based regulatory models such as the safety case in the oil and gas industry, and ways to advance the use of such models in the US. The forum included a discussion of the safety case regulatory regime as a performance-based regulatory model, and industrial safety and accident analysis expert Dr. Andrew Hopkins spoke in support of that model.

The CSB has utilized a broad range of expert testimony and research to gain a comprehensive understanding of regulatory models for onshore and offshore oil and gas facilities in countries around the world, and, in light of this investigation, the state of California. This report highlights the significant attributes of the safety case regime that together result in a more effective regulatory approach to process safety and risk reduction. It also provides a detailed contrast of the safety case regulatory model to the existing regulatory structures in the US and California, and makes recommendations to improve California's regulatory oversight of its petroleum refineries and to promote a broader national dialogue on the safety case regulatory approach.

[47] *Ibid.*
[48] For more information *see* https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=23267 (accessed July 10, 2013).
[49] *See* https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=23267 (accessed August 13, 2013).

3.0 The Safety Case Regulatory Regime

3.1 Introduction

Throughout modern history, major industrial accidents have been catalysts for significant regulatory reform, as countries around the world strive to mitigate risk and improve the safety of their facilities and processes in order to protect human health and the environment. According to industrial safety and accident analysis expert Dr. Andrew Hopkins, "[d]isasters…offer an unparalleled opportunity to study the workings of an organisation and to identify where things are going wrong."[50] Around the world, many of these large-scale incidents have resulted in sweeping changes to legislation surrounding industrial safety and health. These changes replace prescriptive, compliance-based regulations with goal-setting regulations supplemented by prescriptive requirements that support adaptability, require duty holders[51] to demonstrate to the regulator that they have driven risks to as low as reasonably practicable (ALARP) or equivalent, and provide the regulator with the tools to drive continuous improvement among major hazard facilities.[52] A majority of these regulatory regimes are referred to as the safety case, which Dr. Hopkins defines as:

> a case which the operator of a hazardous facility makes to the regulator, setting out how safety is to be managed. It must include details of the hazard identification process, the hazards which have been identified and the procedures which have been set in place to control them. The system remains self-regulatory in principle but rather than the facility being left to its own devices by the regulator it must *convince the regulator that its strategy for managing safety is satisfactory* [emphasis added]. Under any safety case regime, facility operators are expected to adopt best practice risk management.[53]

The safety case regulatory regime is much more than a written report; it shifts risk management responsibility to the company and its employees and provides for rigorous review and oversight by a technically competent regulator to ensure effective implementation.

The remaining portions of Section 3 will introduce major accidents that have occurred around the world and discuss the history behind the global development and implementation of the safety case regulatory

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[50] Hopkins, Andrew. *Managing Major Hazards: The Lessons of the Moura Mine Disaster;* National Library of Australia, 1999; p 1.

[51] Duty holders are considered to be "those who create and/or have the greatest control of the risks associated with a particular activity. Those who create the risks at the workplace are responsible for controlling them." HSE. *Planning to do business in the UK offshore oil and gas industry? What you should know about health and safety;* October 2011; p 2. These entities may include operators, contractors, and subcontractors. http://www.hse.gov.uk/offshore/guidance/entrants.pdf (accessed June 5, 2013).

[52] Major hazard facilities are workplaces that store, handle or process large quantities of hazardous material. Incidents at such facilities have the potential to cause serious damage to employees, people in surrounding areas, and the environment. *See* http://www.pc.gov.au/__data/assets/pdf_file/0018/82350/21-appendixd.pdf (accessed May 9, 2013).

[53] Hopkins, Andrew. *Lessons from Esso's Gas Plant Explosion at Longford;* Australian National University [Online]; p 7. http://www.sirfrt.com.au/Meetings/IMRt/Southeast/IMRt%20East%2000Nov30/Andrew%20Hopkins%20presentation/Lonford%20talk.PDF (accessed May 8, 2013).

approach on and offshore. Section 4.0 will then highlight major attributes of the safety case regulatory approach. The US regulatory model will also be introduced and discussed throughout these sections to allow for comparisons between the different approaches. Finally, Section 5.0 will discuss the regulation of petroleum refineries in California specifically, including Chevron. The report concludes with important recommendations focused on improving the regulatory oversight of California's 15 refineries, and encouraging OSHA, industry, labor, and others to work together to improve the regulation of petroleum refineries throughout the US.

3.2 Initial Safety Case Implementation

3.2.1 United Kingdom

3.2.1.1 Onshore

Two major onshore incidents in the 1970s helped spark legislative reform focused on major accident prevention and risk reduction for onshore major hazard facilities. A large dioxin[54] release in Seveso, Italy, in 1976, which injured hundreds of individuals, led the European Commission[55] to adopt legislation in 1982 known as the Seveso Directive, aimed at the prevention and control of major industrial accidents.[56] Following the 1984 toxic release in Bhopal, India, which resulted in several thousand known fatalities, and the Sandoz chemical plant fire near Basel, Switzerland, which injured 14 individuals and released nearly 30 tons of pesticides into the Rhine River, turning it red, the Seveso Directive was amended and replaced in 1996 with the Seveso II Directive.[57] The regulation requires owners or operators of facilities that contain threshold quantities of listed substances to submit safety reports to a competent authority (CA) within a Member State of the European Commission for its review and acceptance.[58] These reports must demonstrate to the CA that major-accident prevention policies, safety management systems, and internal emergency plans have been created and implemented.[59] The regulation also requires owners or operators to "prove to the competent authority…that he has taken all measures necessary as specified in this Directive."[60]

[54] The term Dioxin refers to a family of toxic chemicals. They have been characterized by EPA as likely to be human carcinogens and are anticipated to increase the risk of cancer at background levels of exposure. *See* http://www.epa.gov/pbt/pubs/dioxins.htm (accessed June 17, 2013).
[55] The European Commission consists of 27 Commissioners and "represents the interests of the EU [European Union] as a whole. It proposes new legislation to the European Parliament and the Council of the European Union, and it ensures that EU law is correctly applied by member countries." http://ec.europa.eu/atwork/index_en.htm (accessed May 6, 2013).
[56] *See* http://ec.europa.eu/environment/seveso/ (accessed May 6, 2013).
[57] The Seveso Directive was adopted in 1982 and was amended twice, in 1987 and 1988. On December 9, 1996, the Seveso II Directive was adopted and replaced the original Seveso Directive. The Seveso III Directive was then adopted on July 4, 2012, and became effective on August 13, 2012. Member States must implement Seveso III by June 1, 2015. http://ec.europa.eu/environment/seveso/ (accessed May 6, 2013).
[58] *See* http://ec.europa.eu/environment/seveso/legislation.htm (accessed May 6, 2013).
[59] Seveso II Directive, Article 9 (1996). Available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1996L0082:20031231:EN:PDF (accessed July 15, 2013).
[60] Seveso II Directive, Article 5, Paragraph 2 (1996). Available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1996L0082:20031231:EN:PDF (accessed July 15, 2013).

On June 1, 1974, the Flixborough Works of Nypro (UK) Limited experienced a massive cyclohexane vapor cloud explosion, killing 28 workers and injuring 36 workers and hundreds of members of the public offsite. This incident along with the Seveso incident led to the Seveso Directive in 1982, and this was converted into legislation in the United Kingdom (UK) via the Control of Industrial Major Accident Hazards (CIMAH) 1984 Regulations. The Control of Major Accidents[61] Hazards Regulations (COMAH) replaced CIMAH in April 1999 to conform to the updated Seveso II Directive. The Health and Safety Executive[62] (HSE), the Environment Agency[63] (EA), and the Scottish Environmental Protection Agency[64] (SEPA) are considered to be the UK's CA responsible for the enforcement of these regulations. A key feature differentiating these two regulations is the increasing emphasis from the operator having to "describe" the safety systems in CIMAH to being required to "demonstrate" their adequacy in COMAH.[65]

The COMAH Regulations require covered onshore facilities in the UK to "take all measures necessary to prevent major accidents and limit their consequences to people and the environment." The HSE interprets this duty as the equivalent of reducing risks to as low as reasonably practicable, or ALARP.

The COMAH regulations apply to all onshore facilities that have sufficient quantities of dangerous substances as listed in Schedule 1[66] of the regulations.[67] The general duty for all duty holders of facilities covered under the COMAH regulations is to "take all measures necessary to prevent major accidents and limit their consequences to people and the environment."[68] The HSE interprets this duty as the equivalent of reducing risks[69] to "as low as reasonably practicable," or ALARP.[70,71,72] Duty holders are required to

[61] The COMAH regulations define "major accident" as "an occurrence (including in particular, a major emission, fire or explosion) resulting from uncontrolled developments in the course of the operation of any establishment and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances…" COMAH Regulations, Part 1, Regulation 2 (2005).

[62] HSE is an independent regulator, and "act[s] in the public interest to reduce work-related death and serious injury across Great Britain's workplaces." *See* http://www.hse.gov.uk/aboutus/ (accessed May 7, 2013). According to the HSE's Enforcement Policy Statement, the HSE's purpose is "to protect the health, safety and welfare of people at work, and to safeguard others, mainly members of the public, who may be exposed to risks from the way work is carried out." http://www.hse.gov.uk/pubns/hse41.pdf (accessed May 7, 2013).

[63] EA is an Executive Non-departmental Public Body responsible for protecting the environment and promoting sustainable development. For more information *see* http://www.environment-agency.gov.uk/default.aspx (accessed July 17, 2013).

[64] SEPA is Scotland's environmental regulator, aimed at protecting and improving the environment. For more information *see* http://www.sepa.org.uk/ (accessed July 17, 2013).

[65] COMAH Regulations. Schedule 4, Part 1. Purpose of safety reports is to "1. demonstrate[e] that a major accident prevention policy and a safety management system for implementing it have been put into effect in accordance with the information set out in Schedule 2; 2. Demonstrate[e] that major accident hazards have been identified and that the necessary measures have been taken to prevent such accidents and to limit their consequences for persons and the environment; 3. Demonstrate[e] that adequate safety and reliability have been incorporated into the – (a) design and construction, and (b) operation and maintenance, of any installation and equipment and infrastructure connected with its operation which are linked to major accident hazards within the establishment…" (2005).

[66] Available at http://www.legislation.gov.uk/uksi/1999/743/schedule/1/made (accessed June 17, 2013).

[67] COMAH Regulations, Part 1, Regulation 3 (2005).

[68] COMAH Regulations, Part 2, Section 4 (2005).

[69] HSE describes "risk" as "the likelihood that a hazard will actually cause its adverse effects, together with a measure of the effect." *See* http://www.hse.gov.uk/risk/theory/alarpglance.htm (accessed May 7, 2013).

[70] *See* http://www.hse.gov.uk/foi/internalops/hid_circs/permissioning/spc_perm_37/ (accessed May 15, 2013).

prepare a safety report that "demonstrate[s] to the CA that all measures necessary for the prevention and mitigation of major accidents have been taken."[73] These reports must contain information for the CA to review and analyze, including a policy on preventing and mitigating major accidents; a management system for implementing that policy that complies with good practice;[74] an effective method for identifying any major accidents that might occur; and measures to prevent and mitigate major accidents.[75] To assist operators with reducing risks to ALARP, HSE publishes guidance documents that contain good practice guidelines and standards and that discuss what constitutes good practice.[76]

3.2.1.2 Offshore

The international offshore energy sector experienced several catastrophic incidents in the 1980s, including the *Alexander Kielland*[77] incident in Norway in 1980 which resulted in 123 fatalities, and the *Piper Alpha*[78] incident in the UK in 1988, which fatally injured 167 workers. These incidents initiated offshore regulatory changes focused on risk reduction and control that were modeled after the CIMAH regulations.

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[71] The principal health and safety legislation in the UK is the Health and Safety at Work etc. Act 1974. It requires employers to ensure that risks to employees and others are reduced "so far as is reasonably practicable," or SFAIRP. Health and Safety at Work etc. Act, Part I, Section 2 (1) and (2) (1974). HSE has interpreted that SFAIRP duties call for the same set of tests to be applied as duties to reduce risks "as low as reasonably practicable," or ALARP. According to HSE, ""the two terms mean essentially the same thing and at their core is the concept of 'reasonably practicable';…" *See* http://www.hse.gov.uk/risk/theory/alarpglance.htm (accessed May 7, 2013).

[72] According to HSE, the concept of "reasonably practicable" "involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which [they] expect to see workplace risks controlled." This allows HSE to "set goals for duty-holders, rather than being prescriptive; HSE's policy is that any proposed regulatory action should be based on what is reasonably practicable." According to HSE, in most situations, deciding whether the risks are ALARP involves a "comparison between the control measures a duty-holder has in place or is proposing and the measures [they] would normally expect to see in such circumstances i.e. relevant good practice. 'Good practice' is defined as 'those standards for controlling risk that HSE has judged and recognized as satisfying the law, when applied to a particular relevant case, in an appropriate manner.'… Once what is good practice has been determined, much of the discussion with duty-holders about whether a risk is or will be ALARP is likely to be concerned with the relevance of the good practice, and how appropriately it has been (or will be) implemented." *See* http://www.hse.gov.uk/risk/theory/alarpglance.htm (accessed May 7, 2013).

[73] COMAH Regulations, Schedule 4, Part 1 (2005). *See* http://www.hse.gov.uk/comah/background/comah99.htm (accessed May 7, 2013).

[74] HSE defines "good practice" as "those standards for controlling risk that HSE has judged and recognized as satisfying the law, when applied to a particular relevant case, in an appropriate manner." HSE, "Assessing compliance with the law in individual cases and the use of good practice," May 2003. Available at http://www.hse.gov.uk/risk/theory/alarp2.htm (accessed June 11, 2013).

[75] COMAH Regulations, Schedule 4, Part 2 (2005). *See* http://www.hse.gov.uk/comah/background/comah99.htm (accessed May 7, 2013).

[76] Such as HSE's "Guidance for the topic assessment of the major accident hazard aspects of safety cases," published in April 2006, and HSE's "Assessing compliance with the law in individual cases and the use of good practice," May 2003, available at http://www.hse.gov.uk/risk/theory/alarp2.htm (accessed June 11, 2013).

[77] The *Alexander Kielland* was a drilling rig built to house offshore workers in the North Sea. During a storm, it suffered a catastrophic failure that caused it to capsize. The incident resulted in 123 fatalities.

[78] On July 6, 1988, an explosion occurred aboard the *Piper Alpha* oil production platform 120 miles off the coast of Scotland in the North Sea. A series of explosions and fire killed 167 workers and almost completed destroyed the platform. This incident became the deadliest accident in the history of the offshore industry.

Following the *Piper Alpha* incident, the UK Secretary of State for the Department of Energy ordered that a public inquiry be held to determine the circumstances surrounding the incident.[79] The Secretary directed Lord Cullen, a Senator of the College of Justice in Scotland, to hold the inquiry and report to the Secretary "the circumstances of the accident and its cause together with any observations and recommendations which he thinks fit to make with a view to the preservation of life and the avoidance of similar accidents in the future."[80]

The result was *The Public Inquiry into the Piper Alpha Disaster* ("the Cullen Report"), an extensive report released in October 1990. The report called into question the adequacy of the detailed prescriptive regulatory regime that existed at the time of the incident[81] for offshore oil and gas operations, and listed 106 recommendations to revamp offshore safety regulation in the UK, 57 of which the HSE was responsible for overseeing.[82]

The Cullen Report found that the operating company (Occidental Petroleum, a US company), "did not possess any system which ensured that such remote, but potentially disastrous, events were subjected to systematic scrutiny…[and] there was for major projects no comprehensive system of safety assessment and management did not appear to appreciate fully the contribution which it could make."[83] The report noted that there was a need for a formal safety assessment (FSA), "an assessment essentially equivalent to the Safety Case,"[84] which "involves the identification and assessment of hazards over the whole life cycle of a project…[because]…the combinations of potential hardware and human failures are so numerous that a major accident hardly ever repeats itself…[and] [a] strategy for risk management must [] address the entire spectrum of possibilities."[85]

In his analysis, Lord Cullen noted that the current offshore regulations were prescriptive in nature rather than goal-setting, and that this had the effect of hampering operators' flexibility and stifling innovation.[86] He stated that "one of the reasons for adopting the goal-setting approach was to make regulations that were more flexible, so that changing technology could be accommodated without the need for new legislation."[87] Lord Cullen pointed to the CIMAH Regulations, discussed above, as a forward-looking regulatory model, which required onshore major hazard installation operators to "provide HSE with a written report on the safety of the installation…commonly called the Safety Case."[88] Lord Cullen noted

[79] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p iii.
[80] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p iv.
[81] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p 27.
[82] Oil &Gas UK. *Piper Alpha: Lessons Learnt;* 2008; p 2.
[83] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p 275.
[84] Lord Cullen describes the Safety Case as "a means by which an operator demonstrates to itself the safety of its activities…[and] as the basis for the regulation of major hazard activities…" *Ibid at* 276-277.
[85] *Ibid.*
[86] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p 339.
[87] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p 364.
[88] *Ibid* at 276.

that the safety case "is a means by which an operator demonstrates to itself the safety of its activities…[and] also serves as the basis for the regulation of major hazard activities."[89]

Lord Cullen concluded that an FSA "is an essential element in a modern safety regime for major hazard installations…that this FSA should take the form of a Safety Case…[and that] [t]he regime should have as its central feature demonstration of safe operation by the operator."[90] He recommended that a safety case regulatory regime be implemented offshore for both fixed and mobile installations as it already was for onshore major hazard installations, that it be complemented by other regulations dealing with specific features, that the safety case contain goal-setting regulations, and that it be part of a continuing dialogue between the operator and the regulatory body.[91]

Lord Cullen recommended the implementation of safety regulations requiring the owner or operator of every fixed and mobile installation operating in UK waters to submit a safety case to HSE. In response, the UK established the Offshore Installations (Safety Case) Regulations in 1992.[92] The primary goal of these Regulations was "to reduce the risks from major accident hazards to the health and safety of the workforce employed on offshore installations or in connected activities."[93]

Oil & Gas UK, [94] the main UK offshore oil industry trade association whose members include the major oil companies that operate in the Gulf of Mexico (such Shell and Exxon), has expressed strong support for the safety case regime. In its response to the European Commission's published draft legislative proposals to modify offshore safety case regulations, Oil & Gas UK noted that those proposals would undermine the "proactive, flexible and responsive approach to managing risks, borne out of the lessons learnt from Piper Alpha as well as the evolving nature of the offshore oil and gas business itself."[95] In the wake of the Macondo incident in the Gulf of Mexico, the UK government directed Professor Geoffrey Maitland of Imperial College London to lead an independent review of the offshore safety case regime in the UK.[96] In the report stemming from the review, which highlighted strengths of the safety case regime as well as recommendations for improvement, Professor Maitland commended the UK's "'goal-setting' safety regime and its ability to foster innovation and continuous improvement in process integrity…"[97] and noted that the UK authorities, including the HSE, are held in high regard by both the UK operators and international observers.[98]

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[89] *Ibid* at 276 and 277.
[90] *Ibid* at 282.
[91] *Ibid* at 283 and 284.
[92] The 1992 Regulations have since been replaced by the Offshore Installations (Safety Case) Regulations 2005, which were effective as of April 6, 2006. The objective of the revisions in 2005 was "to improve the effectiveness of the regulations whilst at the same time reducing the burden of three yearly resubmissions." Oil & Gas UK. *Piper Alpha: Lessons Learnt;* 2008.
[93] HSE. *A Guide to the Offshore Installations (Safety Case) Regulations 2005: Guidance on Regulations;* 2006; p 5. http://www.hse.gov.uk/pubns/priced/l30.pdf (accessed May 7, 2013).
[94] *See* http://www.oilandgasuk.co.uk/aboutus/aboutus.cfm (accessed December 10, 2013).
[95] Oil & Gas UK. *European Commission Proposed Regulation on Offshore Safety and Related Issues: Oil & Gas UK Position Paper*. November 2011; p 1. http://www.oilandgasuk.co.uk/ProposedEURegulation.cfm (accessed December 10, 2013).
[96] Maitland, Geoffrey. *Offshore Oil and Gas in the UK: an independent review of the regulatory regime.* December 2011. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48252/3875-offshore-oil-gas-uk-ind-rev.pdf (accessed December 10, 2013).
[97] *Ibid* at 3.
[98] *Ibid* at 3.

3.2.2 Global Analysis of Safety Case Implementation

3.2.2.1 Australia

3.2.2.1.1 Offshore

Following the *Piper Alpha* disaster in 1988, the then Australian Commonwealth Minister for Resources at the time, Senator Peter Cook, formed a Consultative Committee on Safety in the Offshore Petroleum Industry to advise him on safety issues surrounding offshore operations in Australia. In 1991, the Committee released its *Report of the Consultative Committee on Safety in the Offshore Petroleum Industry*.[99] In the report, the Committee examined the circumstances, causes, and recommendations described in both the Cullen Report and Esso Australia's[100] investigation report on a fire that occurred on the Tuna platform in April 1989 in Bass Strait that injured four individuals. The Committee noted that while there were many differences between the two incidents, they "both demonstrated the need for greater attention to the management of safety in a number of areas of offshore operations."[101] They pointed to the safety case as an important regulatory concept that should be applied to oil and gas operations in Australian waters, and concluded by recommending that the safety case concept described by Lord Cullen and carried out onshore by the Seveso Directive and CIMAH regulations be adopted for Australian offshore petroleum operations.[102] It would "require the operator of a facility to formally document how safety is to be managed within the facility, [and] [] demonstrate that the major hazards of the installation have been identified and appropriate controls provided…"[103] The Committee also recommended the implementation of both prescriptive and "objective" regulations.[104] At that time, offshore petroleum safety was the joint responsibility of the Commonwealth and the States/Northern Territory. Following this inquiry, new Commonwealth regulations were created: for example, Schedule 8 on "Occupational Health and Safety" was added to the Petroleum Submerged Lands Act (PSLA) in 1992 to require safety cases to be developed for all offshore petroleum facilities.

The Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 set out the requirements for the contents of offshore safety cases. The operator of an offshore petroleum facility must submit a safety case for review and acceptance to the Australian National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), the Australian Commonwealth Statutory Agency charged with regulating the health and safety, structural integrity, and environmental management of all offshore petroleum facilities in Australian Commonwealth waters, and in coastal waters where State powers have been reduced. NOPSEMA accepts a safety case "if it is satisfied that the arrangements set out in the document demonstrate that the risks will be reduced to…ALARP."[105]

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[99] *See* http://www.mrt.tas.gov.au/mrtdoc/petxplor/download/OR_0935/OR_0935.pdf (accessed May 8, 2013).
[100] Esso was an oil and gas company in Australia that was sold to Mobil Oil Corporation in 1990. It is now part of Exxon Mobil. *See* http://www.exxonmobil.com/Australia-English/PA/about_who_history_esso.aspx (accessed May 8, 2013).
[101] *Report of the Consultative Committee on Safety in the Offshore Petroleum Industry*, 1991; p 2. *See* http://www.mrt.tas.gov.au/mrtdoc/petxplor/download/OR_0935/OR_0935.pdf (accessed May 8, 2013).
[102] *Ibid* at 25.
[103] *Report of the Consultative Committee on Safety in the Offshore Petroleum Industry*, 1991; p 3. *See* http://www.mrt.tas.gov.au/mrtdoc/petxplor/download/OR_0935/OR_0935.pdf (accessed May 8, 2013).
[104] *Ibid.*
[105] *See* http://www.nopsema.gov.au/safety/safety-case/what-is-a-safety-case/ (accessed July 15, 2013).

3.2.2.1.2 Onshore

In 1998, Esso Australia's gas plant at Longford in Victoria suffered a major release and fire caused by cold temperature embrittlement due to a process upset and lack of engineering support for diagnosis, which resulted in two fatalities, eight additional injuries, and cut the State of Victoria's gas supply for two weeks causing major industrial disruption and workforce stand downs. While the safety case at this time was required for offshore operations in Australia, onshore facilities like the Longford plant were subject only to prescriptive provisions contained within the Victoria *Occupational Health and Safety Act 1985.* In its report on the incident, the Royal Commission concluded that all major hazard facilities in Victoria should be required to develop and submit a safety case to the appropriate regulatory authority. In 1996, Australia's National Occupational Health and Safety Commission[106] (NOHSC) recommended the safety case be adopted for all major onshore hazard facilities in Australia, and in 2002 NOHSC established a *National Standard for the Control of Major Hazard Facilities* and a *National Code of Practice for the Control of Major Hazard Facilities.*[107] The *Standard* states that operators of major hazard facilities "shall provide the relevant public authority with a safety report…" that, among other things, identifies the type, relative likelihood and consequences of major accidents that might occur, and provides details of the safety management system (SMS) for that facility.[108] In addition, operators of major hazard facilities must identify all major hazards and the risks associated with those hazards, and minimize each risk "so far as practicable."[109]

According to the Australian Safety and Compensation Council's 2004 *Annual Situation Report for the National Standard for the Control of Major Hazard Facilities*, all Australian jurisdictions were expected to have the standard in place before the end of 2005, roughly three years after its inception.[110]

3.2.2.2 Norway

Following the capsizing of the *Alexander Kielland*[111] in 1980, Norway moved in a direction similar to the European Commission and developed performance-based regulations focused on major accident

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[106] In 1985 The National Occupational Health and Safety Commission (NOHSC) was established as a tripartite body to develop, facilitate and implement a unified national approach to occupational health and safety in Australia. On January 1, 2006, NOHSC was replaced by the Australian Safety and Compensation Council (ASCC). On March 31, 2009, the ASCC was abolished and replaced with Safe Work Australia. Safe Work Australia was established by the Safe Work Australia Act 2008 with the authority to help develop policy to improve worker health, safety, and compensation across Australia. It does not regulate work health and safety laws; rather it develops national policy. *See* http://www.safeworkaustralia.gov.au/sites/swa/about/pages/about (accessed May 8, 2013).

[107] National standards are documents which prescribe preventative action to avert occupational deaths, injuries and diseases; national codes of practice are documents prepared for the purpose of advising employers and workers of acceptable ways of achieving national standards. *National Standard for the Control of Major Hazard Facilities* [NOHSC: 1014(2002)], p 2. http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/271/NationalStandard_ControlMajorHazardFacilities_NOHSC_1014-2002_PDF.pdf (accessed May 8, 2013).

[108] *Ibid* at 13.

[109] *Ibid* at 12.

[110] Australian Safety and Compensation Council. *Major Hazard Facilities Annual Situation Report;* 2004; p1. http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/475/MHFAnSituationReport_2004.pdf (accessed May 8, 2013).

[111] The *Alexander Kielland* was a flotel for housing workers. A total of 212 people were on board when it capsized near the Edda platform in the Ekofisk area of the North Sea on March 27, 1980. As a result of this incident, 123 individuals lost their lives and only 89 survived.

prevention. Although the country did not adopt the safety case regulatory regime per se, the current regulatory approach implements many similar elements.

Currently in Norway, the Petroleum Safety Authority[112] (PSA) regulates safety for activities at onshore and offshore major hazard facilities, and requires the responsible party[113] to reduce risk "to the extent possible," and "select technical, operational and organisational solutions that reduce the probability that harm, errors and hazard and accident situations occur."[114] This concept is akin to ALARP whereby companies choose the solutions and barriers that have the greatest risk-reducing effect, provided the costs are not significantly disproportionate to the risk reduction achieved.[115] However, unlike the UK and Australia, PSA regulations do not require the submission of a safety case report by the operator of a facility, although facilities are still expected to develop them and make them available to the regulator upon request for auditing purposes. Rather, PSA "supervises" industry, as explained in the following:

> Supervision involves much more than audits offshore or on land. It embraces the total contact between the regulator and the regulated. It covers everything which gives the PSA the necessary basis to determine whether the companies are accepting their responsibility to operate acceptably in all phases. Supervisory activities include investigations, considering consent applications and meetings with the industry.[116]

As will be discussed below, because the safety case regulatory approach requires the regulator to conduct detailed assessments of safety case reports and auditing of facilities against the safety case, its implementation requires substantial funding to support and maintain a sufficient number of highly experienced and competent staff.

3.2.2.3 The United States

Despite this international shift to the safety case regime and even though major oil companies that operate globally both onshore and offshore have expressed their support for the safety case regime,[117] the US has

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[112] The Petroleum Safety Authority (PSA) is "the regulatory authority for technical and operational safety and for the working environment." PSA was created in 2004 as a result of a government decision to split the Norwegian Petroleum Directorate (NPD) into two parts. *See* http://www.ptil.no/main-page/category9.html (accessed May 8, 2013).

[113] PSA defines a "responsible party" as "[t]he operator and others participating in activities covered by these regulations, without being a licensee or owner of an onshore facility." *Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities* (The Framework Regulations); Section 6(a). Definitions. http://www.ptil.no/framework-hse/category403.html (accessed November 26, 2013).

[114] PSA. *Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities* (The Framework Regulations); Section 11, Risk Reduction Principles. http://www.ptil.no/framework-hse/category403.html (accessed November 26, 2013).

[115] *Ibid.*

[116] http://www.ptil.no/supervision/what-is-supervision-article8519-88.html (accessed June 3, 2013).

[117] Shell Geelong Refinery Plant Manager Huck Poh has stated, "As a Major Hazard Facility, Shell Geelong Refinery and Lara Terminal is required to submit a Safety Case for assessment by Safe Work Victoria. This document is a summary of that Safety Case and explains the potential impact of the facility on our neighbours and the community. We take a systematic approach to managing safety and preventing incidents that place our people, our neighbours, the Geelong community, the environment and our facilities at risk. This is reflected in our Safety Management System and the approach that has been undertaken for the development and review of the Safety Case. Shell is committed to achieving continuous Health, Safety, Security and Environment (HSSE) performance improvement. There are ongoing review and revision activities to ensure our analyses remain relevant and reflect

persisted in the use of a more activity-based regulatory scheme that does not contain a specific risk reduction target and that lacks the ability to adapt to advancing technology and recently developed industry standards. Due to the major potential hazards present in onshore and offshore oil and gas operations, these sectors should have in place adaptable safety regimes that adequately engage companies and their employees in continuous improvement and risk reduction. As the CSB has devoted extensive time and resources to studying and analyzing the regulation of offshore oil and gas facilities in the US as a result of its Macondo incident investigation, this report will focus on the regulation of onshore oil and gas operations in the US and California.

On October 23, 1989, a massive explosion and fire occurred at the Phillips 66 Company's Houston Chemical Complex in Pasadena, Texas, resulting in 23 fatalities and injuring more than 130. In response, the U.S. Department of Labor issued a report to the President and declared, among other things, that the U.S. Occupational Safety and Health Administration (OSHA) would "expedite completion of its rulemaking requiring employers to implement comprehensive chemical process safety management plans for hazardous chemical processes."[118] Sparked by a number of serious accidents, including the Phillips 66 incident and the 1984 toxic release in Bhopal, India, which resulted in several thousand known fatalities, OSHA published in the Federal Register (55 FR 29150) on July 17, 1990, a proposed standard containing requirements for the management of hazards associated with processes using highly hazardous chemicals.[119] Soon after, the Clean Air Act (CAA) Amendments (CAAA) of 1990 were adopted by Congress, which resulted in the creation of the CSB and authorized the first federal regulations specifically designed to prevent major chemical accidents that threaten workers, the public, and the environment: OSHA's Process Safety Management (PSM) standard and the U.S. Environmental Protection Agency's (EPA's) Risk Management Program.

3.2.2.3.1 OSHA PSM Standard

Section 304 of the CAAA mandated that OSHA develop "a chemical process safety standard designed to protect employees from hazards associated with accidental release of highly hazardous chemicals in the workplace."[120] OSHA responded by adopting 29 CFR §1910.119 *Process Safety Management of Highly*

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the current status of operations and our risk reduction measures are consistent with latest industry practice. This commitment to continuous improvement is reflected in the Shell HSSE Policy and supported by our HSSE results." *See* http://s04.static-shell.com/content/dam/shell-new/local/country/aus/downloads/geelong/safety-case-summary.pdf p3. (accessed December 10, 2013). Esso Longford Plant Manager Monte Olson has stated that "[t]he Safety Case is a systematic and comprehensive review of our operations and processes which includes the identification of potential major incidents that could occur, assesses the risks associated with these major incidents and demonstrates the controls we have in place to manage these risks to as low as reasonably practicable." *See* http://www.exxonmobil.com/Australia-English/PA/Files/publication_Longford_Safety_Case_2013.pdf p5. (accessed December 10, 2013)

[118] Dole, Elizabeth. *Phillips 66 Company Houston Chemical Complex Explosion and Fire: Implications for Safety and Health in the Petrochemical Industry, A Report to the President;* April 1990; p ix. http://ncsp.tamu.edu/reports/phillips/first%20part.pdf (accessed August 6, 2013).

[119] Preamble to Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents. Section 1 – I. Background (March 4, 1992). *See* http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=PREAMBLES&p_id=1039 (accessed May 10, 2013).

[120] Clean Air Act Amendments of 1990. Section 304(a). November 5, 1990. *See* http://www.epa.gov/air/caa/caaa.txt (accessed May 10, 2013).

Hazardous Chemicals (PSM standard) in 1992. This standard applies to a process[121] involving a chemical at or above the listed threshold quantity (also known as a highly hazardous chemical), or flammables in a quantity of 10,000 pounds or more.[122] It contains 14 elements with broad requirements to implement management systems, identify and control hazards, and prevent "catastrophic releases of highly hazardous chemicals." While the PSM standard was intended to be performance-based and does contain some goal-setting elements, a majority of the standard is activity-based, and there is no general duty requirement under the PSM standard to reduce risks to a certain extent or prevent catastrophic accidents. As will be discussed at length in Section 4.3, the PSM standard has essentially remained stagnant since its inception in 1992. According to Center for Chemical Process Safety (CCPS), the PSM standard has resulted "in a minimum cost, compliance-based approach to managing process safety… 'If [it] isn't a regulatory requirement, I'm not going to do it!'"[123]

A key provision of the PSM standard is the process hazard analysis (PHA) of covered processes.[124] PHA requirements include a review of the process to identify, evaluate, and control the hazards, and an evaluation of the consequences of failure of those controls.[125,126] The PHA required by the OSHA PSM standard is an example of a goal-setting requirement in that it allows for a variety of hazard analysis methodologies to be performed to satisfy the requirement. However, the element is activity-based in that completing a PHA for each covered process and updating it at least every five years is satisfactory. The regulator is not responsible for evaluating the effectiveness of controls or safeguards, and there is no requirement to reduce risks to a certain extent such as ALARP. Thus, the resulting PHA that meets the regulatory requirements of "controlling" hazards may actually inadequately identify or mitigate the hazards. In addition, there is no requirement for employers to submit their PHAs to the regulator for review. In most cases, this means the regulator will not review these PHAs until there is a significant process accident, a complaint, or a (rare) planned inspection.

Another key element of the PSM standard, the Management of Change (MOC) provision, requires the development of written procedures "to manage changes to process chemicals, technology, equipment, and procedures…"[127] The procedures must consider, among other things, the technical basis for a proposed change and its potential impact on safety and health.[128] Historically, the MOC requirement has been

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[121] The PSM standard defines "process" as "any activity involving a highly hazardous chemical including any use, storage, manufacturing, handling, or the on-site movement of such chemicals, or combination of these activities." 29 CFR §1910.119(b) (1992).

[122] 29 CFR §1910.119(a)(1) (1992). This standard also applies to the manufacture of explosives and pyrotechnics in any quantity [29 CFR §1910.109(k)(2) & (3)].

[123] CCPS. *Guidelines for Risk Based Process Safety.* 2007; p 2.

[124] A Process hazard analysis is a thorough, orderly, systematic approach for identifying, evaluating, and controlling hazards of processes involving highly hazardous chemicals. The employer must perform an initial process hazard analysis on all processes covered by the PSM standard and all process hazard analyses must be updated and revalidated, based on their completion date, every five years. *See* http://www.osha.gov/doc/outreachtraining/htmlfiles/psm.html (accessed May 10, 2013).

[125] 29 CFR §1910.119(e) (1992).

[126] The other elements of the PSM standard are process safety information, operating procedures, employee participation, training, contractor safety, pre-startup safety review, mechanical integrity, hot work permits, management of change, incident investigation, emergency planning and response, and compliance audits. The 14th "element" is mainly a requirement that maintaining trade secrecy not interfere with an employer's compliance with the other 13 elements.

[127] 29 CFR §1910.119(l)(1) (1992).

[128] *Id* at (l)(2)(i) and (ii) (1992).

treated and enforced as an activity-based requirement as well. For example, when the BP Texas City refinery explosion and fire occurred on March 23, 2005, all 15 fatalities and many of the 180 injuries occurred in or around nine contractor trailers that were sited near process areas and as close as 121 feet to the isomerization (ISOM) unit where the incident occurred. The refinery had been using trailers as temporary office spaces for several years. The refinery addressed facility siting for trailers during its 2004 MOC for an upcoming 2005 turnaround. The MOC form indicated that a double-wide mobile office trailer would be temporarily sited in the open area between the ISOM and naphtha desulfurization units (NDU) for use during the upcoming turnaround, to be removed at the end of April 2005. However, the MOC did not analyze siting hazards; rather the MOC team attached a drawing showing the proposed interior configuration of the trailer and measured its location from the catalyst warehouse.[129] In early 2005, eight other trailers were sited between the ISOM and NDU without even conducting an MOC. The CSB pointed out in its Urgent Recommendations stemming from the Texas City incident that these trailers could have been easily relocated to less hazardous sites, and BP did so following the incident.[130] Despite this fact, BP's siting policy considered that utilizing trailers in this way posed little or no danger to occupants, which conformed with the American Petroleum Institute's (API) Recommended Practice (RP) 752, *Management of Hazards Associated with Location of Process Plant Buildings.*

Although the MOC failed to identify or analyze hazards stemming from siting trailers so close to process areas, OSHA did not cite BP for conducting a poor MOC following the incident, as merely completing the MOC satisfied the requirements of the PSM standard. As it would have been very practical to move the trailers to a safer location, a regulator under the safety case regulatory regime would have the ability to require BP to do just that to reduce risks to ALARP.

The OSHA PSM standard includes requirements for two of its 14 elements – mechanical integrity and process safety information (PSI) – to comply with recognized and generally accepted good engineering practices, or RAGAGEP.[131] RAGAGEPs are technologically focused, with no emphasis on organizational, human factors, or culture-based measures. OSHA developed the mechanical integrity RAGAGEP requirement to "make sure that process equipment is inspected and tested properly, and that the inspections and tests are performed in accordance with appropriate codes and standards."[132] OSHA has recognized a number of practices, guidelines, and standards as RAGAGEPs, including the American Society of Civil Engineers (ASCE), *Design of Blast Resistant Buildings in Petrochemical Facilities*, the

[129] To learn more about the PHA and MOC processes relating to the BP Texas City Refinery, *see* the CSB BP Texas City Final Investigation Report at http://www.csb.gov/assets/1/19/CSBFinalReportBP.pdf (accessed October 24. 2013).
[130] *See* CSB Urgent Trailer Siting Recommendations at http://www.csb.gov/assets/1/19/BP_Recs_2.pdf (accessed October 24. 2013).
[131] RAGAGEPs "are engineering, operation, or maintenance activities based on established codes, standards, published technical reports or recommended practices (RP) or a similar document. RAGAGEPs detail generally approved ways to perform specific engineering, inspection or mechanical integrity activities, such as fabricating a vessel, inspecting a storage tank, or servicing a relief valve." OSHA Instruction CPL 03-00-004. June 7, 2007. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=3589&p_table=DIRECTIVES (accessed August 13, 2013).
[132] OSHA. Preamble to 29 CFR Part 1910, Process Safety Management of Highly Hazardous Chemicals, Section 3, Title III. Summary and Explanation of the Final Rule, 1992. Available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=PREAMBLES&p_id=1041 (accessed June 6, 2013).

Department of Defense, *TMS-1300 Structures to Resist the Effects of Accidental Explosions*, and the American Petroleum Institute (API) Recommended Practice (RP) 520: *Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries.*[133] Unlike other regulators such as the HSE, OSHA has not compiled a comprehensive list of good practices, or RAGAGEPs, for companies to utilize during operations, and the CSB has only identified two OSHA Letters of Interpretation regarding implementation of RAGAGEP in PSM. According to CCPS, "[o]rganizations lack a thorough understanding of recognized and generally accepted good engineering practices and are inconsistent in interpreting and applying them."[134] In addition, key PSM elements such as PHA, incident investigation, and MOC do not reference RAGAGEP, and have not kept up to date with good practice guidelines, including CCPS' *Guidelines for Risk Based Process Safety*, which addresses 20 PSM elements for process safety, including human factors, workforce involvement, and safety culture.

Historically, OSHA has primarily enforced[135] RAGAGEP reactively, and may cite companies for violations of RAGAGEPs following an incident. For example, following the BP Texas City Refinery incident, OSHA issued BP hundreds of citations, some of which covered BP's willful violations of API 520 and the *American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code*, both considered by OSHA to be RAGAGEPs. Following the Chevron incident, California's Division of Occupational Safety and Health (Cal/OSHA) issued Chevron two willful citations for allegedly not complying with API RP 939(c), *Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries* and Chevron's own internal corrosion mitigation plan as RAGAGEPs (this will be discussed in greater detail in Section 5.1.2.2).

3.2.2.3.2 U.S. Environmental Protection Agency Risk Management Program

Section 301(r) of the CAAA called for EPA to develop regulations related to the prevention and detection of accidental releases for regulated substances, including requiring owners or operators of stationary sources that have regulated substances present to prepare and implement a "risk management plan to detect and prevent or minimize accidental releases of such substances from the stationary source…"[136] The risk management plan would require a "hazard assessment to assess the potential effects of an accidental release of any regulated substance."[137] In 1996, EPA promulgated the Risk Management Program regulations at 40 CFR Part 68, which went into effect in 1999.

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[133] All three are cited in OSHA Letter of Interpretation. *Applicability of the PSM standard's mechanical integrity requirements to refinery structures*, February 1, 2010. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27443 (accessed June 6, 2013).
[134] CCPS. *Guidelines for Risk Based Process Safety*. 2007; p 2.
[135] An exception to this would be OSHA's NEP that was implemented from 2007 to 2011, where OSHA inspectors cited to RAGAGEP following NEP audits.
[136] Clean Air Act Amendments of 1990. Section 301(r)(7)(B)(ii). November 5, 1990. *See* http://www.epa.gov/air/caa/caaa.txt (accessed May 10, 2013).
[137] Clean Air Act Amendments of 1990. Section 301(r)(7)(B)(ii)(I). November 5, 1990. *See* http://www.epa.gov/air/caa/caaa.txt (accessed May 10, 2013).

The EPA's Risk Management Program requires facilities that contain more than the threshold quantity of any of the 77 listed toxic chemicals or 63 flammable substances[138] to prepare and submit to the regulating agency emergency contact information, descriptions of processes and hazardous chemicals onsite, an accident history, and worst-case release scenarios.[139] The regulation defines three different Program levels (Program 1, 2, or 3) based on a process unit's potential for impact to the public and the requirements to prevent accidents.[140] Program 3 processes are subject to additional, more stringent requirements to prevent accidents similar to those of the OSHA PSM standard. Program 3 facilities must implement elements of a prevention program, including: process safety information (PSI), PHA, standard operating procedures (SOPs), training, mechanical integrity, compliance audits, incident investigations, MOC, pre-startup reviews, employee participation, and hot work permits. These prevention program elements are based primarily on the OSHA PSM standard, and much of the language contained in each element is identical to the PSM standard. As such, the Risk Management Program regulations contain the same RAGAGEP requirements for mechanical integrity and PSI as the OSHA PSM standard for covered facilities. For example, 40 CFR §68.48 requires an owner or operator to "ensure that the process is designed in compliance with recognized and generally accepted good engineering practices [RAGAGEP]."[141] Like OSHA, the EPA is able to cite facilities for failure to comply with RAGAGEP following an incident, but does not maintain a list of RAGAGEPs for reference.

Finally, each covered facility must submit a risk management plan (RMP) to EPA for all covered processes[142] and update and resubmit these plans at least once every five years, or whenever a major accident occurs or the emergency contact information changes. Completing and submitting the RMP satisfies the regulatory requirement; again, the effectiveness of the RMP in risk reduction is not assessed by the EPA, rendering this another activity-based requirement for a covered facility. There is no approval of the RMP by the EPA, and there is no additional duty on the facility to implement what it says it is doing in the RMP, unlike the safety case regulatory regime.

Any facility with one or more covered processes must include in its RMP an executive summary the registration for the facility; the certification statement; a worst-case scenario for each process involving flammables or toxics; the five-year accident history for each process; information concerning emergency response at the facility; at least one alternative release scenario analysis for each regulated toxic substance or flammable; a summary of the prevention program for each Program 2 process; and a summary of the prevention program for each Program 3 process.[143]

The CSB found in its BP Texas City Investigation Report that as of March 2007, the RMP regulation had focused primarily on reviewing the submitted RMPs and required updates by covered facilities. The EPA

[138] According to 40 CFR §68.10(a), "[a]n owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process, as determined under §68.115, shall comply with the requirements of this part no later than the latest of the following dates…"
[139] *See* 40 CFR §68.12. General Requirements.
[140] *See* 40 CFR §68.10. Applicability.
[141] 40 CFR §68.48(b) (1999). Additionally *see* 40 CFR §68.56 (d) which requires the owner or operator's inspection and testing procedures to "follow recognized and generally accepted good engineering practices."
[142] 40 CFR §68.150 (1999).
[143] EPA Office of Solid Waste and Emergency Response. *General Guidance on Risk Management Programs for Chemical Accident Prevention (40 CFR Part 68);* March 2009; pp 9-1 and 9-2. *See* http://www.epa.gov/osweroe1/docs/chem/Toc_final.pdf (accessed May 14, 2013).

Office of Inspector General (OIG) concluded in 2009 that over half of the RMP-covered facilities identified in the US as high-risk[144] had never received an on-site inspection or audit, and over 65 percent of all active RMP facilities had not received an on-site inspection or audit since inception of the RMP program in 1999.[145] The EPA OIG also noted that of the 296 uninspected high-risk facilities managed by EPA, 151 of these could each impact 100,000 people or more in a worst-case accident scenario.[146]

3.2.2.3.3 Safety Case in the United States

In contrast to its mainly activity-based regulation of hazardous chemicals, including oil and gas operations, the US has adopted a more goal-based regulatory approach for its nuclear and aeronautics and space science sectors. The U.S. Nuclear Regulatory Commission (NRC) was an early adopter of goal or performance-based regulation, which it defines as "[a] regulatory approach that focuses on desired, measureable outcomes, rather than prescriptive processes, techniques, or procedures…[and] leads to defined results without specific direction regarding how those results are to be obtained."[147] According to the NRC, performance-based regulations permit licensees to "have flexibility to determine how to meet the established performance criteria in ways that encourage and reward improved outcomes."[148] The NRC's Reactor Oversight Process, the means by which it achieves its mission of public health and safety in commercial nuclear power plant operations, is its primary performance-based regulation.[149] It uses seven "cornerstones," such as mitigating systems and barrier integrity, to monitor three performance areas (reactor safety, radiation safety, and security safeguards).[150] Licensee performance data, inspection plans, quarterly assessments, and assessment and inspection responses are tied to each performance area and several cross-cutting objectives, such as worker involvement and human performance.[151] Licensees are permitted to choose the precise methods they use to meet overarching performance goals, which are guided by their duty to reduce risks to as low as

The NRC and NASA both implement safety case regulatory approaches in the US to regulate their respective highly hazardous activities.

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[144] A high-risk facility is one that meets one of more of the following characteristics established by the EPA Office of Emergency Management: 1) Facilities whose reported RMP worst-case scenario population exceeds 100,000 people; 2) Any RMP Program facility with a hazard index greater than or equal to 25; and/or 3) Facilities that have had one or more significant accidental releases within the previous five years. *See* "EPA Office of Inspector General, "Improvements Needed in EPA Training and Oversight for Risk Management Program Inspections." March 21, 2013; Page 5. Available at http://www.epa.gov/oig/reports/2013/20130321-13-P-0178.pdf (accessed June 11, 2013).

[145] EPA OIG. *Evaluation Report: EPA Can Improve Implementation of the Risk Management Program for Airborne Chemical Releases;* February 10, 2009; p 15.

[146] *Ibid.*

[147] *See* NRC Glossary, available at http://www.nrc.gov/reading-rm/basic-ref/glossary/performance-based-regulation.html (accessed June 10, 2013).

[148] US NRC NUREG/BR-0303. Guidance for Performance-Based Regulation (2002). http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0303/br0303.pdf (accessed June 13, 2013).

[149] http://www.nrc.gov/about-nrc/regulatory/risk-informed/concept/performance.html#example (accessed June 13, 2013).

[150] NRC Reactor Oversight Process publication (2006), available at http://pbadupws.nrc.gov/docs/ML0708/ML070890365.pdf (accessed June 13, 2013).

[151] NRC Reactor Oversight Process publication (2006), available at http://pbadupws.nrc.gov/docs/ML0708/ML070890365.pdf (accessed June 13, 2013).

reasonably achievable, or ALARA.[152,153] The NRC has stated that this flexibility is one of the main reasons that its regulatory philosophy encourages continuous improvement.[154]

The National Aeronautics and Space Administration (NASA) has the goal of implementing a safety system that is "as safe as reasonably practicable," or ASARP,[155] which it considers to be closely related to ALARP. NASA relies on a risk-informed safety case, or RISC,[156] to ensure that the system's safety objectives, goals, and thresholds have been achieved, and that safety risk is as low as possible within reasonable impacts on cost, schedule, and performance.[157]

[152] US NRC NUREG/BR-0303, Guidance for Performance-Based Regulation (2002). http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0303/br0303.pdf (accessed June 13, 2013).
[153] ALARA "means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest." 10 CFR §20.1003 (2007).
[154] US NRC NUREG/BR-0303, Guidance for Performance-Based Regulation (2002). http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0303/br0303.pdf
[155] NASA defines ASARP as "a fundamental principle of adequate safety. A determination that a system is ASARP entails weighing its safety performance against the sacrifice needed to further improve it. The system is ASARP if an incremental improvement in safety would require a disproportionate deterioration of system performance in other areas." NASA/SP-2010-580, *NASA System Safety Handbook, Volume 1, System Safety Framework and Concepts for Implementation;* November 2011; p 5.
http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20120003291_2012003429.pdf (accessed June 10, 2013).
[156] NASA defines RISC as "a structured argument, supported by a body of evidence that provides a compelling, comprehensive and valid case that a system is or will be adequately safe for a given application in a given environment. This is accomplished by addressing each of the operational safety objectives that have been negotiated for the system, including articulation of a roadmap for the achievement of safety objectives that are applicable to later phases of the system life cycle. The term 'risk-informed' is used to emphasize that a determination of adequate safety is the result of a deliberative decision making process that necessarily entails an assessment of risks and tries to achieve a balance between the system's safety performance and its performance in other areas." *Ibid* at 13.
[157] *Ibid* at xiii.

4.0 Key Features of an Effective Safety Case Regulatory Regime

Following the Macondo disaster, the National Commission on the Macondo Oil Spill and Offshore Drilling[158] made a recommendation in its *Report to the President*[159] for the US to "develop a proactive, risk-based performance approach specific to individual facilities, operations and environments, similar to the 'safety case' approach in North Sea."[160] Despite the major potential hazards that are present in both onshore and offshore oil and gas operations, the safety case regime has not been implemented in the US for either sector. The US has instead implemented for major hazards at onshore facilities a more activity-based approach, resulting in static regulations such as the PSM and RMP regulations that have not seen significant improvements[161] since their inception, despite advances in technology and good industry practice.

According to Dr. Hopkins and other renowned experts in the field, it is essential for an effective major accident prevention safety regime to take the form of a safety case, with adaptable goal-setting regulations that facilitate innovation and sustainability, and that drive industry to continuously improve and reduce risks to ALARP. To accomplish this, the regime must utilize sufficient numbers of highly competent personnel to effectively collect or promote industry use of process safety indicators[162] and to provide knowledgeable oversight of industry operations.

The CSB has determined that there are several key features of an effective major accident prevention regulatory approach such as the safety case regime:

- Duty Holder Safety Responsibility, including a Written Case for Safety
- Continuous Risk Reduction to ALARP
- Adaptability and Continuous Improvement
- Active Workforce Participation
- Process Safety Indicators that Drive Performance
- Regulatory Assessment, Verification, and Intervention; and an
- Independent, Competent, Well-Funded Regulator

As will be discussed in Section 5, California's patchwork of regulations does not effectively implement these features, which are also illustrated in the figure below. Section 4 provides a detailed discussion of these features.

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[158] President Barack Obama established the National Commission on the BP Macondo Oil Spill and Offshore Drilling through Executive Order 13543 on May 21, 20130 to examine the facts and circumstances concerning the root causes of the Macondo explosion and fire. For more information *see* http://www.oilspillcommission.gov/page/about-commission (accessed June 17, 2013).

[159] Available at http://www.oilspillcommission.gov/final-report (accessed June 17, 2013).

[160] National Commission on the BP Macondo Oil Spill and Offshore Drilling. *Report to the President: Deep Water, The Gulf Oil Disaster and the Future of Offshore Drilling;* January 2011; 252.

[161] OSHA did implement changes to 29 CFR §1910.106, creating a new Hazard Communication Standard. However, no changes have been made that impact the management of process safety under PSM. *See* https://www.osha.gov/dsg/hazcom/ (accessed August 6, 2013).

[162] Process safety indicators are also referred to as performance indicators, metrics, key process indicators (KPI), performance measures, indicators, etc.

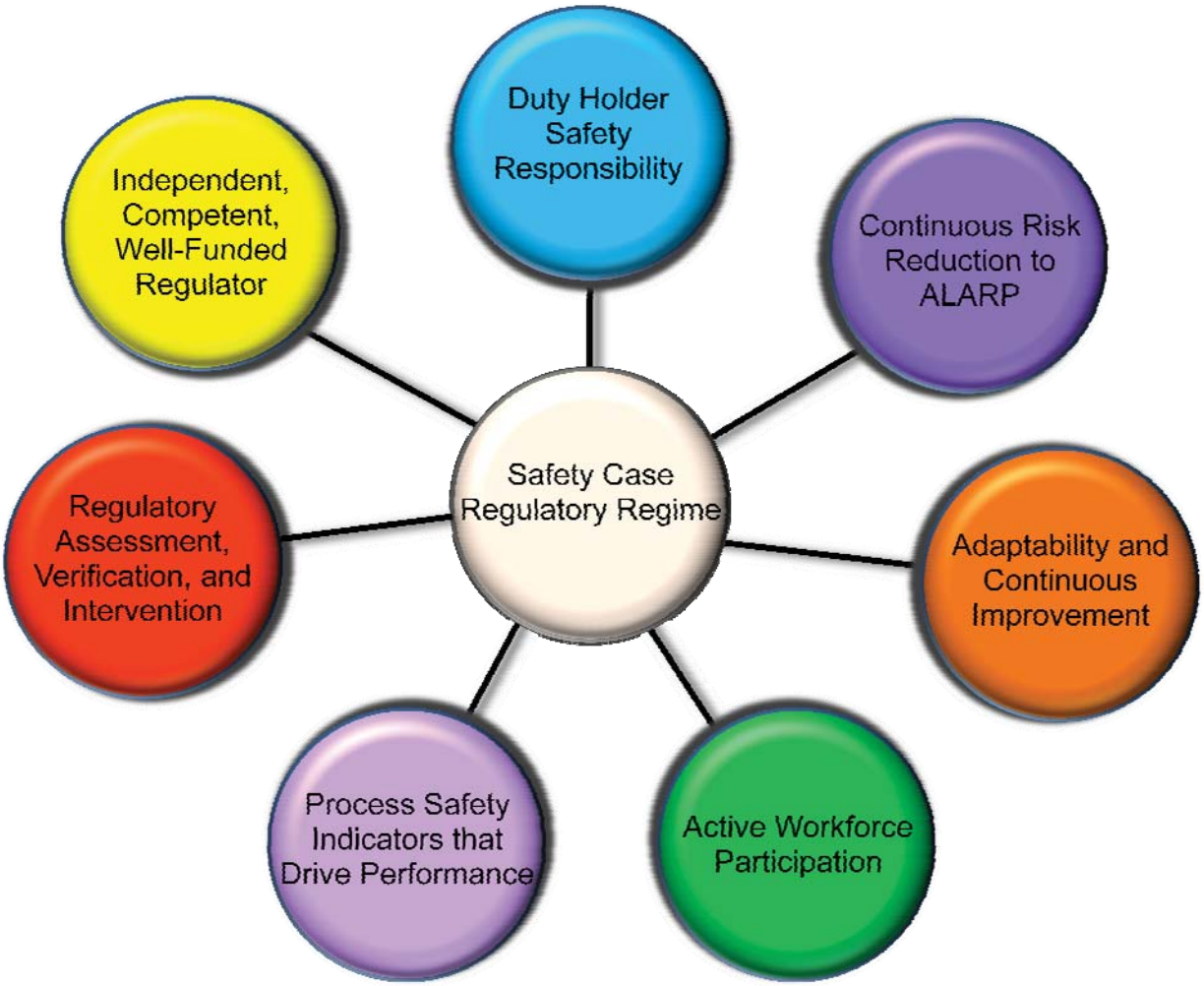

Figure 1. Safety Case Attributes.

4.1 Duty Holder Safety Responsibility, including a Written Case for Safety

Under the safety case regulatory regime, each individual company is responsible for the safety of each hazardous facility. The onus is on the duty holder[163] to prove to the regulator that the company's processes, methodologies used to assess risks, and reasoning for choosing one control over another have substantially reduced risks to as low as reasonably practicable (ALARP), or equivalent. The duty holder

[163] Duty holders are considered to be "those who create and/or have the greatest control of the risks associated with a particular activity. Those who create the risks at the workplace are responsible for controlling them." HSE. *Planning to do business in the UK offshore oil and gas industry? What you should know about health and safety;* October 2011; 2. http://www.hse.gov.uk/offshore/guidance/entrants.pdf (accessed June 5, 2013). These entities may include operators, contractors, and subcontractors. According to NOPSEMA, the idea is that those who create the risk must manage it. *See* http://www.nopsema.gov.au/safety/safety-case/what-is-a-safety-case/ (accessed July15, 2013).

is required to prepare a written case for safety[164] ("safety case report") that identifies the hazards and risks and describes how they will be reduced to ALARP. The HSE has noted that the safety case report "demonstrates that the duty holder has arrangements in place which, if implemented, are capable of achieving compliance with legal objectives set out in other [] regulations…[and] provides a comprehensive core document that can be used as a check by both the duty holder and HSE that the accepted risk control measures and the health and safety management systems are in place and operate as they should."[165] The HSE has also stated:

> [t]he principal matters to be demonstrated in a safety case are that: a) the management system is adequate to ensure compliance with statutory health and safety requirements; and for management of arrangements with contractors and sub-contractors, b) that adequate arrangements have been made for audit and for audit reporting, [and] c) that all hazards with the potential to cause a major accident have been identified, their risks evaluated, and measures have been, or will be, taken to control those risks to ensure that the relevant statutory provisions will be complied with.[166]

The safety case report must also demonstrate "how inherently safer design concepts have been applied in the design decisions taken."[167] This principle applies to all stages of the installation's life cycle, and includes materials selection and managing corrosion in the design.

The written safety case report is an evergreen document that must be reviewed and revised so that it reflects the existing hazards.

It is also important to note that safety case reports are meant to be evergreen documents that reflect continuous improvement in risk reduction. For onshore operations in the UK, the duty holder is required to review the safety case report during the construction of a new facility, whenever new facts or technical knowledge about safety matters become known, or whenever the operator makes a change to the safety management system that could have significant impacts on the prevention of major accidents.[168] The duty holder must revise the safety report to ensure that it "remains up to date and continues to provide an accurate representation of the major accident hazards…and the measures in place to control them."[169] According to HSE guidance

[164] The HSE defines "safety case" as "a document that gives confidence to both the duty holder and HSE that the duty holder has the ability and means to control major accident risks effectively. It provides an extra level of regulatory control on top of regulations such as the Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995 (PFEER) and the Offshore Installations and Wells (Design and Construction, etc) Regulations 1996 (DCR), justified by the major accident potential of the offshore activities within scope." HSE. *A Guide to the Offshore Installations (Safety Case) Regulations 2005: Guidance on Regulations;* 2006; p 6.
[165] HSE. *A Guide to the Offshore Installations (Safety Case) Regulations 2005: Guidance on Regulations*; 2006; p 6. http://www.hse.gov.uk/pubns/priced/l30.pdf (accessed November 13, 2013).
[166] HSE. *Assessment Principles for Offshore Safety Cases (APOSC);* March 2006; p 7. http://www.hse.gov.uk/offshore/aposc190306.pdf (accessed August 6, 2013).
[167] *Ibid* at 16.
[168] COMAH Regulations, Part 3, Regulation 8 (1) (a)(b) and (c) (1999).
[169] The Competent Authority. *Revised guidance for operators of top tier COMAH establishments. Review and revision of COMAH safety reports.* December 2009; p 5. http://www.hse.gov.uk/comah/report-review.pdf (accessed November 26, 2013).

on the offshore Safety Case Regulations, safety case reports are "intended to be living documents, kept up to date and revised as necessary during the operational life of the installation."[170]

In order for the facility to begin operation or remain in operation, the regulator must "accept" [171] the facility's safety case report; however, the regulator's acceptance of a safety case does not license the facility or installation as "fit,"[172] nor does it shift the duty of risk control and reduction away from the facility owner or operator and onto the regulator; rather, the duty of major accident prevention and risk reduction to ALARP remains with the duty holder throughout the life of the facility. Following the regulator's acceptance of the safety case report, the duty holder must ensure that the installation is operated in conformity with the management system and other provisions described in the safety case.[173]

In the US, facilities commence operation before they are inspected or evaluated for complying with PSM or RMP regulations. In fact, the CSB has investigated incidents where the employer disputed tthat its process was covered by the PSM standard or RMP. Regulators do not evaluate and approve PHAs or other hazard reviews and do not have the authority to license specific facilities for operation, based on the adequacy of their process safety programs. If an operating facility contains processes covered by PSM, the facility must complete mostly activity-based regulatory requirements at least once every five years. Under the PSM standard the employer has no general duty to continually reduce risk or prevent the occurrence of a catastrophic accident. RMP-covered facilities must submit fairly high-level information exhibiting compliance with RMP requirements at least once every five years. While the regulator ensures the RMP has been filed and contains the required sections, there is no analysis of the effectiveness of controls identified in the RMP to mitigate hazards.

4.2 Continuous Risk Reduction to ALARP

As discussed above, a majority of the safety case regimes implemented globally impose a duty on owners or operators of covered facilities on and offshore to reduce risks to ALARP or equivalent. The Center for Chemical Process Safety (CCPS) defines ALARP as "a risk reduction goal, where risk reduction efforts are continued until the incremental effort to further reduce risk becomes grossly disproportionate to the level of additional risk reduction."[174] This principle provides the regulator with the main foundation on which to accept or reject a safety case report. In essence, the regulator ultimately determines whether ALARP has been achieved through the authority to accept or reject the safety case report. An advantage

[170] HSE. *A Guide to the Offshore Installations (Safety Case) Regulations 2005: Guidance on Regulations;* 2006; p 7. http://www.hse.gov.uk/pubns/priced/l30.pdf (accessed May 7, 2013).
[171] "Acceptance requires satisfaction with the duty holder's approach to identifying and meeting health and safety needs…HSE 'accepts' the validity of the described approach as being capable, if implemented as described, of achieving the necessary degree of risk control, but HSE does not confirm the outcomes of that approach." Therefore, "HSE will accept a safety case or a revision…when duty holders demonstrate and describe specified matters to HSE's satisfaction. Acceptance will be based on HSE's judgment that the arrangements and measures described in the safety case taken as a whole are **likely** to achieve compliance if implemented as described. To give acceptance HSE does not need to be satisfied that compliance **will** be achieved…" *Ibid* at 6.
[172] TAF Powell, SPE, UK Health & Safety Executive. *US Voluntary Semp Initiative: Holy Grail or Poisoned Chalice?* Proceedings of the Offshore Technology Conference, Houston, Texas, May 8-9, 1996; p 8.
[173] *Ibid* at 7.
[174] Center for Chemical Process Safety (CCPS). *Inherently Safer Chemical Processes – A Life Cycle Approach;* 2nd ed., 2009; p 46.

of ALARP as opposed to a prescriptive or activity-based approach is that ALARP should result in the continuous reduction of risk and is not predicated on a specific risk acceptance target.[175]

In reviewing the safety case report, the regulator may accept the application of relevant good practice as a sufficient demonstration of ALARP.[176] As the HSE notes, "the measures in place to prevent or limit major accidents should be described in the safety report and be at least to 'relevant good practice.'"[177] According to Dr. Hopkins, the duty of ALARP "provides leverage for the regulator…[i]f an operator wishes to adopt a procedure or a standard that falls short of good or best practice, the regulator can reject it on the grounds that it does not reduce the risk as low as reasonably practicable."[178] As noted above, regulators such as HSE provide guidance on what is considered good practice, and publish documents containing good practice standards to assist operators with applying this concept. However, the duty holder must make the case for the standard or practice being utilized, and the regulator may determine that applying good practice alone is not sufficient to demonstrate that risks have been reduced to ALARP. In addition, if there is no directly applicable rule or standard, operators still have a duty to manage risk, and they therefore must maintain a reasonable level of risk awareness that goes beyond mere compliance.[179] This raises a safety case regime above the compliance mentality of a more activity-based regime, such as PSM, and requires the duty-holder and the regulator to continuously ask whether there are other measures that would be effective in further reducing risks.

Risk reduction to ALARP requires at least a demonstration of relevant good practice. The regulator may require the duty holder to implement additional controls if they result in further risk reduction.

The UK HSE provides ample guidance on determining what is considered to be ALARP, and many British courts have interpreted the concept as well. In the 1949 case *Edwards v. National Coal Board*, decided by the Court of Appeal, Judge Asquith wrote:

> 'Reasonably practicable' is a narrower term than 'physically possible' and seems to me to imply that a computation must be made by the owner, in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other; and that if it be shown that there is a gross disproportion between them – the risk being insignificant in relation to the sacrifice – the defendants discharge the onus on them.[180]

While some critics in the US have argued that the determination of ALARP is strictly a quantitative risk assessment (QRA) calculation that is not sufficiently protective, the CSB has found that the evaluation of ALARP has evolved, as the HSE now allows reliance upon qualitative assessments, QRA, and semi-

[175] *See* http://www.hse.gov.uk/foi/internalops/hid_circs/permissioning/spc_perm_37/ (accessed December 9, 2013).
[176] HSE. *Assessing compliance with the law in individual cases and the use of good practice;* May 2003. http://www.hse.gov.uk/risk/theory/alarp2.htm (accessed June 12, 2013).
[177] HSE. *Guidance on ALARP Decisions in COMAH.* http://www.hse.gov.uk/foi/internalops/hid_circs/permissioning/spc_perm_37/ (accessed November 26, 2013).
[178] Hopkins, Andrew. *The Meaning of "Safety Case";* February 2013; p 6.
[179] Hopkins, Andrew. *The Meaning of "Safety Case";* February 2013; p 6.
[180] *Edwards,* [1949] 1 K.B. at 704.

quantitative risk assessments to determine ALARP.[181] According to the HSE, essential considerations for determining whether a duty holder has reduced risks to ALARP include "the adoption of inherently safer designs…"[182] and "[i]dentification of possible further measures that could be applied to lower the risk."[183] The HSE also notes that the guidance to COMAH Regulation 4 (General Duty) "describes the application of all measures necessary to reduce risk of a major accident to ALARP based on a hierarchical approach (inherent safety, prevention, control, mitigation)."[184] In Norway, PSA requires companies to "select technical, operational and organisational solutions that reduce the probability that harm, errors and hazard and accident situations occur."[185] PSA regulations require companies to choose the solutions that offer the best results, provided the costs are not significantly disproportionate to the risk reduction achieved.[186] In Australia, the NOPSEMA enforces the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* and its regulations, which imposes a duty of care on the operator of a facility to "take all reasonably practicable steps" to ensure the facility is safe and all work and other activities are "carried out in a manner that is safe and without risk to the health of any person at or near the facility."[187] NOPSEMA explains that to achieve ALARP, the company "has to show, through reasoned and supported arguments, that there are no other practical measures that could reasonably be taken to reduce risks further."[188]

In the US, the NRC has "gradually revised its original scheme, giving an increasing importance to the 'economic and social factors', in particular the involvement of all 'stakeholders' (authorities, management, staff, public) in the ALARA process."[189] For the regulator, the focus for whether ALARA

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[181] Center for Chemical Process Safety (CCPS) guidance on risk assessment implies that as the predicted consequence of potential hazard scenarios increases, the level of analytical detail should also increase. Risk assessment approaches range in order of increasing analytical detail from qualitative, to semi-quantitative, to quantitative. Qualitative risk assessment is the simplest approach where judgments about consequence, likelihood, and the tolerability of risk are made on a subjective basis using the knowledge and experience of team members and may not be consistently applied within an organization. Semi-quantitative risk assessment is the second level of analytical detail, where organizations develop and provide to team members predetermined risk matrices and guidance for establishing numerical consequence and frequency levels. This approach is of greater value to team members as based upon their collective experience; the team typically has a sense of how frequently an event might occur and how great the potential consequence may be within the predetermined ranges. Layer of protection analysis (LOPA) is a semi-quantitative form of risk assessment, using order of magnitude categories for evaluating frequency, consequence, and adequacy of safeguards. Quantitative risk assessment involves the highest level of analytical detail and typically involves specialized expertise to perform. Complex models are commonly developed to evaluate frequency, consequence, and the effectiveness of safeguards in a quantitative risk assessment. Such approaches are typically standardized to minimize result variability within an organization and even between organizations in countries where a quantitative risk assessment is mandated by regulatory authorities. Center for Chemical Process Safety (CCPS). *Guidelines for Developing Quantitative Safety Risk Criteria;* August 2009.
[182] HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 30. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013).
[183] *Ibid* at 8.
[184] *Ibid* at 8.
[185] Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations). Section 11, Risk Reduction Principles. http://www.ptil.no/framework-hse/category403.html (accessed November 26, 2013).
[186] *Ibid.*
[187] Offshore Petroleum and Greenhouse Storage Act 2006, Volume 3, Schedule 3, Clause 9. http://www.comlaw.gov.au/Details/C2012C00148/Html/Volume_3#_Toc315688204 (accessed October 30, 2013).
[188] ALARP Guidance Note N-04-300-GN0166, Rev. 3 (Dec. 2011) available at http://www.nopsema.gov.au/assets/document/N-04300-GN0166-ALARP.pdf (accessed May 15, 2013).
[189] Fasso, Alberto, and Rokni, S. *Operational Radiation Protection in High Energy Physics Accelerators. Implementation of ALARA in Design and Operation of Accelerators.* May 2009; p 6.

has been achieved is on "processes, procedures, and judgments."[190] The duty holder must ensure that choices made to achieve ALARA are "fully documented together with the criteria which have brought to those choices. When the criteria are qualitative, it is more likely that subjective judgments play a large role, but those judgments must be equally recorded."[191]

There is no corresponding duty to reduce risks to ALARP in the PSM standard or RMP program. Rather, these regulations require that facilities "control" identified hazards, with no further dialogue on how far the operator must go to control those hazards. Neither the facility nor the regulator is required to determine whether more could be done to control hazards or reduce risks to comply with these regulations, and this may result in the implementation of insufficient controls relating to a hazard.

While OSHA and the EPA do rely on general duty standards when implementing the PSM standard and the RMP program, these duties do not drive onshore companies toward reducing the risks of their activities to ALARP, and instead are utilized as enforcement tools typically after an incident has occurred, meant to cover those activities not specifically regulated. These standards may also be used by OSHA or EPA to cite a company for not following a specific RAGAGEP for 2 of the 14 process safety elements - mechanical integrity and PSI.

OSHA enforces section 5(a) of the Occupational Safety and Health Act (OSHAct), which states the following:

> (a) Each employer –
>
> > (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
> >
> > (2) shall comply with occupational safety and health standards promulgated under this act…[192]

Section 5(a)(1), also known as OSHA's General Duty Clause, has been described as a "catch-all" provision meant to fill gaps in OSHA law for recognized unregulated hazards.[193,194] In order for OSHA to issue a General Duty Clause violation, the hazard must be recognized, the employer must have failed to keep the workplace free of the hazard to which his or her employees were exposed, a practical method must be available to correct the hazard, and the hazard must be causing or likely to cause death or serious injury.[195] This duty would thus only apply if the absence or failure of one control in a series of controls makes an accident *likely* to occur (emphasis added).

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[190] *Ibid* at 6.
[191] *Ibid* at 6 and 7.
[192] 29 U.S.C. §654(a)(1) and (2) (2004).
[193] Morrison, Kyle W. *The General Duty Clause: What is it, how does OSHA use it and what should employers know?* Safety + Health [Online]; May 1, 2011. http://www.nsc.org/safetyhealth/Pages/5%2011%20The%20General%20Duty%20Clause.aspx (accessed June 5, 2013).
[194] According to the National Safety Council, General Duty Clause violations make up only about 1.5 percent of total violations issued annually by OSHA. Available at http://www.nsc.org/safetyhealth/Pages/5%2011%20The%20General%20Duty%20Clause.aspx (accessed June 5, 2013).
[195] *Ibid.*

On the other hand, in a safety case regulatory regime, the regulator proactively reviews identified hazards and risk reduction strategies proposed by the operator to ensure that risks are being reduced to ALARP. The regulator may require the installation of an absent control if such a control is considered good industry practice, or if it goes further in reducing risks to ALARP. This is a key feature of the safety case approach in preventing major accidents.

Under the CAA, the General Duty Clause requires owners and operators "to identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur."[196] Similar to OSHA, the EPA can use its General Duty Clause enforcement authority to create legally binding requirements or enforce actions for hazards that have not been specifically regulated. The EPA can use this authority proactively (before an incident) or reactively (following an incident), and can enforce the clause where it finds the possibility of imminent and substantial endangerment.[197]

According to EPA guidance on the RMP program, because it is the owner or operator's duty to "prevent accidents and ensure safety at [their] source…" this may require steps to be taken "beyond those specified in the risk management program rule."[198] While this principle appears to be similar to ALARP requirements of the safety case, in practice whether this is done is not subject to regulation or review. In addition, it is permissive in that it uses the word "may." Nothing additional, such as ALARP, is required. This will be addressed below in more detail in the discussion of implementation of the EPA RMP program in California.

4.3 Adaptability and Continuous Improvement

A key strength of the safety case regulatory regime is that it provides the regulator with the tools to drive continuous improvement among facilities and ensure risks have been reduced to ALARP or equivalent, rather than focusing on compliance with activity-based regulatory requirements. Although complying with good practice may achieve ALARP, the regulator also has the ability under this regime to require facilities to go above and beyond good practices and standards to achieve ALARP without requiring rulemaking. The Baker Panel[199] noted in its 2007 report (the Baker Report) on BP and its process safety performance following the 2005 BP Texas City disaster that an effective process safety management system builds upon an "improvement cycle" that "should include, in practice, continuous reduction of process risk and improvements in safety performance according to some measurable criteria."[200]

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[196] 42 U.S.C. §7412(r)(1) (1990).
[197] 42 U.S.C. §7412(r)(9) (1990).
[198] EPA Office of Solid Waste and Emergency Response. *General Guidance on Risk Management Programs for Chemical Accident Prevention (40 CFR Part 68);* March 2009; p 7-7. http://www.epa.gov/osweroe1/docs/chem/Toc_final.pdf (accessed May 14, 2013).
[199] In the aftermath of the BP Texas City Incident, BP followed the recommendation of the CSB and formed an independent panel known as the Baker Panel to conduct a thorough review of the company's corporate safety culture, safety management systems, and corporate safety oversight at its US refineries. For a copy of their findings and recommendations *see* http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/SP/STAGING/local_assets/assets/pdfs/Baker_panel_report.pdf (accessed August 13, 2013).
[200] Baker, J. *The Report of the BP U.S. Refineries Independent Safety Review Panel*, 2007; p 166.

The Baker Panel defined "continuous improvement" as

- improving controls for process hazards, including process safety knowledge and competence of workers;
- improving process safety leadership of supervisors;
- improving process engineering to identify and then design to remove or mitigate the effects of process hazards;
- going beyond legal compliance to best practices to reduce risks;
- going beyond mere compliance with internal standards, but learning from operating experiences, incident and near miss investigations, hazard studies, audits, and other assessments to improve those internal standards; and
- identifying and implementing not only those external standards that must be observed, but also those that represent best practices that can lead to process safety excellence.[201]

An independent review conducted of the Australian offshore safety case regime in 2000 echoes the importance of continuous improvement in process safety management, stating that "critical to the successful implementation of a safety case regime is the achievement of a qualitative shift in industry and regulatory safety cultures from the minimalist compliance of the prescriptive regime to the philosophy of best practice and continuous improvement."[202] Recently, Lord Cullen addressed the importance of adaptability as well, when he spoke at the 2013 Oil & Gas UK Piper 25 offshore safety conference in Aberdeen, Scotland.[203] In his keynote speech, Lord Cullen quoted the Maitland panel, which examined the UK offshore safety regime after the Macondo incident, noting that "safety cases should be *living documents* [emphasis added] central to the way facilities are operated, with contents widely understood."[204]

As changes to regulatory requirements necessitate an extensive, lengthy rulemaking process in the US,[205] process safety-related regulations can remain static for decades, while industry standards (many of which are voluntary under the current US system), technologies, and improved procedures and practices continue to change and advance, and new chemicals come into production. In light of major accidents that have occurred, such as the BP Texas City explosion and fire which resulted in 15 fatalities, and the

[201] Baker, J. *The Report of the BP U.S. Refineries Independent Safety Review Panel*, 2007; p 166.
[202] Department of Industry, Science and Resources; Offshore Safety and Security, Petroleum and Electricity Division. *Australian Offshore Petroleum Safety Case Review: Report of the Independent Review Team.* 2000; p 33.
[203] In June 2013, Oil & Gas UK held a large offshore safety conference in Aberdeen, which marked the 25th anniversary of the Piper Alpha disaster. For more information *see* http://www.oilandgasuk.co.uk/events/Piper25.cfm?frmAlias=/Piper25/ (accessed September 16, 2013).
[204] Finding Petroleum. *Review: Lord Cullen – what have we learned from Piper Alpha?* September 16, 2013. http://www.findingpetroleum.com/n/Review_Lord_Cullen_what_have_we_learned_from_Piper_Alpha/044b5113.aspx (accessed September 16, 2013).
[205] 5 U.S.C. Chapter 5, sections 511-599, also known as the Administrative Procedure Act, or APA, requires that federal agencies seeking to promulgate a rule or regulation submit to a lengthy notice and comment rulemaking process that includes publishing the proposed rule making in the *Federal Register;* providing the public with at least 30 days to participate in the rulemaking process by submitting written comments or data, and then discussing the public comments and providing a rationale for accepting or rejecting them. The OSHAct Section 6(b) specifies the procedures OSHA must use to promulgate, modify, or revoke its standards (29 U.S.C. §655(b)). These procedures include publishing the proposed rule in the *Federal Register*, providing interested persons an opportunity comment, and holding a public hearing upon request.

Motiva Enterprises sulfuric acid tank explosion, which fatally injured one worker and injured eight others, the CSB has made a number of key recommendations to OSHA and the EPA to revise the PSM and RMP regulations, respectively. However, agencies have failed to implement these recommendations and these regulations have remained static despite the important lessons learned from these incidents. In addition, the OSHA PSM standard's Appendix A, which contains a list of toxic and reactive highly hazardous chemicals and the threshold quantity for each, was originally created using a number of older sources, including the EPA's "Extremely Hazardous Substance List," the 1982 Seveso Directive, the 1984 CIMAH regulations, and others. A number of these sources have been revised, updated, and amended throughout the years, while Appendix A has not. In fact, no chemicals have been added to either the PSM or the RMP programs since the rules were initially adopted in the 1990s, even as numerous serious process incidents occurred involving chemicals that were not listed.

The U.S. Government Accountability Office (GAO) published a 2012 report on OSHA's standard setting abilities, which noted that between 1981 and 2010, OSHA took anywhere from 15 months to 19 years to develop and issue 58 significant safety and health standards (averaging seven years).[206] According to the report, OSHA reasoned that it must evaluate technological and economic feasibility of a potential standard using data gathered by visiting worksites in industries that will be affected, on an industry-by-industry basis.[207] This was described as "an enormous undertaking because, for example, it requires visits to multiple worksites."[208] In addition, Executive Order 12866[209] requires that federal agencies, including OSHA, provide an assessment of the potential overall costs and benefits for significant rules to the Office of Management and Budget (OMB). OSHA will typically be required under the Small Business Regulatory Enforcement Fairness Act of 1996[210] to initiate a panel process to receive and consider input from representatives of affected small businesses, which could take eight months or more.[211] Only OSHA, the EPA, and the Consumer Financial Protection Bureau are subject to this requirement.[212] Finally, the OSHAct directs courts to review OSHA's standards using a more stringent legal standard than the Administrative Procedure Act's (APA) "arbitrary and capricious" test[213] when reviewing

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[206] GAO. *Workplace Safety and Health: Multiple Challenges Lengthen OSHA's Standard Setting;* April 19, 2012; p 5. Available at http://gao.gov/assets/600/590210.pdf (accessed June 12, 2013).

[207] *Ibid* at 6. The Supreme Court has held that the OSHAct requires that standards be both technologically and economically feasible. *Am. Textile Mfrs. Inst. V. Donovan*, 452 U.S. 490, 513 n. 31 (1981). *Also see United Steelworkers v. Marshall*, 647 F. 2d 1189, 1301 (D.C. Cir. 1980), quoted in *AFL-CIO v. OSHA*, 955 F. 2d 962, 980 (11th Cir. 1992). Assessing feasibility on an industry-by-industry basis requires that the agency research all applications of the hazard being regulated, as well as the expected cost for mitigating exposure to that hazard, in every industry.

[208] *Ibid* at 6.

[209] Exec. Order No. 12866, 48 Fed. Reg. 190 (September 30, 1993). http://www.whitehouse.gov/sites/default/files/omb/inforeg/eo12866/eo12866_10041993.pdf (accessed June 12, 2013).

[210] 5 U.S.C. §609(b), (d) (1996).

[211] GAO. *Workplace Safety and Health: Multiple Challenges Lengthen OSHA's Standard Setting;* April 19, 2012; p 6. Available at http://gao.gov/assets/600/590210.pdf (accessed June 12, 2013).

[212] 5 U.S.C. §609(d) (1996).

[213] Pursuant to the APA, agency decisions may be set aside only if "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. §706(2)(A). There is abundant case law that discusses this standard. Courts have held that a court "may reverse under the arbitrary and capricious standard only if the agency has relied on factors that Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise. *See Greater Yellowstone Coalition v. Lewis*, 638 F. 3d 1143, 1148 (9th Cir. 2010) (as amended) (relaying on *The Lands Council*

OSHA's standards;[214] an OSHA standard may only be upheld if it is supported by "substantial evidence in the record considered as a whole."[215] According to the GAO report, OSHA officials claim this more stringent standard (known as the "substantial evidence" standard) requires a higher level of scrutiny by the courts and as a result, OSHA staff must conduct a large volume of detailed research in order to understand all industrial processes involved in the hazard being regulated, and to ensure that a given hazard control would be feasible for each process.[216] The GAO also found that although OSHA has the ability to address urgent hazards by issuing emergency temporary standards, the agency has not used this authority since 1983 because of the difficult hurdles the agency faces in presenting the evidence necessary to meet the statutory requirements.[217] In summary, all of these extensive rulemaking constraints have resulted in OSHA's failure to undertake many standard revisions or improvements.

In Spring 2013, OSHA announced its new regulatory agenda, which stated that one of the things OSHA plans to consider is revising the PSM standard to "address gaps in safety coverage."[218] Potential revisions include "expanding coverage and requirements for reactivity hazards," which the CSB addressed in its 2002 report entitled "Improving Reactive Hazard Management,"[219] and "expanding the scope of paragraph (j) to cover the mechanical integrity of any safety-critical equipment…"[220] However, OSHA has proposed changes to the PSM standard before, with no action ultimately being taken. On April 27, 1998, OSHA announced that it was considering issuing an Advance Notice of Proposed Rulemaking[221] (ANPRM) "to address issues related to reactive chemicals raised by the explosion of a chemical plant in

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v. McNair, 537 F.3d 981, 987 (9th Cir. 2008) (en banc), *overruled on other grounds by Winter v. Natural Res. Def. Council*, 555 U.S. 7 (2008)).

[214] GAO. *Workplace Safety and Health: Multiple Challenges Lengthen OSHA's Standard Setting;* April 19, 2012; p 9. http://gao.gov/assets/600/590210.pdf (accessed June 12, 2013).

[215] 29 U.S.C. §655(f).

[216] GAO. *Workplace Safety and Health: Multiple Challenges Lengthen OSHA's Standard Setting;* April 19, 2012; p 9. http://gao.gov/assets/600/590210.pdf (accessed June 12, 2013).

[217] OSHA must demonstrate that workers are exposed to grave danger and establish that an emergency temporary standard is necessary to protect workers from that grave danger. OSHA is also required to replace an emergency temporary standard with a permanent standard within six months using the requirements laid out in OSHAct 6(b). *Ibid* at 11.

[218] *See* OSHA's rulemaking abstract at http://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201304&RIN=1218-AC82 (accessed September 17, 2013).

[219] In this report, the CSB recommended to OSHA that it amend the PSM standard "to achieve more comprehensive control of reactive hazards that could have catastrophic consequences." The report is available at http://www.csb.gov/assets/1/19/ReactiveHazardInvestigationReport.pdf (accessed September 17, 2013). The recommendations start on page 89 of the report.

[220] *See* OSHA's rulemaking abstract at http://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201304&RIN=1218-AC82 (accessed September 17, 2013).

[221] Most federal agencies develop rules through "informal rulemaking." Under the Administrative Procedure Act, or APA, informal rulemaking requires a publication of a "Notice of Proposed Rulemaking" (NPRM) in the Federal Register; opportunity for public participation by submission of written comments; consideration by the agency of the public comments and other relevant material; and publication of a final rule not less than 30 days before its effective date, with a statement explaining the purpose of the rule. Under the APA, an agency may publish an Advance Notice of Proposed Rulemaking (ANPRM) when the agency wants to test out a proposal or solicit ideas before it drafts its NPRM. For more information *see* http://www.foreffectivegov.org/node/226 (accessed September 17, 2013).

Lodi, New Jersey in 1995."[222,223] On May 14, 2001, OSHA clarified its intent to publish an ANPRM "to address the need to add reactive chemicals that are not currently covered by PSM…"[224] On December 3, 2001, however, the entry on reactives was withdrawn from the rulemaking agenda.[225] Following the devastating ammonium nitrate explosion on April 17, 2013, in West, Texas, which resulted in at least 14 fatalities and mass destruction in the town of West, CSB Chairperson Moure-Eraso urged both OSHA and the EPA to expand their standards to include reactive chemicals and hazards such as ammonium nitrate.[226]

On July 25, 2013, the CSB held a public meeting in Washington, DC to discuss the status of key open recommendations the CSB has made to OSHA over the last decade to revise its PSM standard and create a new combustible dust standard. These recommendations, which include revising the PSM standard to require MOC reviews for organizational changes such as mergers and acquisitions that may impact process safety, and ensuring PSM coverage for atmospheric storage tanks that could be involved in a potential catastrophic release, have stemmed from major CSB investigations including its BP Texas City, Motiva, ConAgra, Kleen, Imperial Sugar, and Hoeganaes investigations, as well as its Combustible Dust Study.[227] OSHA's failure to implement these recommendations, which can be attributed to its lack of rulemaking activities over the last decade, led the CSB to reclassify seven key open recommendations as "Open-Unacceptable." The CSB also adopted the OSHA Combustible Dust Standard recommendation as a CSB "Most Wanted Chemical Safety Improvement." OSHA formally responded and cited to the GAO report discussed above, noting that on average, it takes OSHA seven years to issue a standard, a process that is only getting longer. Hence, OSHA reserves rulemaking for "widespread and serious hazards." Needed petroleum refinery and chemical process safety improvements may never fall under this category. OSHA noted at the meeting that it will be utilizing a Request for Information[228] (RFI) to aid in the revision of its PSM standard, which will contain questions aimed at addressing a number of issues that have developed in the 21 years since the PSM standard was promulgated in 1992. This is an important opportunity to enhance the dialogue on implementation of the safety case regulatory approach to enhance process safety management and risk reduction in the US.

OSHA's ability to adapt to process safety-related new or revised codes, standards, technology, and lessons learned is mainly limited to RAGAGEP requirements, which OSHA included in the mechanical

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[222] *See* https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=13792 (accessed September 17, 2013).

[223] This incident took place on Friday, April 21, 1995, at a chemical facility occupied by Napp Technologies. The explosion and fire resulted in five fatalities.

[224] *See* https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=16776 (accessed September 17, 2013).

[225] *See* https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=16946 (accessed September 17, 2013).

[226] In a 2002 study entitled *Improving Reactive Hazard Management*, the CSB made recommendations to OSHA and the EPA to expand their regulations to include reactive chemicals and hazards. To date, neither agency has acted on the recommendations. *See* http://www.csb.gov/in-safety-message-csb-chairperson-rafael-moure-eraso-calls-for-regulatory-coverage-of-reactive-chemicals-following-the-west-fertilizer-explosion-and-fire-/ (accessed September 23, 2013).

[227] For more information on this meeting, *see* http://www.csb.gov/events/csb-public-meeting-to-vote-on-key-safety-recommendations-and-initiate-most-wanted-program/ (accessed July 29, 2013).

[228] An RFI is a tool used by a federal agency to help it develop a proposed rule. Federal agencies generally use RFIs when they want public input on whether a new rule or changes to an existing rule are needed, and comments on what course the agency should take should it decide to move forward. More information available at http://www.dol.gov/regulations/participate.htm (accessed July 29, 2013).

integrity and PSI elements of its PSM standard in part to "provide flexibility for the employer to choose the frequency which would provide the best assurance of equipment integrity."[229] OSHA meant for RAGAGEP to include "both appropriate internal standards and applicable codes and standards…"[230] However, the concept of RAGAGEP only applies to 2 of the 14 PSM standard elements (mechanical integrity and PSI), only addresses equipment and mechanical integrity, and is usually utilized by OSHA as a mechanism to issue citations to companies post-incident.

In addition, OSHA has had difficulty enforcing RAGAGEP citations. In a recent OSHA Review Commission proceeding, *Secretary of Labor v BP Products North America, Inc., & BP-Husky Refining, LLC,*[231] *and United Steelworkers Local 1-346*, the Administrative Law Judge (ALJ) vacated OSHA RAGAGEP citations issued to BP for violations of 29 CFR §1910.119(d)(3)(ii)[232] for failure to comply with a specific RAGAGEP, holding that OSHA impermissibly adopted a specific RAGAGEP, thereby diminishing the performance aspect of the RAGAGEP requirements contained within the OSHA PSM standard. The ALJ concluded that by citing to only one specific RAGAGEP, OSHA impermissibly adopted a prescriptive standard; in the ALJ's view, OSHA should have acknowledged other possible RAGAGEPs for BP to comply with, including BP's own internal standards. If upheld, this ruling may limit OSHA's ability to utilize RAGAGEP as a means of requiring companies to implement industry good practices in the future.[233]

The cumbersome rulemaking process and lack of flexibility that has resulted in stagnant and static OSHA standards can be contrasted with the structure of the safety case regulatory regime, which facilitates adaptability and enables the regulator to improve industry safety performance and practices without requiring a major rule change. The safety case essentially provides the regulator with the tools to recognize more rigorous standards and practices that exist and drive a company to implement those practices to further reduce risks, as well as work with industry to improve existing standards and practices if necessary. It also enables companies to implement new, more efficient or safer technologies that do not necessarily meet strict prescriptive regulations, but that drive risk reduction.

This adaptability is illustrated by the HSE's recommendations following the 2004 Buncefield incident. On December 11, 2004, a number of explosions occurred at Buncefield Oil Storage Depot in Hemel Hemptstead, Hertfordshire, England following the overfilling of a gasoline tank. Over 40 people were injured and there was significant offsite damage to homes and businesses. An independently chaired Major Incident Investigation Board led by Lord Newton of Braintree was set up to investigate the incident. Between 2006 and 2008 the Board issued a number of reports and recommendations. In the report issued in March 2007 entitled "Recommendations on the design and operation of fuel storage sites," the Board highlighted the adaptability of the existing regulatory regime by noting that the recommendations to improve standards and revise guidance should not require actual changes to the law, because the existing legal framework was "sufficient to ensure that necessary improvements are put in

[229] 57 Fed. Reg. 6390-6391 (1992).
[230] *Ibid* at 6390-6391.
[231] BP Products North America, Inc. operates a refinery in Oregon, Ohio. BP-Husky is a joint venture with a business interest in the refinery.
[232] 29 CFR 1910.119(d)(3)(ii) requires the employer to document that equipment complies with RAGAGEP.
[233]The Occupational Safety and Health Review Commission is scheduled to review the decision.

place."[234] The Board followed by making its first recommendation of the report, to the COMAH CA and operators of Buncefield-type sites to develop and agree on a methodology to determine safety integrity level (SIL) requirements for overfill prevention systems, which takes account of, among other things, nearby resources or populations.[235] The Board also recommended that the sector "develop guidance to incorporate the latest knowledge on preventing loss of primary containment and on inhibiting escalation if loss occurs."[236] Another key recommendation was made to the CA to "ensure that safety reports submitted under the COMAH Regulations contain information to demonstrate that good practice in human and organisational design, operation, maintenance and testing is implemented as rigorously as for control and environmental protection engineering systems."[237] Finally, the Board recommended in this report that the "sector agree with the Competent Authority on a system of leading[238] and lagging[239] performance indicators for process safety performance…" based on HSE's guidance on *Developing process safety indicators.*[240]

Spurred by recommendations made surrounding the Buncefield incident, the BP Texas City incident, and the BP Grangemouth incident,[241] the COMAH CA developed an Operational Delivery Guide entitled "COMAH Competent Authority Workstream 2e: Process safety performance indicators,"[242] which was "designed to continue the promotion and development of site level process safety performance indicators (PSPIs) as part of the monitoring arrangements for an effective process safety management system at major hazard sites."[243] The guide states that by the end of March 2013 all "Buncefield-type" sites would "have effective monitoring of process safety performance in place and that site specific leading and lagging performance indicators have been developed…"[244] and that by the end of 2015 "all major hazard establishments and duty holders will measure their performance on the control of major hazard risks by way of key leading and lagging performance indicators."[245] It lays out in detail a six-step process for implementing a process safety measurement system; how inspectors will assess a duty holder's performance; and adds that full implementation of this program could take between 18 months and two and a half years from when the initial introduction takes place – all without requiring any fundamental changes to the COMAH regulations themselves.

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[234] Buncefield Major Incident Investigation Board. *Recommendations on the design and operation of fuel storage sites;* March 2007; p 3. http://www.buncefieldinvestigation.gov.uk/reports/recommendations.pdf (accessed May 21, 2013).
[235] *Ibid* at *8.*
[236] *Ibid* at 15.
[237] *Ibid* at 19.
[238] Leading indicators are measurements that predict future performance to ensure that safety protection layers and operating discipline are being maintained, including unsafe behaviors or insufficient operating discipline equipment selection, engineering design, specification of inspection frequency, and technique. *See* Center for Chemical Process Safety (CCPS), *Guidelines for Process Safety Metrics*; October 2009; p 20.
[239] Lagging indicators are facts about previous events, such as process safety incidents, that meet the threshold of severity and should be reported as part of the process safety metric. *Ibid* at 20.
[240] *Ibid* at 13.
[241] Between May 29 and June 10, 2000, three incidents occurred at the BP Grangemouth Petrochemical Complex in Scotland, which is one of the largest of the 950 COMAH sites in the UK.
[242] Available at http://www.hse.gov.uk/comah/guidance/process-safety-performance-indicators.pdf (accessed May 21, 2013).
[243] COMAH Competent Authority, "Workstream 2e: Process safety performance indicators," 2012; page 3.
[244] COMAH Competent Authority, "Workstream 2e: Process safety performance indicators," 2012; page 6.
[245] *Ibid* at 3.

The COMAH CA Investigation Team noted in its publication summarizing the conclusions of the Buncefield investigation that following the incident, the CA, industry and trade unions worked together to "drive forward high standards at fuel storage sites…[which] has resulted in agreement on improved standards of safety and environmental protection for all UK sites storing large volumes of gasoline and to systematically upgrade sites to meet these standards…"[246]

In another example following the Buncefield incident, the Board recommended significantly higher standards than were generally in place in the sector. For example, the Board recommended that fuel storage tanks be fitted with automatic overfill protection equipment that would cut off supply if an overfill event occurs, rather than continuing to rely on operators to interrupt flow manually in the case of an event. In response, the UK Petroleum Industry Association and the Tank Storage Association adopted the recommendation, and the British government announced that it would require all sites to move to fully automatic shutdown systems on tanks storing gasoline. The Process Safety Leadership Group (PSLG) was formed to help develop the details of the new rule, and to "meet the need for an effective framework for interaction between industry, trade unions and the COMAH Competent Authority (CA)…"[247] As will be discussed in the next section, workforce involvement is a key element of an effective safety case regulatory regime. In 2009, HSE published the PSLG's work in a document entitled *Safety and Environmental Standards for Fuel Storage Sites.* The document lays out precisely which tanks must utilize automatic overfill protection equipment, and also allows for duty holders to demonstrate technical reasons as to why automatic overfill protection would not be appropriate by "prepar[ing] a robust demonstration that alternative measures are capable of achieving an equivalent ALARP outcome to an overfill protection system that is automatic…"[248] This document in essence was developed as an industry good practice, and compliance with its requirements would likely ensure that the duty holder is complying with the law and reducing risks to ALARP.[249]

This can be contrasted with an even larger release of gasoline and a subsequent explosion that occurred in the 2009 tank overfill at the Caribbean Petroleum Corporation near San Juan, Puerto Rico. This incident severely damaged surrounding buildings and impacted moving vehicles. This incident has not resulted in any re-evaluation of safety rules by the EPA or OSHA, despite the fact that tank terminals largely fall outside the PSM and RMP program regulations, (let alone the more rigorous requirements of a major hazard safety case regulatory regime, as practiced in the UK).

These post-Buncefield examples highlight one of the most important attributes of the safety case regulatory approach: it is a regulatory framework that implements a balance of goal-setting and prescriptive elements which enable the regulator to drive facilities to continuously improve practices aimed at reducing risks to ALARP, without having to adhere to the extensive and time-consuming rulemaking requirements that exist in the US. This flexibility and adaptability encourages facilities to focus on improving practices and technology rather than on completing activity-based requirements, which can have the effect of stifling innovation and technological advancement.

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[246] The Competent Authority. *Buncefield: Why did it happen? The underlying causes of the explosion and fire at the Buncefield oil storage depot, Hemel Hempstead, Hertfordshire on 11 December 2005*; February 2011; p 3. http://www.hse.gov.uk/comah/buncefield/buncefield-report.pdf (accessed May 21, 2013).

[247] Process Safety Leadership Group. *Safety and environmental standards for fuel storage sites;* London, 2009; p 7. http://www.hse.gov.uk/comah/buncefield/fuel-storage-sites.pdf (accessed August 1, 2013).

[248] *Ibid* at 29.

[249] For a detailed discussion of rule-compliance and the safety case, *see* Hopkins, Andrew. *Risk-management and rule-compliance: Decision-making in hazardous industries;* Safety Science 49 (1011) 110-120.

Critics argue that because there have been significant industry problems with the maintenance of safety critical equipment and aging equipment in the UK, [250] the safety case regime is not operating effectively. Regulators and commissions in the UK have found degradation of pipes, valves, and other equipment at many facilities due to company deferral of maintenance, insufficient testing of safety-critical elements, and a continuing industry culture of responding to disasters. However, the HSE has worked to make improvements to these areas. In 2010, the UK HSE initiated Key Programme 4 to address the issue of aging equipment offshore and the operation of installations beyond their design life.[251] The same year, the HSE published a report intended to inform industry and aid in the prevention of major accidents entitled *Managing Ageing Plant: A Summary Guide*,[252] which provides an overview of ageing plant mechanisms and their management. This document presents analysis and findings for loss of containment incidents to demonstrate how aging plant equipment may be a factor. The HSE has been able to take this type of programmatic proactive approach in the UK thanks to the safety case regime's adaptive nature, which is lacking in the US both on and offshore. This is positive evidence of a competent and effective regulator with the capability under the safety case regime to identify and proactively address industry gaps in safety performance.

4.4 Active Workforce Participation

As the CSB noted in its Interim Report on the Chevron incident, workforce participation is a key element of process safety and effective major accident prevention. In one of its publications, the Center for Chemical Process Safety (CCPS) lists workforce involvement as one of 20 essential management components necessary to reduce process safety risks and prevent chemical accidents.[253] According to CCPS,

> …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 mechanism for tapping into this valuable expertise.[254]

This CCPS publication discusses general areas of workforce involvement in risk assessments, inspections, audits, and performance reviews, and notes that participation leads to empowerment, management responsiveness, and process safety performance improvement. [255] The OSHA PSM standard requires employers to consult with employees and their representatives on the conduct and development of PHAs and on the development of the 13 remaining PSM elements, and to develop a written plan of action

[250] The HSE published a report to communicate the results and conclusions of the Asset Integrity Key Programme carried out between 2004 and 2007 by the Health and Safety Executive's Offshore Division. *See* http://www.hse.gov.uk/offshore/kp3.pdf, (accessed August 28, 2013).
[251] The UK launches Key Programmes to address poor performance in specific areas. Access the report entitled *Key Programme 4 (KP$): Ageing and life extension* at http://www.hse.gov.uk/offshore/ageing/kp4-interim-report.pdf (accessed November 1, 2013).
[252] *See* http://www.hse.gov.uk/research/rrpdf/rr823-summary-guide.pdf (accessed November, 1, 2013).
[253] CCPS. *Guidelines for Risk Based Process Safety;* March 2007; p liv.
[254] *Ibid* at 124.
[255] *Ibid* at 125.

regarding the implementation of the employee participation required under this section.[256] During facility inspections, OSHA inspectors must request and evaluate these written plans of action regarding the implementation of employee participation as well as interview employees and their representatives to verify that the employer is satisfying the requirements.[257]

In previous investigation reports, the CSB has identified that workers and their representatives play a very important role in major incident prevention. For example, as will be discussed in the next section on performance indicators, the CSB recommended in the BP Texas City investigation report that BP and the United Steelworkers Union (USW) establish a joint program to report incidents and near misses, and to ensure that recommendations made during investigations were implemented. The CSB also recommended that API and the USW work together to develop a safety standard addressing leading and lagging process safety indicators.[258] However, representatives from the USW have stated to the CSB that it is a constant struggle for workers and their representatives to have a voice or play a role in the management of safety in US petroleum refineries.

The law in the UK also requires employers to consult with their employees or their safety representatives on health and safety matters. The Safety Representatives and Safety Committees Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996 set out the legal framework for such consultation and worker involvement at both unionized and non-unionized onshore facilities.[259] However, these regulations go further than the OSHA PSM standard in that they provide for the election of safety representatives by the workers to serve many health and safety-related functions, including investigating complaints and accidents and carrying out inspections. In his keynote speech at the Oil and Gas UK Piper 25 conference mentioned in Section 4.3, Lord Cullen stated that the safety representative positions have "important functions, such as the power to carry out investigations and reporting safety concerns to management, without fear of recrimination," noting that they "help[] reinforce the principle that each employee is responsible for his own safety."[260] The regulations also require employers to establish a safety committee when one is requested by at least two health and safety representatives. The 1996 regulations require employers to consult with employees not represented by safety representatives under the 1977 Regulations on a number of health and safety-related matters, such as the introduction of any measure which may substantially affect their health and safety at work, the planning and organization

[256] 29 CFR §1910.119(c) (2012).
[257] *See* OSHA CPL 02-02-045. Process Safety Management of Highly Hazardous Chemicals – Compliance Guidelines and Enforcement Procedures. September 13, 1994. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=1558&p_table=directives (accessed September 6, 2013).
[258] Process safety indicators are also referred to as safety performance indicators, metrics, key process indicators, performance measures, indicators, etc…
[259] The 1977 regulations apply to workplaces where the employer recognizes trade unions and trade unions are recognized for collective bargaining purposes. Regulations available at http://www.legislation.gov.uk/uksi/1977/500/contents/made (accessed September 4, 2013). The 1996 regulations apply to workplaces where employees are not in a trade union and/or the employer does not recognize the trade union, or the trade union does not represent those employees not in the trade union. Regulations available at http://www.legislation.gov.uk/uksi/1996/1513/contents/made (accessed September 4, 2013).
[260] Finding Petroleum. *Review: Lord Cullen – what have we learned from Piper Alpha?* September 16, 2013. http://www.findingpetroleum.com/n/Review_Lord_Cullen_what_have_we_learned_from_Piper_Alpha/044b5113.aspx (accessed September 16, 2013).

of health and safety training, and the health and safety consequences of introducing new technology.[261] The law in the UK protects employees from being penalized for taking part in health and safety consultation.[262]

The UK's existing regulations and policies regarding worker involvement offshore were developed and strengthened as a result of the Piper Alpha incident. In the *Piper Alpha* Report, Lord Cullen emphasized the importance of workforce involvement in safe operations, and noted that a safety committee system is "the most visible instrument for the involvement of the workforce in safety."[263] He concluded by recommending that "the regulatory body, operators and contractors should support and encourage the involvement of the offshore workforce in safety."[264] HSE developed guidance in response to Lord Cullen's recommendations entitled *Play your part! How offshore workers can help improve health and safety*, intended to encourage workforce participation offshore.[265] The most current version of this guidance document, which was prepared by the Workforce Involvement Group (WIG),[266] located within HSE's Offshore Industry Advisory Committee (OIAC),[267] utilizes good practice and examples of successful workforce involvement in improving health and safety with the goal of assisting operators, contractors, safety representatives, and others in effectively utilizing workforce involvement in their workplaces. It encourages companies to facilitate workforce involvement by providing information, improving communication at all levels, good training, and ensuring that all workers are represented in the decisions that affect them.[268]

The Piper Alpha incident also resulted in the swift development of the SI971 Offshore Regulations (Safety Representatives and Safety Committees) Regulations 1989 ("the SI971 Regulations"), which provide for the nomination and election of safety representatives and require offshore installations to establish safety committees.[269][270] The HSE has published a guidance document entitled *A guide to the*

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[261] *See* HSE. *Consulting employees on health and safety: A brief guide to the law.* 2013. http://www.hse.gov.uk/pubns/indg232.pdf (accessed September 4, 2013).
[262] *See* Employment Rights Act 1996. Section 44. Health and safety cases. http://www.legislation.gov.uk/ukpga/1996/18/section/44 (accessed September 4, 2013).
[263] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p 301.
[264] Department of Energy. *The Public Inquiry into the Piper Alpha Disaster;* Presented to Parliament by the Secretary of State for Energy by Command of her Majesty; November 1990; p 392.
[265] *See* HSE. *Play your part! How offshore workers can help improve health and safety;* 2013. http://www.hse.gov.uk/pubns/indg421.pdf (accessed June 17, 2013).
[266] The WIG's mission is to improve safety "by stimulating lateral learning and best practice across the offshore industry through involvement of the whole workforce." It looks at ways to increase worker involvement in health and safety matters offshore and is chaired by HSE. For more information *see* http://www.hse.gov.uk/aboutus/meetings/iacs/oiac/wig.htm (accessed June 17, 2013).
[267] The OIAC is a tripartite committee that includes members representing employers, employees, unions, trade associations and other government departments. It is focused solely on the offshore sector. More information is available at http://www.hse.gov.uk/aboutus/meetings/iacs/oiac/information.htm (accessed June 17, 2013).
[268] HSE. *Play your part! How offshore workers can help improve health and safety;* 2013; p 4. http://www.hse.gov.uk/pubns/indg421.pdf (accessed June 17, 2013).
[269] Under Regulation 16, safety representatives are responsible for investigating potential hazards and incidents, examining causes of accidents, investigating complaints by any member of his or her constituency relating to occupational health and safety, representing members of the workforce in consultations on the offshore installation with inspectors, and consulting constituency members on any matters arising out of the Regulation. Under Regulation 17, a safety representative may inspect any part of the offshore installation or its equipment either on a regular basis or following an incident. According to HSE, "this can be of great benefit to the duty holder because it brings an independent look at health and safety factors from the workforce viewpoint. Workers are in the front line

Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989[271] designed to assist duty holders, employers, installation managers, safety representatives, safety committee members and all members of the workforce in the offshore industry with what the regulations require and what must be done to comply with them. The document explains that although the primary responsibility for health and safety resides with the duty holder, "all members of the workforce must play their part if risks are to be eliminated or minimized."[272] It also emphasizes the importance of training of safety representatives, which enables them to effectively represent workers and fulfill their responsibilities and functions under these Regulations.

In April 2010, HSE launched an inspection project to examine the effectiveness of the SI971 Regulations and the effectiveness of those regulations, as well as to collect examples of best practice to present to the offshore industry.[273] Forty-one inspections were completed in a six-month period on offshore installations operated by 25 different duty holders. The project helped focus on the power of safety representatives and how to strengthen their ability to effectively perform their duties. It also was well received by the safety representatives, as it gave them encouragement and recognition, and sent a message to management on the importance of SI971 and the key role of safety representatives and committees in workplace health and safety.

The HSE has placed great emphasis and importance on the role of worker involvement and consultation in improving workplace health and safety and reducing major accidents on and offshore. In June 2009, HSE launched a new strategy entitled *Be part of the solution*, which lists workforce involvement as one of its main priorities, and the agency has published a significant amount of guidance on worker involvement and consultation on its website.[274]

The Norwegian Working Environment Act addresses the rights and duties of safety representatives and committees in Norway. It applies to nearly all workers in Norway, including onshore and offshore oil workers. The Act provides for the election of government recognized safety representatives whose duty is to "safeguard the interests or employees in matters of the working environment."[275] These representatives have the right to information, consultation, and participation in inspections.[276] They also have the right to halt unsafe work until the regulator decides when the work may continue.[277]

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and are often well placed to see problems and put forward practical suggestions." HSE. *A guide to the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989;* 2012; p 20. http://www.hse.gov.uk/pubns/priced/l110.pdf (accessed September 4, 2013).

[270] Under Regulation 22, safety committees are responsible for reviewing the system of constituencies so as to ensure adequate representation of the workforce on health and safety matters, reviewing training of safety representatives, reviewing the frequency of safety committee meetings and the circumstances under which they may be called, and considering causes of accidents and making recommendations to the installation manager.

[271] Third edition published in 2012. Available at http://www.hse.gov.uk/pubns/priced/l110.pdf (accessed September 4, 2013).

[272] *Ibid* at 7.

[273] *See* HSE. *Offshore workforce involvement and consultation: Compliance Inspection Project.* Available at http://www.hse.gov.uk/offshore/si971.pdf (accessed September 4, 2013).

[274] *See* http://www.hse.gov.uk/involvement/hsrepresentatives.htm (accessed September 4, 2013).

[275] Act Relating to Working Environment, Working Hours and Employment Protection, Etc. (Working Environment Act). December 2012. Section 6-1. Obligation to elect safety representatives.

[276] *Ibid* at Section 6-2. Duties of safety representatives.

[277] *Ibid* at Section 6-3. The safety representative's right to halt dangerous work.

A fundamental element in effective safety management for major accident prevention is active and equal participation from the regulator, industry, and labor. Each entity provides unique and essential insights, and removing the participation of these entities removes a critical voice in health and safety matters. In the UK and Norway, tripartite systems consisting of industry, the regulator, and the workforce have been established to deal with safety and health issues at the highest levels beyond just site workforce representation.

A tripartite system consisting of active and equal participation from the regulator, workforce, and industry, is necessary for effective safety case implementation.

The CSB investigation staff has had extensive discussions with worker representatives who have voiced their opinions on their systems to the CSB. Roy Furre, a Representative from the Norwegian Union of Energy Workers, spoke at the CSB's 2010 public hearing on the Regulatory Approaches to Offshore Oil and Gas Safety, and stated that the Norwegian working environment and the accompanying petroleum regulations empower unions and safety delegates in all phases of the petroleum activities.[278] He also noted that the Norwegian petroleum regulations require that all necessary information about risks and decisions be given to the workers' representatives.[279] During the CSB's public hearing on Safety Performance Indicators in July 2012, Jake Molloy, the Regional Organizer for the National Union of Rail, Maritime and Transport Workers in the UK, stated that the input of workers is "crucial" in major accident prevention and that "if the people operating these systems and delivering these results are unable for any reason to tell you what the true picture is, everything else is worthless."[280] When speaking at a "Step Change for Safety" Conference in Aberdeen, Scotland, on September 5, 2012, Mr. Molloy noted that attending the public hearing in Houston was "eye opening" and that hearing about the US system was like a "walk back in time."[281]

4.5 Process Safety Indicators that Drive Performance

As the CSB noted in both its July 2012 public hearing on Safety Performance Indicators and its Chevron Interim Report, leading and lagging process safety indicators help drive continuous process safety improvement, as long as regulators utilize these indicators to focus inspections, audits, and investigations, and organizations focus attention on them in a way that makes a difference. Process safety indicators are a significant element of process safety management systems. They measure the strengths and weaknesses of these systems to achieve and maintain safe and reliable operations[282] and, if properly defined, collected and used, can identify the successes and flaws of the system.[283]

Lagging indicators are a "form of reactive monitoring"[284] that includes events such as major spills, fires, or gas releases. Leading indicators, on the other hand, are a "form of active monitoring,"[285] and are

[278] CSB. Public Hearing: Regulatory Approaches to Offshore Oil and Gas Safety. December 15, 2010; p 300. http://www.csb.gov/assets/1/19/Transcript_of_Public_Meeting_12_15_2010.pdf (accessed December 10, 2013).
[279] *Ibid* at 300.
[280] CSB. Public Hearing: Safety Performance Indicators. July 23, 2013; p 143. http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed December 10, 2013).
[281] http://www.youtube.com/watch?v=-xDzb4x8t_c (accessed December 10, 2013).
[282] CCPS. *Guidelines for Process Safety Metrics;* October 2009; p 109.
[283] *Ibid.*
[284] HSE. *Developing process safety indicators: A step-by-step guide for chemical and major hazard industries;* 2006; p 7. http://www.hse.gov.uk/pubns/books/hsg254.htm (accessed May 28, 2013).
[285] *Ibid.*

described as events that do not result in severe consequences and usually address safety system performance, such as deviations from safe operating limits or timely maintenance on safety critical equipment.[286] Leading indicators "can be considered as measures of process or inputs essential to deliver the desired safety outcome."[287] The general thinking globally is that if companies rely primarily on lagging indicator data, which is retrospective, they are not effectively managing process safety to ensure major accidents are prevented. According to HSE, "[t]oo many organizations rely heavily on failure data to monitor performance, so improvements or changes are only determined after something has gone wrong. Discovering weaknesses in control systems by having a major incident is too late and too costly."[288] Rather, facilities must identify critical controls to monitor and set leading indicators against each one to show that the system is operating as intended.

The HSE was one of the earliest regulators to adopt process safety indicators regulations. In 1995, the agency began requiring companies to report health and safety data, and then published annual reports based on those statistics. In 2006, the HSE developed a step-by-step guidance document entitled *Developing process safety indicators*[289] to assist industry. The guide establishes and discusses in detail six main steps necessary to implement a process safety measurement system, including developing leading and lagging indicators. It also defines leading and lagging indicators for each of the controls in the risk control system. According to Jake Molloy, "It is our firm belief that the most influential and effective schemes using indicators to measure improvements and major accident prevention are those initiatives generated by our regulator, the Health and Safety Executive [HSE]."[290]

As discussed in the previous section, a number of large incidents, including BP Texas City and BP Grangemouth, have highlighted the need for the chemical and other major hazard sectors to demonstrate that risks are being adequately controlled. In response to recommendations stemming from such incidents, the COMAH CA developed an *Operational Delivery Guide* in 2010 on process safety performance indicators setting out four stages to aid facilities in the development of process safety indicators. The document sets out a goal that by the end of 2015 major hazard establishments and duty holders will measure their safety performance and control of risk by way of key leading and lagging performance indicators.

Following the 2005 BP Texas City incident, BP developed company-wide process safety indicators, and now includes process safety metrics in performance contracts for its US refinery managers.[291] However, existing guidance in the US pertaining to safety performance indicators does not adequately aid companies in managing major hazards onshore. The CSB has noted that in virtually every incident it investigates in the US, process safety indicators are either not used at all or not used effectively.[292] Millions of workplaces around the US primarily measure their safety performance using OSHA

[286] Hopkins, Andrew. *Disastrous Decisions: The Human and Organisational Causes of the Gulf of Mexico Blowout;* CCH Australia Limited, 2012; p 83.
[287] HSE. *Developing process safety indicators: A step-by-step guide for chemical and major hazard industries;* 2006; p 7. http://www.hse.gov.uk/pubns/priced/hsg254.pdf (accessed October 30, 2013).
[288] *Ibid* at 1.
[289] Full title is *Developing process safety indicators: A step-by-step guide for chemical and major hazard industries;* first published in 2006. http://www.hse.gov.uk/pubns/books/hsg254.htm (accessed May 28, 2013).
[290] Molloy Testimony. *CSB Indicators Public Hearing Transcript;* July 24, 2012; p 139.
[291] Hopkins, Andrew. *Disastrous Decisions: The Human and Organisational Causes of the Gulf of Mexico Blowout;* CCH Australia Limited, 2012; p 84.
[292] Donald Holmstrom. *CSB Indicators Public Hearing Transcript*; July 24, 2012; p 13.

recordable injury and illness rates, which include slips, trips, and falls. While collecting this type of data is also necessary in hazardous operations, it is not sufficient. Injury rates do not depict the effectiveness of a high hazard facility's process safety management program.[293] For example, the CSB noted in its BP Texas City investigation that BP's personal injury metrics were described as being at the best level on record; yet, around this same time, in March 2005, BP Texas City experienced the devastating 15-fatality incident, which resulted from a progressive erosion of process safety performance that was not reflected in injury statistics.

Following the BP Texas City incident, a number of key recommendations were made to strengthen guidance on indicators in the US. For example, the Baker Panel[294] issued a report (the Baker report) that recommended the incorporation of safety indicators to measure safety performance, and stated:

> The Panel believes that relying exclusively or predominantly on lagging indicators to assess process safety performance is ill-advised. … BP's reliance on lagging, after-the-fact indicators of process safety performance rather than leading, predictive measures…impaired BP's ability to measure, monitor and detect deteriorating or degraded process safety conditions and performance… This failure to use a set of effective performance metrics that includes leading indicators increased the likelihood that the organisation would identify the need for improvements or additional controls only after something had gone wrong.[295]

The Baker Panel also noted that it was not enough just to develop process indicators: these indicators needed to be meaningful to the company. As such, the Baker Panel also recommended that "a significant proportion of total compensation of refining line managers and supervisors [be] contingent on satisfactorily meeting process safety performance goals…"[296]

In its final investigation report on the incident, the CSB made a recommendation to API and USW to jointly lead development of a consensus standard for leading and lagging process safety indicators to drive performance improvements in the prevention of major incidents. API responded by issuing RP 754, *Process Safety Performance Indicators for the Refining and Petrochemical Industries.* However, this voluntary standard, which defines a framework of four tiered indicators that incorporate the concepts of lagging to leading measures, has significant shortcomings, as the CSB described in a two-day public hearing on Safety Performance Indicators that was held in July 2012. The CSB analysis found that the ability of RP 754 to drive performance improvement and inform key stakeholders will be hampered by

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[293] *Ibid.*

[294] In the aftermath of the BP Texas City Incident, BP followed the recommendation of the CSB and formed an independent panel known as the Baker Panel to conduct a thorough review of the company's corporate safety culture, safety management systems, and corporate safety oversight at its US refineries. For a copy of their findings and recommendations *see* http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/SP/STAGING/local_assets/assets/pdfs/Baker_panel_report.pdf (accessed August 13, 2013).

[295] Baker, J. *The Report of the BP U.S. Refineries Independent Safety Review Panel*, 2007; p 194.

[296] *Ibid* at 251.

- lagging indicators with insufficient statistical rigor needed to allow for trending or incremental performance improvements;
- the lack of well-defined standardized and normalized leading indicators that are needed for comparison among sites, corporations, or to national averages;
- weak employee protection requirements; public reporting requirements that will be ineffective to adequately inform stakeholders; and
- the lack of broadly based consensus in the standard's development process.[297]

As a result, in 2012 the CSB Board designated the response to the CSB's recommendation as "open-acceptable,"[298] meaning that the recommendations recipient is moving in the right direction, but more remains to be done.

The CSB also noted in the Chevron Interim Report the important role the public plays in monitoring safety management systems, and referenced CCPS as promoting the sharing of process safety indicators with the public:

> Sharing performance metrics and results broadly can engage the public as a partner in holding the organization accountable for process safety performance. Making metrics and performance public can be an especially powerful way of maintaining upper management commitment since it will likely be the CEO or other senior managers who will be called to account by the public if goals are not met or performance declines. Communicating process safety successes also demonstrates to employees and the public that positive change can be, and are being, made within an organization.[299]

The Petroleum Safety Authority (PSA) in Norway provides annual reports to the public on its website assessing indicators it has collected directly from offshore and onshore major hazard facilities since 2000 and 2006, respectively. The PSA utilizes the indicators data found in these reports to identify critical safety areas that must be targeted for improvement in order to prevent near misses and accidents.[300] The onshore report, *Risk level in the petroleum industry, Onshore facilities*,[301, 302] includes a description and explanation of the indicators collected and analysis of these data. In this report PSA notes a decreasing trend in the number of reported hydrocarbon leaks on offshore production

PSA's analysis of indicator data showed a decreasing trend in the number of reported hydrocarbon leaks offshore between 2007 and 2010.

[297] CSB Public Hearing: Safety Performance Indicators. July 23-24, 2012; p 26. http://www.csb.gov/events/csb-public-hearing-safety-performance-indicators/ (accessed August 14, 2013).
[298] For more information on recommendations status designations, *see* http://www.csb.gov/recommendations/faq/#5 (accessed June 21, 2013).
[299] Center for Chemical Process Safety (CCPS). *Guidelines for Process Safety Metrics*. 2010; p 109.
[300] PSA. *Trends in Risk Level: Summary Report 2012 – Norwegian Continental Shelf.* 2012; p 1.
[301] *See* http://www.ptil.no/publications/category175.html?ptil_md_art_list-select_group=Category-233. The CSB had the 2010 version of the onshore report translated into English. http://www.ptil.no/getfile.php/PDF/RNNP_2012/Trends%20in%20risk%20level_2012.pdf (accessed September 17, 2013. (accessed September 17, 2013).
[302] The corresponding report discussing offshore indicator data is entitled *Trends in Risk Level.* http://www.ptil.no/getfile.php/PDF/RNNP_2012/Trends%20in%20risk%20level_2012.pdf (accessed September 17, 2013.

facilities between 2007 and 2010.[303] However, it is too soon for PSA to assess trends in the onshore indicators data, because the time period for onshore data collection has been relatively short and there are fewer data points with only eight facilities onshore. The PSA also indicated that it will take time for the onshore data to improve as indicators are refined, but recognized that the same approach has already yielded good results in the offshore sector.[304] Additional information on data and trends based on safety case regime implementation are provided in Appendix C.

4.6 Regulatory Assessment, Verification, and Intervention

To effectively oversee covered facilities and enforce safety case regulations, technically competent regulators review and assess[305] safety case reports and utilize preventative inspections and audits to effectively intervene before high-risk activities commence. According to the HSE, "[t]he assessment process is only a part of the COMAH regime and examines at face value the factual information and examines arguments and demonstrations contained in the report against the requirements of the regulations."[306] The HSE places great emphasis during the assessment phase on the adoption of inherently safer designs[307] and notes that "[m]ajor accident hazards should be avoided or reduced at source through the application of principles of inherent safety."[308] Conclusions on the adequacy of the safety case report are developed at the end of the assessment process, and, if deficiencies are found, an intervention strategy for the facility is developed to addresses those deficient measures. According to the HSE, assessment of a safety case report or document "is not a discrete activity but leads to further action under the intervention plan for the operator at that establishment."[309] Intervention by the regulator ensures that the facility and its operations are consistent with information provided in the safety case report, and that there are robust systems in place to "reduce the likelihood of hazards and to mitigate their consequences until the associated risks are ALARP."[310][311] Under the safety case regulatory regime, the regulator has the authority to accept the safety case report or reject it and require additional measures to further reduce risks.

Preventative inspections and audits by a technically competent regulator can also result in deep challenges to industry, which does not typically happen under PSM or RMP. In the UK, the COMAH regulations authorize the CA to

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[303] PSA. *Risk level in the petroleum industry, Onshore facilities.* 2010; p 80.
[304] *Ibid.*
[305] According to the HSE, the "assessment reviews the documentary evidence in the report and further documentation, as appropriate, which is referred to in the report or requested by the assessor." HSE. *The Safety Report Assessment Manual, Sections 2 to 7.* p 3. http://www.hse.gov.uk/comah/sram/s2-7.pdf (November 26, 2013).
[306] HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 9. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013).
[307] *Ibid* at 30.
[308] HSE. *The Safety Report Assessment Manual, Sections 2 to 7.* p 3. http://www.hse.gov.uk/comah/sram/s2-7.pdf (November 26, 2013).
[309] HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 4. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013).
[310] HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 30. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013).
[311] According to HSE, essential considerations to ensure ALARP are "the scope of hazard elimination, the adoption of inherently safer designs, whether good practice has been, or is to be adopted, [and] the application of risk-reducing measures where relevant good practice is not yet established." *Ibid* at 30 and 31.

> organize an adequate system of inspections of establishments or other measures of control appropriate to the type of establishment concerned…[that are] sufficient for a planned and systematic examination of the systems being employed at the establishment, whether of a technical, organisational or managerial nature, so as to ensure…(a) that the operator can demonstrate that he has taken appropriate measures to prevent major accidents; (b) that the operator can demonstrate that he has provided appropriate means for limiting the consequences of major accidents both inside and outside the establishment; (c) that the information contained in any report sent to the competent authority by the operator of the establishment adequately reflects the conditions in the establishment…[312]

The safety case regulatory regime provides the regulator with the tools to accept or a reject a safety case report.

The CSB noted in its BP Texas City Final Investigation Report that in the UK, HSE inspectors thoroughly inspect high hazard facilities annually, and all COMAH-covered facilities are inspected every five years. For the approximately ten petroleum refineries in the UK, detailed planned inspections (ranging from 80 to 150 days) are conducted annually for each refinery by a multidisciplinary team (regulatory inspectors, process safety, mechanical engineering, electrical and instrumentation, and human factors specialists).[313]

On its website, HSE lists its offshore priorities as safety case assessment;[314] verification;[315] inspection; investigation; and enforcement.[316] In its business plan for 2012-2015, HSE set out a goal of assessing 72 safety cases onshore and 100 safety cases offshore for 2013 and 2014.[317] The work required to be conducted to assess a safety case both on and offshore is very resource-intensive (a typical new offshore safety case assessment requires anywhere from 100 to 300 hours of work), and demands that the regulator hire and retain individuals with significant oil and gas experience, specifically in areas such as process safety, human factors, engineering, and organizational performance.

In Australia, the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* authorizes NOPSEMA to conduct planned inspections of offshore installations to ensure compliance with the Act.[318] NOPSEMA notes that planned inspections "are a critical examination of aspects of a facility, its systems and

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[312] COMAH Regulations 1999 Part 6, Regulation 19(1) and (2).
[313] The CSB. *Investigation Report: BP Texas City Refinery Explosion and Fire.* March 2007; p 205. http://www.csb.gov/assets/1/19/CSBFinalReportBP.pdf (accessed October 29, 2013).
[314] An owner or operator (i.e. the duty holder) is required to submit a safety case to HSE for each offshore installation. HSE then assesses the safety case using both regulations and HSE's "Assessment Principles for Offshore Safety Cases (APOSC) and must accept it before an installation can operate. *See* http://www.hse.gov.uk/offshore/aposc190306.pdf (accessed July 31, 2013).
[315] Duty holders have a duty under the Offshore Installations (Safety Case) Regulations 2005 to put in place and keep under continual review a verification scheme by which assurance is obtained from an independent competent person (ICP) that safety critical elements and the PFEER (Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) specified plant are suitable and remain suitable for the life of the installation. For more information *see* http://www.hse.gov.uk/offshore/verification.htm (accessed July 31, 2013).
[316] *See* http://www.hse.gov.uk/offshore/priorities.htm (accessed July 15, 2013).
[317] HSE. *HSE Business Plan 2012-15;* June 2012; p 14. http://www.hse.gov.uk/aboutus/strategiesandplans/businessplans/plan1215.pdf (accessed June 3, 2013).
[318] Offshore Petroleum and Greenhouse Gas Storage Act 2006, Sections 600 and 601. *See* http://www.comlaw.gov.au/Series/C2006A00014 (accessed July 15, 2013).

operations with information obtained from the facility safety case."[319] Subjects of planned inspections include risk control measures related to either a Major Accident Event[320] or Occupational Health and Safety controls, or both. NOPSEMA states that it conducts at least two per year for each normally manned offshore installation.[321] NOPSEMA distinguishes between two types of planned inspections: field-based inspections, which focus on implementation of control measures described in a facility's safety case, and themed audits, which deal with inspection of organizational issues by following a common theme to direct lines of questioning.[322]

In a 1992 compliance directive,[323] OSHA stated that the primary enforcement model for the PSM standard would be planned, comprehensive, and resource-intensive Program Quality Verification (PQV) inspections.[324] These inspections consist of three parts: determining if the elements of a PSM program are in place; evaluating if the programs comply with the requirements of the standard; and verifying compliance with the standard through interviews, data sampling, and field observations. However, OSHA does not make planned inspections, which have the most opportunity for prevention, a high priority. Rather, OSHA lists its inspection priorities as 1) imminent danger situations; 2) fatalities and catastrophes; 3) complaints; 4) referrals; 5) follow-ups; and 6) planned inspections.[325] The CSB does not consider reacting to catastrophic or potentially catastrophic incidents and issuing fines on the part of the regulator to be effective substitutes for preventative inspections and audits – especially for high hazard facilities where catastrophic incidents are possible.

The CSB noted in its BP Texas City Final Investigation Report that for the 10-year period prior to the Texas City incident, federal OSHA had conducted no planned PQV inspections in oil refineries. As a result, CSB recommended in its report that OSHA strengthen the planned enforcement of the OSHA Process Safety Management (PSM) standard by developing more highly trained and experienced inspectors to conduct more comprehensive inspections, such as the PQV audits envisioned in the 1992 directive, at facilities presenting the greatest risk of a catastrophic accident. The intent of the recommendation was to establish a permanent, ongoing planned comprehensive inspections program.

Spurred in part by the CSB's recommendations, OSHA issued the Petroleum Refinery Process Safety Management National Emphasis Program (NEP) on June 7, 2007.[326] The NEP was a federal program that established guidelines for inspecting petroleum refineries to assure compliance with the PSM standard. Unlike the PQV approach to inspections, which "employs a broad, open-ended inspection strategy and

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[319] NOPSEMA. *Inspection Policy;* p 2. http://www.nopsema.gov.au/assets/document/N-02000-PL0025-Inspection.pdf (accessed July 15, 2013).
[320] Australia's Offshore Petroleum and Greenhouse Gas Storage Regulations 2009 define an MAE as "an event connected with a facility, including a natural event, having the potential to cause multiple fatalities of person at or near the facility." Chapter 1.5. *See* http://www.comlaw.gov.au/Details/F2009L04578/Html/Text#param5 (accessed July 15, 2013).
[321] For more information, *see* http://www.nopsema.gov.au/safety/inspections/ (accessed July 15, 2013).
[322] For more information, *see* http://www.nopsema.gov.au/assets/document/N-02000-PL0025-Inspection.pdf (accessed July 15, 2013).
[323] Compliance directives are the main method OSHA uses to communicate plans, inspection methods, and compliance expectations to their Compliance Safety and Health Officers (CSHOs) for enforcing a new regulation.
[324] OSHA Instruction CPL 02-02-045 (1994).
[325] "OSHA Fact Sheet: OSHA Inspections," available at http://www.osha.gov/OshDoc/data_General_Facts/factsheet-inspections.pdf (accessed on May 20, 2013).
[326] Originally Directive Number CPL 03-00-004. Extended August 18, 2099 as Directive Number CPL 03-00-010 to allow more time to complete NEP inspections under the original CPL 03-00-004.

uses a more global approach to identify compliance deficiencies…," the NEP "provide[d] a specific tool to evaluate compliance with the [PSM] standard…[which] identifies a particular set of requirements from the PSM standard from which CSHOs [Compliance Safety and Health Officers] are to review documents, interview employees, and verify implementation for specific processes, equipment, and procedures."[327] The NEP inspections were meant to be more targeted and efficient than PQV inspections. However, the inspections being conducted pursuant to the NEP were terminated in 2011 partly because they were very time-consuming and resource-intensive. OSHA has publicly stated[328] that NEP inspection hours were roughly 40 times greater than average OSHA inspection hours. OSHA described the NEP as its most effective emphasis program in its history, citing a disturbing number of issues and subsequent citations.

In 1999, EPA established an audit[329] program to help ensure compliance with the RMP. The audits were intended to provide an independent verification of the information in the RMP and include on-site inspections. Under these requirements, the implementing agency (EPA or a correlating state agency) must "periodically audit" RMPs to review their adequacy and require revisions when necessary to ensure compliance. [330]

Between fiscal years (FY) 2010 and 2012, each EPA Region responsible for implementing the RMP program was mandated by EPA to perform inspections[331] at five percent of the total number of regulated facilities in the regions, and a certain percentage of these facilities were required to be high-risk.[332] In FY 2010, regions were to conduct 10 percent of the inspections at high-risk facilities, and in FYs 2011 and 2012, 25 percent at high-risk facilities.[333]

Although EPA has acknowledged that "full compliance with the Risk Management Program regulations cannot be determined without on-site or independent verification of all or part of the information

[327] CPL 03-00-004, Section X(D)(1). 2007.
[328] *See* Barab, Jordan. OSHA's Refinery & Chemical National Emphasis Programs. *Power Point presentation made at CSB Public Hearing on Process Safety Indicators;* July 20, 2012. http://www.csb.gov/UserFiles/file/Barab%20%28OSHA%29%20PowerPoint.pdf (accessed August 14, 2013). *Also see* Transcript of CSB Public Hearing on Safety Performance Indicators; p 52. http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed August 14, 2013).
[329] Within Part 68, the term "audit" refers to the process that implementing agencies may use to verify the quality of the RMP submitted to EPA and require revisions when necessary to ensure compliance. RMP audits will generally involve on-site verification of a facility's underlying risk management program. Section 68.220 of the RMP rule requires implementing agencies to select facilities for audits based on specific criteria, and to follow a specific process for resolving audit findings prior to any enforcement action. *See* EPA. *Guidance for Conducting Risk Management Program Inspections under Clean Air Act Section 112(r);* January 2011; p 4. Available at http://www.epa.gov/osweroe1/docs/chem/clean_air_guidance.pdf (accessed June 11, 2013).
[330] 40 CFR §68.220 (1999).
[331] RMP inspections "are different from audits in that facilities are not necessarily selected for inspection based on Part 68 regulatory criteria, and inspections can lead directly to implementing agency enforcement actions for regulatory violations. Also, RMP inspections always involve on-site verification activities." *See* EPA, "Guidance for Conducting Risk Management Program Inspections under Clean Air Act Section 112(r)." January 2011; page 4. Available at http://www.epa.gov/osweroe1/docs/chem/clean_air_guidance.pdf (accessed June 11, 2013).
[332] Criteria used to determine high-risk includes the number of people in the footprint (if it is more than 100,000); accidental releases reported in the RMP; the hazard index (percentage of chemical quantity above threshold and number of chemicals onsite); and the number of Program Levels 2 or 3. US EPA Region 9 Emergency Prevention and Preparedness Program; *Stanislaus County Powerpoint*; March 2013. *See* http://www.condorearth.com/files/08-Enforcement_Priorities-Mary_Wesling.pdf (accessed May 14, 2013).
[333] EPA OIG. *Improvements Needed in EPA Training and Oversight for Risk Management Program Inspections;* March 21, 2013; p 7. http://www.epa.gov/oig/reports/2013/20130321-13-P-0178.pdf (accessed June 11, 2013).

submitted in an RMP[,]"[334] the EPA has not effectively implemented the audit and inspection elements of the Risk Management Program. As mentioned above in Section 3.2.2.3.2, the EPA Office of Inspector General (OIG) concluded in 2009 that over half of the RMP-covered facilities identified in the US as high-risk[335] had never received an on-site inspection or audit, and over 65 percent of all active RMP facilities had not received an on-site inspection or audit since inception of the RMP program in 1999.[336] The EPA OIG also noted that of the 296 uninspected high-risk facilities managed by EPA, 151 of these could each impact 100,000 people or more in a worst-case accident scenario.[337]

4.7 Independent, Competent, Well-Funded Regulator

As noted by NOPSEMA, a safety regulator "provides 'independent' assurance to society, governments and industry that companies have identified the risks to health and safety and have put appropriate measures in place to control these risks."[338] To ensure that companies are managing risks and employing the best available standards and technologies, the regulator must be independent,[339] well-resourced, and retain a sufficient number of technically competent, experienced, and well-trained staff that can critically assess companies' safety case reports and performance. Without independent and competent examinations, the safety case report becomes a meaningless document in terms of controlling risk and preventing major accidents. Offshore regulators in the UK and Australia also utilize independent third party specialist safety companies recognized by the regulator. Third party inspectors review important aspects of the safety case, such as safety critical elements[340] and performance standards.[341] Third party inspections, however, do not take the place of rigorous inspections by the regulator.

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[334] EPA. *Guidance for Conducting Risk Management Program Inspections under Clean Air Act Section 112(r);* January 2011; p 4. http://www.epa.gov/osweroe1/docs/chem/clean_air_guidance.pdf (accessed June 11, 2013).

[335] A high-risk facility is one that meets one of more of the following characteristics established by the EPA Office of Emergency Management: 1) Facilities whose reported RMP worst-case scenario population exceeds 100,000 people; 2) Any RMP Program facility with a hazard index greater than or equal to 25; and/or 3) Facilities that have had one or more significant accidental releases within the previous five years. *See* "EPA Office of Inspector General, "Improvements Needed in EPA Training and Oversight for Risk Management Program Inspections." March 21, 2013; Page 5. Available at http://www.epa.gov/oig/reports/2013/20130321-13-P-0178.pdf (accessed June 11, 2013).

[336] EPA OIG. *Evaluation Report: EPA Can Improve Implementation of the Risk Management Program for Airborne Chemical Releases;* February 10, 2009; p 15.

[337] *Ibid.*

[338] *See* http://www.nopsema.gov.au/safety/safety-case/safety-case-approach/ (accessed May 31, 2013).

[339] You will find a more detailed discussion of regulator independence in the CSB's upcoming Macondo Final Investigation Report.

[340] The UK HSE requires offshore installations to define "safety critical elements," which are the technical barriers in place for the prevention, detection, control, and mitigation of major accident risks. Lauder, Bob. *Major Hazard (Asset Integrity) Key Performance Indicators in use in the UK Offshore Oil and Gas Industry.* Paper at the CSB Indicators Public Hearing. July 24, 2012.

[341] In the UK, duty holders have a duty under the Offshore Installations (Safety Case) Regulations 2005 to "put in place and keep under continual review a verification scheme by means of which assurance is obtained from an independent competent person (ICP) that safety critical elements and PFEER [Offshore Installations) Prevention of Fire and Explosion, and Emergency Response] specified plant are suitable and remain suitable for the lifetime of the installation." *See* http://www.hse.gov.uk/offshore/verification.htm (accessed November 14, 2013).

As of June 2012, the HSE employed roughly 3,300 staff, of which 1,381were front-line inspectors,[342] whose responsibilities include conducting preventative inspections of roughly 950 COMAH facilities throughout the UK. The HSE employs roughly 105 inspectors to inspect approximately 300 offshore installations, in effect a one to three ratio. As such, the HSE, with a budget of roughly $472 million,[343] has the authority to offer higher specialist salaries to attract and retain more experienced, competent personnel. According to information obtained from the HSE, in 2011 and 2012 their onshore specialist inspector pay ranged from $85,806 to $102,344, and their offshore inspector pay ranged from $134,387 to $148,423 at the highest grade and $116,288 to $131,499 at the next highest grade.[344]

A safety case regime requires regulators to conduct preventative facility inspections and audits against the safety case to ensure that specified controls are functioning as intended. Regulators must be capable of interacting as equals with company risk managers when conducting these inspections. Former HSE staff have communicated to the CSB that HSE seeks new employees with good communication skills in addition to education and experience, as the job of a safety case regulator requires encouraging companies to aspire to make safety improvements that they may not want to make. One message that current and former HSE staff have repeated is that the industry believes having competent regulatory staff adds significant value to their business.[345] In any country, competent offshore regulatory staff can persuade companies to manage risks in a rigorous manner, knowing that if not done properly, their risk management practices will be challenged.[346] This competence is also essential for companies' confidence in the accuracy of the regulatory staff's advice, inspections, and citations. According to a literature review on the safety case in the UK, "[s]ome companies see as positive the requirement to have 'someone external to the company keeping you on your toes by regularly asking if you have done all you can,' and that it 'forces you to convince yourself' that you have covered all the risks."[347]

In the US, the federal government has used extensive resources to retain the best available talent to focus on health and safety oversight of US commercial and defense nuclear facilities.[348] For instance, many nonsupervisory technical staff at the US Nuclear Regulatory Commission[349] (NRC) and the Defense

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[342] HSE. *The Health and Safety Executive Annual Report and Accounts 2011/12;* July 2012; p 30. http://www.hse.gov.uk/aboutus/reports/1112/ar1112.pdf (accessed June 3, 2013).

[343] For 2013/2014, HSE's budget is listed as 308.1 £million. HSE recovers approximately 40 percent of its costs through income mainly in the nuclear, offshore, and chemical sectors, and the remainder is funded from Grant-in-Aid pursuant to the Health and Safety at Work etc. Act 1974, and fee for intervention (FFI).[343] *See* HSE, "HSE Business Plan 2012-15," July 2012; page 17. Available at http://www.hse.gov.uk/aboutus/strategiesandplans/businessplans/plan1215.pdf (accessed June 3, 2013). Conversion of UK Pounds to US Dollars is based on 1£ = 1.5313$. See http://wsj.com/mdc/public/page/2_3021-forex.html (accessed June 4, 2013).

[344] Conversion of UK Pounds to US Dollars is based on 1£ = 1.5313$. See http://wsj.com/mdc/public/page/2_3021-forex.html (accessed June 4, 2013).

[345] Based on conversations between the CSB staff and Mange Ognedal (Norway PSA), Ian Whewell (the UK HSE), Peter Wilkinson (Australia NOPSEMA), and John Clegg (Australia NOPSEMA).

[346] Peter Wilkinson, Manager Review Implementation Team, Offshore Safety Section, Australia Department of Industry, Tourism and Resources, Presentation to the National Research Centre for Occupational Health and Safety, ANU (May 15, 2002).

[347] Vectra Group Limited. *Literature Review on the Perceived Benefits and Disadvantages of UK Safety Case Regimes;* 2003; p 40.

[348] DNFSB FY2013 Budget Justification at p. 100 http://www.dnfsb.gov/sites/default/files/About/Budget%20Requests/2013/FY%202013_CONG%20BUDGET_FINAL.PDF (accessed May 15, 2013).

[349] Presentation by NRC Executive Director Bill Borchardt, January 2011.

Nuclear Facilities Safety Board are paid at the top of the General Schedule pay schedule.[350] Virtually all technical staff at the Defense Nuclear Facilities Safety Board hold technical master's degrees and approximately 25 percent hold doctoral degrees.[351]

The federal government has a unique category of non-executive positions that involve high-level research and development in the physical, biological, medical, or engineering sciences, or a closely-related field.[352] These are known as "Scientific or Professional" positions, and they are classified above the highest general schedule pay level.[353] These special salary authorizations contribute to the technical agencies' ability to compete with private industry to recruit and retain highly competent staff. The NRC also has a type of funding mechanism that ensures that the agency's budget adequately covers its regulator activities, as the NRC is required by law to recover at least 90 percent of its budget through licensing and inspection fees.[354]

Another method by which the NRC is able to attract and retain competent technical staff is its extensive training programs. For new inspection staff, the NRC requires a series of courses, assessments, and simulation, all of which takes approximately two years to complete.[355] Inspectors must have a bachelor's degree in engineering or a degree in a relevant scientific field and Professional Engineer certification.[356] The agency operates a technical training center in Chattanooga, Tennessee, with various control room simulators that mirror licensees' facilities. The NRC staff is expected to sufficiently understand this equipment so that they are able to conduct sufficient audits and investigations.[357] Before he or she is fully qualified to conduct inspections, inspector candidates must be recommended by the NRC inspector qualification board and certified by the regional administrator or division director.[358]

As will be discussed in greater detail under Section 5.0, at the time of the Chevron incident, a majority of the regulators responsible for oversight of Chevron and other petroleum refineries in California did not have sufficient, sustainable funding or staffing to oversee major accident prevention activities. An effective safety case regulatory system would necessitate that the California industry regulator be well-resourced and retain a sufficient number of competent, well-trained and experienced staff to critically assess a company's safety case. The overall knowledge and expertise of the regulator must at a minimum match that of industry in order for the regulator to successfully assess a company's safety case with the ultimate goal of preventing major accidents.

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[350] $123,758 to $155,500 per year in 2012 in Washington, DC. *See* https://www.opm.gov/oca/12tables/html/dcb.asp (accessed May 15, 2013).
[351] DNFSB FY2013 Budget Justification at p. 100 http://www.dnfsb.gov/sites/default/files/About/Budget%20Requests/2013/FY%202013_CONG%20BUDGET_FINAL.PDF (accessed May 15, 2013).
[352] http://www.opm.gov/ses/recruitment/stpositions.asp (accessed May 15, 2013).
[353] http://www.opm.gov/ses/recruitment/stpositions.asp (accessed May 15, 2013).
[354] Section 6101 "NRC User Fees and Annual Charges," Omnibus Budget Reconciliation Act, Pub. L. 103-66. 107 Stat. 312 (Aug. 10, 1993).
[355] NRC Inspection Manual, Qualification Program for Operating Reactor Programs (Ch. 1245) at 4, available at http://pbadupws.nrc.gov/docs/ML1110/ML11105A153.pdf (accessed May 28, 2013).
[356] NRC Reactor Inspector Job Posting No. R-I/DRS-2013-0001
[357] *See, e.g.*, http://www.iaea.org/ns/tutorials/regcontrol/regbody/reg2124.htm (accessed May 28, 2013).
[358] NRC Inspection Manual, Qualification Program for Operating Reactor Programs (Ch. 1245) available at http://pbadupws.nrc.gov/docs/ML1110/ML11105A153.pdf

5.0 Oversight of Petroleum Refineries in California

In California, there currently exists a patchwork of primarily activity-based federal, state, and local laws and regulations aimed at preventing harmful releases of hazardous materials at facilities such as petroleum refineries. This regulatory framework does not foster continuous improvement by driving companies to reduce risks of their hazardous activities to ALARP, nor does it have the requisite number of regulatory staff with the skills, knowledge, and experience to provide sufficient oversight.

5.1 Cal/OSHA

5.1.1 Background Information

Section 18 of the OSHAct[359] encourages states to develop and implement their own job safety and health programs. Twenty-five states (including California), Puerto Rico and the Virgin Islands currently implement OSHA-approved State Plans.[360] States must set job safety and health standards that are "at least as effective as" comparable federal standards; most adopt standards that are identical to the federal standards.[361]

California was certified as an OSHA State Plan state on August 12, 1977.[362] California's Division of Occupational Safety and Health (Cal/OSHA) administers the California Occupational Safety and Health Program. A PSM District Office[363] within Cal/OSHA enforces California's PSM standard, which is established under Title 8, Section 5189 of the California Code of Regulations (CCR) and entitled *Process Safety Management of Acutely Hazardous Materials*.[364,365] The PSM District Office is comprised of seven inspectors, known as Associate Safety Engineers, and one District Manager to regulate nearly 1,700 PSM-covered facilities in California, including 15 petroleum refineries. Only one of these individuals has a technical background, with a degree in Chemical Engineering. Appendix B of this report summarizes the key differences between the federal and California PSM standards and the safety case regulatory regime. A more detailed analysis of those differences will be provided in the remainder of Section 5.1.

The CSB in its Interim Report identified a number of weaknesses of Chevron's process safety performance. In many of these causal issues, Chevron was not required to perform at a more effective level by the existing California PSM regulations. In Table 1 below, the CSB identifies the causal issues or findings, which highlight the gaps in the California and federal PSM regulations, and how each issue is more effectively managed in the safety case regulatory regime. In this section of the report, some of these examples will be examined in relation to key features of an effective regulatory approach such as the

[359] 29 U.S.C. §667 (2004).
[360] These are referred to informally as OSHA State Plans. OSHA approves and monitors State plans and provides up to 50 percent of an approved plan's operating costs
[361] 29 U.S.C. §667 (c)(2) (2004). *Also see* http://www.osha.gov/dcsp/osp/faq.html (accessed May 13, 2013).
[362] *See* http://www.osha.gov/dcsp/osp/stateprogs/california.html (accessed June 17, 2013).
[363] The California PSM District Offices were established in 2001 after the February 1999 Tosco refinery incident in which four workers were fatally injured following the ignition of a highly flammable material during a turnaround operation. In January 2012 the two district offices were combined into one PSM District Office.
[364] *See* http://www.osha.gov/dcsp/osp/stateprogs/california.html (accessed May 13, 2013).
[365] 8 CCR §5189 (2012).

safety case. More information on these causal findings can also be found in the CSB Chevron Interim Report.

Process Safety Element	Causal Finding	California PSM Regulation*	The Safety Case Regulatory Regime**
MOC	Inspection recommendation to upgrade pipe to 9-Chrome not implemented. The MOC to implement the recommendation narrowed the scope allowing the 52-inch component that failed to remain in service. Implementation of 9-Chrome could have prevented the incident.[366]	MOC element requires implementation of written procedures to manage changes that shall address the impact of the change on health and safety; however the element is activity based and there is no requirement to implement effective recommendations or control hazards. There is no requirement in the MOC element to consider inherent safety. Cal/OSHA did not cite Chevron for this issue.	Duty holder is required to drive risk to ALARP. Description of MOC procedures and demonstration of their effectiveness in managing major accident hazard risk are a key requirement of the safety case. Implementation of the concept of inherent safety is required.[367]

* Unless otherwise noted, California and federal PSM requirements are nearly identical.

** Regulatory regimes such as offshore in Norway have many attributes of the safety case regulatory regime but are not called the safety case regulatory regime.

[366] For more information, *see* CSB's *Chevron Richmond Refinery Interim Investigation Report*. April 2013; p 41 and 42. http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf (accessed October 30, 2013).

[367] According to the HSE, essential considerations for determining whether a duty holder has reduced risks to ALARP include "the adoption of inherently safer designs…". HSE. *The Safety Report Assessment Manual, Sections 8 to 15*. p 30. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013). The HSE also notes that the guidance to COMAH Regulation 4 (General Duty) "describes the application of all measures necessary to reduce risk of a major accident to ALARP based on a hierarchical approach (inherent safety, prevention, control, mitigation)." *Ibid* at 8.

Process Safety Element	Causal Finding	California PSM Regulation*	The Safety Case Regulatory Regime**
MOC	Chevron conducted MOCs to evaluate proposed changes to crude feed that introduced higher sulfur concentration. However, Chevron failed to thoroughly evaluate the change of increasing sulfur weight percentage in crude oil feed and to assess how it might affect corrosion rates within the 4-sidecut piping circuit. Cal/OSHA did not issue any citations for failing to consider the impact of corrosion in the MOC process when sulfur composition in the crude oil feed was increased.[368]	MOC element is activity-based rather than performance based and requirements in RAGAGEP such as API 570[369] do not apply to the MOC element of PSM. Cal/OSHA did not cite Chevron for this issue.	Duty holder is required to drive risk to ALARP. Duty holder must identify in the safety case report the standards that they are using to reduce risk such as API 570. The implementation of those standards can be enforced by the regulator to achieve ALARP.
PHA	In its 2009 crude unit PHA, Chevron simply cited non-specific, judgment-based qualitative safeguards such as: utilizing metallurgy to minimize corrosion, having effective maintenance and inspection programs, and providing pipe wall corrosion allowances. The effectiveness of these safeguards was neither evaluated nor documented; instead the safeguards were merely listed in the PHA.	While the PHA element requires addressing the control of hazards, it does not require addressing the effectiveness of the controls or using the hierarchy of controls. For example, the standard would not require the use of improved metallurgy or inherent safety to mitigate corrosion hazards. Cal/OSHA did not cite Chevron for this issue.	Requires the use of the most effective practical safeguards to achieve ALARP. The safety case requires the use of inherently safer design and the hierarchy of controls.[370]

[368] For more information, *see* CSB's *Chevron Richmond Refinery Interim Investigation Report.* April 2013; p 34, 35 and 36. http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf (accessed October 30, 2013).

[369] API 570. *Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems.* November 2009.

[370] According to the HSE, essential considerations for determining whether a duty holder has reduced risks to ALARP include "the adoption of inherently safer designs…". HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 30. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013). The HSE also notes that the guidance to COMAH Regulation 4 (General Duty) "describes the application of all measures necessary to reduce risk of a major accident to ALARP based on a hierarchical approach (inherent safety, prevention, control, mitigation)." *Ibid* at 8.

Process Safety Element	Causal Finding	California PSM Regulation*	The Safety Case Regulatory Regime**
PHA	The 4-sidecut line was analyzed in the most recent crude unit PHA. Corrosion was not identified as a potential cause of a leak/rupture in the piping.	Damage mechanism hazard reviews are not required by the PSM regulation. The process hazard analysis element does not require consideration of RAGAGEP such as API RP 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*. Cal/OSHA did not cite Chevron for this issue.	For example in the UK the HSE has worked with the industry to develop guidance on damage mechanism hazard reviews in the UK's offshore petrochemical industry. The implementation of best practice standards referenced by a duty holder's safety case report may be enforced by the regulator to achieve ALARP.
Incident Investigations	Chevron made recommendations following its investigation of sulfidation incidents at Richmond, Salt Lake City and Pascagoula refineries requiring 100 percent component inspection in high risk piping systems. These recommendations were not implemented in the Richmond refinery crude unit prior to the incident. In 2007 Chevron identified the inherently safer solution of improved metallurgy to prevent sulfidation corrosion but only applied it to the crude unit small spool piece that failed.	Neither California nor federal PSM regulations require root cause investigations or recommendations to be developed as the result of incident investigations. While California does require taking action to prevent reoccurrence, (goes beyond federal OSHA) it does not drive risk to ALARP. Cal/OSHA did not cite Chevron for this issue. Federal PSM does not require the development of recommendations or the prevention of future incidents.	Investigation of incidents is required to demonstrate legal compliance with framework legislation. ALARP requirement would require remedial action including cross-company learning from incident investigations. HSE can require safety case duty holder compliance with investigation report recommendations (e.g. Buncefield Report- "determine SIL level requirements for overfill protection").

Process Safety Element	Causal Finding	California PSM Regulation*	The Safety Case Regulatory Regime**
Mechanical Integrity	Chevron was instrumental in the development of API RP 939-C, which suggests ("should") but does not require ("shall") that 100 percent component inspection be performed. API states that the use of "shall" denotes minimum requirements in the use of the standard - API RP 939-C has no minimum requirements (no substantive "shalls" are used in the recommended practice).	The mechanical integrity element of PSM requires that for inspection and testing procedures, employers follow RAGAGEP. However, API RP 939-C has no minimum requirements. Nonetheless, Cal/OSHA cited Chevron for failure to follow API RP 939-C under this mechanical integrity provision. In the federal regulatory context, this approach has been called into question by the recent administrative law judge decision in *BP Products*. This case is scheduled for review by the full commission.	In a safety case regime, the regulator can reject the use of weak and inadequate standards referenced in a safety case report (by rejecting the report) and can require more rigorous performance to achieve ALARP.

Process Safety Element	Causal Finding	California PSM Regulation*	The Safety Case Regulatory Regime**
Inherent Safety	Chevron employees have recommended implementing inherently safer designs through the MOC process, incident investigations, technical reports, and past employee recommendations. However, the CSB has not identified any documented, thorough analysis of the proposed inherently safer solutions. In addition, Chevron has repeatedly failed to implement proposed inherently safer recommendations. Had Chevron implemented these recommendations, the incident could have been prevented.	Neither California nor federal PSM regulations require the use or implementation of inherent safety. Cal/OSHA did not cite Chevron for this issue. In its Interim Report, the CSB made a recommendation to the California legislature and the Governor of California to use inherently safer systems analysis and the hierarchy of controls to the greatest extent feasible in establishing safeguards for identified process hazards.	Safety case requires the implementation of inherently safer systems analysis.[371]
Regulator Enforcement	Despite numerous safety system deficiencies the Cal/OSHA regulator failed to identify these issues prior to the incident. Cal/OSHA conducted three planned inspections prior to the incident that resulted in no citations or fines.	The CSB determined Cal/OSHA lacked sufficient resources and numbers of highly qualified inspectors. California is adding 15 additional inspectors to its PSM unit. The Governor's Interagency Task Force on Refinery Safety will be proposing to implement additional recommendations from their draft report.	A key feature of the safety case is a rigorous review of the safety case report that may be accepted or rejected by the regulator. Preventative audits of covered facilities are regularly performed by technically competent, well resourced regulators.

[371] According to the HSE, essential considerations for determining whether a duty holder has reduced risks to ALARP include "the adoption of inherently safer designs…". HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 30. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013). The HSE also notes that the guidance to COMAH Regulation 4 (General Duty) "describes the application of all measures necessary to reduce risk of a major accident to ALARP based on a hierarchical approach (inherent safety, prevention, control, mitigation)." *Ibid* at 8.

Process Safety Element	Causal Finding	California PSM Regulation*	The Safety Case Regulatory Regime**
Workforce Involvement	The workers in previous loss of containment incidents raised concerns about the level of corrosion in the Crude and RLOP incidents, but their concerns were not effectively addressed prior to the August 6, 2012, incident.	The workforce participation element requires an employer to develop a written plan to "ensure employee participation in process safety management." including "consultation with employees and their representatives on the conduct and development of the elements of process safety management..." However, development of a written plan to satisfy the regulatory requirements does not ensure that workers and their representatives in practice are able to effectively participate in a company's safety management system such as PHAs, MOCs, and investigation activities.	Safety case sets out a legal framework for the participation of employees on health and safety-related matters, the election of safety representatives, and the establishment of safety committees to serve health and safety related functions. Workforce participation practices are documented by the duty holder and submitted to the regulator.

Table 1. CSB Causal Findings.

5.1.2 Analysis

5.1.2.1 ALARP

Unlike the OSHAct, the California Occupational Safety and Health Act does not have a General Duty Clause. Rather, Section 5189 was established to "eliminate to a substantial degree, the risks to which employees are exposed in petroleum refineries, chemical plants and other facilities."[372] By focusing on the significant reduction of risk, this language supports the principle of ALARP, which requires a showing by the company that "there are no other practical measures that could reasonably be taken to reduce risks further."[373] However, this section, which lays out the "scope and purpose" of the regulation, is not an enforceable element of the regulation that is subject to citations, and the remaining PSM regulation elements do not lead in practice to that result. Rather, California's PSM standard has remained activity-based, with many activity-based elements almost identical to the federal PSM standard. For example, an employer must "perform a hazard analysis [PHA] appropriate to the complexity of the

[372] 8 CCR §5189 (a) (2012).
[373] ALARP Guidance Note N-04-300-GN0166, Rev. 3 (Dec. 2011) available at http://www.nopsema.gov.au/assets/document/N-04300-GN0166-ALARP.pdf (accessed May 15, 2013).

process for identifying, evaluating, and controlling hazards involved in the process..."[374] The PHA must address hazards of the process; engineering and administrative controls applicable to the hazards and their relationships; consequences of failure of these controls; facility siting; human factors; a qualitative evaluation of a range of the possible safety and health effects of the failure of controls on facility employees; and the identification of any previous incident which had a likely potential for catastrophic consequences in the workplace."[375] This language does not support the principle of ALARP, and makes no mention of risk or continuous improvement in any way. As a result, PHAs satisfy the California PSM regulatory requirement by merely listing safeguards; there is no requirement to evaluate or document the effectiveness of these safeguards, or to show that the safeguards in place are effectively reducing risks.

As discussed in the CSB's Interim Report on the Chevron incident, Chevron cited in its 2009 crude unit PHA non-specific, judgment-based qualitative safeguards such as: utilizing metallurgy to minimize corrosion, having effective maintenance and inspection programs, and providing pipe wall corrosion allowances.[376] The effectiveness of these safeguards was neither evaluated nor documented. Had the adequacy of these safeguards been verified, improved safeguards intended to protect against sulfidation-induced failure of carbon steel piping could have been recommended. In addition, while the 4-sidecut line was analyzed in this PHA, corrosion was *not* identified as a potential cause of a leak/rupture in the piping (emphasis added). A corrosion review, also referred to as a damage mechanism hazard review, analyzes hazards presented by all process failure mechanisms such as corrosion and cracking. This type of review, while considered to be good practice,[377] is not required by the PSM regulations either federally or in California, and as such the CSB made a recommendation in its Interim Report to require these in future California PHAs. Under a safety case regulatory regime, the regulator has the ability to drive industry to adapt new technologies and safer practices as soon as they are developed; new rulemaking is not required for immediate improvements, because companies are obligated to continually work toward specified performance goals such as reducing risks to ALARP. Therefore, under a safety case regulatory regime the regulator could require these types of reviews to be conducted to reduce risk without requiring additional legislation.

Cal/OSHA does not typically review a company's PHA as part of its routine oversight of process safety management unless there is a specific complaint, accident, or targeted inspection. Nor does it "accept" a company's PHA and proposed hazard mitigations. Therefore, prior to the August 2012 incident, Cal/OSHA inspectors did not require any additional information or analysis to be provided in the Chevron crude unit PHA. Highlighting the reactive nature of the PSM standard, Cal/OSHA inspected the Chevron facility post-incident and issued 17 citations related to the incident and eight additional citations, with a total proposed fine of nearly $1 million. Only one citation related to PHAs, and it was not associated with evaluating the effectiveness of safeguards or failure to control the 4-sidecut corrosion hazard. Rather, the emphasis was that Chevron's PHA did not adequately account for hazards caused by other units

[374] 8 CCR §5189 (e)(1) (2012).
[375] 8 CCR §5189 (e)(2) (A) through (G) (2012).
[376] Corrosion allowance refers to extra wall thickness added as a safety factor to the design of a piece of equipment beyond that needed solely for mechanical considerations such as design temperature and pressure. This extra thickness is provided to accommodate for expected loss of wall thickness due to corrosion over the life of the equipment.
[377] API RP 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*, describes common process failure mechanism and is considered to be good practice for analyzing risks presented by process failure mechanisms such as corrosion and cracking.

associated with the crude unit. This again highlights the lack of a requirement for Chevron to demonstrate that risks have been reduced to ALARP, or for Chevron to provide this type of analysis to Cal/OSHA to review.

5.1.2.2 Adaptability and Continuous Improvement

Of the 25 Cal/OSHA citations mentioned above, two were issued to Chevron for its failure to follow API RP 939-C, *Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries* as RAGAGEP. This voluntary API standard will be discussed in greater detail in the CSB's Final Investigation Report on the Chevron incident. However, it is important to note for purposes of this report that API RP 939-C is a permissive, voluntary standard merely intended to provide guidance to industry personnel on how to address sulfidation corrosion in petroleum refining operations. Existing safety guidelines use words "shall" and "should" to denote either requirements or recommendations. API RP 939-C does not use the word "shall"; as such, it contains no requirements for industry. While the regulator in a safety case regulatory regime has the authority to analyze and challenge the requirements of API RP 939-C with the goal of driving continuous improvement and risk reduction (note the Buncefield examples discussed in Section 4.3), in the present case Cal/OSHA utilized the voluntary practice as an opportunity to issue a citation to Chevron post-incident. Cal/OSHA did not analyze API RP 939-C to determine whether its provisions are sufficient to reduce risks and manage hazards. It also remains to be seen whether this citation will be upheld considering the permissive language contained within the standard.

Chevron has investigated a number of sulfidation incidents at its refineries over the years, including Richmond, Salt Lake City, and Pascagoula. Figure 2 shows a timeline of Chevron's key sulfidation events. In January 2007, a failure due to sulfidation corrosion caused a serious fire in the Chevron Richmond Refinery crude unit resulting in a CWS Level 3 alert, injuring one worker and initiating a shelter-in-place for the surrounding community. As a result of these investigations, Chevron made internal recommendations to require 100 percent component inspections in high-risk piping systems. However, these recommendations were not implemented in the Richmond Refinery crude unit prior to the incident, highlighting a lack of learning from previous incidents by Chevron.

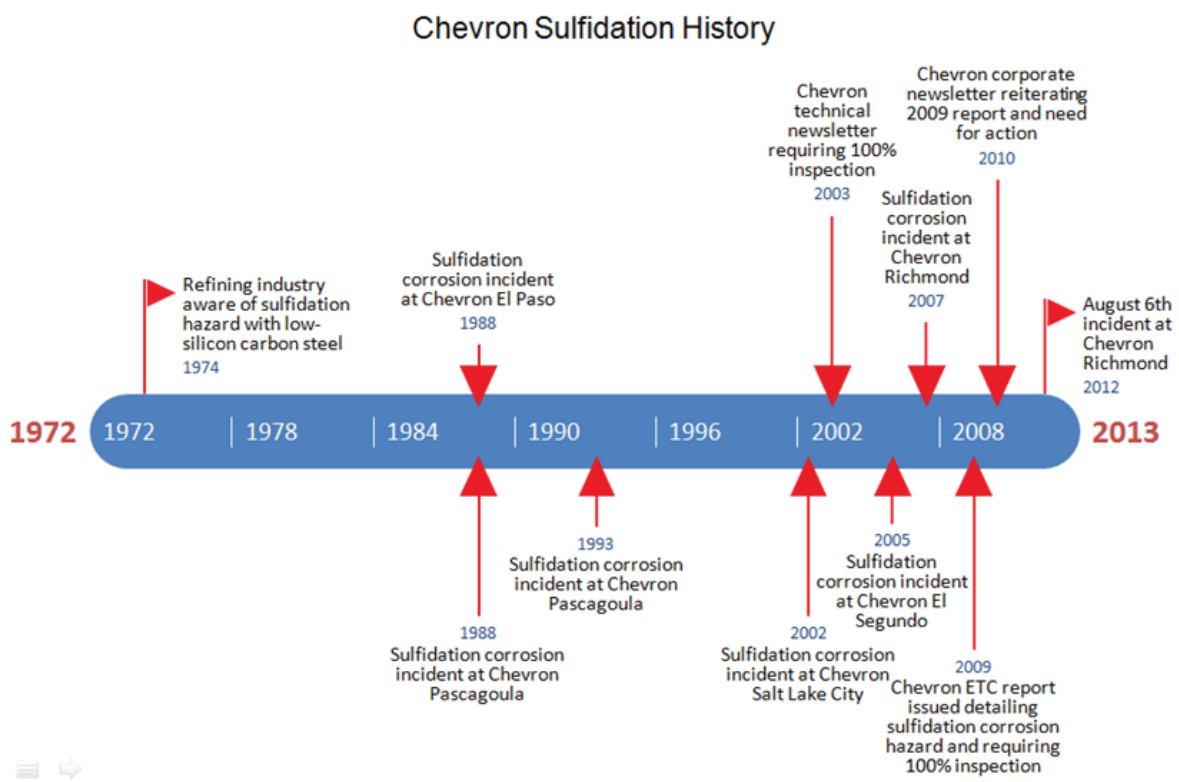

Figure 2. Chevron's key sulfidation events between 1974 and 2013.

In addition, as a result of the January 2007 incident, Chevron informed Contra Costa Health Services' Hazardous Materials Program[378] (CCHMP) in a letter that the crude unit piping metallurgy had been upgraded following this incident as an inherently safer solution. However, the CSB learned that this upgrade was limited to only the immediate piping spool[379] that failed. Cal/OSHA also did not require Chevron to update the crude unit PHA to address the findings from this incident. Under a safety case regulatory regime, the regulator would work with the company to improve its practices following such an incident. The company would also be required to update its safety case report to address these corrosion hazards and demonstrate how the company has reduced risks to ALARP.

The CSB also noted in its Chevron Interim Report that despite internal recommendations to replace the entire #4 sidecut piping with an inherently safer, more corrosion-resistant material of construction, Chevron's 2006 Management of Change (MOC) analysis limited the application of those recommendations. Instead of replacing the entire piping segment identified by the original recommendation, the 2006 MOC considered only the replacement of a small section. Although the recommendation was intended to more broadly apply inherently safer materials of construction, the final implementation under the 2006 MOC limited the application of this more corrosion resistant

[378] Contra Costa Health Services' Hazardous Materials program is designed to respond to emergencies and monitor hazardous materials within Contra Costa County. *See* http://cchealth.org/hazmat/ (accessed April 17, 2013). CCHSHMP also implements the CalARP and ISO programs, which will be discussed in greater detail later on.
[379] A piping spool is a small, removable section of piping. In some cases, a piping spool is installed or removed in order to provide a temporary connection or complete disconnection between two piping circuits.

metallurgy.[380] As the mere completion of an MOC and the implementation of any action item satisfy the California PSM standard requirements, regardless of its adequacy or effectiveness, Cal/OSHA did not evaluate the MOC or cite Chevron for narrowing the scope of the MOC, despite its disregard of internal recommendations. Neither the California nor the federal PSM standards allow citations for inadequate MOCs. In addition, RAGAGEP does not apply to the MOC PSM element.

This can be contrasted with the safety case regulatory regime in the UK, where the HSE includes the adoption of inherently safer designs as an essential consideration for determining whether a duty holder has reduced risks to ALARP.[381] The HSE also notes that the guidance to COMAH Regulation 4, (the COMAH General Duty provision) "describes the application of all measures necessary to reduce risk of a major accident to ALARP based on a hierarchical approach (inherent safety, prevention, control, mitigation)."[382]

5.1.2.3 Process Safety Indicators

As the CSB has noted in its BP Texas City Investigation Report, Chevron Interim Report, and Section 4.5 of this report, process safety indicators are a significant element of process safety management systems and are critical for reducing process safety incidents. A major goal of process safety indicators is to drive continuous process safety improvement. Regulators can utilize these indicators to focus inspections, audits, and investigations.

Federally and in the state of California, neither the PSM standard nor the RMP rule require companies to utilize or report process safety indicators. Chevron voluntarily utilizes both leading and lagging indicators internally in its US petroleum refineries, in a system called Operational Excellence and Reliability Intelligence (OERI), which tracks 26 different process safety indicators. OERI was implemented in May 2009. However, Chevron is not required to report the status of its indicators to California regulators. Nor is Chevron held accountable to use the indicators to drive performance or continuous improvement. As a result, in its Interim Report, the CSB made a recommendation to the California State Legislature to identify and require the reporting of leading and lagging process safety indicators to state and local regulatory agencies, with the goal of improving mechanical integrity and process hazard analysis performance at all California petroleum refineries, and preventing major chemical incidents.

5.1.2.4 Inspections

As noted in Section 4.6, safety case regulators utilize preventative inspections and audits to monitor compliance with legislation and to ensure that the facility and its operations are consistent with information provided in the safety case. However, like federal OSHA, California regulations require Cal/OSHA to prioritize accident, complaint, and referral-based inspections over planned inspections. As such, Cal/OSHA's inspection program of the nearly 1,700 PSM-regulated facilities in California,

[380] As discussed in the Interim Report, only the section of piping downstream of the pumps was replaced with 9-Chrome.
[381] HSE. *The Safety Report Assessment Manual, Sections 8 to 15.* p 30. http://www.hse.gov.uk/comah/sram/s8-15.pdf (accessed October 30, 2013).
[382] *Ibid* at 8.

including 15 petroleum refineries, [383] has been reactive in nature rather than proactive to maximize prevention.

OSHA State Plan states[384] were strongly encouraged but not required to implement the federal Petroleum Refinery NEP. Cal/OSHA did not adopt the NEP "because of its dedicated PSM Unit."[385] Between 2006 and August 6, 2012, the Cal/OSHA PSM District Office conducted only three planned inspections of the Chevron Richmond facility, totaling only 150 inspector hours of effort. Cal/OSHA has acknowledged that these were not PQV inspections, as envisioned in its mission statement and in the federal PSM compliance directive. None of these inspections resulted in citations or fines. According to statistics provided by OSHA, federal NEP refinery inspections conducted between 2007 and the end of 2011 required roughly 1,000 inspector hours each and resulted in an average of 11.2 violations and $76,821 in penalties per inspection. OSHA noted that hours spent on a typical federal refinery NEP inspection were 40 times greater than the average OSHA inspection. These numbers indicate a major disparity in thoroughness and comprehensiveness between the planned inspections conducted by Cal/OSHA and the NEP inspections conducted by OSHA and other OSHA State Plan States. The federal NEP, which represented a more robust and intensive inspection program, was terminated in 2011 due to the stated great demand on OSHA resources.

5.1.2.5 Workforce Participation

Like the federal PSM standard, California's PSM standard provides for workforce participation in a company's process safety management program. 8 CCR §5189 (p) requires an employer to develop a written plan to "ensure employee participation in process safety management" including "consultation with employees and their representatives on the conduct and development of the elements of process safety management…"[386] However, developing a written plan to satisfy the regulatory requirements does not ensure that workers and their representatives in practice are able to effectively participate in a company's process safety management systems.

In its investigation of the Chevron incident, the CSB noted that the Chevron Richmond Refinery workforce and its representatives, the United Steelworkers (USW), had expressed concerns regarding sulfidation corrosion and broader workplace safety issues, but were not consistently listened to by Chevron managers, and their concerns regarding corrosion were not adequately acted upon. In November 2011, Cal/OSHA investigated a complaint of unsafe working conditions during the fourth quarter Richmond Lube Oil Plant (RLOP) turnaround at the Richmond Refinery. The RLOP receives feedstock from the crude unit where the August 6th incident occurred and has similar sulfidation corrosion concerns. During the shutdown of the RLOP, a fire occurred at one of the RLOP furnaces. According to Cal/OSHA's inspection report, Chevron employees told Cal/OSHA that "OPERATORS GET IGNORED." Many of the employees were concerned about increased corrosion they were finding during the turnaround, and believed that increased temperatures and throughput rates had an adverse effect on

[383] *Also see* the California Labor Code Sections 6309 to 6315 (The California Occupational Safety and Health Act of 1973).
[384] Section 18 of the Occupational Safety and Health Act of 1970 encourages States to develop and operate their own job safety and health programs, referred to informally as an OSHA State Plan. OSHA approves and monitors State plans and provides up to 50 percent of an approved plan's operating costs.
[385] Department of Industrial Relations, Division of Occupational Safety and Health, California, Process Safety Management District Office. *Mission Statement: Goals Reached in 2011 & Strategic Plan for 2012.*
[386] 8 CCR §5189(p)(1) (2012).

equipment integrity. According to the interview notes, many operators had raised issues of corrosion in the RLOP to higher level supervisors to no avail; according to one, if you raise an issue a couple of times, "you get labeled a 'pest.'" The CSB has not identified evidence indicating that Cal/OSHA took further action to respond to these concerns, and Cal/OSHA did not issue any citations as a result of its investigation.[387] Post-incident, significant sulfidation corrosion was found in the RLOP and piping and equipment were replaced.

The CSB found other significant evidence that increased workforce participation could have reduced the likelihood that unchecked corrosion would lead to the August 2012 incident. As discussed in the CSB's Interim Report on the Chevron incident, Chevron technical staff has considerable knowledge and expertise regarding sulfidation corrosion, specifically with respect to corrosion rate variations caused by differing silicon concentration in carbon steel piping. Chevron employees have authored industry papers on sulfidation corrosion and had significant influence in the development of the industry sulfidation corrosion recommended practice, API RP 939-C. In 2009, Chevron Energy Technology Company (Chevron ETC)[388] created an internal document on the subject of sulfidation corrosion. Chevron ETC metallurgists released a formal report dated September 30, 2009 (nearly 3 years prior to the incident) to Chevron refinery-based reliability managers and chief inspectors entitled *Updated Inspection Strategies for Preventing Sulfidation Corrosion Failures in Chevron Refineries.*

Sulfidation experts explained in the Chevron ETC report that, "[u]ntil now, Chevron has not directly addressed the risk of low Si[licon] carbon steel…"[389] and that the ETC report introduced a program that "seeks to close these gaps, and to maximize the effectiveness of our inspection." The report clearly indicates that Chevron understood both the potential consequence and the high likelihood of a rupture or catastrophic failure from sulfidation corrosion and calls out Chevron's need for action.

The Chevron ETC report specifically recommended that inspectors perform 100 percent component inspection on high temperature carbon steel piping susceptible to sulfidation corrosion. However, this 100 percent component inspection program was not implemented at the Richmond refinery prior to the August 6, 2012, incident. The Chevron ETC report defined a priority ranking system to help focus the inspection implementation efforts. The process conditions of the 4-sidecut pipe placed it in the highest priority for inspection.

Chevron ETC technical experts issued a corporate newsletter in 2010 that again warned of the potential consequence of sulfidation failures. In this newsletter, the 100 percent component inspection recommendation from the 2009 report was reiterated for piping systems such as the crude unit 4-sidecut piping. The newsletter stated:

> Sulfidation corrosion failures … are of great concern because of the comparatively high likelihood of 'blowout' or catastrophic failure. This typically happens because corrosion occurs at a relatively uniform rate over a broad area, so a pipe can get progressively thinner until it actually bursts rather than leaking at a pit or local thin area. In addition, the

[387] Post-incident, there were significant mechanical integrity improvements and piping replaced in the RLOP unit.
[388] The Chevron Energy Technology Company is a separate business unit within the Chevron Corporation that provides technology solutions and technical expertise for Chevron operations worldwide. *See* http://richmond.chevron.com/home/aboutchevronrichmond.aspx (accessed April 4, 2013)
[389] A 2003 corporate technical newsletter recommended 100 percent component inspection of carbon steel piping susceptible to sulfidation corrosion following a 2002 Chevron Salt Lake City sulfidation corrosion incident.

> process fluid is often above its auto ignition temperature. The combination of these factors means that sulfidation corrosion failures frequently result in large fires. Chevron and the industry have experienced numerous failures from this mechanism and recent incidents have reinforced the need for revised inspection strategies and a robust PMI (Positive Materials Identification) program.

The Chevron ETC 100 percent component inspection recommendation for high risk piping systems, established in 2009, was not implemented at Richmond, and the thin-walled low silicon 4-sidecut piping component remained in service until it catastrophically failed on August 6, 2012.

Chevron and Chevron ETC metallurgists, materials engineers, and piping inspectors had expertise regarding sulfidation corrosion. They educated personnel and advocated for identification and control of damage mechanisms, including sulfidation corrosion. However, they had limited practical influence to implement their recommendations. These individuals did not participate in the crude unit PHA and did not affect decisions concerning control of sulfidation corrosion during the crude unit turnaround process.[390]

Despite the history of sulfidation corrosion incidents and the recommendations by Chevron's workforce to implement better inspection methodologies, Cal/OSHA did not evaluate these recommendations or determine whether Chevron management ensured that the hazards of this damage mechanism were addressed and mitigated in Chevron's PHAs. In addition, Cal/OSHA issued no citations to Chevron post-incident regarding the failure to address sulfidation corrosion in its crude unit PHA. Finally, when Chevron employees raised concerns, Cal/OSHA did not effectively address them. The examples highlighted in this section speak to the need for California to develop more effective regulation similar to the UK legislation discussed in Section 4.4, to ensure strong workforce involvement in health and safety matters at petroleum refineries. This will not only help prevent incidents such as the one that occurred at Chevron, but it will also help improve communication and ensure that workers are represented in the decisions that affect them.

5.1.2.6 Funding and Regulator Competency

Cal/OSHA has not received sufficient funding to employ a well-staffed, multi-disciplinary team capable of conducting thorough inspections of PSM-covered facilities in California. This is apparent when examining the lack of preventative, planned inspections of petroleum refineries being conducted by the PSM team in the state. In order for a safety regulatory regime to successfully regulate with the goal of major accident prevention, there must be a technically competent, well-resourced regulator in place to sufficiently review, scrutinize, and challenge the hazard identification and evaluation that has been conducted and controls that have been put in place to reduce risk, to help drive continuous improvement and ensure that risks are being controlled. It is not an acceptable outcome for society that petroleum refineries with the potential for catastrophic accidents be inspected only after an accident occurs or a complaint is filed.

[390] The turnaround process includes both the planning stage prior to the shutdown and the activities staged during the shutdown.

Compensation is one important factor for recruiting and retaining technically competent personnel. The CSB found that California regulators are significantly less compensated when compared to their industry counterparts. Based on information Chevron provided to the CSB, the average annual salary of refinery personnel who would interact with a California regulator performing an audit or safety inspection is $187,630. Table 2 below provides the 2012 salaries of California regulatory personnel that the CSB determined would likely perform a safety inspection or a hypothetical safety case assessment. These figures indicate a substantial compensation gap between the regulator and the regulated. A Cal/OSHA PSM team of associate safety engineers receive an average annual salary that is 46 percent lower than the refinery employees they would likely interface with during an inspection. EPA RMP inspectors receive an annual salary that is 33 percent lower than their facility counterparts and Contra Costa County accidental release prevention engineers and their supervisor are paid 48 percent less than these industry personnel.[391]

Entity	Average Annual Salary
Refinery Personnel	**$187,630**
Cal/OSHA	$100,536
Contra Costa County	$96,875
EPA	$125,000

Table 2. Average 2012 salary for individuals selected by the CSB as representative of the professional staff within each California regulator and of the refinery professional staff who interface with the regulators regarding audits or safety inspections at the Chevron Richmond Refinery.

As noted in the introduction of this report, the California State Legislature approved a 2013-2014 state budget bill (AP 110) that allows the California Department of Industrial Relations to charge state petroleum refineries a fee by March 31, 2014, to support an increase in funding and to pay for at least 15 new positions in Cal/OSHA's PSM Unit.[392] The CSB considers this to be a positive step towards improving process safety management in the state of California, as it will provide the team the opportunity to conduct more thorough inspections. However, it is imperative that these additional inspectors have the skills, knowledge, and experience to provide sufficient direct oversight over PSM-covered facilities. Despite the additional funding, there remains a longstanding salary cap on associate safety engineers within Cal/OSHA. This will continue to make it difficult for Cal/OSHA to consistently attract or retain the necessary talent and expertise to effectively oversee these facilities.

[391] Compensation information is based on salary only. It does not take into account non-salary information such as bonuses, retirement programs, or benefit programs.
[392] *See* http://www.caltax.org/homepage/062113_Legislature_Approves.html (accessed July 9, 2013).

5.2 U.S. Environmental Protection Agency

According to the EPA OIG, as of May 2012, only eight states and five local agencies had accepted full or partial RMP program delegation from EPA.[393] As such, EPA regions directly implement the RMP program in most states. As no state agency has requested or received delegation to implement the RMP program within EPA Region 9, the federal EPA regional office is responsible for RMP program implementation for California as well as Arizona, Nevada, Hawaii, the Pacific Islands, and 148 Tribal Nations.

5.2.1 Risk Management Plan (RMP) Program

As of March 2013, there were 1,137 RMP-covered facilities in Region 9: 957 in California; 118 in Arizona; 42 in Nevada; 16 in Hawaii; and four in Guam.[394] The Chevron Richmond Refinery has many processes covered by the RMP rule, including Program 3 processes, [395] such as the crude unit. As such, Chevron is required to submit an RMP every five years to EPA Region 9, and EPA is expected to audit the facility against this RMP to ensure compliance. According to Chevron's most recent RMP submitted to EPA Region 9 in October 2011, its crude unit contained 400,000 pounds of a flammable mixture of propane, pentane, butane, ethane, and methane, well above the 10,000-pound threshold quantity for flammables.[396]

EPA Region 9 employs four full-time and two part-time RMP inspectors to implement the RMP program for the roughly 1,100 RMP-covered facilities in the entire region. Region 9 staff informed the EPA OIG that to most effectively utilize their resources, they "place an additional focus on facilities in States, such as Arizona, that do not have their own risk management or accident prevention programs.[397] The EPA's mandates to conduct a certain number of inspections at high-risk facilities plus a lack of resources and staffing prevent the inspectors from fully auditing many of the petroleum refineries in each state; thus, the inspectors aim to visit each refinery every three years, where they pick one process to evaluate for two to three days. These inspectors target their inspections towards a specific industry issue during these visits. For example, when they last inspected Chevron in 2010, the inspectors focused on the issue of high temperature hydrogen attack (HTHA) due to the Tesoro incident[398] that occurred in April 2010.

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[393] EPA OIG. *Improvements Needed in EPA Training and Oversight for Risk Management Program Inspections;* March 21, 2013; p 2.

[394] US EPA Region 9 Emergency Prevention and Preparedness Program; *Stanislaus County Powerpoint*; March 2013. *See* http://www.condorearth.com/files/08-Enforcement_Priorities-Mary_Wesling.pdf (accessed May 14, 2013).

[395] Processes not eligible for Program 1 and either subject to OSHA's PSM standard or classified in one of ten specified North American Industrial Classification System (NAICS) codes are placed in Program 3, which imposes OSHA's PSM standard as the prevention program as well as additional hazard assessment, management, and emergency response requirements.

[396] EPA List of Regulated Chemicals and Threshold Quantities for RMP program available at http://www.epa.gov/R5Super/cepps/pdfs/rmp-listed-chemicals-200708.pdf (accessed May 17, 2013).

[397] California has its own RMP program, called CalARP. *See* EPA OIG. *Evaluation Report: EPA Can Improve Implementation of the Risk Management Program for Airborne Chemical Releases;* February 10, 2009; p 23.

[398] On April 2, 2010, a heat exchanger ruptured due to high temperature hydrogen attack, resulting in seven worker fatalities at the Tesoro Anacortes Refinery in Anacortes, Washington. The CSB is currently investigating this incident.

5.2.2 Implementation of the RMP Program

In order for a safety regime to function well, there must be a competent, well-resourced regulator in place to implement the regime. However, the EPA Region 9 RMP group is extremely understaffed and under-resourced, as there are only six full-time inspectors to cover over 1,100 facilities across many states. Instead of fully inspecting or auditing petroleum refineries, the group is able to inspect one process at each refinery for two to three days every three years, which makes fully inspecting these facilities or auditing against the RMPs submitted by these facilities impossible. In addition, this group has other responsibilities beyond the RMP program, including the management of contracts, emergency prevention and preparedness training and outreach, and reporting violations under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The CSB has learned that because this group has such limited resources, it hopes to delegate RMP inspection authority to other agencies throughout the region, as long as it maintains power to enforce violations.

Like the federal and California PSM standards, the RMP regulations provide for workforce participation[399] and require facilities to prepare a written plan of action regarding employee participation. It is the RMP program's policy to invite employee representatives to participate in all parts of onsite inspections. EPA Region 9 RMP staff told the CSB, however, that the limited amount of time they were able to spend onsite at refineries made speaking with facility inspectors and operators a difficult task. They expressed that a lesson learned from the Chevron incident was that EPA RMP inspectors should commit more time onsite during facility inspections and audits, which will allow them more time to speak with workers to gain a better insight into how any issues within the facility are being addressed and resolved.[400]

As mentioned above, EPA guidance on the RMP program states that the owner or operator's duty to "prevent accidents and ensure safety at [their] source…" may require steps to be taken "beyond those specified in the risk management program rule."[401] While this principle appears to be similar to ALARP requirements of the safety case, in practice this is not required, and whether this is done is not subject to regulation or review. Similar to the PSM standard, RMP regulations require each facility with Program 3 processes to conduct a PHA as part of its prevention program that is "appropriate to the complexity of the process…and[] identify, evaluate, and control the hazards involved in the process."[402] However, these regulations do not require facilities to include these analyses in the RMPs they submit to EPA. Rather, facilities with Program 2 or 3 processes are only required to include in the RMP very high-level, simplified information on their prevention programs and their PHAs. The Chevron Richmond Refinery's most recent RMP submission from October 2011 included the following information on the PHAs for each relevant process: the date of the last PHA for that process; what technique was used; what major hazards were identified; what process controls were in use (i.e. automatic shutoffs, interlocks, alarms, emergency power); what mitigation systems were in use (i.e. dikes, fire walls, water curtain); what monitoring/detection systems were in use (i.e. process area detectors); date of the most recent review or

[399] *See* 40 CFR §68.83 (2000).
[400] This need for greater interface with worker is a professional opinion by EPA staff, but has not resulted in EPA policy modifications to ensure effective worker input in future inspections.
[401] EPA Office of Solid Waste and Emergency Response. *General Guidance on Risk Management Programs for Chemical Accident Prevention (40 CFR Part 68);* March 2009; p 7-7. *See* http://www.epa.gov/osweroe1/docs/chem/Toc_final.pdf (accessed May 14, 2013).
[402] 40 CFR §68.67(a) (1998).

revision of training programs; and maintenance. Chevron included one paragraph entitled "E.5. General Accidental Release Prevention Program," which stated that PSM is applied to the entire refinery, and the PSM program is documented in Refinery Instruction (RI)-360, "Richmond Refinery PSM Policy." No additional information or analysis could be located concerning the identification or control of hazards, or risk reduction, as, unlike the safety case model, there is no requirement for the company to demonstrate to the regulator that it is effectively ensuring that the safety systems are functioning as intended.

Under the EPA RMP program, there is no regulatory requirement to reduce risks to ALARP. In addition, there is no requirement to submit to the regulator detailed information relating to risk reduction or hazard assessments. Finally, the Region 9 EPA RMP inspection team does not have the resources to fully audit petroleum refineries and other high hazard facilities subject to the RMP program. As a result, the EPA RMP program is not comprehensive or rigorous enough to control major accident hazards and reduce risks. Instead, facilities submit high-level summary information providing evidence that the activity-based requirements contained within the RMP regulations have been completed by the facility.

5.3 Unified Program

Chevron's Richmond refinery was also subject to process safety regulatory requirements at the county and city level. The facility had to adhere to additional requirements above RMP and PSM, but these requirements were not sufficient to prevent the Chevron incident. The following sections will discuss those county and city requirements.

In 1993, Chapter 418, Statutes of 1993 (Senate Bill 1082) established Chapter 6.11 of the California Health and Safety Code (HSC), which required the Secretary of the California Environmental Protection Agency (Cal/EPA) to adopt regulations creating a "unified hazardous waste and hazardous materials management" regulatory program, or Unified Program, by January 1, 1996, to consolidate and make consistent six existing hazardous materials and hazardous waste programs within the state.[403] The Secretary of Cal/EPA was charged with ensuring that the Unified Program was established and implemented by a Certified Unified Program Agency, or CUPA, in all counties in California. Cal/EPA adopted the Unified Program regulations under Title 27, Division 1 of the California Code of Regulations, which integrated six existing programs: the Hazardous Waste Generator and Onsite Hazardous Waste Treatment programs; the Aboveground Storage Tank program; the Underground Storage Tank program; the Hazardous Materials Release Response Plans and Inventory program; the California Accidental Release Prevention (CalARP) program; and the California Uniform Fire Code.[404] The CalARP program, which was created through Assembly Bill AB1889 with the goal of major accident prevention, will be discussed at greater length below. There are currently 83 CUPAs in the state of California that implement the Unified Program at a local level.[405]

5.3.1.1 Contra Costa County Hazardous Materials Programs

The Chevron Richmond Refinery is located in the City of Richmond, within Contra Costa County. The local CUPA responsible for implementing the Unified Program in all areas of the country is the Contra

[403] California Health and Safety Code §25404(b) (1993). *Also see* http://www.calepa.ca.gov/cupa/Reports/2002/ReimbAcct.pdf (accessed May 16, 2013).
[404] 27 CCR §15100 (a)(1) through (6) (1994).
[405] *See* http://www.calepa.ca.gov/cupa/Documents/2012/FactSheet.pdf (accessed May 16, 2013).

Costa Health Services' Hazardous Materials Programs (CCHMP).[406] CCHMP is responsible for implementing the Unified Program in all areas of Contra Costa County.

CCHMP implements two programs that are relevant to this investigation: the CalARP program and the City of Richmond Industrial Safety Ordinance (RISO). CCHMP also implements the county's own Industrial Safety Ordinance (ISO), which covers seven facilities. CCHMP has five full-time engineers, known as accidental release prevention engineers, who are responsible for implementing these programs for the county. While all have technical degrees in engineering, only two of these engineers have past refinery experience.

5.3.1.1.1 CalARP

The California Health and Safety Code Article 2 (Chapter 6.95, Sections 25531 – 25543.3) was amended effective January 1, 1997, to implement EPA's RMP program at the state level through the creation of the CalARP program regulations. Modeled after EPA's RMP program and California's Risk Management and Prevention Plan, which was enacted in 1986, the CalARP regulations (Title 19, Chapter 4.5 of the CCR) were implemented with the goal of preventing accidental releases of substances that can cause serious harm to the public and the environment, minimizing damage caused by a release, and to satisfy community right-to-know laws.[407] California is one of at least three states that implement a state RMP program without delegation of the federal program from EPA.[408]

The CalARP regulations, including PHA requirements, are essentially duplicative in nature to EPA's RMP program, with a few exceptions: the list of toxic chemicals covered is 276 instead of 77; the threshold quantities of some chemicals are smaller; CalARP requires a seismic analysis; and there is more interaction with the public and other agencies.[409] The CalARP regulations require that businesses that produce, handle, process, distribute, or store certain chemicals over a certain threshold quantity develop a Risk Management Plan (RMP) and submit the RMP to a local CUPA for review. Like the EPA RMP program, facilities with a Program 3 process must develop a management system that includes a PHA and emergency response program.[410] State oversight authority and responsibility for the CalARP program is with the California Emergency Management Agency (Cal EMA).[411]

The CalARP regulations apply to roughly 45 facilities in Contra Costa County, including the Chevron refinery in Richmond. Each covered facility is required to submit an updated RMP to CCHMP at least once every five years.[412] The group of CCHMP engineers reviews these plans and is required to

[406] Contra Costa County's Hazardous Materials program is responsible for responding to emergencies and monitoring hazardous materials in Contra Costa County. It is the duty of CCC to safeguard the Contra Costa County ecosystem from the release of hazardous materials and other pollutants. For more information *see* http://cchealth.org/hazmat/ (accessed May 21, 2013).
[407] Information available at http://www.calema.ca.gov/HazardousMaterials/Pages/Accidental-Release-Prevention-(CalARP).aspx (accessed May 16, 2013).
[408] EPA OIG. *Evaluation Report: EPA Can Improve Implementation of the Risk Management Program for Airborne Chemical Releases;* February 10, 2009; p 20.
[409] Information on differences between EPA's RMP program and CalARP available at http://cchealth.org/hazmat/differences-rmp-calarp-iso.php (accessed May 16, 2013).
[410] 22 CCR §2735.5(f) (2004).
[411] Cal EMA is responsible for the coordination of overall state agency response to major disasters in support of local government. For more information *see* http://www.calema.ca.gov/Pages/default.aspx (accessed May 21, 2013).
[412] 22 CCR §2745.10(a)(1) (2004).

"periodically audit RMPs"[413] against the regulations to ensure compliance. This group has told the CSB that it audits each facility at least once every three years. It last audited Chevron in February 2011, and has been conducting another audit in October and November 2013.

Although CCHMP is authorized to issue enforcement actions for violations uncovered during facility audits, in practice CCHMP engineers issue "ensure" action items that list the deficiencies and recommend improvements. They then work with the facility to make sure that these action items are implemented. CCHMP has rarely issued fines or citations to facilities for violations. If the engineers identify other gaps or areas for improvement that are not actual regulatory violations, they can issue "consider" action items, which are essentially suggestions to the facility for improvements that are not technically required to be implemented by the regulation. Whether these types of action items are issued is dependent upon the knowledge and experience of the engineer conducting the audit. Once CCHMP engineers have completed the audit, CCHMP issues a final audit report on the facility, which they also supply to Cal/OSHA's PSM District Office and the EPA Region 9 RMP group.

5.3.1.1.2 Industrial Safety Ordinance

The Contra Costa County Industrial Safety Ordinance (ISO) became effective January 15, 1999. Adopted as County Ordinance Chapter 450-8, the ISO expands on the CalARP program in Contra Costa County for facilities meeting the following criteria: 1) the facility is within an unincorporated area of the County; 2) the facility is either a petroleum refinery or chemical plant; 3) the facility is required to submit a Risk Management Plan (RMP) to the EPA and the Contra Costa County Health Service; and 4) the facility has at least one Program 3 process.[414] Seven of the 45 CalARP facilities in the county are currently required to comply with the ISO requirements.

The ISO was adopted to improve industrial safety by, among other things, requiring more comprehensive coverage of the whole facility rather than only certain processes; providing review, inspection, auditing and safety requirements more stringent than are currently in effect; requiring the development and implementation of a human factors program; and preventing and reducing the number, frequency and severity of accidental releases in Contra Costa County.[415]

Facilities subject to the ISO are essentially required to treat every process as subject to the CalARP Program 3 prevention program requirements. Covered facilities have additional requirements as well, including developing and implementing a human factors program, considering inherently safer technologies and systems for new and existing facilities or processes, submitting a safety plan to CCHMP, and conducting a Management of Organizational Change (MOOC) prior to changes in permanent staffing levels or reorganization in operations, maintenance, health and safety, or emergency response.[416]

[413] 22 CCR §2775.2(a) (2004).
[414] *See* http://cchealth.org/groups/hazmat/industrial_safety_ordinance.php (accessed May 21, 2013).
[415] Chapter 450-8.004(a)(1) through (10) (
[416] Information available at http://cchealth.org/groups/hazmat/industrial_safety_ordinance_risk_management.php (accessed May 22, 2013).

5.3.1.1.3 City of Richmond Industrial Safety Ordinance

On December 18, 2001, the City of Richmond adopted an Industrial Safety Ordinance (RISO) under Municipal Code Chapter 6.43 that was almost identical to the ISO. In February 2013, the City of Richmond Council amended the RISO to make it equivalent to the ISO. Chevron is one of two facilities subject to RISO requirements. Pursuant to an agreement with the City of Richmond, CCHMP implements and enforces the RISO within the city.

Like the ISO, the RISO requires that a covered facility submit a safety plan to CCHMP that includes safety elements such as process safety information (PSI), operating procedures, mechanical integrity, employee participation, and management of change (MOC).[417] CCHMP has posted a Safety Plan Guidance Document on its website to assist facilities in developing these plans. Each facility is also required to comply with safety requirements including performing PHAs, and must include a description of the manner of compliance with these in the safety plan.[418] In performing a PHA, facilities are required to address the hazards of the process, identify any previous incident, identify controls applicable to the hazards, and identify consequences of failure of those controls, human factors, and a qualitative evaluation of a range of possible safety and health effects of failure of controls.[419]

The CCHMP engineers are required to review each facility's safety plan as well as audit each facility to determine compliance with ISO or RISO. CCHMP engineers conduct the CalARP and ISO/RISO audits concurrently at each covered facility. CCHMP generally audits each facility once every three years. To aid in the auditing process, CCHMP engineers have entered all the CalARP program requirements into a database. They have taken each of these requirements and turned them into questions. When the engineers go onsite, they perform three main functions: 1) they identify and review any policy statement that directs how people should handle a particular piece of equipment; 2) they identify and review records of procedures, such as MOCs and permits; and 3) they randomly select and interview individuals about their familiarity with various aspects of different programs. If the engineers find a regulatory deficiency, they issue an ensure action item to the facility.

Once the engineers have completed their facility audit, they issue a preliminary determination to the facility. The facility has 90 days to review the draft and provide a proposed remedy with specifics on how they it fix each deficiency, and the timeline. Once the report is finalized it goes out for public comment. Following public comment, it is issued to the facility and provided to Cal/OSHA's PSM District Office and the EPA Region 9 RMP group.

5.3.1.2 Analysis

Chevron submitted its most updated safety plan to CCHMP on February 25, 2013. Section 3.12 of the plan discusses PHAs and Action Items. Under this section, Chevron lists eight objectives of its PHAs, including identifying possible failures or releases, evaluating potential consequences, and proposing recommendations that would reduce the risks. Chevron also discusses its possible justifications for declining recommendations from PHAs, including the fact that an alternative measure would be sufficient, and that the recommendation may be infeasible. There was no additional information or

[417] Richmond Municipal Code Section 6.43.090 (a) (2013).
[418] *Ibid* at Sections (a) through (e) (2013).
[419] *Ibid* at (d) (2013).

analysis contained in this section concerning the identification or control of hazards, or risk reduction, as there is no requirement to do so.

The RISO and CalARP regulations require that PHAs list controls and possible consequences of failure of those controls, but there is no specific requirement to include evaluations of the safeguards and controls in the PHA. As CCHMP engineers are only required to audit against the regulatory requirements, they would only examine the evaluation of safeguards if such an evaluation were performed and documented in the facility's PHAs. As noted previously, Chevron's most recent crude unit PHA ineffectively listed qualitative safeguards for corrosion and mechanical integrity.

While CCHMP engineers are able to issue "consider" action items to the facility recommending actions above and beyond regulatory requirements, CCHMP engineers did not do this regarding Chevron's Crude Unit PHA or its evaluation of safeguards. After reviewing CCHMP's most recent audit of Chevron, the CSB could find nothing referring to sulfidation corrosion, reduction of risk, or safeguard evaluation. While CCHMP is able to utilize these "consider" action items to encourage facilities to go above and beyond regulatory requirements to reduce risk, CCHMP engineers have stated to the CSB that they do not make sufficient use of this mechanism. Rather, they tend to audit against the existing regulatory requirements to ensure compliance.

Unlike the safety case regulatory approach, which requires a reduction of risk to ALARP or equivalent, facilities covered by RISO or ISO are only required to "*consider* [emphasis added] the use of inherently safer systems in the development and analysis of mitigation items resulting from a process hazard analysis [PHA] and in the design and review of new processes and facilities."[420] Despite multiple internal recommendations to replace its piping due to the risk of sulfidation corrosion, Chevron failed to replace the piping prior to the incident with an inherently safer material. Again, the CSB has not found evidence that CCHMP effectively encouraged Chevron to go above and beyond regulatory requirements by utilizing inherently safer systems to reduce risk.

As emphasized repeatedly in this report, a regulatory regime is only as strong as its regulators, and must employ individuals with the requisite skills, knowledge, and experience to provide sufficient oversight over facilities. In the case of CCHMP, there are only five engineers for nearly 45 facilities in the county, and only two have previous refinery experience.[421] In addition, while the CCHMP is funded mostly through CUPA fees, ISO fees, and other means of cost recovery, the engineers are part of a bargaining unit and their salaries are paid through the county's general fund, which has experienced annual budget reductions in the millions.[422] This has unnecessarily resulted in a decrease in the CCHMP engineers' salaries and has made it extremely difficult for CCHMP to fill a current position that has been open over three years because of its inability to offer competitive salaries to attract its engineers. Overall, CCHMP suffers from a lack of resources and funding, limiting its ability to hire additional highly qualified staff to oversee the petroleum refineries in Contra Costa County.

[420] City of Richmond Municipal Code §6.43.050(g) (February 5, 2013).
[421] Two of the other engineers have chemical plant experience and have led or participated in refinery compliance audits in the past ten years.

6.0 Conclusion

This report has focused on seven aspects of the safety case regulatory approach that the CSB believes differentiate it from existing US and California process safety regulations: safety responsibility on the part of the facility; reduction of risk to ALARP; adaptability; workforce involvement; the effective use of process safety indicators; regulatory oversight; and an independent, competent, well-funded regulator. These attributes together enable industry and the regulator to ensure that facilities are developing and implementing comprehensive, robust safety management systems to prevent major accidents.

Implementation of the safety case regulatory regime in California for petroleum refineries will require a commitment of extensive resources to fund a regulator that has the requisite skills, knowledge, and experience to ensure petroleum refineries in the state continually assess their practices and reduce risks to ALARP. However, the CSB believes that effective implementation of this regulatory approach will achieve greater major accident prevention in California and, in the process, provide greater protection for its workers and the public.

The safety case provides the adaptability necessary to keep current with improving standards and advancing technology, without requiring lengthy and often unproductive rulemaking on the part of the regulator. With the safety case regulatory regime in place, a competent regulator will independently ensure that California refineries have taken all practical measures that can be reasonably taken to reduce risks. For example, the regulator would have the ability to work with these facilities to implement recommendations and lessons learned from significant petroleum refinery incidents throughout the world without requiring extensive rulemaking or legislation, as regulators have done post-incident in the UK, Norway, and Australia. If questions remain regarding the safety case regulatory regime after reading this report, see Appendix C for additional information and discussion.

The safety case regulatory regime will require a full commitment and extensive effort by the California legislature, regulators, and California petroleum refineries. However, the CSB believes that this effort is necessary to ensure that California, like other regions around the world, is effectively managing process safety and risk, and in the process, preventing major accidents such as the August 6, 2012, Chevron pipe rupture and hydrocarbon release.

7.0 Recommendations

Pursuant to its authority under 42 U.S.C. §7412(r)(6)(C)(i) and (ii), and in the interest of promoting safer operations at California petroleum refineries and protecting workers and communities from future accidents, the CSB makes the following safety recommendations:

California State Legislature,

Governor of California

2012-03-I-CA-R21

Develop and implement a step-by-step plan to establish a more rigorous safety management regulatory framework for petroleum refineries in the state of California based on the principles of the "safety case" framework in use in regulatory regimes such as those in the United Kingdom, Australia, and Norway, and as described in this report, with the following minimum components:

a. A case for safety written by the duty holder that includes a systematic analysis and documentation of all major hazards and effective control methods implemented to reduce those risks as low as reasonably practicable (ALARP);

b. A thorough review of the safety case report by technically competent regulatory personnel that requires modifications and improvements to the document as necessary prior to acceptance;

c. Audits and preventative inspections by the regulator to verify effective implementation of safety case elements;

d. A risk management approach that requires analysis and effective implementation of safeguards, using the hierarchy of controls, to protect people and the environment from major accident hazards. The effectiveness of the safeguards will be demonstrated through the use of leading and lagging process safety indicators;

e. Ability to adapt and implement safety requirements in response to newly identified hazards, advances in technology, lessons learned from major accidents, and improved safety codes without the need for new rule-making;

f. Determines when new or improved industry standards and practices are needed and initiates programs and other activities such as forums to prompt the timely development and implementation of such standards and practices;

g. Uses a tripartite model where the regulator, the company, and workers and their representatives play an equal and essential role in the direction of preventing major accidents;

h. A regulatory model and accompanying guidance based on the UK's The Safety Representatives and Safety Committees Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996, which set out the legal framework for the rights and responsibilities of workers and their representatives on health and safety-related matters, and the election of safety representatives and establishment of safety committees to serve health and safety-related functions. The elected representatives should have a legally recognized role that goes beyond consultation in activities such as the development of the safety case report, process hazard analysis, management of change, incident investigation, audits, and identification

and effective control of hazards. The representatives should also have the authority to stop work that is perceived to be unsafe or that presents a serious hazard until the regulator intervenes to address the safety concern. Workforce participation practices should be documented by the duty holder and submitted to the regulator;

i. Requires reporting of information to the public such as a summary of the safety case report, a list of safeguards implemented and standards utilized to reduce risk, and process safety indicators that demonstrate the effectiveness of the safeguards and management systems;

j. An independent, well-funded, well-staffed, technically competent regulator; and

k. A compensation system to ensure the safety case regulator has the ability to attract and retain a sufficient number of employees with the necessary skills and experience to ensure regulator technical competency. Periodically conduct a market analysis and benchmarking review to ensure the compensation system remains competitive with California petroleum refineries.

2012-03-I-CA-R22

Work with the regulator, the petroleum refining industry, labor, and other relevant stakeholders in the state of California to develop and implement a system that collects, tracks, and analyzes process safety leading and lagging indicators from operators and contractors to promote continuous safety improvements. At a minimum, this program shall:

a. Require the use of leading and lagging process safety indicators to actively monitor the effectiveness of process safety management systems and safeguards for major accident prevention. Include leading and lagging indicators that are measureable, actionable, and standardized. Require that the reported data be used for continuous process safety improvement and accident prevention;

b. Analyze data to identify trends and poor performers and publish annual reports with the data at facility and corporate levels;

c. Require companies to publicly report required indicators annually at facility and corporate levels;

d. Use process safety indicators (1) to drive continuous improvement for major accident prevention by using the data to identify industry and facility safety trends and deficiencies and (2) to determine appropriate allocation of regulator resources and inspections; and

e. Be periodically updated to incorporate new learning from world-wide industry improvements in order to drive continuous major accident safety improvements in California.

Occupational Safety and Health Administration

2012-03-I-CA-R23

This report highlights significant advantages of the safety case regime over the existing Process Safety Management standard to prevent potentially catastrophic chemical accidents that are relevant to OSHA's response to Executive Order 13650. In the development of the OSHA EO response, incorporate a written

plan that includes the evaluation of issues raised from the findings, conclusions and recommendations in this report concerning the safety case regime.

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Appendix A: Significant Petroleum Refinery Incidents in 2012

1. Tank failure at the ExxonMobil refinery in Beaumont, Texas on 11 January
2. Vessel pressure excursion at the Flint Hills refinery in St. Paul, Minnesota on 22 January
3. Hydrogen Sulfide release from mechanical integrity failure at the Northern Tier Energy refinery in St. Paul, Minnesota on 26 January
4. Sulfuric acid release from a mechanical integrity failure at the ConocoPhillips refinery in Wood River, Illinois on 27 January
5. Hydrogen Sulfide release from mechanical integrity failure at the Marathon refinery in Garyville, Louisiana on 31 January
6. Hydrocarbon and hydrogen fluoride release from a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 31 January
7. Sulfur dioxide and hydrogen sulfide release following a vessel pressure excursion at the Alon refinery in Big Spring, Texas on 1 February
8. Hydrocarbon release from a vessel pressure excursion at the ConocoPhillips refinery in Belle Chasse, Louisiana on 1 February
9. Benzene release from a mechanical integrity failure at the Husky refinery in Lima, Ohio on 16 February
10. Fire at the Tesoro refinery in Salt Lake City, Utah on 17 February
11. Fire at the BP refinery in Cherry Point, Washington on 17 February
12. Tank failure at the Shell refinery in Deer Park, Texas on 22 February
13. Tank failure at the Paulsboro refinery in Paulsboro, New Jersey on 23 February
14. Fire at the Citgo refinery in Corpus Christi, Texas on 24 February
15. Hydrogen Sulfide release from a mechanical integrity failure at the Flint Hills refinery in Rosemount, Minnesota on 28 February
16. Vessel pressure excursion at the Motiva refinery in St. Charles, Louisiana on 28 February
17. Benzene release from a mechanical integrity failure at the Chalmette refinery in Chalmette, Louisiana on 28 February
18. Crude oil release from a mechanical integrity failure at the Flint Hills refinery in North Pole, Alaska on 4 March
19. Hydrogen fluoride release from a mechanical integrity failure at the Citgo refinery in Corpus Christi, Texas on 6 March
20. 1 worker was fatally injured and 2 other workers were burned at the Valero refinery in Memphis, Tennessee on 6 March
21. Fire during a hot work activity at the Tesoro refinery in Martinez, California on 7 March
22. Benzene release from a mechanical integrity failure at the Chevron refinery in Pascagoula, Mississippi on 8 March
23. Heavy oil release from a mechanical integrity failure at the Chevron refinery in Pascagoula, Mississippi on 13 March
24. Benzene release from a mechanical integrity failure at the Marathon refinery in Texas City, Texas on 14 March
25. Fire at the PBF Energy refinery in Delaware City, Delaware on 16 March
26. Hydrocarbon release from a mechanical integrity failure at the Chevron refinery in Pascagoula, Mississippi on 19 March

27. Hydrocarbon release from a mechanical integrity failure at the Tesoro refinery in Anacortes, Washington on 23 March
28. Hydrocarbon release from a mechanical integrity failure at the ExxonMobil refinery in Baytown, Texas on 24 March
29. Fire at the ExxonMobil refinery in Billings, Montana on 25 March
30. Hydrogen fluoride release from a mechanical integrity failure at the BP refinery in Texas City, Texas on 27 March
31. Hydrocarbon release from a mechanical integrity failure at the Total refinery in Port Arthur, Texas on 11 April
32. Fire at the ConocoPhillips refinery in Rodeo, California on 13 April
33. Hydrocarbon release from a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 16 April
34. Crane fell over and damaged utility piping at the Citgo refinery in Lemont, Illinois on 17 April
35. Hydrocarbon release from a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 19 April
36. Fire at BP refinery in Texas City, Texas on 20 April
37. Hydrocarbon release from a mechanical integrity failure at the ConocoPhillips refinery in Sweeny, Texas on 24 April
38. Fire at the Sunoco refinery in Philadelphia, Pennsylvania on 8 May
39. 4 workers injured in fire at the Sinclair refinery in Sinclair, Wyoming on 8 May
40. Hydrocarbon release from a mechanical integrity failure at the LyondellBasell refinery in Houston, Texas on 8 May
41. Fire at the Sunoco refinery in Philadelphia, Pennsylvania on 9 May
42. Fire at the Motiva refinery in Port Arthur, Texas on 12 May
43. Hydrogen sulfide release from a mechanical integrity failure at the CVR Energy refinery in Wynnewood, Oklahoma on 11 May
44. Hydrogen fluoride release from a mechanical integrity failure at the Citgo refinery in Corpus Christi, Texas on 15 May
45. Hydrogen sulfide release from a mechanical integrity failure at the Shell refinery in Deer Park, Texas on 17 May
46. Benzene and hydrogen sulfide release from a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 21 May
47. Fire at the Montana Refining Company refinery in Great Falls, Montana on 24 May
48. Hydrocarbon release from a mechanical integrity failure at the Valero refinery in Memphis, Tennessee on 25 May
49. 2 workers injured from a fire at the Sinclair refinery in Sinclair, Wyoming on 28 May
50. Propylene release from overpressure event at the PBF Energy refinery in Delaware City, Delaware on 29 May
51. Hydrocarbon release from a mechanical integrity failure at the Valery refinery in Houston, Texas on 31 May
52. Hydrogen and hydrocarbon release due to loss of containment event at the Shell refinery in Deer Park, Texas on 7 June

53. Hydrogen sulfide and hydrocarbon release due to flare failure at the Motiva refinery in Norco, Louisiana on 7 June
54. Fire at the Motiva refinery in Port Arthur, Texas on 9 June
55. Hydrocarbon release due to a mechanical integrity failure at the BP refinery in Texas City, Texas on 9 June
56. Fire at the ExxonMobil refinery in Torrance, California on 11 June
57. Fire at the Total refinery in Port Arthur, Texas on 13 June
58. Hydrogen sulfide release from a tank failure at the ConocoPhillips refinery in Rodeo, California on 15 June
59. Hydrocarbon release at the Shell refinery in Deer Park, Texas on 20 June
60. Fire at the BP refinery in Whiting, Indiana on 21 June
61. Hydrocarbon release due to a mechanical integrity failure at the Valero refinery in Corpus Christi, Texas on 23 June
62. Benzene release due to a mechanical integrity failure at the ExxonMobil refinery in Baton Rouge, Louisiana on 25 June
63. Benzene release due to a mechanical integrity failure at the ExxonMobil refinery in Baytown, Texas on 28 June
64. Propane release due to a mechanical integrity failure at the Valero refinery in McKee, Texas on 28 June
65. Sulfuric acid release due to a mechanical integrity failure at the Chevron refinery in El Segundo, California on 2 July
66. Hydrocarbon release due to a mechanical integrity failure at the Phillips 66 refinery in Westlake, Louisiana on 14 July
67. Fire at the Citgo refinery in Corpus Christi, Texas on 16 July
68. Fire at the Valero refinery in Meraux, Louisiana on 22 July
69. Sulfuric acid release due to a mechanical integrity failure at the Sunoco Point Breeze refinery in Philadelphia, Pennsylvania on 22 July
70. Fire at the BP refinery in Whiting, Indiana on 23 July
71. Hydrocarbon and hydrogen fluoride release due to a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 24 July
72. Fire at the HollyFrontier refinery in Tulsa, Oklahoma on 2 August
73. 8,614 lbs of hydrogen sulfide were released to the atmosphere due to a mechanical integrity failure on a compressor suction line at the Chevron refinery in Richmond, California on 2 August.
74. Hydrogen sulfide release from an overpressure event at the Valero refinery in Texas City, Texas on 5 August
75. Fire at the Sinclair refinery in Sinclair, Wyoming on 5 August
76. Fire at the Chevron refinery in Richmond, California on 6 August
77. Fire at the Shell refinery in Martinez, California on 13 August
78. Hydrogen sulfide release from a mechanical integrity failure at the Shell refinery in Martinez, California on 14 August
79. 2 workers injured from a fire at the BP refinery in Whiting, Indiana on 14 August
80. Hydrogen sulfide release due to a mechanical integrity failure at the Phillips 66 refinery in Wood River, Illinois on 22 August

81. Fire at the Sinclair refinery in Sinclair, Wyoming on 24 August
82. Hydrocarbon release due to a mechanical integrity failure at the LyondellBasell refinery in Houston, Texas on 25 August
83. Hydrocarbon release due to a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 26 August
84. Hydrogen sulfide and propylene release due to a mechanical integrity failure at the ExxonMobil refinery in Beaumont, Texas on 29 August
85. Fire at the Phillips 66 refinery in Rodeo, California on 29 August
86. A high pressure excursion in a vessel resulted in a hydrocarbon release with offsite consequences at the Holly refinery in Woods Cross, Utah on 30 August
87. Worker injured following a fire at the Marathon refinery in Detroit, Michigan on 5 September
88. Chemical release with offsite consequences at the Marathon refinery in Detroit, Michigan on 8 September
89. Sulfuric acid release due to a mechanical integrity failure at the Tesoro refinery in Martinez, California on 10 September
90. Carbon monoxide and hydrogen sulfide release due to a mechanical integrity failure at the ExxonMobil refinery in Baytown, Texas on 11 September
91. Hydrogen sulfide release due to a mechanical integrity failure at the Marathon refinery in Garyville, Louisiana on 11 September
92. Hydrocarbon release due to a mechanical integrity failure at the Chevron refinery in Pascagoula, Mississippi on 14 September
93. Unspecified leak at the Tesoro refinery in Martinez, California on 15 September
94. Hydrocarbon release due to a mechanical integrity failure at the PBF Energy refinery in Delaware City, Delaware on 21 September
95. Hydrogen sulfide release due to a mechanical integrity failure at the Motiva refinery in Norco, Louisiana on 24 September
96. 1 worker killed and another worker injured from an explosion at the CVR Energy refinery in Wynnewood, Oklahoma on 28 September
97. Fire at the Motiva refinery in Convent, Louisiana on 1 October
98. Hydrogen fluoride release at the Placid refinery in Port Allen, Louisiana on 1 October
99. Hydrogen sulfide release from a high pressure excursion at the Valero refinery in Port Arthur, Texas on 1 October
100. Fire at the ExxonMobil refinery in Baytown, Texas on 3 October
101. Vapor cloud release at the Hess refinery in Port Reading, New Jersey on 3 October
102. Hydrocarbon release due to a mechanical integrity failure at the Phillips 66 refinery in Rodeo, California on 8 October
103. Fire at the Citgo refinery in Corpus Christi, Texas on 9 October
104. Vapor cloud release with offsite impact from the Kern Oil refinery in Bakersfield, California on 17 October
105. Hydrocarbon and hydrogen sulfide release from a pressure excursion at the ExxonMobil refinery in Joliet, Illinois on 19 October
106. Hydrocarbon release due to a mechanical integrity failure at the Citgo refinery in Sulfur, Louisiana on 22 October

107. Hydrogen sulfide release at the Chalmette refinery in Chalmette, Louisiana on 23 October
108. Fire at the Tesoro refinery in Martinez, California on 21 October
109. Fire at the BP refinery in Texas City, Texas on 30 October
110. Fire at the Valero refinery in Port Arthur, Texas on 3 November
111. Benzene release due to a mechanical integrity failure at the Shell refinery in Deer Park, Texas on 8 November
112. Vapor release at the Tesoro refinery in Martinez, California on 8 November
113. Hydrogen sulfide release due to a mechanical integrity failure or a high pressure excursion at the Shell refinery in Martinez, California on 24 November
114. Hydrogen sulfide and hydrocarbon release at the Northern Tier Energy refinery in St. Paul Park, Minnesota on 27 November
115. Benzene release due to a mechanical integrity failure at the ExxonMobil refinery in Baton Rouge, Louisiana on 1 December
116. Hydrogen fluoride release that killed one worker, injured 2 other workers and 7 emergency responders at the Valero refinery in Memphis, Tennessee on 3 December
117. Hydrocarbon release due to a mechanical integrity failure at the Flint Hills refinery in Corpus Christi, Texas on 5 December
118. Hydrogen sulfide release at the Phillips 66 refinery in Wood River, Illinois on 8 December
119. Fire at the Motiva refinery in Port Arthur, Texas on 11 December
120. Benzene release due to a mechanical integrity failure at the Alon refinery in Big Spring, Texas on 11 December
121. Hydrocarbon release due to a mechanical integrity failure at the Shell refinery in Deer Park, Texas on 11 December
122. Hydrocarbon release at the Shell refinery in Anacortes, Washington on 12 December
123. Hydrogen sulfide release due to a pressure excursion at the PBF Energy refinery in Paulsboro, New Jersey on 14 December
124. Hydrocarbon and hydrogen sulfide release due to a mechanical integrity failure at the Marathon refinery in Garyville, Louisiana on 15 December
125. Fire at the Motiva refinery in Port Arthur, Texas on 17 December

Note -Incidents of hydrocarbon leaks into a cooling tower or releases to a flare system are not included in the above list.

Appendix B: Regulatory Comparison Table

	OSHA PSM Standard	California PSM Standard	The Safety Case Regulatory Regime
Scope	Covered processes excluding oil and gas well drilling and servicing	Covered processes excluding oil and gas well drilling and servicing	Applies to offshore and onshore oil and gas operations
Specific PSM/ Major Accident Focus	Yes	Yes	Yes
ALARP or Equivalent	No	No	Yes
Adaptability to New or Revised Codes, Standards, Technology, Hazard Information, Lessons Learned, etc.	Limited to RAGAGEP –only addresses equipment and mechanical integrity (2 of 14 elements); RAGAGEP not defined in the standard or a referenced list, only a handful of standards referenced as RAGAGEP in OSHA interpretation letters	Limited to RAGAGEP – only addresses equipment and mechanical integrity; RAGAGEP not defined in the standard or a referenced list, only a handful of standards referenced as RAGAGEP in OSHA interpretation letters	Yes via safety case and supporting framework legislation
PSM Indicators Req.	No	No	Yes for Companies
Competent Regulator 50% or more Engineers/PSM	OSHA-some progress but no	Cal/OSHA – some progress but no	Yes
Sufficient Funding for Competent Regulatory staff	OSHA-No	California is increasing funding to support additional staff on Cal/OSHA PSM team	Yes
Hazard Analysis	Required – "shall identify, evaluate, and control the hazards involved in the process."	Required – "appropriate to the complexity of the process for identifying, evaluating, and controlling hazards involved in the process."	Is a specific aspect of SC and supporting framework regulation and is required for all onshore and offshore facilities. To meet legislative goal-setting requirements, a structured risk assessment including HA as appropriate is required from all "employers."

Incident Investigation	Requires a report but activity-based; requires including "**any** recommendations resulting from the investigations" (what if there are none?); system required to "**resolve** the incident report findings and recommendation; no explicit requirement to prevent a similar occurrence or controlling hazards.	Requires a report including "any recommendations resulting from the investigation." System required to "establish a system to promptly address and resolve the report findings and recommendations and…implement the report recommendations in a timely manner, or take action to prevent a reoccurrence."	Investigation of incidents required to demonstrate legal compliance with framework legislation. 'Reasonably practicable' requirement would require remedial action and cross company learning from incident investigations. HSE can require SC duty holder compliance with investigation report recommendations (e.g. Buncefield Report-"determine SIL level requirements for overfill protection")
Management of Change	Activity-based; the employer "shall establish and implement written procedures to manage changes;" "the procedures shall assure the following considerations are addressed…impact of change on safety and health;" no formal hazard analysis required; no requirement that the identified safety impacts or hazards be controlled.	Activity-based: the employer "shall establish and implement written procedures to manage changes…;" "the procedures shall assure that the following are addressed prior to any change…technical basis for proposed change; impact of change on safety and health;" no formal hazard analysis required; no requirement that the identified safety impacts or hazards be controlled.	Description of MOC procedures and demonstrations of their effectiveness in managing major accident hazard risk are a key requirement of the safety case.
Workforce Participation	"Employers shall develop a written plan of action regarding the implementation of the employee participation;" Employers shall consult with employees and their representatives on the conduct and development of PHAs and the other elements of PSM in this standard."	"Employer shall develop a written plan of action to ensure employee participation in process safety management;" includes employer consultation with employees and their representatives on the conduct and development of the elements of process safety management required by this section; and providing employees and their representatives with access to all information required to be developed by this section…"	Provides for the election of protected safety representative positions and safety committees.

Inherent Safety	No	No	Yes

Appendix C: Frequently Asked Questions (FAQs) Regarding the Safety Case Regulatory Approach

1. Is it true that the safety case regulatory approach leads to self-regulation by industry?

Critics of the safety case regulatory approach have noted that this type of regulatory regime is likely to result in mere industry self-regulation.[423] Critics have also noted that this is at least partly due to the fact that there is no will in the US to ensure that regulators have the tools, resources, and competence to effectively regulate workplaces. The CSB and those with experience in developing and implementing the safety case regulatory regime have repeatedly stated that the purpose of the safety case regulatory approach is to ensure that all hazards have been identified, evaluated, and controlled so that risks are reduced to as low as reasonably practicable, or ALARP. In simple terms, the safety case report is a series of claims as to how an installation is being safety operated. The real strength of the safety case regulatory regime is testing the validity of those claims through strategic intervention by competent, well-funded regulators. Advanced performance-based regulatory regimes in the United Kingdom (UK) and Norway, for example,[424] incorporate a list of regulator-accepted standards and good practices that provide companies with the minimum performance that is expected. Companies must demonstrate that they meet or exceed those standards. Therefore, companies are aware of minimum performance expectations they must meet as they work to reduce risks to ALARP. If a competent regulator is not in place, then the safety case report equates to nothing more than a lifeless document sitting on a shelf, and the criticism of self-regulation becomes valid.

It is also important to point out that in a letter from the USW Local 5 to the CSB dated November 22, 2013, it was stated that "[t]he current system is truly a self regulated system, with the industry setting the rules, changing the rules, and monitoring themselves." Individuals are noting that the current system in place has actually led to self-regulation despite the intent of the PSM standard and RMP program to be performance-based.

The CSB has also noted that post-incident criminal or civil enforcement is not an effective approach to prevent major accidents; rather than accepting the inevitability of catastrophic events, we should act to prevent them from happening. This sentiment has been shared by many members of Congress in the past year following serious incidents such as the Chevron pipe failure in Richmond, California, and the West Fertilizer explosion in West, Texas. As noted in this report, there is a movement in California to improve oversight of petroleum refineries – the Cal/OSHA PSM Unit is already receiving additional funding to help increase staffing numbers. There has also been increased dialogue in the US in recent years surrounding the regulation of the oil and gas industry and how to make improvements. As such, the support exists to not only shift the current activity-based regulatory structure to a more goal-based safety

[423] *See e.g.* Rena Steinzor. *Lessons from the North Sea: Should "Safety Cases" Come to America?* Vol. 38: 417; 2011; p 439. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1735537 (accessed September 4, 2013).

[424] Norway requires many similar aspects of a safety case regime offshore but there are differences in implementation and style and content of the regulations. The UK implements a safety case regime both onshore and offshore.

case regulatory regime, but to also ensure that competent, well-funded regulators are in place to implement and enforce such a regime.

2. How does the safety case regulatory regime in the US allow for changes to be made without requiring rulemaking under the Administrative Procedure Act?

The Administrative Procedure Act, or APA, was passed in 1947, and lays out the basic framework under which federal rulemaking is conducted. It defines "rule" as "the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of an agency…"[425] "Rulemaking" is defined as the "agency process for formulating, amending, or repealing a rule."[426] Federal agencies often impact their specific area of jurisdiction by publishing rules promulgated through notice and comment rulemaking, or informal rulemaking, under the APA. Unfortunately, as this report discusses at length, the rulemaking process in the US is a cumbersome one, and some federal agencies, such as OSHA and the EPA, are subject to additional requirements and more stringent review standards that go above and beyond those contained in the APA. To avoid these additional burdens, many agencies provide further guidance to regulated parties through more informal means, such as answering questions and issuing policy statements, guidance, or opinion letters. Another way to lessen the burden on regulating agencies and their regulated entities is to adopt performance or goal-based regulations rather than prescriptive regulations. Performance-based standards state the objective or outcome to be achieved, such as risk reduction, without describing the specific means of obtaining that objective. This provides the regulated entities with the freedom and flexibility to work to achieve a stated goal, such as reducing risks to as low as reasonably practicable, or ALARP, through their chosen and preferred means.[427] Performance-based standards also provide flexibility to the regulator; for example, in a safety case regulatory regime, should the regulator determine through assessment of the safety case report and/or inspection that the facility has not reduced risks to ALARP with regard to a specific hazard, he or she may require that the facility take additional steps to further reduce risk without needing to propose and adopt a new rule or regulation to address it. The regulator must accept the safety case report in order for the facility to operate.

The Regulatory Flexibility Act (RFA) was passed in 1980 during the Carter Administration. It requires agencies to prepare and make available for public comment regulatory flexibility analyses of proposed rulemaking, and also encourages agencies to consider alternatives to rulemaking, including "the use of performance rather than design standards…"[428] Executive Order 13272 then directed federal agencies to establish procedures and policies to comply with the Act.[429] Federal agencies have been encouraged to adopt performance-based standards in the US for decades. Recognizing the inefficient process of federal rulemaking in the US, President Clinton signed Executive Order 12866 in September of 1993, which, among other things, directed federal agencies to "identify and assess alternative forms of

[425] 5 U.S.C. §551(4) (2011).
[426] 5 U.S.C. §551(5) (2011).
[427] Such as reliance upon qualitative assessments, quantitative assessments, semi-quantitative risk assessments, and good practice guidance.
[428] 5 U.S.C. §603(3) (2010).
[429] Exec. Order No. 13272, 67 Fed. Reg. 159 (August 13, 2002). http://www.gpo.gov/fdsys/pkg/FR-2002-08-16/pdf/02-21056.pdf (accessed September 24, 2013).

regulation…[and] specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt."[430] Executive Order 13563, entitled *Improving Regulation and Regulatory Review*, supplemented and reaffirmed Executive Order 12866 by ordering agencies to "identify and consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public."[431] Its stated goal was to "protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation."[432] Its seven guiding principles are as follows:

- Increase predictability and reduce uncertainty;
- Use and rely on best available science;
- Ensure public participation and open exchange of ideas;
- Use the most innovative and least burdensome tools;
- Consider cost benefit analysis (quantitative and qualitative);
- Ensure regulations are publicly available, consistent, written in plain language and easy to understand; and
- Measure results and seek to improve actual results.[433]

The safety case regime aims to satisfy all of these principles.

California has adopted its own version of the APA, known as the California Administrative Procedure Act (CAPA) (California Government Code §11340 *et seq.*).[434] Among its many requirements for California state agencies that adopt regulations, CAPA directs them to consider the substitution of performance standards for prescriptive standards.[435] CAPA defines "performance standard" as "a regulation that describes an objective with the criteria stated for achieving the objective."[436]

Federal agencies that are engaged in and responsible for regulating high hazards, such as NASA and the Nuclear Regulatory Commission (NRC), have adopted goal or performance-based standards that require risks to be reduced to "as safe as reasonably practicable" (ASARP) and "as low as reasonably achievable," (ALARA), respectively. The OSHA Process Safety Management (PSM) standard also contains performance-based elements to some extent; for example, it provides regulated entities with flexibility in how to perform a process hazard analysis (PHA). However, it contains no risk reduction goals such as ALARP. This has resulted in an activity-based regulatory scheme that emphasizes completing activities, such as a PHA or a Management of Change (MOC) analysis, rather than actual risk reduction. Without a risk reduction goal such as ALARP in place, the PSM standard will not have the ability to successfully drive continuous improvement and adaptation of industry safety management advances.

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[430] Exec. Order No. 12866, 48 Fed. Reg. 190 (September 30, 1993). http://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf (accessed September 24, 2013).
[431] Exec. Order No. 13563, 76 Fed. Reg. 14 (January 21, 2011). http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf (accessed September 24, 2013).
[432] *Ibid.*
[433] *Ibid.*
[434] *Available at* http://www.oal.ca.gov/administrative_procedure_act.htm (accessed September 18, 2013).
[435] California Government Code, §11340.1(a) (1995).
[436] California Government Code, §11342.570 (1995).

3. Can the safety case regulatory approach work in the US when workforce involvement is emphasized less than other regions and unionization rates are lower than other countries?

A majority of the workforce in California petroleum refineries is unionized, as the unionization rate for the 15 petroleum refineries in California is actually 73 percent,[437] which is significantly higher than the 2012 rates for the US as a whole (11.1 percent), Australia (17.9 percent), the UK (25.8 percent), and Norway (54.7 percent).[438] Despite a declining unionization rate in the UK, the region has developed strong onshore and offshore regulations that provide for the creation of protected safety representative positions and safety committees for unionized and non-unionized facilities. These positions are meant to create a healthier and safer workplace, and result in better decision-making regarding health and safety, increased productivity, higher workforce motivation, a stronger commitment to implementing decisions or actions (as employees have been actively involved in reaching these decisions), and greater cooperation and trust.[439] The HSE has devoted extensive time and resources to ensuring employers are complying with these regulations and understand the importance and benefits of involving workers in health and safety-related matters.

The UK also has a standard establishing the minimum level of training that elected safety representatives offshore should receive to enable them to fully perform their functions as defined in the Safety Representatives and Safety Committees Regulations – SI 1989/971. This training standard, entitled the OPITO Approved Standard, was developed by an industry workgroup facilitated by OPITO.[440] In June 2013, Det Norske Veritas (DNV)[441] became accredited by OPITO to offer newly developed training courses to more than 2,000 elected safety representatives in the offshore industry. The training, which has been driven and supported by HSE, Oil and Gas UK, and the Offshore Industry Advisory Committee's (OIAC's) Workforce Involvement Group, consists of four separate Modules run over the course of eight days.[442] The training covers topics such as Understanding and Identifying Major Accident Hazards and Investigating Incidents and Applying Root Cause Analysis.

The CSB recognizes HSE's effort to improve workforce involvement through regulations, protected positions, and training, and has recommended in this report that California develop regulations and guidelines to establish similar protected safety positions to ensure effective workforce participation. The CSB believes the HSE model can also be effective in the US as these regulations require effective safety representation regardless of unionization rates.

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[437] In September 2013, the USW provided the CSB with a list of California petroleum refinery locations as of October 2012 and the existing unionization representation at those refineries. Of the 15 petroleum refineries operating in California as of October 2012, 11 of those were unionized, with USW providing the union representation at all 11 facilities.
[438] For complete statistics on trade union density for countries around the world *see* http://stats.oecd.org/Index.aspx?QueryId=20167 (accessed September 5, 2013).
[439] HSE. *Consulting employees on health and safety: A brief guide to the law*. 2013; p 2. http://www.hse.gov.uk/pubns/indg232.pdf (accessed September 5, 2013).
[440] OPITO is an industry-owned non-profit that serves the needs of the oil and gas industry in the UK and around the world. *See* http://www.opito.com/ (accessed September 10, 2013).
[441] DNV is an independent foundation headquartered in Oslo, Norway, that provides services for managing risk around the world. For more information *see* http://www.dnv.com/ (accessed September 10, 2013).
[442] http://www.marinelink.com/news/launches-offshore355749.aspx (accessed September 10, 2013).

4. Has the safety case regulatory approach resulted in fewer major accidents?

Unfortunately, there have been few objective studies conducted on the impact of the safety case regulatory approach on safety performance onshore and offshore. In 1999, a report commissioned by the HSE ("the Aberdeen Report") which evaluated the impact of the offshore Safety Case Regulations on offshore safety was published.[443] One of the purposes of the study was to review published safety data for trends in offshore accidents and incidents from 1990 until 1997.[444] Upon this review, it was determined there had been a decrease in accidents since the implementation of the offshore safety case regulations in the UK, but cautioned it was difficult to distinguish the effect of the safety case regulations from other industry activities such as the level and type of exploration and production activity, oil prices, and industry-led initiatives.[445] The Aberdeen Report also cautioned about the difficulties in analyzing offshore data that also hold true for the more current data presented in Figure 3. The total number of accidents and incidents recorded can be affected by industry attitudes toward reporting, changes in how and what data is reported, and the decrease or increase in offshore activity. As stated in the Aberdeen Report, "[d]espite these cautions, accident statistics play an important role in the analysis of the state of safety in any industry, since accidents represent the 'bottom line' in safety. It is therefore important to analyze the trends, but to also take the drawbacks into consideration."[446] As discussed in this report, the reporting and analyzing leading process safety indicators is important to gain a better understanding of how safety management systems are functioning, and thus a better idea of how well the various regimes are managing hazards and mitigating risk.

Statistics from the seven years covered by the Aberdeen Report indicated an overall decrease in reported accident rates in the UK and Norwegian databases up until 1994. From 1994 to 1997, both the UK and Norway reported a slight increase in the number of reported accidents.[447] Norway did report a drop in 1997 from 1996. The decrease reported up until 1994 for the UK appeared to be independent of the offshore production activities as those levels had been on the increase during the same time period. Drilling in the UK decreased during the same time frame, making the cause for the decrease in reported drilling accidents unclear.

More recent reviews of accident data indicate decreasing trends in accident statistics. The Presidential Oil Spill Commission noted the following in its report to the President on the Macondo disaster:

> [f]rom 2004 to 2009, fatalities in the offshore oil and gas industry were more than four times higher per person-hours worked in U.S. waters than in European waters, even though many of the same companies work in both venues. This striking statistical discrepancy reinforces the view that the problem is not an inherent trait of the business itself, but rather

[443] *Evaluation of the Offshore Safety Legislative Regime*—A study undertaken by AUPEC Ltd. For the Safety Policy Division, Health & Safety Executive, Ref: 8938/3714, June 1999.
[444] *Ibid* at Ch 7.
[445] *Ibid* at Ch 7, p 7-1.
[446] *Ibid* at Ch. 7, p 7-11.
[447] This was based on the number of accidents per million man hours for the two Continental Shelves (Ibid, Figure 7.8)

> depends on the differing cultures and regulatory systems under which members of the industry operate.[448]

In September 2013, Det Norske Veritas (DNV)[449] released a position paper discussing necessary improvements to reduce risk of major offshore accidents, and noted in the report that "there are no good globally accepted metrics for major accident hazards…"[450] However, DNV was able to point to UK HSE's Hydrocarbon Releases Database System (HCR)[451] in the North Sea to provide an example of improving safety performance trends.[452] The HRC contains detailed voluntary information of over 4,000 hydrocarbon releases offshore from close to 300 installations since 1992. The HRC data, plotted in Figure 3, show the total number of releases to be on the decline. Classifying the severity of a release is based on agreed-upon criteria with the offshore industry.[453] The UK has defined significant events to be those that, if ignited, have the potential to cause a major accident where multiple casualties could occur. The occurrence of any hydrocarbon release is undesirable because of the potential to escalate, and so reporting data from minor incidents has also been included in Figure 3 below.

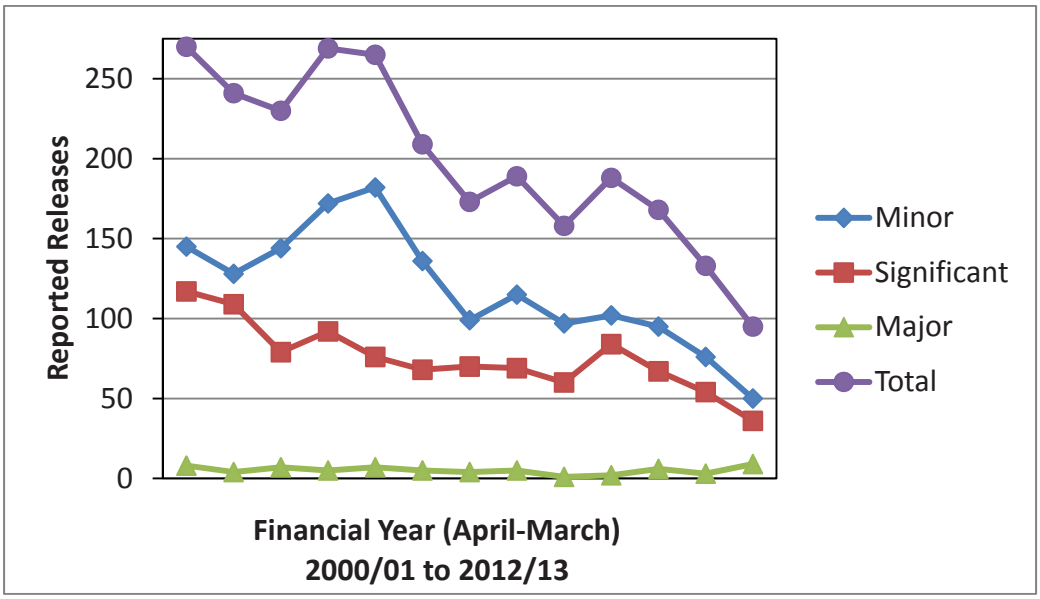

Figure 3. Hydrocarbon releases in the North Sea reported to UK HSE as dangerous occurrences under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations.[454]

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[448] National Commission on the BP Deepwater Horizon Oil Spill. *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling.* Report to the President; January 2011; Ch 8 p 225.
[449] DNV is an independent foundation headquartered in Oslo, Norway, that provides services for managing risk around the world. For more information *see* http://www.dnv.com/ (accessed September 10, 2013).
[450] DNV. *Enhancing offshore safety and environmental performance: Key levers to further reduce the risk of major offshore accidents.* 2013; p 5. http://www.dnv.com/industry/oil_gas/services_solutions/offshore_safety.asp (accessed September 10, 2013).
[451] https://www.hse.gov.uk/hcr3/
[452] In its position paper, DNV cited data from 1996, but UK HSE has noted that the criteria for severity classification was refined in 1999 so data since that date is presented here.
[453] Hydrocarbon Releases System Internet Help File, https://www.hse.gov.uk/hcr3/help/help_public.asp (accesses September 10, 2013)
[454] RIDDOR – Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 became effective offshore on April 1, 1996, http://www.hse.gov.uk/riddor/ (accessed September 10, 2013)

It is important to note that major accidents are low-probability, high-consequence events, and as such they are difficult to measure. According to Dr. Andrew Hopkins, major accidents are more difficult to define than, say, a car accident, and they are rare, making it difficult to estimate the number of major accidents prevented.[455] In addition, based on the data in existence, there is a continued need for improved data collection; key leading performance indicators development and implementation on a global scale would provide an improved glimpse into how safety is being managed for major accident prevention.

5. The UK HSE has published reports[456] showing significant industry problems with maintenance of safety critical equipment, poor understanding of the potential impact of degrading plant and utility systems on safety critical elements, and lack of understanding of the role of asset integrity and the concept of barriers in major hazard risk control. Don't these reports developed by the UK regulator demonstrate that the safety case is not effective and is not working?

The CSB recognizes that there have been critiques of the safety case regime and its implementation. The CSB acknowledges that the safety case is not perfect and that no regulatory system will be perfect in its implementation. Some have noted the issue of aging equipment due to many issues, including the harsh conditions that exist in the North Sea. Regulators and commissions in the UK have found degradation of pipes, valves, and other equipment at many facilities due to company deferrals of maintenance, insufficient testing of safety-critical elements, and a continuing industry culture of responding to disasters, rather than anticipating worst-case scenarios. However, the safety case regime's adaptive nature has been able to address these concerns. The HSE has recognized asset integrity management and the issue of ageing equipment as key issues to address in its inspection programs, and has developed internal processes and priorities for these areas.

In 2010, the UK HSE initiated Key Programme 4 to address the issue of aging equipment offshore and the operation of installations beyond their design life.[457] The same year, the HSE published a report intended to inform industry and aid in the prevention of major accidents entitled *Managing Ageing Plant: A Summary Guide*,[458] which provides an overview of ageing plant mechanisms and their management and presents the findings of an analysis of loss of containment incidents to indicate the extent to which ageing plant equipment may be a factor. This type of programmatic proactive approach and information dissemination is lacking in the US both on and offshore.

[455] Hopkins, Andrew. *The Cost-Benefit Hurdle for Safety Case Regulation: A discussion paper prepared for the US Chemical Safety Board.* Add Date, Page, and Link.

[456] The HSE published a report to communicate the results and conclusions of the Asset Integrity Key Programme carried out between 2004 and 2007 by the Health and Safety Executive's Offshore Division. *See* http://www.hse.gov.uk/offshore/kp3.pdf, (accessed August 28, 2013).

[457] The report is available at http://www.hse.gov.uk/offshore/ageing/kp4-interim-report.pdf (accessed November 1, 2013).

[458] *See* http://www.hse.gov.uk/research/rrpdf/rr823-summary-guide.pdf (accessed November, 1, 2013).

6. How have other countries implemented the safety case regime? What challenges do the countries face when transitioning to a safety case approach?

From the international safety case community, the CSB has found that when transitioning to a safety case regime there are many obstacles that may hinder the transition, such as:

- Major stakeholders not being committed to the process, unconvinced of the need;
- Lack of understanding that the safety case regime is a "process" to be undertaken by the duty holder and the workforce to improve understanding of the hazards, risks, and their controls, and to put in place measures for continuous improvement, rather than just creation of a "document";
- Lack of sufficient funding by government and industry; and
- Lack of the necessary legislative timetable.

The transition to a safety case regime has significant challenges for both the duty holder and the regulator, including:

- The safety case report could be treated as a check-the-box exercise;
- Documented safety management system does not reflect reality;
- Poor identification of hazards and risks;
- Poor understanding of the performance of control systems;
- Attempting to justify existing controls rather than to seek opportunity to improve;
- Insufficient workforce involvement in the process;
- The safety case process is under-resourced;
- The safety case report is "inaccessible" so the report simply lives on the shelf;
- The regulator does not use the safety case report to inform the inspection or audit;
- Limited requirement for the reporting of accidents, dangerous occurrences and precursors resulting in lack of comprehensive performance data; and
- The regulator is under-resourced, technically challenged, poorly trained, has poor systems and procedures, and is inconsistent.

In implementing the safety case regime, there should be regard for the regulatory principles and frameworks which represent best practice. The underlying principles are:

- The legislation and regulation should be fit for purpose, not simply superimposed on existing prescriptive regulation;
- Regulation should be effective and efficient; and
- Industry should move away from a culture of compliance with detailed prescriptive regulation to one of involving the workforce in understanding the hazards.

Some significant points worth noting from international experience in setting up the regulation are:

- Staff should be recruited against detailed job descriptions and should cover the full range of technical, management and regulatory requirements;

- Pay rates and terms and conditions should be sufficient to attract highly qualified staff;
- A competency framework needs to be developed reflecting the required knowledge, skills, and experience required to undertake;
- Appropriate training programs must be in place;
- An electronic dedicated safety case assessment procedure which captures the detail of the process to be followed and records the background to the decision-making process will be needed. This helps ensure good quality, consistent, and transparent assessment and provides a database of information which is used for future validation/topic facility inspections. It also provides a comprehensive record of the process which can be used in the event of an appeal against an assessment decision;
- An accident and dangerous occurrence data base will be needed to store knowledge and data to provide reference information and the capacity to analyze trends; and
- An emergency reporting and response process is necessary to ensure all significant events are properly logged and dealt with.

CSB Investigation Reports are formal, detailed reports on significant chemical accidents and include key findings, root causes, and safety recommendations. CSB Hazard Investigations are broader studies of significant chemical hazards. CSB Safety Bulletins are short, general-interest publications that provide new or noteworthy information on preventing chemical accidents. CSB Case Studies are short reports on specific accidents and include a discussion of relevant prevention practices. All reports may contain include safety recommendations when appropriate. CSB Investigation Digests are plain-language summaries of Investigation Reports.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) is an independent Federal agency whose mission is to ensure the safety of workers, the public, and the environment by investigating and preventing chemical incidents. The CSB is a scientific investigative organization; it is not an enforcement or regulatory body. Established by the Clean Air Act Amendments of 1990, the CSB is responsible for determining the root and contributing causes of accidents, issuing safety recommendations, studying chemical safety issues, and evaluating the effectiveness of other government agencies involved in chemical safety.

No part of the conclusions, findings, or recommendations of the CSB relating to any chemical accident may be admitted as evidence or used in any action or suit for damages. See 42 U.S.C. § 7412(r)(6)(G). The CSB makes public its actions and decisions through investigation reports, summary reports, safety bulletins, safety recommendations, case studies, incident digests, special technical publications, and statistical reviews. More information about the CSB is available at www.csb.gov.

CSB publications can be downloaded at www.csb.gov or obtained by contacting:
U.S. Chemical Safety and Hazard Investigation Board
Office of Congressional, Public, and Board Affairs
2175 K Street NW, Suite 400
Washington, DC 20037-1848
(202) 261-7600

UNITED STATES OF AMERICA
CHEMICAL SAFETY AND
HAZARD INVESTIGATION BOARD
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CHEVRON RICHMOND REFINERY FIRE
RICHMOND, CA
AUGUST 6, 2012

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INTERIM PUBLIC MEETING
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FRIDAY
APRIL 19th, 2013

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6:30 P.M.

CSHIB MEMBERS:

RAFAEL MOURE-ERASO, Chairman

MARK GRIFFON
BETH J. ROSENBERG
DANIEL HOROWITZ, Managing Director
RICHARD C. LOEB, General Counsel

INVESTIGATIVE TEAM:

DAN TILLEMA, Team Lead
STEVE CUTCHEN
ROGER EVANS
LAUREN GRIM
SAM McFADDEN, Anamet, Inc.

PANEL MEMBERS:

ELLEN WIDESS, Cal/OSHA

PAUL AMYOTTE, Dalhousie University

RANDY SAWYER, Contra Costa County

TUPPER HULL, Western States Petroleum
Association

MIKE SMITH, USW Local 5

RON ESPINOZA, USW International

GREG KARRAS, Communities for a Better
Environment

MIKE WILSON, U.C. Berkeley

ELECTED OFFICIALS PRESENT:

JOHN GIOIA, Member, Contra Costa Board of
Supervisors

GAYLE McLAUGHLIN, Mayor, Richmond, CA

GEORGE MILLER, Congressman, California's
Eleventh District

MARK CHEKAL-BAIN, on behalf of NANCY SKINNER,
California State Assembly Member,
Fifteenth State Assembly District

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1 P-R-O-C-E-E-D-I-N-G-S

2 6:30 p.m.

3 CHAIRPERSON MOURE-ERASO: Before

4 we start, I would like to note that we have

5 translation service tonight. We have Spanish

6 and Laotian translators in the back. There

7 are infrared earpieces that you can go in the

8 back and wear it if you need it. You can get

9 the headsets over at the left of the stage.

10 That's left of the stage.

11 So, the meeting will now come to

12 order. Thank you. Good evening, everyone.

13 Welcome to this public meeting of the U.S.

14 Chemical Safety Board. I am Rafael Moure-

15 Eraso, the chairperson of the Chemical Safety

16 Board, and with me at the table are my fellow

17 board members, Mr. Mark Griffon and Beth

18 Rosenberg. We are also joined at the head

19 table here by Richard Loeb, who is the general

20 counsel of the Chemical Safety Board.

21 Before we proceed further, please

22 locate the meeting room exits that you will

1 use in case of an emergency. You can see they
2 are marked there in green lights on the sides,
3 if you need to leave the building.
4 We are especially honored today to
5 be able to have our meeting in this historic
6 facility. And we also are especially honored
7 by the presence this evening of Congressman
8 George Miller who is here with us.
9 (Applause.)
10 CHAIRPERSON MOURE-ERASO:
11 Congressman George Miller is one of our best
12 boosters in Washington, and a good friend of
13 the Chemical Safety Board. Also here with us
14 is John Gioia, who is the chairman of the
15 Contra Costa Board of Supervisors. Could you
16 please stand?
17 (Applause.)
18 CHAIRPERSON MOURE-ERASO: And also
19 with us is Gayle McLaughlin, the mayor of
20 Richmond.
21 (Applause.)
22 CHAIRPERSON MOURE-ERASO: We'd

1 also like to welcome any members of the
2 California Legislature that might be with us
3 today. At the entrance, as you can see, is a
4 copy of the agenda of this meeting, so you can
5 follow the proceedings. Everybody should have
6 one now.
7 And also there are copies of the
8 report. We are calling this an interim
9 report, but as you can see it's almost 100
10 pages, and it's a very complete set of
11 findings and recommendations.
12 We are here this evening so that
13 our investigation team may present a draft
14 report on this investigation, on the
15 investigation findings, along with a series of
16 urgent safety recommendations regarding the
17 massive vapor release and fire which occurred
18 last August at the Chevron refinery here in
19 Richmond.
20 Toward the end of the meeting, the
21 Board will vote on whether to approve this
22 final report and the recommendations, which

1 make the report official and will appear on
2 the website as a public document.
3 As I think everyone knows from our
4 previous reports and press conferences and
5 releases here, the vapor release was caused by
6 a highly corroded piping that gave way. You
7 will hear that Chevron failed to replace
8 critical sections of piping of the crude oil
9 unit over a ten year period, even though the
10 company was aware of the overall hazard of
11 sulfidation corrosion and its risk of
12 catastrophic failure.
13 But make no mistake, the ultimate
14 issue here is not corrosion, but how to make
15 effective corporate decisions.
16 (Applause.)
17 CHAIRPERSON MOURE-ERASO:
18 Companies that run refineries like the one in
19 Richmond must take every measure possible,
20 including the use of inherently safer
21 materials and processes, to run the plants in
22 a safe manner. The lives of workers are too

1 important to do otherwise. The lives and
2 well-being of residents in neighboring
3 communities are too important to do otherwise.
4 (Applause.)
5 CHAIRPERSON MOURE-ERASO: And
6 regulators need effective tools and resources
7 to encourage companies to make the right
8 choices. Even with some resource limitation,
9 California OSHA has the only dedicated process
10 safety management unit of any regulatory
11 agency in the nation. That is a great thing.
12 Still, California OSHA and other regulatory
13 agencies like it, including Federal OSHA, need
14 to be given substantially more resources so
15 that they can do more inspections and ensure
16 the public's safety.
17 (Applause.)
18 CHAIRPERSON MOURE-ERASO: Finally,
19 oil companies need to operate in a more
20 transparent way. Refineries --
21 (Applause.)
22 CHAIRPERSON MOURE-ERASO:

1 Refineries need to share information about
2 their hazards. They need to listen to
3 communities and --
4 (Applause.)
5 CHAIRPERSON MOURE-ERASO: -- and
6 let the public know what they are doing to
7 make the facility as safe as humanly possible.
8 (Applause.)
9 CHAIRPERSON MOURE-ERASO: Life is
10 too precious to do otherwise. We need a
11 change in how refineries do business, in
12 California and nationwide. Here today in
13 Contra Costa we have a unique opportunity to
14 effect meaningful change by learning from this
15 major accident.
16 In this community, we see a
17 constellation of engaged institutions that
18 represent all stakeholders in the region,
19 especially the 15,000 community members that
20 sought medical attention following the fire.
21 The stakeholders are demanding change.
22 These groups that have worked and

1 collaborated with us -- and this is not a
2 complete list -- are the Labor Occupational
3 Health Program with the University of
4 California, the Community for Better
5 Environment, the CBE, the Blue-Green Alliance,
6 the United Steel Workers Local 5, the United
7 Steel Workers International, California OSHA,
8 California EPA, the City of Richmond,
9 especially, Contra Costa County, and the
10 California Legislature.
11 Also, we have been in contact and
12 have spent substantial time, quality time,
13 with the California Refinery Task Force. And
14 very importantly, I hope that our
15 recommendations, that are very specific, will
16 be considered by the Governor of California's
17 Refinery Task Force.
18 All these institutions have the
19 energy and the will to implement our
20 recommendations. Thank you very much.
21 (Applause.)
22 CHAIRPERSON MOURE-ERASO: I would

1 now like to ask if other Board members have
2 opening remarks. I am calling first on Doctor
3 Beth Rosenberg.
4 MEMBER ROSENBERG: Thank you.
5 Thank you, Chairperson.
6 Good evening. It's heartening to
7 see so many of you concerned enough, angry
8 enough, to give up your Friday night to think
9 about refinery safety. I'm Beth Rosenberg.
10 I've been at the CSB for four months, and I'm
11 learning that everyone has his own view of
12 what's important, of what a root cause is.
13 You'll hear many views tonight, and I'll add
14 mine to the mix.
15 Our investigators found that, over
16 a 10 year period, Chevron technical experts
17 and workers made at least six recommendations
18 to increase inspection or replace the piping
19 that eventually leaked.
20 I would like to know what was
21 going on in Chevron's management. What flawed
22 decisionmaking matrices did they use? What

1 financial incentives did they have that
2 allowed them to dismiss the repeated warnings
3 of their employees and gamble with the safety
4 of their workforce and the public?
5 I realize the subject of corporate
6 decisionmaking is on the agenda for the final
7 report and will not be discussed tonight, but
8 I take this incident at Chevron as a
9 cautionary tale about what happens when senior
10 management ignores the concerns and advice of
11 workers.
12 This problem is not unique to
13 Chevron. In my 30 years as an occupational
14 health professional, I have found it to be
15 rampant across many sectors. Whether your
16 workplace is a refinery or a bakery,
17 management ignoring the advice of workers is
18 a serious mistake. Not only is it bad for
19 management, because good information is not
20 put to good use, but as we see here it is
21 dangerous and can have terrible and completely
22 avoidable consequences.

1 Why so many organizations persist
2 in this harmful, ultimately self-destructive
3 behavior is important to figure out, both for
4 the health of the organization or the
5 business, and mainly the public health.
6 Thank you.
7 (Applause.)
8 CHAIRPERSON MOURE-ERASO: Thank
9 you, Doctor Rosenberg. Now I would like to
10 call upon my colleague, the Board member, Mark
11 Griffon. Mark?
12 MEMBER GRIFFON: Thank you,
13 Chairperson.
14 I think this incident brings into
15 focus an issue of great concern to me: the
16 issue of an aging refinery sector. This
17 Chevron refinery has been in operation for
18 over 100 years. The crude unit in question in
19 this incident was constructed in 1976. It
20 seems to me that an aging refinery is like an
21 old house: it needs a lot of constant
22 maintenance.

1 Recent research conducted by the
2 United Kingdom Health and Safety Executive
3 shows that 50 percent of major hazard loss of
4 containment events from 1980 through 2006
5 arising from technical plant failures were
6 primarily due to aging plant mechanisms, such
7 as erosion, corrosion and fatigue. These are
8 sobering statistics, given the age of the
9 refineries in operation around the country.
10 Couple this with what appears to me to be a
11 culture of running to failure and the common
12 practice of running maintenance in the
13 refinery sector, and it seems to me you have
14 a recipe for a catastrophe.
15 It is critical to note that
16 Chevron is well aware of these issues of aging
17 plants, and yet decisions were made that led
18 to the failure on August 6th. Our
19 investigation found that in the 10 years prior
20 to the incident a small number of personnel
21 with knowledge and understanding of
22 sulfidation corrosion made at least six

1 recommendations to increase inspections or
2 upgrade metallurgy.
3 So the question is, why did these
4 recommendations for the most part fall on deaf
5 ears? Who decided not to implement the
6 recommendations, or delay the implementation
7 of the recommendations? And most importantly,
8 why?
9 This, I believe, is critical in
10 understanding why this incident occurred and
11 may have some valuable insights into why we
12 continue to see so many process safety
13 problems in the refinery sector nationwide.
14 I look forward to our team's more extensive
15 examination of these issues in our final
16 report.
17 Finally, and perhaps the most
18 important issue in this case, is the
19 connection of process safety decisions and the
20 potential risk to the community. Fifteen
21 thousand people went to the hospital after
22 this incident. These people have a right to

1 know what they were exposed to and what, if
2 any, adverse health effects can be expected.
3 (Applause.)
4 MEMBER GRIFFON: In our final
5 report, we need to examine the systems in
6 place to answer these questions for the
7 community, and to keep the community safe.
8 Thank you.
9 (Applause.)
10 CHAIRPERSON MOURE-ERASO: Thank
11 you, Mr. Griffon.
12 Our next activity will be the
13 presentation of the report, and I am going to
14 start with the introduction of the Chemical
15 Safety Board Investigation Team.
16 The person that spent a
17 substantial amount of time with the team
18 putting the investigation together is Donald
19 Holstrom. He was planning to be here with us,
20 however probably a lot of you have read about
21 the explosion and terrible accident that took
22 place in West, Texas, in the state of Texas,

1 and he had to deploy with 10 investigators to
2 that place yesterday morning, and at this
3 moment he is there taking the first steps to
4 initiate our investigation in West, Texas. He
5 is not with us today; he had to deploy.
6 Additional members of the team are
7 Dan Tillema, who is the team leader, sitting
8 here at the table on my right, and he is --
9 (Applause.)
10 CHAIRPERSON MOURE-ERASO: Dan
11 Tillema is very well known in these parts,
12 yes. Steve Cutchen, Roger Evans, Lauren Grim,
13 and Sam McFadden from the Anamet Company that
14 has been our consultant. He's also here.
15 (Applause.)
16 CHAIRPERSON MOURE-ERASO: Missing
17 from the table are people that also were part
18 of the team, but they cannot be here with us
19 because they are deployed in West, Texas, and
20 they are Mark Wingard, Amanda Johnson, and
21 Kelly Wilson.
22 Now I would like to turn over the

1 microphone to Mr. Dan Tillema, the
2 investigator in charge of the Chevron
3 investigation. Dan?
4 (Applause.)
5 INVESTIGATOR TILLEMA: Thank you,
6 Chairman Moure. I would also like to note
7 that the investigation team has had great
8 cooperation from other groups and agencies
9 throughout our investigation, including
10 Chevron and their employees, United Steel
11 Workers, Cal OSHA, especially Patrick Bell,
12 Clyde Trombetis and his PSM team (phonetic),
13 Contra Costa County, the City of Richmond,
14 Mary Westling (phonetic) and her team with the
15 EPA, and the Bay Area Air Quality Management
16 District.
17 Last summer on August 6th the
18 Chevron refinery right here in Richmond,
19 California experienced a catastrophic pipe
20 rupture in their crude unit. As a result of
21 this incident, 19 employees lives were
22 endangered and 15,000 members of this

1 community sought medical treatment. We found
2 that the immediate cause of this incident was
3 sulfidation corrosion, a common damage
4 mechanism in refineries.
5 As a result of this incident, the
6 Chevron crude unit remains out of commission
7 over eight months later. We have written an
8 interim report describing this accident, and
9 tonight we are proposing recommendations to
10 Chevron, the City of Richmond, Contra Costa
11 County, the State of California and the U.S.
12 Environmental Protection Agency. These
13 recommendations address the need for
14 inherently safer design, rigorous and
15 documented damage mechanism hazard reviews and
16 thorough analysis process safeguards.
17 We will begin our presentation
18 this evening by showing an animation of the
19 August 6th Chevron incident. We will then
20 present our key investigation findings,
21 followed by our proposed recommendations.
22 Elected officials will then give statements,

1 and the Board will have an opportunity to ask
2 the investigation team questions. We will
3 then hear from panel experts, and then the
4 public. The Board will vote on adopting the
5 interim report and proposed recommendations.
6 I will now show the video
7 depicting the August 6th Chevron incident.
8 (Whereupon, a video was
9 displayed.)
10 RECORDING: The Chevron Richmond
11 Refinery lies approximately 10 miles northeast
12 of San Francisco in California's Contra Costa
13 County. The 2,900 acre facility was initially
14 established in 1902 and primarily makes
15 transportation fuels such as gasoline and
16 diesel, as well as lube oils. The refinery
17 can process up to 250,000 barrels of crude oil
18 per day.
19 The first step of the refining
20 process takes place in the crude unit, where
21 crude oil is cleaned and heated before
22 entering the distillation tower. Inside the

1 tower, the crude oil is boiled. The vapor
2 then condenses into various liquid hydrocarbon
3 fractions, or streams, including jet fuel,
4 diesel, and gas oil. The different streams
5 exit the distillation tower through separate
6 pipes, or sidecuts, that lead to other
7 sections of the refinery.
8 On August 6th, 2012, the crude
9 unit was operating normally. Around 3:50 that
10 afternoon, an operator was performing a
11 routine check when he noticed a small puddle
12 on the ground near the distillation tower.
13 The liquid appeared to be dripping from an 8
14 inch insulated pipe 14 feet overhead. The
15 leaking pipe was a section of the tower's
16 number four sidecut line, which operated at a
17 temperature of 640 degrees Fahrenheit and
18 contained light gas oil, a combustible liquid
19 similar to diesel fuel.
20 Chevron inspectors knew that, over
21 the years, the walls of the number four
22 sidecut had thinned due to corrosion, but they

1 did not realize how close this particular
2 segment was to failure. There was no shutoff
3 valve between the pipe and the distillation
4 tower, and no way to isolate the leak.
5 The head operator was called to
6 the scene. Although he believed the situation
7 was serious, he did not believe the small leak
8 warranted immediately shutting down the unit
9 and stopping production. Following Chevron's
10 standard practice for responding to hazardous
11 leaks, refinery firefighters were sent to the
12 scene.
13 A number of managers, engineers
14 and technicians gathered there informally to
15 assess the problem. The group discussed a
16 recommendation from an operator to shut down
17 the unit, but they decided to first try to
18 pinpoint the leak by removing insulation from
19 the pipe while the crude unit was still
20 running. The hoped they could stop the leak
21 with a temporary metal fitting known as a
22 clamp.

1 A Chevron firefighter tried using
2 a pike pole to hook and pull away the
3 insulation, but this poking action was deemed
4 too dangerous because it was moving the pipe.
5 The CSB later found that the tip of the pike
6 likely caused a small puncture in the already
7 thinned pipe.
8 As the unit continued to operate,
9 workers assembled scaffolding directly beneath
10 the leaking pipe. Two firefighters then used
11 a hook to remove the insulation from the pipe.
12 As they were working, hydrocarbon vapor began
13 to flow out from underneath the insulation.
14 The two firefighters backed away from the
15 growing vapor cloud. As the hot vapor mixed
16 with air, it ignited.
17 That fire was quickly put out, and
18 the two firefighters immediately climbed down
19 off the scaffolding, but the exact location of
20 the leak was still obscured by the remaining
21 insulation and firefighting water, so the
22 Chevron firefighters attempted to strip the

1 insulation off the pipe with high pressure
2 water.
3 But the leak suddenly worsened,
4 and hot hydrocarbon liquid started to spray
5 out of the pipe. A decision was finally made
6 to begin an emergency shutdown of the crude
7 unit, but it was too late. Suddenly the pipe
8 ripped open. A vapor cloud formed and rapidly
9 expanded as the large inventory of
10 hydrocarbons in the distillation tower started
11 to vent through the ruptured pipe.
12 The vapor cloud immediately spread
13 over hundreds of feet, engulfing all 19 people
14 who had gathered nearby. The firefighters and
15 operators struggled to escape through the
16 dense hydrocarbon cloud. Unable to see, they
17 had to feel their way out, some on their hands
18 and knees.
19 At approximately 6:30 p.m., two
20 minutes after the huge vapor cloud formed, the
21 hydrocarbons ignited. One firefighter was
22 trapped inside a fire engine when it was

1 suddenly engulfed in flames. He radioed for
2 help.
3 "Mayday, mayday, mayday. This is
4 460."
5 But when he received no response,
6 he assumed everyone else was dead. To escape
7 the inferno, he fled through what witnesses
8 described as a wall of fire. Fortunately, all
9 the workers would eventually flee to safety,
10 and there were no fatalities.
11 The towering white vapor cloud
12 could be seen as far away as San Francisco on
13 the unusually clear August day. After the
14 ignition, a dense plume of black smoke formed
15 and drifted away from the refinery. The fire
16 continued burning for hours. Over the
17 succeeding days, more than 15,000 people
18 sought medical treatment at nearby hospitals
19 for breathing problems and other symptoms.
20 During its investigation, the CSB
21 determined that the carbon steel pipe
22 installed in 1976 had thinned to the point of

1 failure from an effect known as sulfidation
2 corrosion. Carbon steel piping is
3 particularly susceptible to this type of
4 corrosion, which occurs over time when the
5 steel is exposed to sulfur-containing
6 hydrocarbons at high temperatures. Steel
7 piping that happens to be low in the element
8 silicon corrodes especially quickly.
9 The CSB learned that sulfidation
10 corrosion had caused a major failure at
11 Chevron's refinery in Salt Lake City, Utah in
12 2002. Chevron then performed an enhanced
13 inspection of the number four sidecut pipe at
14 the Richmond refinery. It revealed
15 accelerated thinning in the piping section
16 that would ultimately fail in 2012.
17 Replacement was recommended, but this did not
18 occur, and the section of piping was never
19 inspected again.
20 In 2009, Chevron experts
21 recommended that every segment of high risk
22 carbon steel piping be inspected for

1 corrosion, however this was not done. During
2 a maintenance turnaround of the crude unit in
3 2011, Chevron inspectors examined some, but
4 not all, locations along the number four
5 sidecut, and found significant thinning. Some
6 sections were replaced, but managers decided
7 that the line was thick enough to stay in
8 service and that an overall replacement could
9 wait up to five more years.
10 According to CSB investigators, a
11 key lesson is that each and every segment of
12 the piping should have been inspected. Most
13 importantly, the pipe should have been
14 replaced much earlier with an inherently safer
15 corrosion-resistant alloy. The CSB also
16 concluded that, had the crude unit been shut
17 down when the leak was first noticed, the
18 massive fire likely would not have occurred,
19 the 19 workers would never have been
20 endangered, and the community would have been
21 protected.
22 For more information on the CSB

1 Chevron investigation, please visit CSB.gov.
2 "Ground monitor, we're going to
3 supply from this hydrant. We've got to supply
4 that ground monitor with our five-inch."
5 "I see it. Actually, you may want
6 to add" --
7 "Back in. We're going to back
8 in."
9 "All right. We'll jump out."
10 (Whereupon, the video ended.)
11 (Applause.)
12 INVESTIGATOR TILLEMA: In our
13 presentation this evening, Lauren Grim will
14 detail the technical causes of the incident,
15 describe opportunities to replace the four
16 sidecut pipe, and will discuss the importance
17 of process hazard analyses and the thorough
18 evaluation of safeguards.
19 Roger Evans will then describe
20 inherently safer systems and ways to improve
21 the California regulatory system.
22 And finally, Steve Cutchen will

1 present our proposed recommendations to the
2 Board.
3 I will now turn the presentation
4 over to Investigator Lauren Grim.
5 INVESTIGATOR GRIM: Thank you,
6 Dan. As shown in the video that you have just
7 seen, the four sidecut pipe wall became
8 extremely thin due to sulfidation corrosion
9 and ultimately ruptured. Sulfidation
10 corrosion rates are fastest in carbon steel,
11 which is a plain, basic steel. This was the
12 material of construction of the four sidecut
13 piping that failed at the Chevron refinery
14 here in Richmond. Other metallurgies, like
15 high-chromium steels, thin at a much slower
16 rate.
17 These metallurgies are referred to
18 as inherently safer metallurgies, because they
19 reduce the risk presented by sulfidation
20 corrosion. This animation shown here on this
21 slide shows a pipe cross section demonstrating
22 how the four sidecut line would corrode

1 depending on the line's material of
2 construction. We can see how low-silicon
3 carbon steel and regular carbon steel thin
4 over a 15 year time period when compared to
5 inherently safer steels 9-Chrome and stainless
6 steel.
7 Inherently safer systems experts
8 Paul Amyotte, who is a member of our panel
9 this evening, and Trevor Kletz published an
10 augmented version of the well known risk
11 reduction tool called A Hierarchy of Controls
12 by including concepts of inherently safer
13 systems. For example, replacing metallurgy
14 with an upgraded inherently safer material of
15 construction is a high ranking technique to
16 implement inherently safer design.
17 Piping circuits, such as the
18 Chevron refinery four sidecut piping circuit,
19 are comprised of many piping components,
20 including elbows, straight piping, tees and
21 fittings. In this example shown on the slide,
22 the straight-run piping components are in

1 yellow and the tees and fittings are in gray.
2 Components in piping circuits such as this one
3 are usually connected by welds, which are
4 shown here as red lines on this slide.
5 To monitor corrosion rates,
6 companies are required by regulation to
7 measure piping thickness at periodic locations
8 throughout piping circuits. These measurement
9 locations are typically placed on elbows and
10 fittings. We have found, however, that this
11 presents a problem when measuring sulfidation
12 corrosion in carbon steel piping circuits.
13 Carbon steel elbows and fittings generally
14 contain high percentages of silicon. If there
15 are low-silicon piping components in the
16 circuit, like the straight-run red piping
17 components seen in this slide, they may thin
18 significantly faster than the measured high-
19 silicon fittings, possibly leading to rupture.
20 This is what happened on August 6th here in
21 Richmond.
22 To identify the low-silicon

1 components, such as the ones shown in red
2 here, 100 percent component inspection, by
3 either thickness testing or chemical
4 laboratory testing, must be performed.
5 Here we see a photo that was taken
6 in a laboratory of the pipe component that
7 failed at the Chevron refinery. Directly
8 upstream of the component is an elbow. This
9 elbow contained a high percentage of silicon,
10 and this was also a location where inspectors
11 regularly measured the four sidecut pipe
12 thickness.
13 The component that failed
14 contained an extremely low percentage of
15 silicon, and it was not regularly thickness
16 tested. The high corrosion rates that it
17 experienced were unknown until it ultimately
18 failed on August 6th.
19 We'll now take a closer look at
20 the failed piping component. The yellow
21 rectangle that you can see in this photo is a
22 sample that was cut in our metallurgical

1 laboratory. It consists of a portion of the
2 elbow, the failed component, and the weld that
3 connects the two.
4 When viewing the cross section of
5 this sample, we can see the extreme variation
6 in thinning that occurred in the Chevron four
7 sidecut piping circuit. The ruptured
8 component was approximately 90 percent thinner
9 than the adjacent elbow, and this component
10 also contained almost 94 percent less silicon
11 than the elbow.
12 We do have the cross section of
13 the sample here with us this evening on a
14 posterboard.
15 The August 6th Chevron incident
16 was preventable. The refining industry has
17 been aware of risks associated with low-
18 silicon carbon steel since as early as 1974.
19 In addition, Chevron employees are highly
20 qualified individuals with considerable
21 sulfidation corrosion expertise. These
22 employees made numerous recommendations to

1 either inspect or upgrade the four sidecut
2 piping circuit.
3 The blue arrows you see appearing
4 now on the screen were recommendations to
5 increase inspection of the four sidecut line,
6 and the red arrows are recommendations to
7 replace the four sidecut with an upgraded,
8 inherently safer material of construction.
9 None of these recommendations were fully
10 implemented over the 10 years leading to this
11 incident.
12 The component that ultimately
13 failed due to low silicon was not inspected in
14 the past 10 years, and the piping was never
15 replaced. While numerous, these
16 recommendations were not audited or enforced
17 by the regulator, in part because they were
18 not included in Chevron's process hazard
19 analysis.
20 A process hazard analysis, or a
21 PHA, is an element of OSHA's process safety
22 management program. This is a regulation that

1 covers chemical processes containing a
2 threshold quantity of dangerous chemicals,
3 such as those at the Chevron refinery. PHAs
4 have been required since 1992, 20 years before
5 the August 6th Chevron incident. The PHAs
6 performed by the Chevron Richmond refinery are
7 enforceable by California's OSHA regulator,
8 Cal OSHA, and by the City of Richmond, who
9 designates their inspection authority to
10 Contra Costa County.
11 PHAs are performed by a team of
12 experts who are very familiar with the
13 process, and they are also required to be
14 updated every five years. Using established
15 methodologies, PHAs systematically assess a
16 chemical process for potential hazards, and
17 they identify safeguards to protect against
18 those hazards. Possible hazards can come from
19 considering process upsets, such as changes in
20 flow, changes in temperature and changes in
21 pressure.
22 During Chevron's PHAs, the PHA

1 team is tasked to identify possible causes and
2 consequences of hazards, and to identify
3 existing and needed safeguards to protect
4 against those hazards. If the hazard is not
5 sufficiently protected against, the team then
6 makes recommendations for improvements.
7 In the most recent Chevron
8 Richmond refinery crude unit PHA, one of the
9 hazards analyzed was a leak or rupture of the
10 four sidecut line. However, none of the
11 employees on the PHA team had knowledge of
12 sulfidation corrosion risks in the four
13 sidecut line. Also, no individuals with
14 specific four sidecut corrosion expertise were
15 consulted during this process, and as a result
16 this damage mechanism was not identified as a
17 risk in the four sidecut piping circuit. No
18 recommendations were made to improve the four
19 sidecut safeguards during this process by
20 increasing the metallurgy to an inherently
21 safer material of construction.
22 A damage mechanism hazard review

1 could have assisted the PHA team in
2 understanding sulfidation corrosion risks in
3 the four sidecut piping circuit. Failure
4 mechanisms, such as corrosion and cracking,
5 that can weaken piping and equipment are
6 called damage mechanisms. Damage mechanism
7 hazard reviews ensure that these potential
8 hazards are properly identified and analyzed.
9 They also ensure that safeguards are used to
10 control or eliminate this hazard.
11 In the United Kingdom, this type
12 of review is used in the offshore industry.
13 The Health and Safety Executive, and Chevron
14 as well, participated in the development of
15 the guidance document that establishes this
16 practice. However, in the United States,
17 damage mechanism hazard reviews are not
18 required or recommended by Federal OSHA or Cal
19 OSHA.
20 Had a damage mechanism hazard
21 review been required as part of the PHA cycle,
22 the PHA team could have used the review's

1 findings when identifying hazards and issuing
2 safeguard recommendations. These
3 recommendations could have included improving
4 the metallurgy of the four sidecut piping
5 circuit and upgrading it to an inherently
6 safer material of construction.
7 Reporting findings from damage
8 mechanism hazard reviews to California
9 regulatory bodies will allow regulators to
10 target their inspections and ensure
11 effectiveness of these process safety
12 programs. The implementation of damage
13 mechanism hazard reviews can be used to create
14 leading and lagging indicators for the
15 regulator. Leading indicators are used to
16 predict future performance and are a very
17 preventative tool, and on the other hand
18 lagging indicators are facts about past events
19 that have occurred.
20 Once hazards are identified via
21 damage mechanism hazard reviews and the PHA
22 process, it is necessary to ensure that

1 safeguards exist and that they will
2 effectively control the hazards identified.
3 The identification of safeguards is very
4 important. It's necessary to determine
5 whether the safeguards will work, and it's
6 also necessary to determine if they will
7 reduce the risk of the hazard enough to
8 provide adequate protection.
9 There are methodologies for
10 consistently and objectively making these
11 determinations. These methods can include
12 industry recognized tools, like layers of
13 protection analysis, or LOPA. Chevron does
14 not employ a prescribed methodology for
15 determining whether a safeguard will be
16 effective. Instead, Chevron relies upon the
17 judgment of the people on the PHA team, who
18 base their conclusions upon their experiences,
19 their beliefs, and their areas of expertise.
20 In its 2009 crude unit PHA,
21 Chevron simply cited nonspecific personal
22 judgment-based safeguards. These included,

1 and I quote, "using metallurgy to minimize
2 corrosion, having effective maintenance and
3 inspection programs, and providing pipe wall
4 corrosion allowances," end quote.
5 However, the effectiveness of
6 these safeguards was not evaluated or
7 documented. Instead, Chevron merely listed
8 the safeguards in the PHA. Had a rigorous
9 analysis been performed to determine if
10 metallurgy actually was in place to minimize
11 corrosion, it could have been identified that
12 the four sidecut piping needed to be upgraded.
13 They could have then made a recommendation to
14 replace the piping with an inherently safer
15 material of construction.
16 Such a recommendation made during
17 the PHA process can then be enforced by Cal
18 OSHA and Contra Costa County. The reason for
19 not implementing the recommendation can also
20 then be questioned by the regulator.
21 That concludes the technical
22 portion of the presentation, and I will now

1 turn it over to Investigator Roger Evans, who
2 will discuss inherently safer systems.
3 (Applause.)
4 INVESTIGATOR EVANS: Thank you,
5 Lauren. Regulations of Contra Costa County
6 and the City of Richmond require facilities to
7 look for opportunities to implement inherently
8 safer systems in both PHAs and during the
9 construction of new processes. However, the
10 City and County regulations are currently
11 permissively worded. The regulations only
12 require that analysis be considered by using
13 language that the company, quote, "shall
14 consider the use of inherently safer systems,"
15 end quote.
16 Contra Costa County provides a
17 checklist, as shown here, to companies to
18 provide the company to look for opportunities
19 to implement inherently safer systems. One of
20 the prompts asks the company to analyze if
21 they are using corrosion-resistant material.
22 Chevron's response stated, and I quote,

1 "vessel specifications and piping
2 classifications include a conservative wall
3 thickness and an appropriate corrosion
4 allowance for each surface," end quote.
5 As part of their inherently safer
6 systems review, Chevron did not attempt to
7 actually look for opportunities to use more
8 corrosion-resistant materials, despite the
9 numerous recommendations made over the years
10 to replace the four sidecut piping with an
11 upgraded material. The regulators indicated
12 to Chevron that it complied with the
13 regulation, even though Chevron made no
14 rigorous attempt to implement inherently safer
15 systems.
16 Contra Costa County and the City
17 of Richmond regulations are a positive step
18 forward in improving process safety to include
19 concepts of inherently safer systems.
20 However, while having a good intention, these
21 inherently safer system requirements were
22 performed as a check-the-box exercise by

1 Chevron.

2 Contra Costa County and the City

3 of Richmond require covered facilities to look

4 for potential opportunities to implement

5 inherently safer systems in the PHAs and in

6 new constructions. In addition to PHAs and

7 new construction, companies have many

8 additional opportunities to implement

9 inherently safer design. Companies currently

10 analyze unit designs, and could implement

11 inherently safer systems, during management

12 change, process unit rebuilds, major repairs,

13 and when developing corrective actions from

14 investigation recommendations.

15 Also, as we have discussed, there

16 were a number of opportunities in the 10 years

17 leading up to the incident to implement

18 inherently safer systems. Had more rigorous

19 and encompassing requirements to find

20 opportunities to implement inherently safer

21 systems been required by the City of Richmond,

22 Contra Costa County, and the State of

1 California, this incident could have been
2 prevented.
3 We've talked about hazard
4 identification, safeguards, and inherently
5 safer systems. All of these help to reduce
6 risk. How can a company determine the amount
7 of safeguards required to control hazards to
8 minimize risk? Hazard tools, such as LOPA,
9 can be used to help an organization decide if
10 a scenario or a hazard has been minimized.
11 The goal should be that the risk is reduced to
12 as low as reasonably practicable, or ALARP.
13 ALARP is a widely accepted risk reduction
14 goal. Risk reduction efforts are continued to
15 the practical limit.
16 Using LOPA or other accepted
17 hazard analysis tools to achieve risks that
18 are as low as reasonably practicable can
19 confirm to the company that their safeguards
20 are adequate, inherently safer design is
21 optimally in place, and their process is as
22 low risk as practicable.

1 If Chevron had used LOPA or
2 similar methods to reduce risks to as low as
3 reasonably practicable, Chevron could have
4 prevented the August 6th incident.
5 To ensure all these hazard
6 identification and risk reduction tools are
7 used effectively, the patchwork of regulatory
8 systems in California need to work together.
9 A multi-agency approach is needed by
10 California. By working together, the agencies
11 will improve the public accountability and
12 process safety performance of California
13 process facilities. The sharing of
14 information and joint inspections will
15 increase the cumulative knowledge of these
16 bodies and can drive down the occurrence of
17 major accidents.
18 These groups will be able to
19 target inspections and coordinate operations,
20 working effectively and efficiently. Not only
21 is it important that regulators work together,
22 there are other stakeholders that have an

1 interest in process safety and the impact on
2 the community. There must be transparency so
3 that process industries are accountable to all
4 stakeholders.
5 There is currently a lack of
6 transparency of refineries to their regulators
7 and the public. Transparency, or the public
8 disclosure of safety information, can be
9 successful in driving process safety
10 improvement. The EPA Emergency Preparedness
11 and Prevention Office notes that, quote,
12 "information about hazards in a community will
13 allow local emergency officials and the public
14 to work with industry to prevent accidents,"
15 end quote.
16 In addition, process safety can be
17 further improved by fully involving the
18 experts, the workforce of the company, in risk
19 assessments, inspections, audits and
20 performance reviews. This workforce
21 involvement leads to empowerment, management
22 responsiveness, and process safety performance

1 improvement.
2 This graph illustrates the type of
3 data that improved transparency could provide
4 stakeholders. In the decades preceding the
5 incident, the sulfur content in this four
6 sidecut line increased by over 80 percent.
7 This major increase in sulfur and other
8 process changes sped up the corrosion rate of
9 the four sidecut piping. With increased
10 transparency, this type of information would
11 be provided to regulators, to community
12 officials, and interest groups.
13 In summary, many factors
14 contributed to the August 6th Chevron
15 incident. The immediate cause of this
16 incident was sulfidation corrosion. Also,
17 Chevron failed to shut down the unit when the
18 leak was initially found.
19 But why was this extremely thin
20 pipe there to fail? We have identified both
21 Chevron organizational and California
22 regulatory causal factors. Despite many

1 recommendations from Chevron employees to
2 inspect and to replace the four sidecut line,
3 these recommendations were never implemented.
4 Also, in their PHA process, a regulated
5 analysis, sulfidation corrosion was never
6 identified as a hazard in the four sidecut
7 line.
8 California regulatory causal
9 factors also contributed to this incident.
10 We'd like to emphasize that Contra Costa
11 County is one of a very small number of
12 regulatory systems that has inherently safer
13 systems requirements. Also, Cal OSHA is one
14 of the few states that has a PSM group.
15 However, in our investigation, we
16 found that despite the advances, the existing
17 regulations do not require damage mechanism
18 hazard reviews or the evaluation of safeguard
19 effectiveness. Additionally, current
20 inherently safer system requirements in Contra
21 Costa County and the City of Richmond are
22 overly permissive and do not require rigorous

1 analysis.
2 There are also many opportunities
3 to implement inherently safer systems that are
4 not currently required. Regulatory
5 enforcement can be improved by California
6 agencies working together and sharing
7 information. Finally, enhanced transparency
8 will hold facilities accountable to the
9 regulators, the workforce, and the public.
10 The CSB investigation team is
11 working on a final report that we're planning
12 to release later this year. We are analyzing
13 key issues, including California regulatory
14 effectiveness, Chevron's organizational
15 safety, Chevron's mechanical integrity system,
16 including the use of clamps on hydrocarbon
17 piping, and Chevron's emergency planning and
18 notification and response systems. We will
19 also be investigating Chevron's use of process
20 safety indicators, which are an important part
21 of implementing a strong process safety
22 program.

1 This concludes our findings this
2 evening. I will now turn the presentation
3 over to Investigator Steve Cutchen, who will
4 present our proposed recommendations.
5 (Applause.)
6 INVESTIGATOR CUTCHEN: Thank you,
7 Roger.
8 Based on our analysis and
9 findings, the investigation team proposes to
10 the Board the following recommendations.
11 These first recommendations will improve the
12 analysis of damage mechanisms and process
13 safeguards in the required process hazard
14 analysis cycle.
15 Chevron did not perform a damage
16 mechanism hazard review with its most recent
17 crude unit PHA. The PHA team missed a key
18 opportunity to identify corrosion hazards in
19 the four sidecut line. The conduct of damage
20 mechanism hazards reviews will ensure the
21 identification of hazardous corrosion and
22 cracking present in refinery processes so that

1 preventative inherently safer systems may be
2 implemented.
3 To Chevron USA, this is an urgent
4 recommendation to Chevron, so this important
5 process must be immediately initiated at all
6 Chevron U.S. refineries. Chevron has six
7 months to implement this recommendation. This
8 recommendation is also to the California State
9 Legislature and the Governor of California.
10 Require all refineries to engage a
11 diverse team of qualified personnel to perform
12 a documented damage mechanism hazard review.
13 This review shall be an integral part of the
14 process hazard analysis cycle, and shall be
15 conducted on all PSM-covered process piping
16 circuits and process equipment.
17 The damage mechanism hazard review
18 shall identify potential damage mechanisms and
19 the consequences of failure, and shall ensure
20 that safeguards are in place to control
21 hazards presented by those damage mechanism.
22 Analyze and incorporate into this review

1 applicable industry best practices and
2 inherently safer systems to the greatest
3 extent feasible.
4 To the Mayor and City Council,
5 City of Richmond, California. To the Board of
6 Supervisors, Contra Costa County, California.
7 And to the California State Legislature and
8 the Governor of California: Monitor and
9 confirm the effective implementation of the
10 damage mechanism hazard review program, so
11 that all necessary mechanical integrity work
12 is identified and recommendations at
13 California refineries are completed in a
14 timely way. Indicators are used to monitor
15 how well a company is performing in process
16 safety. These recommendations focus on the
17 need for indicator reporting to the regulator.
18 To Chevron USA: For Chevron, this
19 is a second, urgent recommendation, and this
20 recommendation is also to the California State
21 Legislature, Governor of California. At all
22 California refineries, require the

1 identification and reporting of leading and
2 lagging process safety indicators, such as the
3 action item completion status of
4 recommendations from damage mechanism hazard
5 reviews to Federal, State and Local regulatory
6 agencies that have chemical release prevention
7 authority.
8 It is vital that safeguards are
9 thoroughly evaluated and verified during the
10 process hazard analysis process. These
11 recommendations aim to require this evaluation
12 and verification.
13 To the Mayor and City Council,
14 City of Richmond, California. To the Board of
15 Supervisors, Contra Costa County, California.
16 And to the California State Legislature,
17 Governor of California: Require that process
18 hazard analyses include documentation of the
19 recognized methodologies, rationale and
20 conclusions used to claim that safeguards
21 intended to control hazards will be effective.
22 This process shall use established

1 qualitative, quantitative and/or semi-
2 quantitative methods, such as layers of
3 protection analysis, or LOPA.
4 The use of inherently safer
5 systems can drive risks down to as low as
6 reasonably practicable. A more rigorous
7 requirement for inherently safer systems
8 implementation is needed by California
9 regulators.
10 To the Mayor and City Council,
11 City of Richmond, California. To the Board of
12 Supervisors, Contra Costa County, California.
13 And to the California State Legislature,
14 Governor of California: Require the documented
15 use of inherently safer systems analysis in
16 the Hierarchy of Controls to the greatest
17 extent feasible in establishing safeguards for
18 identifying process hazards. The goal shall
19 be to drive the risk of major accidents as low
20 as reasonably practicable (ALARP). Include
21 requirements for inherently safer systems
22 analysis to be automatically triggered for all

1 management of change and process hazard
2 analysis reviews, prior to the construction of
3 new processes, process unit rebuilds,
4 significant process repairs and in the
5 development of corrective actions from
6 incident investigation recommendations.
7 Regulatory enforcement can be
8 improved by California agencies working
9 together and sharing information. Also,
10 enhanced transparency will hold process
11 facilities accountable to regulators, the
12 workforce, and the public. There are four
13 parts to this recommendation.
14 To the California State
15 Legislature, Governor of California: Establish
16 a multi-agency process safety regulatory
17 program for all California oil refineries to
18 improve the public accountability,
19 transparency and performance of chemical
20 accident prevention and mechanical integrity
21 programs.
22 This program shall (1) establish a

1 system to report to the regulator the
2 recognized methodologies, findings,
3 conclusions and corrective actions related to
4 refinery mechanical integrity inspection and
5 repair work arising from process hazards
6 analysis, California oil refinery turnarounds,
7 and maintenance-related shutdowns;
8 (2) require reporting of
9 information, such as damage mechanism hazard
10 reviews, notice of upcoming maintenance-
11 related shutdowns, records related to proposed
12 and completed mechanical integrity worklists,
13 and the technical rationale for any delay in
14 work proposed but not yet completed;
15 (3) establish procedures for
16 greater workforce and public participation,
17 including the public reporting of information;
18 (4) provide mechanisms for
19 Federal, State and Local agency operational
20 coordination, sharing of data, including
21 safety indicator data, and joint accident
22 prevention activities.

1 The California Department of
2 Industrial Relations will be designated as the
3 lead state agency for establishing a
4 repository of joint investigative and
5 inspection data, and coordinating the sharing
6 of data in joint accident prevention
7 activities.
8 To the U.S. Environmental
9 Protection Agency: Jointly plan and conduct
10 inspections with Cal OSHA, California EPA, and
11 other State and Local regulatory agencies with
12 chemical accident prevention responsibilities
13 to monitor the effective implementation of
14 damage mechanism hazard review and disclosure
15 requirements under recommendations 9 and 10.
16 And in case you don't recall them
17 by number, recommendation 9 to the California
18 State Legislature, Governor of California,
19 requires that refineries perform a documented
20 damage mechanism hazard review.
21 Recommendation 10, also to the California
22 State Legislature, Governor of California,

1 requires that refineries identify and report
2 leading and lagging process safety indicators.
3 To the Board of Supervisors,
4 Contra Costa County, California. To the Mayor
5 and City Council, City of Richmond,
6 California. To the California Air Quality
7 Management Divisions. And to the U.S.
8 Environmental Protection Agency, and to the
9 California Environmental Protection Agency:
10 participate in the joint regulatory program
11 described in Recommendation 11. This
12 participation shall include contributing
13 relevant data to the repository of
14 investigation and inspection data created by
15 the California Department of Industrial
16 Relations and jointly coordinating activities.
17 And in case you don't recall,
18 recommendation 11 to the California State
19 Legislature, Governor of California, is the
20 four part recommendation that requires the
21 establishment of a multi-agency process safety
22 regulatory program for all California oil

1 refineries.

2 That concludes our investigation

3 presentation.

4 (Applause.)

5 CHAIRPERSON MOURE-ERASO: Thank

6 you very much to the panel. I thank you for

7 your work. It has been more than six months

8 of very sleepless nights, I know, from all the

9 people here, and I really very much appreciate

10 all the effort that this panel has put into

11 this report. Thank you.

12 Our next issue on the agenda is

13 statements by elected officials. The first

14 statement I would like to invite, the

15 Congressman from California, George Miller, is

16 going to present a statement. Congressman

17 Miller?

18 (Applause.)

19 REPRESENTATIVE MILLER: Thank you

20 very much, Mr. Chairman. Before I begin

21 speaking, maybe we can take a moment for a

22 sigh of relief that the second suspect in

1 Boston has been apprehended, and an expression
2 of gratitude to our first responders at all
3 levels of agencies and government. That's
4 some good news.
5 (Applause.)
6 REPRESENTATIVE MILLER: I want to
7 thank you, Mr. Chairman and Members of the
8 Board, for allowing us this time to speak to
9 you in response to the initial report. And I
10 want to express our gratitude, I hope for our
11 whole community, for the professionalism and
12 the diligence and the persistence of your
13 investigative staff since the time of the
14 accident. They've been remarkable in their
15 leadership and in their willingness to work
16 with our other agencies at the county and
17 state level. So thank you very much for that
18 effort by the Chemical Safety Board.
19 The massive fire that occurred on
20 August 6th threatened the lives of workers who
21 escaped the vapor cloud, and had a direct and
22 tangible impact on the West County community.

1 The investigation by the CSB, Cal OSHA and
2 Chevron suggests deeper problems than whether
3 or not Chevron should have replaced a corroded
4 piece of pipe that eventually leaked.
5 First, we have learned that
6 Chevron's metallurgist and inspection teams
7 had put up a red flag since 2002, and as
8 recently as the 2011 turnaround, calling for
9 the replacement of the corroded piping.
10 Second, the investigation reports
11 indicate that Chevron had repeatedly failed to
12 implement its internal guidance, which called
13 for 100 percent inspection of all piping
14 components where there is potential for
15 sulfidation corrosion. Chevron also failed in
16 the implementation of recommended practices
17 developed by the American Petroleum Institute,
18 even though they'd helped to develop these
19 guidances based upon numerous catastrophic
20 failures over the past 40 years.
21 Third, we have learned that over
22 the past 10 years Chevron has patched pipe

1 that was too thin or was leaking with over
2 2,000 clamps. Nearly 400 of these were used
3 in hydrocarbon service, and in some cases when
4 clamps leaked Chevron slapped even bigger
5 clamps on top of the leaking clamps. And when
6 Cal OSHA finally looked into this, they found
7 that the defective pipe had not been replaced
8 as required during the next turnaround. I
9 must say that I agree with Member Beth
10 Rosenberg, that this begs a much larger set of
11 questions.
12 Chevron has pointed to its
13 operational excellence program as the
14 cornerstone of its safety culture. It is
15 founded on two key principles. One, and I
16 quote, "do it safely or not at all," unquote.
17 And the second one, "there is always time to
18 do it right."
19 What happened to these principles?
20 Are these principles something that was
21 discarded when it was inconvenient? Someone
22 needs to answer this question. How did the

1 management of a highly sophisticated
2 corporation lack the ability to connect the
3 expertise of its physical materials
4 scientists, located right here in Richmond,
5 with the practices of its business units
6 operating 300 yards away in its refinery?
7 Was there an organizational
8 failure? Are there other cracks lurking in
9 Chevron's management systems? Does Chevron
10 have the same problems at its El Segundo
11 refinery? Is this an industry-wide refinery
12 problem? I hope that the Safety Board's final
13 report gets to the bottom of these questions.
14 Why was Chevron's inspection team's advice to
15 replace the piping overridden during the 2011
16 refinery turnaround? Was the decision not to
17 replace this piping driven by budget
18 considerations? How much was saved? Did
19 someone pencil whip the numbers to justify
20 keeping the corroding pipe in place a little
21 longer?
22 I urge the Safety Board to tackle

1 these unanswered questions in its final
2 report. I am aware that Supervisor Gioia and
3 the County Health Department under Randy
4 Sawyer's leadership is also doing a
5 comprehensive audit of the Richmond refinery,
6 and hopefully this work will help shed light
7 on these questions.
8 The need for effective regulations
9 -- because our second overarching concern is
10 the lack of the effective regulations to serve
11 as a check and balance. Chevron cannot
12 currently guarantee the security of the
13 workers and our community. Inspection by the
14 company alone is not enough, and it is
15 troubling that the regulators did not
16 recognize the magnitude of the problem and did
17 not bend Chevron back into compliance.
18 We know that Cal OSHA is severely
19 underresourced, with a mere seven professional
20 staff in its process safety unit to tackle
21 1,600 facilities statewide, and I think that's
22 why we see some of the recommendations of your

1 staff. We cannot tolerate these once-over
2 lightly programmed inspections at these
3 facilities.
4 I have written to Governor Brown
5 asking that he submit a budget proposal that
6 would assess a process safety fee on
7 refineries and other chemical facilities so
8 that there is enough staff to oversee these
9 facilities in a more thorough manner.
10 (Applause.)
11 REPRESENTATIVE MILLER: In case
12 anyone is worried about the added cost, it
13 amounts to less than one cent of every barrel
14 of crude that is fed through the refineries in
15 California. That is far less than the
16 increased gasoline prices paid by consumers
17 due to the refinery outage.
18 I want to commend Senators Loni
19 Hancock, Mark DeSaulnier, and Assemblymember
20 Nancy Skinner for their leadership and working
21 hard to get funding to hire more inspectors.
22 They recognize the status quo is unacceptable.

1 They have also been working on the
2 improvements to the State's workplace safety
3 laws and evaluating ideas for better
4 regulation systems for refineries, and I want
5 to help them get those improvements as soon as
6 we possibly can.
7 I would like to hear from the
8 Chemical Safety Board what the definitive
9 schedule will be for a final report that will
10 answer these big questions that your interim
11 report has raised, but does not answer: Were
12 the budget considerations a driver in the
13 failure to replace the piping? Does Chevron
14 have a safety culture problem, as raised by
15 Board Member Griffon?
16 These are serious considerations.
17 It would be not the first time this Board has
18 considered that question. We saw it in the
19 Alyeska Pipeline, where for almost a decade
20 the culture problem was admitted to and never
21 cured.
22 Were there organizational

1 failures, and are there other cracks in the
2 safety system? What is broken in the current
3 regulatory system, and do we need to look for
4 a new way to regulate refinery safety? I
5 think the presentation tonight goes a long way
6 towards answering that question, but we have
7 to answer it from the corporate side for the
8 safety of our community and our workers.
9 In light of the large backlog of
10 unfinished investigations at CSB and the
11 constant demand for work that you notice today
12 because of the Texas explosion and the burden
13 that that puts on your Board and staff, I
14 would also ask that you provide a clear date
15 when the community will get a final report
16 with the answers to these questions.
17 I look forward to hearing from
18 you, and a response in the near future. I
19 have seen too many refinery accidents in my
20 years representing this community, and I want
21 to see some meaningful solutions emerge from
22 this discussion.

1 Again, I want to thank you so very
2 much for your endeavor here, for your
3 professionalism, and again for the
4 professionalism and the diligence and the
5 expertise of your staff. Thank you very much.
6 We look forward to your responses.
7 (Applause.)
8 CHAIRPERSON MOURE-ERASO: Thank
9 you very much, Congressman Miller. Now I
10 would like to call for a statement to John
11 Gioia, the Chairman of the Contra Costa Board
12 of Supervisors.
13 MR. GIOIA: Thank you. I am not
14 chair this year, so let me just clarify that.
15 CHAIRPERSON MOURE-ERASO: Okay.
16 MR. GIOIA: I'm also a member of
17 the Bay Area Air Quality Management District,
18 and let me first start by saying we welcome
19 the Chemical Safety Board coming to Richmond.
20 Your investigation, report and recommendations
21 are thorough and comprehensive. Personally,
22 I appreciate the attention, transparency and

1 professionalism that you have brought to this
2 investigation.
3 I know that all Richmond residents
4 care and have an interest in ensuring that our
5 safety and health come first and foremost when
6 it comes to the operation of an industrial
7 facility. I personally know this well. In
8 1999, I was forced to pick up my son from a
9 local elementary school near the Chevron
10 refinery while a release was going on and
11 while shelter in place was going on, and I
12 felt the same fear and uncertainty as I know
13 other Richmond residents felt at that time.
14 I think the most important
15 conclusion in your report is that this
16 accident is not about pipe corrosion, but is
17 about corporate decisionmaking. It's about
18 the need to improve the safety culture and
19 decisionmaking at the refinery. Things like
20 deciding in advance on which materials to use
21 which are safer, frequency of inspections and
22 maintenance, and when to replace equipment and

1 pipes.
2 So as you've said, while we're
3 fortunate that Richmond and Contra Costa
4 County have, in your own assessment, the
5 strongest local industrial safety ordinance in
6 the country, we also know that this ordinance
7 can be further improved. Both the Contra
8 Costa Health Department and myself personally
9 welcome your recommendations, and especially
10 your two main recommendations to improve the
11 industrial safety ordinance, first requiring
12 the use of inherently safer systems prior to
13 the construction of new processes, prior to
14 process unit rebuilds, prior to significant
15 process repairs, or when implementing
16 corrective actions after an incident like the
17 one that just occurred.
18 This will give both Contra Costa
19 County and Richmond power to force refineries
20 to use inherently safer systems, a power that
21 we don't have today.
22 Second, requiring a process hazard

1 analysis conducted by refineries to use
2 quantitative and qualitative methods to
3 document that the refinery is using the safest
4 methodology to control hazards within its
5 facility.
6 Immediately after the Chevron
7 accident, the Contra Costa Board of
8 Supervisors formed an ad hoc Committee of the
9 Board, including myself and Supervisor Federal
10 Glover, to address the issue of the industrial
11 safety ordinance. We have awaited your
12 recommendations, and now that you have made
13 these specific recommendations we will work
14 with Richmond to quickly implement these
15 changes in the local ordinance.
16 (Applause.)
17 MR. GIOIA: Let me also say, we've
18 already taken action. Several weeks ago under
19 the current ISO Contra Costa County ordered a
20 full safety culture audit of the Chevron
21 refinery to be conducted by an independent
22 professional entity. An oversight committee

1 made up of community residents, workers at the
2 refinery, Health Department staff and City
3 staff will be established to ensure that the
4 safety audit is conducted in a transparent,
5 thorough and independent manner.
6 Under the industrial safety
7 ordinance, we have the authority to require
8 Chevron to pay for this study.
9 Finally, last year in my role as
10 Chair of the Bay Area Air Quality Management
11 District I proposed, and the Air Board voted,
12 to work with Senator Hancock and Assemblywoman
13 Skinner to carry a bill to increase the
14 maximum fines under State law for air quality
15 violations. The current maximum fines are
16 nowhere near high enough to be an incentive.
17 They are too low.
18 (Applause.)
19 MR. GIOIA: And we appreciate the
20 support of our local legislators in carrying
21 that bill. We know we will face opposition
22 from industry. And I think your

1 recommendations going forward, in your final
2 report, encouraging that would be helpful.
3 So again, thank you, even under
4 these circumstances, for coming to Richmond
5 and setting a model in terms of how an
6 investigation should be conducted, in terms of
7 your transparency and your professionalism.
8 Thank you.
9 (Applause.)
10 CHAIRPERSON MOURE-ERASO: Thank
11 you very much. Thank you very much, Mr.
12 Gioia. I would like to invite now one person
13 that has been a very gracious host for us
14 here, or I would say hostess, in the City of
15 Richmond. I would like to invite Ms. Gayle
16 McLaughlin, the mayor of the City of Richmond.
17 (Applause.)
18 MAYOR McLAUGHLIN: Hello. Thank
19 you. Thank you so much to the Chairman and
20 the entire Chemical Safety Board, and all the
21 staff of the Safety Board, for coming to
22 Richmond, for being here today to share with

1 us the interim results of your investigation.
2 The August 6th fire was a
3 devastating experience for our community. Not
4 only were 15,000 people treated at local
5 hospitals, but the workers had their lives put
6 at great risk. We were forced to stay in our
7 homes and shelter in place for hours. The
8 damage to our health, to our community, to the
9 image of our city, was massive.
10 And this wasn't the first time
11 Chevron has wreaked havoc in our community.
12 There have been many, many incidents over
13 recent years and decades. In fact, there was
14 a fire in the same crude unit that occurred in
15 2007.
16 We need to have Chevron understand
17 that our community is not going to forget
18 about this. We cannot afford to forget about
19 these incidents. These incidents have been
20 harming us again and again. There have been
21 around 14 incidents since 1989, 1990, and this
22 last incident, this 2012 incident, was the

1 last straw.

2 It reminds me of a metaphor. You

3 know, I think we've all heard of the abused

4 spouse syndrome, where the abused spouse takes

5 the abuse and the next day, after the abuse,

6 the spouse comes and says to him or her that

7 "I'm so sorry, it'll never happen again." And

8 it happens again. And it happens again. And

9 it happens again. But sometimes abused

10 spouses wake up, and abused communities wake

11 up. And that is going to happen, and is

12 happening in the Richmond community.

13 (Applause.)

14 MAYOR McLAUGHLIN: Many of you

15 remember, many of you in the community

16 remember that it wasn't that long ago that we

17 had a majority of Chevron-influenced

18 officeholders on the Richmond City Council.

19 We used to call them the Chevron Five. And we

20 still have some Chevron-influenced and

21 Chevron-backed officeholders on the Richmond

22 City Council, but we're pushing forward, and

1 we're going to continue to push forward.
2 We have an organized, mobilized
3 community, and I call on all of our community
4 to continue to mobilize. Call on your
5 neighbors. Let people know we cannot and will
6 not forget this incident, and past incidents,
7 and we will not suffer a future incident,
8 because we will make sure that these wonderful
9 recommendations that the Chemical Safety Board
10 is presenting to us today will be put in
11 place.
12 (Applause.)
13 MAYOR McLAUGHLIN: The political
14 will is here in this community, and I can tell
15 you that I stand side by side with this
16 community, and others on the City Council. I
17 know we have City Councilmember Jovanka
18 Beckles in the audience today, who stands
19 right with me in making sure that it's
20 understood that Chevron needs to be regulated.
21 (Applause.)
22 MAYOR McLAUGHLIN: You know, we

1 have often -- those of us who have stood up to
2 Chevron have often been called Chevron-
3 bashers, when in reality it is Chevron who has
4 been bashing our community.
5 (Applause.)
6 MAYOR McLAUGHLIN: And we are
7 standing up. And we are so grateful that this
8 independent board recognizes the injustices
9 that we have suffered, and is here helping us
10 today.
11 I take your recommendations so
12 much internally to heart, and I can tell you
13 that as mayor I will be bringing to the City
14 Council a resolution on May 21st to revise the
15 industrial safety ordinance as per the
16 recommendations of the Chemical Safety Board.
17 (Applause.)
18 MAYOR McLAUGHLIN: And I call on
19 the community --
20 (Applause.)
21 MAYOR McLAUGHLIN: The Chemical
22 Safety Board proposes that Richmond strengthen

1 its industrial safety ordinance to require
2 inherently safer technology and a hierarchy of
3 controls that would eliminate hazards instead
4 of minimizing them when feasible, and would
5 prohibit companies from relying totally on
6 managing hazards that can be eliminated by
7 design through inherently safer technology.
8 So we know what you're
9 recommending. I will be bringing it forward.
10 I know the community will be standing there,
11 speaking out at the City Council meeting,
12 because this community does hear the call when
13 a rational recommendation gets put forward, as
14 is being recommended by the Board today.
15 Lastly, I want to say that we are
16 transforming our city. We are transforming
17 our city by way of creating a healthy city, a
18 sustainable city, an equitable city. And
19 this, this incident has put such a negative,
20 if you will, shadow over us. You know, we
21 have so much shadow over us based on Chevron:
22 the shadow of their pollution, the shadow of

1 the risk they create for us. And I mean,
2 ultimately, it's the shadow over the image
3 that we're creating.
4 But we will persist, and we will
5 continue to showcase Richmond as a 21st
6 century city, a city that's standing up for
7 itself, in its own interest. So we will not
8 be satisfied until Chevron understands that
9 they have to stop polluting our air, stop
10 putting us at risk.
11 (Applause.)
12 MAYOR McLAUGHLIN: And lastly,
13 because they influence our elections with
14 their millions and millions of dollars, we
15 will not be satisfied until they stop
16 polluting our elections as well.
17 (Applause.)
18 MAYOR McLAUGHLIN: Thank you.
19 CHAIRPERSON MOURE-ERASO: Thank
20 you very much, Mayor McLaughlin. We
21 appreciate your words. The next elected
22 official is the representative of Senator

1 Skinner, who cannot be with us. The person
2 representing the message of Senator Skinner is
3 Mark Chekal-Bain. So Mr. Chekal-Bain, please.
4 MR. CHEKAL-BAIN: Thank you.
5 Thank you so much for inviting Assemblymember
6 Skinner to speak today. Unfortunately, she's
7 in Southern California on business, and asked
8 that I present for her this evening.
9 First of all, she wants to thank
10 the Chemical Safety Board's staff. They've
11 done an incredible job of the work and
12 informing us along the way when they can. And
13 as the U.S. Chemical Safety Board staff stated
14 at a press conference on Monday, and again
15 several times tonight, the Chevron refinery
16 fire was ultimately a preventable accident.
17 As Assemblymember Skinner found in
18 the draft report, it calls for the State of
19 California to have more technically competent
20 regulators, increased inspections, and much
21 better regulations to prevent future
22 incidents. But these are not an excuse for

1 Chevron failing to follow their own internal
2 technical documents, to learn from failures at
3 Richmond and the other sites, to listen to
4 their own employees, or to replace corroded
5 and leaking pipes during routine turnarounds,
6 all things that Congressman Miller addressed
7 earlier.
8 But as far back as 2007, the CSB
9 had identified the need across the country for
10 OSHA units to have more highly trained and
11 experienced regulatory inspectors, and for
12 more comprehensive inspections at oil
13 refineries. Yet, as of today, Cal OSHA does
14 not have any more inspection staff than
15 previously, nor any higher training
16 requirement. And because of the small number
17 of refinery inspectors, what happens is that
18 we in California are unable to put adequate
19 hours into accident prevention. Instead, the
20 vast majority of inspector time ends up
21 investigating, post incidents.
22 For example, Cal OSHA has spent

1 thousands of hours investigating the August
2 fire, but in the last six years Cal OSHA
3 inspected Chevron only three times, each time
4 for about 50 hours. In contrast, refinery
5 inspections following federal guidelines last
6 year, roughly 1,000 hours each.
7 In the report, the CSB concludes
8 that issuing fines and prosecuting companies
9 post-incident are not acceptable substitutes
10 for prevention. Therefore, after the CSB
11 report, this week Assemblymember Nancy Skinner
12 testified on behalf of additional staffing and
13 training levels for Cal OSHA before the
14 California State Assembly Budget Subcommittee
15 that decides on the Cal OSHA and California
16 Department of Industrial Relations budget.
17 At the request of Assemblymember
18 Skinner, the Budget Subcommittee on State
19 Administration is examining the process safety
20 management unit, which works to prevent or
21 minimize the consequences of catastrophic
22 releases of toxic, flammable, or explosive

1 chemicals.

2 As she stated at the hearing,

3 Assemblymember Skinner said the staffing

4 numbers are alarming. Cal OSHA, the state

5 agency responsible for workers' safety, has

6 only one chemical engineer to regulate all

7 chemical processing facilities, and only seven

8 inspectors total to cover 15 refineries, as

9 well as 1,665 other facilities.

10 Explosions like the one here in

11 Richmond, as well as Wednesday's explosion at

12 a fertilizer plant near Waco, Texas, have

13 taught us all that California needs to ensure

14 that OSHA has enhanced funding and staffing,

15 and the technical training to enact precise

16 safeguards so that our chemical and refinery

17 facilities are not a disaster waiting to

18 happen.

19 Assemblymember Skinner looks

20 forward to working with the Chemical Safety

21 Board, and the community of Richmond, to

22 ensure that we have effective California

1 regulations and funding for OSHA to prevent
2 future incidents from happening.
3 Thank you.
4 (Applause.)
5 CHAIRPERSON MOURE-ERASO: The next
6 item on the agenda is that the Board is going
7 to have some questions to the investigative
8 team. So I'll take the privilege of the Chair
9 to ask the first question.
10 I would like to ask the team if
11 they consider that the changes in the
12 recommendations to the California Legislature
13 in this investigation could be considered for
14 adoption by the California Task Force on
15 Refineries in this state, and also if those
16 recommendations are also applicable to be a
17 standard nationwide.
18 INVESTIGATOR TILLEMA: To address
19 the first part of your question, whether this
20 could be adopted by the governor's task force
21 to write the report, we focus on three key
22 areas that are covered on the front cover of

1 the report: inherently safer design, damage
2 mechanism hazard reviews, and ensuring
3 effective safeguards, in this report. We also
4 touch on some of the regulatory issues.
5 So I think this would be a good
6 first step for the California Governor's Task
7 Force to utilize, but I want to reiterate
8 things that we've said already tonight. This
9 is our interim report, and we still have a lot
10 of work to do to complete our final report.
11 One of the key areas we want to
12 focus on that we haven't done much work on yet
13 is the safety case, which is a regulatory
14 regime that's been utilized in other countries
15 effectively, and we want to look at whether or
16 not that's an opportunity for California to
17 adopt that type of regime as a more effective
18 way, or a more effective approach, to prevent
19 major accidents. So that's a key area that we
20 want to focus on that I think the Governor's
21 Task Force would be interested in that's not
22 covered in this report.

1 And the second part of the
2 question was about the U.S.?
3 CHAIRPERSON MOURE-ERASO: Yes.
4 INVESTIGATOR TILLEMA: I guess one
5 thing that I'd like to make clear to everyone
6 is, these things that we've identified, these
7 damage mechanism hazard reviews, the use of
8 inherently safer design, ensuring that
9 safeguards are effective, these are not things
10 we went back to Denver and developed. These
11 are all things that were developed by the
12 petrochemical industry as ways to prevent
13 major accidents, and they're just not being
14 effectively utilized in the industry.
15 So I think absolutely that these
16 are things that could be -- that these
17 recommendations could apply to the U.S. I
18 think we have some challenges we want to look
19 at as to how to best approach bringing those
20 type of recommendations to the entire nation,
21 but I think they would be applicable, yes.
22 CHAIRPERSON MOURE-ERASO: Thank

1 you very much. I wonder if some of the Board
2 members have some questions. Let's start with
3 Beth Rosenberg.
4 MEMBER ROSENBERG: Nothing.
5 CHAIRPERSON MOURE-ERASO: Mark
6 Griffon?
7 MEMBER GRIFFON: I have just a few
8 questions, especially because we have a panel
9 still waiting to give us some great insights.
10 So I -- one question, just a couple on the
11 technical side of the report, though. The
12 first thing that struck me in the write-up was
13 that we concluded that 19 people were caught
14 in the vapor cloud.
15 And I'm just wondering, this is in
16 the midst of a leaking pipe that they're
17 trying to patch or repair, and I'm wondering,
18 did we look at why there were so many people
19 near that situation and caught in that vapor
20 cloud? It seems to me that's a lot of people
21 to be out in that area of the site when
22 there's a leaking pipe and there's a repair

1 going on. I just wondered if you looked at
2 that.
3 INVESTIGATOR TILLEMA: I'd say we
4 done some preliminary looks at that, and we
5 share the same concerns you do. It's
6 definitely an area we want to focus on in the
7 second half of the report. The rest of the
8 team has gone down to Texas A&M where there's
9 a world-renowned fire training school, where
10 they focus on emergency response. We've done
11 some initial work with them, but we need to
12 continue that effort. That's an area that we
13 definitely want to focus on in the second half
14 of our investigation.
15 I don't know if anyone wants to
16 add to that.
17 MEMBER GRIFFON: Thanks. Just two
18 more quick ones, I think. This question about
19 -- there's a couple references in our report
20 to the pipe thickness. And obviously I'm much
21 more interested in the higher-level
22 decisionmaking issues. Having said that, we

1 mentioned this pipe, the nominal thickness of
2 .32 inches. And I'm just curious, what was
3 the allowable thickness, and how is that
4 derived? Or how did Chevron derive that, and
5 was it adequate in your opinion?
6 INVESTIGATOR TILLEMA: That's
7 actually a much more complicated question than
8 you might at first --
9 MEMBER GRIFFON: Well, if you can
10 give me the 30 second answer?
11 INVESTIGATOR TILLEMA: I think I'm
12 going to defer. Steve and Roger have done a
13 lot of work in this area, and are probably the
14 best people to answer that.
15 INVESTIGATOR EVANS: One way to
16 try to describe it, there's a term that they
17 use at Chevron called flag thickness, and what
18 they mean by that is, that's kind of when you
19 raise the red flag. When the pipe thickness
20 gets to that point, that's when you actually
21 have to start making decisions about what
22 you're going to do.

1 When they get to flag thickness,
2 they have three options according to their
3 internal procedures. The first is, they can
4 shut down and replace the pipe.
5 The second is, they can do some
6 calculations -- the flag thickness is a book
7 number. They can do some calculations to try
8 to determine, based on the pressure in the
9 pipe or based on the mechanical strength
10 necessary to keep it up in the air, they can
11 calculate an actual minimum thickness based on
12 those structural needs. And if they haven't
13 reached that yet, then they can continue to
14 operate as long as they are looking at it
15 regularly. They have to do a management of
16 change, that is a temporary management of
17 change with a date certain, usually the next
18 turnaround.
19 And then the third thing that they
20 can do is, that they can do a management of
21 change to install some type of a leak control
22 device, like the clamps that you've heard

1 referred to this evening. And those three
2 options, when they hit flag thickness, they
3 have to do one of those three things.
4 INVESTIGATOR TILLEMA: Thank you,
5 Roger.
6 I'd just like to add that the main
7 thing about this particular case, and this
8 piping that failed, we didn't have a flag
9 thickness on it because it wasn't inspected.
10 That's a key point.
11 INVESTIGATOR EVANS: Yeah, the key
12 there is that you have to, in a situation like
13 sulfidation corrosion that affects the entire
14 length of the pipe, you have to make sure
15 you're looking at the places that are the
16 thinnest part of the pipe. And this pipe, had
17 they looked at it, had they known it was this
18 thin during the turnaround, they would have
19 replaced it. But they didn't know. I mean,
20 what you don't know is the devils in the
21 details sometimes.
22 And so the flag thickness was

1 quite a bit thicker than what this pipe
2 actually was. It was way beyond flag
3 thickness. We've mentioned, about half the
4 thickness of a dime. That's also a little
5 less than the thickness of a credit card, or
6 about the thickness of two business cards, to
7 give you just another couple of visuals.
8 MEMBER GRIFFON: I'd like to have
9 that --
10 INVESTIGATOR EVANS: One more
11 thing. Mr. Sam McFadden over here from
12 Anamet, that's his poster over there, and he
13 has that sample that shows the thinning, the
14 thin sample, and he also has two rings. The
15 rings he has are eight inch diameter pipe.
16 One of the rings is a .322 wall, which is the
17 thickness the piping is when you buy it. The
18 other sample he has is a ring that is
19 indicative of what was at Chevron. And you
20 can just feel the weight and see the drastic
21 difference. Sam would be glad to show you
22 that.

1 INVESTIGATOR TILLEMA: Maybe just
2 to summarize --
3 CHAIRPERSON MOURE-ERASO: Where
4 are the rings right now, Roger? If somebody
5 would like to examine the rings, they should
6 talk with Doctor McFadden there.
7 INVESTIGATOR TILLEMA: And just to
8 summarize that question, we just touched on
9 the complications involved with this issue.
10 But the whole complication with this issue
11 highlights again the importance of using
12 inherently safer materials so that you don't
13 have as many details encumbered in your system
14 as you do with carbon steel in this surface.
15 MEMBER GRIFFON: And one final
16 question. We recently received a copy of
17 Chevron's investigation report on, I think,
18 April 12th. And I was curious if you could
19 highlight just a few of the main differences
20 between sort of our causal analysis versus the
21 root causes they identified.
22 INVESTIGATOR TILLEMA: Okay. I'll

1 confess, I've only read the report one time,
2 and I think it was last Sunday. We've been
3 quite busy preparing for this meeting. We
4 talked about it briefly this week, and I think
5 in general we were encouraged that Chevron
6 also identified the need to properly identify
7 damage mechanisms. Their report doesn't call
8 it a damage mechanism hazard review, but they
9 were getting at the same concepts, and we were
10 encouraged by that.
11 On the other hand, we were quite
12 disappointed that a lot of Chevron's focus was
13 on low-level administrative issues. They
14 focused on inspector training and competency.
15 They talk about in 2002 that an inspector
16 identified this corrosion, and one of the
17 problems was that he only placed a comment in
18 the inspection file. In 2009, when the ETC,
19 the technical report, came out and identified
20 the need for 100 percent inspection, it wasn't
21 entered into their management system. In the
22 2011 turnaround, they didn't perform 100

1 percent component inspection because it had
2 not been placed in the inspection plan for the
3 turnaround.
4 All of these are very low
5 administrative failures. However, I would
6 point you to paragraph 49, which we added to
7 the report this week, and it wasn't available
8 on the version that went out on the internet.
9 During our team meetings this week, we added
10 this section that talks about in March of
11 2012, a Chevron corporate review was done of
12 the Richmond refinery, and they found that
13 critical inspection recommendations were being
14 submitted by employees but were being denied.
15 So Chevron corporate identified
16 this problem back in March, five months before
17 the incident, and that same review focused on
18 Richmond refinery leadership as needing to
19 implement these 2009 recommendations. And so
20 the corporation focused at a higher level than
21 what Chevron's investigation report does.
22 MEMBER GRIFFON: Thank you.

1 CHAIRPERSON MOURE-ERASO: Thank
2 you very much. Thank you very much for the
3 panel, and I think we move to the next item on
4 the agenda. We are very lucky, and we are
5 very thankful of having with us a very
6 important and wise panel that could address a
7 lot of the issues that were raised by this
8 accident. I would like to name the panel
9 first on a list, and then I will call them in
10 the order of the agenda.
11 With us is Ellen Widess, who is
12 the Chief of California OSHA. She's here on
13 the table. Also we have Professor Paul
14 Amyotte, from the Department of Chemical
15 Engineering of Dalhousie University, from
16 Canada. We have Randy Sawyer, the Chief
17 Environmental Health and Hazardous Materials
18 Officer of Contra Costa County. We have
19 Tupper Hull, the Vice President for Strategic
20 Communications from the Western States
21 Petroleum Association. We have Mike Smith
22 from the United Steel Workers Local 5, safety

1 representative. We have Ron Espinoza, from
2 the United Steel Workers International Union.
3 He is the subdirector of District 1. We have
4 also Greg Karras, from Communities for a
5 Better Environment, who is a senior scientist.
6 WE have Mike Wilson, who is the director of
7 the Labor Occupational Health Program for the
8 University of California at Berkeley.
9 So I will call first on Ellen
10 Widess, the Chief of California OSHA. Ms.
11 Widess?
12 MS. WIDESS: Thank you, Mr.
13 Chairman, Board and Staff of the Chemical
14 Safety Board for your thorough investigation
15 and productive collaboration with Cal OSHA.
16 And I also want to give thanks to our State,
17 Local and national legislators for their
18 leadership and commitment to improving
19 refinery safety for workers and communities.
20 There are many, many lessons from
21 the August 6th fire, and chiefly the
22 importance of adequate preventive measures to

1 ensure no future incidents. That requires
2 both a strong and informed regulatory system
3 to monitor refinery compliance, and a true and
4 genuine proactive commitment to an investment
5 in safety by the refineries.
6 I will briefly summarize Cal
7 OSHA's investigative findings, and I want to
8 kind of indicate that, while we were grateful
9 -- we are grateful -- that there were no
10 serious worker injuries and fatalities from
11 this preventable fire and explosion, our
12 investigation over the past six months
13 indicated many systemic, pervasive problems in
14 corporate management, in failure to follow not
15 only California's and national process safety
16 standards, but Chevron's own policies and
17 procedures.
18 As a result of our investigation,
19 we found and issued 25 citations, 23 of which
20 were serious or willful serious violations,
21 which indicates the degree of severity of the
22 hazards, the serious possibility, reasonable

1 possibility of death or injury of these
2 hazards, and the degree of knowledge and
3 intentional conduct on the part of Chevron in
4 ignoring those hazards and known safety
5 standards.
6 I might add that our citations
7 issued January 30th in many ways mirror
8 Chemical Safety Board's findings issued this
9 week. We issued nearly 1,000,000 dollars in
10 penalties, the highest in Cal OSHA's history,
11 and the maximum allowed under current law.
12 Chevron has appealed all citations and
13 penalties, and the appeal has not yet been set
14 for hearing by the Independent OSHA Appeals
15 Board of California.
16 What is striking to us was that
17 there were many, many serious violations prior
18 to, during and after the fire. This was
19 demonstrated in the video that Dan provided,
20 which helped me understand in ways I now get
21 much more clearly the many, many problems.
22 And as I mentioned, failure to comply not only

1 with the PSM standards but Chevron's own
2 policies put workers at risk at every point in
3 the process.
4 Just to summarize very, very
5 quickly, no effective process hazard analysis
6 of the crude unit, no corrosion monitoring, no
7 replacement of severely corroded pipe known,
8 as we've heard repeatedly now, for 10 years,
9 identified, ignoring the strong and repeated
10 recommendations of pipe inspectors and
11 Chevron's own metallurgists. Failure to take
12 advantage of at least three opportunities to
13 replace this severely corroded pipe and
14 prevent the accident that did occur during
15 turnarounds at least three times, in 2002,
16 2007, and 2011.
17 We, too, were concerned that so
18 many workers were at grave risk in the zone of
19 danger, Chevron's own workers and contractor
20 workers brought in. We were concerned and
21 cited for the failure to shut down despite the
22 obvious leak, putting workers at risk while

1 attempting to clamp the obviously dangerous
2 situation, not following Chevron's own
3 emergency procedures.
4 And then, in the course of this
5 investigation and through information provided
6 also by the workers and union at Chevron, the
7 identification of really failed leak repair
8 procedures throughout the refinery. The use
9 of clamps throughout the refinery well beyond
10 allowable time limits, rather than
11 implementation of permanent and safe
12 correction of problems.
13 And most disturbing -- I think I
14 repeat what has been suggested before -- from
15 Cal OSHA's perspective, most disturbing was
16 the fact that Chevron knew for over a decade
17 of the hazardous conditions of severely
18 corroded and worn pipes and leaks, knowledge
19 that they uniquely had, knowledge not
20 available to Cal OSHA or other regulatory
21 agencies, of the highly corrosive high-sulfur
22 crude state of pipes in existence for 38

1 years.

2 Chevron had that unique knowledge

3 of hazards, the ability and ample opportunity

4 to act to prevent the fire that occurred, the

5 risk posed to workers and communities, and

6 frankly other accidents that could have caused

7 catastrophic consequences. We can only wonder

8 what other hazards have been known and not

9 reported to us.

10 Frankly, running to failure rather

11 than following best practices, industry

12 guidance, and Chevron's own policies and

13 internal recommendations to replace, to

14 inspect more frequently, were conclusions that

15 we drew from our investigations. The

16 consequence was putting Chevron's own workers

17 and their contractor employees, as well as the

18 community, at great risk of death or serious

19 injury, with the knowledge of the likely

20 consequences of this action and pervasive

21 violation of safety standards.

22 What may be lost in the aftermath

1 of the August 6th fire, and what I want to
2 emphasize, is the fundamental responsibility
3 of Chevron and other refineries to ensure the
4 safety of their workers and all other workers
5 on site at all times.
6 Cal OSHA's mandate -- no matter
7 what resource level we have, our mandate is to
8 monitor the compliance of refineries to ensure
9 that they are maintaining safe and healthy
10 workplaces. Our recommendations from this and
11 lessons learned are fourfold.
12 First, again as has been
13 mentioned, the need for greater transparency.
14 At this point, we are operating without
15 sufficient information from Chevron and other
16 refineries, information that is often
17 technical, trade secret, proprietary, but
18 information that is desperately needed for
19 effective monitoring and enforcement.
20 Given the size and complexity of
21 refineries, the changing technologies,
22 processes and materials, there is an

1 overwhelming need for more timely information
2 and reporting by refineries at such times as
3 turnarounds so that we can better target and
4 prioritize inspections, rather than look and
5 divine hazards that are well known to Chevron
6 and to other refineries.
7 We need to be able to have that
8 kind of information to address most serious
9 and known hazards that refineries have
10 themselves identified, rather than guessing.
11 That is the most effective use of resources.
12 Even the most well-resourced agency alone
13 cannot act effectively without this type of
14 information in real time provided by
15 refineries.
16 Second, prevention should be the
17 driving force, not reaction to accidents.
18 Continuous improvement is the best practice,
19 and that includes improvement in process
20 management, in refinery maintenance, in
21 standards and in regulatory strategies.
22 As the CSB's report has

1 underscored, the industry has the knowledge
2 and the power to eliminate hazards in so many
3 ways, by using inherently safer designs and
4 materials, instead of relying on government
5 inspections alone, when possible and when
6 adequately informed, to detect problems known
7 to the refineries.
8 Again, the refineries are in a
9 unique position to have that information. The
10 need for more investment by refineries in
11 infrastructure -- as pointed out, this is an
12 aging industrial system. Pipes, the pervasive
13 use of clamps demonstrates this lack of
14 commitment at Chevron, and maybe as well
15 throughout our refineries in California. That
16 will be the subject of our process quality
17 verification inspections this year. That's
18 looking at only one of myriad issues we could
19 be looking at in the refineries.
20 I want to just remind the
21 community and the CSB, we spent a lot of time
22 as State and Local and national regulators

1 considering the appropriate pipe material to
2 rebuild the crude unit after the fire. And
3 though there was a lot of attention to the
4 pipe material, frankly, the quality and the
5 frequency of maintenance was equally important
6 in this decision, and that requires a
7 commitment by Chevron.
8 They alone, again, have the
9 intelligence about the type of crude, the
10 silicon content, the temperature, the pressure
11 in those pipes, so the simple decision --
12 again, decisions which in some cases are being
13 foisted on local government without all of
14 this information to reach the best informed
15 decision, leaves us all, workers and the
16 community, at peril.
17 Thirdly, the culture of safety.
18 Frankly, I'd like to understand better what
19 that term means. And I look forward to the
20 CSB's final report to provide more to that
21 mysterious title, which can belie many things.
22 But I want to indicate -- and much has been

1 said about corporate decisionmaking, decisions
2 to ignore the clear and repeated
3 recommendations by scientists, where business
4 management ignored those decisions. I share
5 Congressman Miller's curiosity, frustration,
6 with that whole process, and we look forward
7 to those answers by Chevron and by the
8 Chemical Safety Board.
9 I think, though, that one element
10 of a culture of safety that Cal OSHA believes
11 is absolutely imperative is empowered workers.
12 Workers are in the best position to identify
13 the hazards --
14 (Applause.)
15 MS. WIDESS: -- and they need to
16 be part, an integral part, of policies and
17 procedures and decisionmaking at refineries.
18 I was equally concerned by the report we
19 received that indicated concern about
20 retaliation, fear of reporting hazards to
21 management at Chevron, as well as to Cal OSHA.
22 The freedom and the necessity of

1 workers to report unsafe conditions and
2 concerns, both to us and to management, the
3 ability of workers to freely know that they
4 can shut down hazardous operations facing
5 imminent hazards, we feel was at fault, the
6 lack of that freedom was at fault in this
7 accident, which could have killed not only
8 many workers but many community members.
9 And then finally, I just want to
10 close with a comment about an agreement with
11 the CSB's recommendation for the need for a
12 more coordinated and collaborative inter-
13 agency regulatory approach to both worker,
14 community, and environmental protection from
15 refinery hazards.
16 I am proud to be part of this
17 administration, and want to note that the
18 Governor's Interagency Task Force was launched
19 well before CSB's recommendations and report.
20 We began very early in the process and
21 realized it was not only Cal OSHA's regulatory
22 insights and investigation, but the work of

1 our sister agencies at a local, state and
2 national level that are the only way to ensure
3 future protection.
4 We are hard at work, both looking
5 at better coordinated and effective and
6 responsive emergency preparedness, as well as
7 prevention measures. This report will give us
8 new risks to consider. The Governor's Task
9 Force is certainly looking at ways we can
10 share data about hazards, about enforcement
11 histories, consider joint or coordinated
12 enforcement actions, and certainly to improve
13 the transparency and clarity of the different
14 agencies' responsibilities, their laws, their
15 jurisdictions, and empower much more effective
16 enforcement actions, again to ensure the
17 protection of refinery workers and
18 communities.
19 We have been gathering the
20 perspectives of all stakeholders: labor,
21 industry, community and others, and will be
22 issuing a report and recommendations in May.

1 And I want to again just loop back to the
2 transparency and the critical ingredient of
3 information from refineries of their hazards,
4 of their processes. A strong and well
5 informed regulatory system is certainly key,
6 and better systems for collaboration are in
7 the works. But they will demand, ultimately,
8 more transparency from the refineries of key
9 information essential for worker protection
10 and community protection.
11 Thank you.
12 (Applause.)
13 CHAIRPERSON MOURE-ERASO: Thank
14 you. Thank you very much, Ms. Widess.
15 The next person is Professor Paul
16 Amyotte from the Department of Chemical
17 Engineering of Dalhousie University. Doctor
18 Amyotte is one of the few experts in the world
19 on inherently safer systems. Doctor Amyotte?
20 DR. AMYOTTE: Thank you, Chairman,
21 Members of the Board, ladies and gentlemen.
22 I'd like to begin by offering my expression of

1 concern for the workers and the members of the
2 public who have been so adversely impacted by
3 the process incident that we're discussing
4 this evening. I also want to thank the
5 Chemical Safety Board for inviting me to be
6 here and to give this presentation.
7 A little bit of legal business
8 here for a moment. On the advice of the
9 California Board for Professional Engineers,
10 Land Surveyors and Geologists, I declare that
11 while I am registered as a licensed
12 professional engineer in the province of Nova
13 Scotia, Canada, I do not hold a similar
14 license in the State of California.
15 There are two main areas in which
16 I have focused my presentation. First, I will
17 comment on the CSB's interim investigation
18 report from the perspective of inherently
19 safer design. And secondly, I will comment on
20 the need for the adoption of a lessons learned
21 mentality in the process industries.
22 Let me start by saying that I

1 wholeheartedly agree with the analysis and the
2 conclusions on the above points which are
3 contained in the interim report. I'm a strong
4 proponent of inherent safety and lessons
5 learned. As a process safety educator and
6 researcher, both have figured prominently in
7 my teaching and in my research efforts.
8 The discussion in the interim
9 report on inherently safer design is perhaps
10 the most direct and extensive use of the
11 language of inherent safety that I've ever
12 read in a CSB report. Inherently safer
13 design, ISD, or inherently safer processes,
14 ISP, or inherently safer technologies, IST, or
15 just plain inherent safety, is a proactive
16 approach in which hazards are eliminated or
17 lessened so as to reduce risk with a decreased
18 reliance on engineered or add-on devices and
19 procedural safety measures.
20 The concepts of inherently safer
21 design have been formalized in the process
22 industries over the past 35 or so years,

1 beginning, of course, with the pioneering work
2 of Trevor Kletz, largely in response to the
3 cyclohexane explosion at Flixborough in 1974.
4 Trevor Kletz, and many others
5 worldwide, including key individuals here in
6 the United States, have formulated a number of
7 principles or guidewords that have gained
8 widespread acceptance. These are familiar:
9 minimization, substitution, moderation and
10 simplification.
11 The CSB interim report thoroughly
12 covers the issue of substitution of alternate
13 metallurgy to help address the problem of
14 sulfidation corrosion. One also sees in the
15 report the need to moderate process
16 temperatures when these approach or exceed
17 design limits for existing pipe materials.
18 And rather than continue with a
19 lecture on the principles of inherent safety -
20 - because I should warn you, as a university
21 professor, you know I'm programmed to speak in
22 increments of 50 minutes.

1 (Laughter.)
2 DR. AMYOTTE: But I won't do that.
3 I'm simply going to state that numerous
4 resources on the topic of inherently safer
5 design are now available. There are books,
6 including those by Trevor Kletz, and also the
7 Center for Chemical Process Safety, or CCPS,
8 of the American Institute of Chemical
9 Engineers. There are journal articles,
10 conference presentations, trade publications,
11 and company guidance documents.
12 And Dan referred to this in his
13 response to Board Member Griffon. What's
14 noteworthy about all these resources is that
15 most of them have been written by industrial
16 practitioners, industry people, at all career
17 stages, from the newly arrived to those with
18 a full career already in hand.
19 So the call for widespread use of
20 inherently safer design principles in industry
21 is being made largely by people in industry,
22 people like Trevor Kletz, formerly of ICI in

1 the United Kingdom, and Dennis Hendershot,
2 formerly of Rohm and Haas in the United
3 States.
4 Of the 18 committee members
5 responsible for the production of the 2009
6 CCPS book Inherently Safer Chemical Processes:
7 A Lifecycle Approach, 16 are listed as having
8 affiliation with industrial companies. One is
9 affiliated with a municipal regulator, and I
10 believe I'm sitting next to him this evening,
11 and one is a federal regulator. So again, the
12 call for expanded ISD usage in industry is
13 coming from within.
14 Earlier in my remarks, I referred
15 to myself as a strong proponent of inherent
16 safety. That is true, but it does not mean
17 that I think inherent safety is a cure for all
18 ills, or that ISD principles can always be
19 fully implemented in all scenarios. There are
20 some very practical issues related to
21 inherently safer design that should be
22 recognized by anyone either proposing or

1 regulating its use, and these issues, I
2 believe, are well addressed in the Chevron
3 interim report, as I'll now demonstrate.
4 First, there is clear recognition
5 in the report that inherent safety works with
6 other means of reducing risk, namely passive
7 and active engineered safety and procedural
8 safety, within a framework commonly known as
9 the hierarchy of controls. Inherent safety,
10 being the most effective and robust approach
11 to risk reduction, sits at the top of the
12 hierarchy, and it's followed in order of
13 decreasing effectiveness by passive engineered
14 safety devices, such as explosion relief
15 vents, and then active engineered safety
16 devices, like automatic fire suppression
17 systems, and finally procedural safety
18 measures, such as inspections, corrosion-
19 related or otherwise.
20 This hierarchical arrangement,
21 however, does not invalidate the usefulness of
22 engineered and procedural safety measures.

1 Quite the opposite. The hierarchy of controls
2 recognizes the importance of engineered and
3 procedural safety by highlighting the need for
4 careful examination of the reliability of both
5 mechanical devices and human actions.
6 Second, inherent safety is
7 referred to as being hazard-specific, meaning
8 the risk of any new hazards that might be
9 introduced must be adequately managed. The
10 interim report makes ample reference to the
11 use of management of change, or MOC, for this
12 purpose.
13 Third, the report comments that
14 ISD principles should not be restricted to
15 only process hazard analysis, but should be
16 implemented wherever it is possible to make
17 improvements in the process safety management
18 system. Examples would include the just-
19 mentioned management of change, as well as
20 incident investigation, training and human
21 factors.
22 Fourth, the interim report

1 references the need to provide thorough
2 documentation of process hazard analysis
3 results and implementation of the findings.
4 Dennis Hendershot reminds us that this is
5 especially critical when dealing with ISD
6 features that could be put at risk because the
7 reasons they were implemented were not clearly
8 and adequately documented. Facility safety
9 could then be compromised when future
10 modifications are made by people who do not
11 understand the intent of the original
12 designer.
13 Fifth, the report makes clear
14 reference to inherent safety being most easily
15 and effectively introduced early in the
16 process lifecycle, for example at the design
17 build stage. Extended turnarounds, such as
18 would be required to replace process piping,
19 also afford excellent opportunities in this
20 regard.
21 And finally, the report introduces
22 the concepts of LOPA and ALARP in the section

1 on inherently safer systems. LOPA, or Layer
2 of Protection Analysis, can indeed be used to
3 determine the adequacy of safeguards or layers
4 of protection for a given scenario. And it's
5 interesting to note that the classic CCPS
6 depiction of LOPA has inherently safer process
7 design sitting at the central core of the
8 layers.
9 As explained in the interim
10 report, ALARP, or As Low As Reasonably
11 Practicable, involves the implementation of
12 risk reduction efforts until the incremental
13 effort to further reduce risk becomes grossly
14 disproportionate to the level of additional
15 risk reduction achieved. ALARP is, therefore,
16 a risk reduction goal that can be assessed by
17 tools such as LOPA and other tools such as the
18 combination of a fault tree and an event tree,
19 in what is now known as bow tie analysis.
20 So the general point here is that,
21 in addition to more qualitative tools, such as
22 ISD checklists, some form of barrier analysis

1 is highly beneficial, so long as the barriers
2 cover the full spectrum of the hierarchy of
3 controls.
4 So I spent considerable time in my
5 presentation on the matter of inherently safer
6 design, and as for the second topic, that of
7 the importance of learning from previous
8 incidents, I'm going to leave that discussion
9 to my written presentation, which I'll make
10 available, and that I request be entered into
11 the official record of this meeting.
12 To conclude, I'd like to quote
13 from a letter that will be published in an
14 upcoming issue of the Journal of Process
15 Safety Progress. It's not confidential; it's
16 just an early view on the PSP website. This
17 letter was written by John Murphy, an
18 industrial practitioner and a well known
19 figure in the loss prevention community. John
20 writes:
21 "So why should chemical
22 engineering professors take the

1 time to teach the basics of hazard
2 evaluation procedures and the
3 concept of inherent safety to
4 undergraduates? For those of us
5 who have spent our careers in
6 process safety, the answer is
7 obvious: to prevent future
8 catastrophic process safety
9 incidents that will result in
10 fatalities, injuries, property
11 damage, business interruption, and
12 loss of respect from the chemical
13 industry stakeholders."
14 Well, I can tell you that I agree
15 with John. In fact, he very nicely describes
16 why I do what I do as a chemical engineering
17 professor, and what people like me in this
18 profession do. I would suggest, though, that
19 if there is an obligation for people like me
20 to educate the next generation of engineers in
21 matters of inherently safer design, an equally
22 strong argument can be made for the obligation

1 on industry to implement inherently safer
2 design principles to the greatest extent
3 reasonably practicable.
4 Thank you, Mr. Chairman.
5 (Applause.)
6 CHAIRPERSON MOURE-ERASO: Thank
7 you very much, Professor.
8 Our next speaker is Mr. Randy
9 Sawyer from Contra Costa County. He's the
10 Chief Environmental Health and Hazardous
11 Materials Officer. Mr. Sawyer?
12 MR. SAWYER: Chairman Moure-Eraso
13 and Honorable Members of the Board, thank you
14 for inviting me to participate in today's
15 hearing.
16 The Chemical Safety Board
17 investigators have been very thorough and
18 professional in their investigations, and it's
19 been really good to work with them in their
20 process, and we appreciate the work they've
21 done.
22 I know our Board and the City of

1 Richmond was eager to see the recommendations
2 come forward, especially on how we could
3 improve the industrial safety ordinance. The
4 Contra Costa County Hazardous Materials
5 Program administers the Contra Costa County
6 and the City of Richmond's industrial safety
7 ordinance. The industrial safety ordinance
8 expands the requirements of the federal and
9 state OSHA process safety management and the
10 EPA and state accidental release prevention
11 programs.
12 The industrial safety ordinance
13 covers all of the processes at a facility, and
14 requires that facility to submit its safety
15 plan, address human factors issues beyond what
16 is required under process safety management
17 and the risk management program, determine the
18 root cause or root causes of an incident,
19 consider inherently safer systems, perform
20 management of organizational changes, perform
21 safety culture assessments, and perform
22 security vulnerability assessments.

1 There are four engineers and
2 engineering supervisors who work on the
3 County's accidental release prevention
4 programs. That includes the California
5 Accidental Release Prevention Program and the
6 Industrial Safety Ordinances. Engineers audit
7 and inspect each of the facilities covered
8 under these programs at least once every three
9 years.
10 The Contra Costa Hazardous
11 Materials Program has a hazardous materials
12 response team that is a primary hazardous
13 response team for the County. During the
14 evening of August 6th, the hazardous materials
15 response team responded to the refinery and to
16 the surrounding community. The team took six
17 air samples that evening, as well as direct
18 monitoring reads.
19 The team also activated the
20 hazardous materials operations center and
21 worked with the media and the Health Services
22 Department's public information officer on

1 getting the information about the incident out
2 to the public, kept track of what the
3 different teams were finding in the field and
4 at the refinery, communicated with the
5 County's health officer and worked with him on
6 determining if the shelter in place could be
7 lifted. The team also resounded sirens around
8 the refinery every 30 minutes until the
9 shelter in place was lifted.
10 One of the shortcomings of the
11 response on August 6th was the telephone
12 emergency notification system. The telephone
13 emergency notification system makes telephone
14 calls to the landlines in the area designated
15 and to the cell phones that have been
16 registered. Telephone calls that were
17 initiated took far longer than expected during
18 that evening.
19 The community warning system is
20 operated through the County's Office of the
21 Sheriff. Since the incident, the community
22 warning system staff have contracted with a

1 new telephone emergency notification system
2 provider and is developing a test for a second
3 telephone emergency notification provider.
4 When that test is completed, if the second
5 provider is successful, that provider will
6 become the primary provider and the provider
7 that is now under contract will become the
8 backup provider.
9 Other changes that have occurred
10 since the fire with the community warning
11 system include that individuals can now not
12 only register their cell phones, they can be
13 able to state if they would like to receive
14 text messages and/or emails when an event
15 occurs in the area they have asked to be
16 notified about.
17 FEMA has a system that can send
18 text messages to all cell phones within the
19 County. Before the incident, the message
20 would be one message that would be based on
21 the type of incident. So for a hazardous
22 materials incident, the message would be

1 shelter in place, with no indication of where
2 the incident is occurring and what to do to
3 shelter in place successfully, and every cell
4 phone in the County would receive this
5 message.
6 Since the incident, FEMA is now
7 allowing customized messages, and the
8 community warning staff is able to tailor the
9 message to include where we are asking people
10 to shelter in place, and to have a link to a
11 webpage to get directions on how to shelter in
12 place. Social media, including Twitter and
13 Facebook, is also being used to push out
14 information about the incident. Another
15 change is that text, email and social media
16 messages would direct people and the media on
17 where to get additional information on the
18 incident, including a map that shows the area
19 where people are being asked to shelter in
20 place.
21 Finally, since the incident, the
22 community warning system has become a web

1 based system that can be accessed from
2 anywhere by emergency response personnel.
3 Most of these changes were already started
4 before the incident.
5 One of the shortcomings from the
6 response that is in the process of being
7 addressed is a direct means to determine the
8 amount of particulates that are in the air to
9 assist in determining the impact of the smoke
10 from a fire. The Hazardous Materials Program
11 staff is working with the Bay Area Air Quality
12 Management District on a means to do this on
13 a real time basis.
14 As Supervisor Gioia mentioned
15 earlier, the County Hazardous Materials
16 Program is contracting with a third party
17 consultant to perform a safety inspection
18 audit of the Richmond refinery. The process
19 will include an oversight committee made up of
20 community members representing United Steel
21 Workers Local 5, the Building Trades Union,
22 Contra Costa Health Services, and the City of

1 Richmond.
2 The safety inspection audit will
3 look at the safety culture of the refinery,
4 the management systems that are in place to
5 implement process safety and the human factors
6 within the refinery. The Hazardous Materials
7 Program's staff is working with the facilities
8 that are covered by the industrial safety
9 ordinance within the City of Richmond and the
10 County, and the United Steel Workers, on
11 developing indicators or metrics on process
12 safety that will give an overall indication of
13 how healthy a process safety program a
14 facility has in place and make some of these
15 indicators public.
16 One of the issues that the
17 Chemical Safety Board investigators have found
18 to be a concern is the implementation of
19 inherently safer systems. I believe the
20 County's Board of Supervisors and the Richmond
21 City Council will adopt the recommendations
22 made by the Chemical Safety Board into their

1 ordinance. I believe that the recommendations
2 will improve the safety of the facilities
3 covered by the ordinance.
4 I do caution what the Chemical
5 Safety Board considers inherently safer. In
6 my experience, if a very clear definition of
7 inherent safety is not followed, then anything
8 that may improve safety will be considered
9 inherently safer, including improving
10 procedures or adding relief devices.
11 The Chemical Safety Board
12 investigation report on public safety at oil
13 and gas storage facilities states that passive
14 and active means to prevent accidents, such as
15 internal loading roofs, pressure vacuum relief
16 valves, flame arrestors and vapor recovery
17 systems are inherently safer tank designs.
18 These active and passive
19 mitigations do reduce the likelihood of an
20 accident -- and are pretty good risk reduction
21 measures -- from occurring, but does not
22 decrease the hazard, and these mitigations add

1 layers of protection but are not inherently
2 safer designs.
3 The Center for Chemical Process
4 Safety Inherently Safer Chemical Process
5 Lifecycle, Second Edition, Book defines
6 inherent safety as a concept and approach to
7 safety that focuses on eliminating or reducing
8 the hazards associated with a set of
9 conditions. A chemical manufacturing process
10 is inherently safer if it reduces or
11 eliminates the hazard associated with
12 materials and operations using a process, and
13 the reduction or elimination is permanent and
14 inseparable.
15 The process of identifying and
16 implementing inherent safety is a specific
17 concept called inherently safer design. A
18 process that will reduce hazard is described
19 as inherently safer compared to a process with
20 only passive, active or procedural controls.
21 By improving the materials and construction of
22 piping, or of equipment that is more resistant

1 to corrosion, is a passive and a good means,
2 and should be done, of reducing risk of
3 release, but does not reduce the overall
4 hazard, and as such that is not considered
5 inherently safer.
6 Contra Costa Hazardous Materials
7 do include passive means to reduce the overall
8 risk as a part of inherently safer systems
9 review, specifically where the passive means
10 reduces the possibility of release impacting
11 the public. This includes moving the
12 processing and storage of the chemicals
13 further away from the community. It also
14 could include the design of equipment and
15 piping such that the equipment and piping
16 could not be overpressured where a loss of
17 containment would occur.
18 But overall, I think the thought
19 process that goes behind implementing
20 inherently safer systems can be used for all
21 different management strategies, including
22 passive, active and procedural, and should be

1 used.
2 The County guidance states that
3 facilities should use an inherent safety way
4 of considering how to handle mitigations, or
5 use the different strategies of minimize,
6 substitute, moderate and simplify, and to move
7 up the risk management strategies from the
8 lower level of procedure all the way up to the
9 inherent safety risk management strategy.
10 I believe this process could also
11 be used in the MOC process and recommendations
12 from audit results, or from incident
13 investigations. I think it could be used for
14 any mitigations that come about through the
15 process, and especially for new facilities or
16 modified facilities it should be considered
17 that way, too.
18 It's really a different way of
19 thinking than just the way many engineers --
20 and I can speak because I've been an engineer,
21 a project engineer, and stuff -- were thinking
22 in the past. It's a different way of

1 thinking, and I think it's a pretty good way
2 of thinking, and it should be implemented.
3 Again, I thank you for allowing me
4 to testify today.
5 (Applause.)
6 CHAIRPERSON MOURE-ERASO: Thank
7 you very much, Randy. We appreciate your
8 work.
9 Our next speaker is Tupper Hull,
10 from the Western States Petroleum Association.
11 Mr. Hull?
12 MR. HULL: Mr. Chairman and
13 Members of the Board, we are very appreciative
14 of the invitation you extended for us to
15 address the Board tonight on an industrywide
16 perspective on safety. By way of background,
17 our association represents the major
18 integrated oil companies, as well as
19 independent produces and refiners in the
20 Western United States, certainly including
21 California as well.
22 Notwithstanding the reason we are

1 here tonight, I want to communicate that
2 safety is an extraordinarily high top priority
3 of refiners in California. Protecting the
4 safety of employees, communities and the
5 environment receive an extraordinary amount of
6 attention and resources within the refining
7 community, because everyone is harmed by
8 accidents. The goal of their operations is
9 zero accidents.
10 We're here tonight because that
11 goal was not met and has not been met, but it
12 still remains the overarching objective and
13 the focus of the companies that operate
14 refineries in California, and the men and
15 women who work in those facilities. We
16 understand, and the industry understands, that
17 when accidents occur it is vital to undertake
18 a thorough and impartial review of what went
19 wrong, and what can be done to ensure that it
20 won't happen again.
21 Our members currently are working
22 closely with the California Division of

1 Industrial Relations, the Governor's Refinery
2 Task Force, and other agencies to review
3 safety practices and responses in California.
4 That review and assessment is being conducted
5 in a very thorough and thoughtful manner, and
6 any gaps or deficiencies that are identified
7 by that process will carefully be considered,
8 and very likely incorporated into refinery
9 operations.
10 And certainly, refineries will
11 also carefully review and consider the
12 recommendations that you have made and will
13 make in your final report, and our association
14 will facilitate that consideration.
15 As was noted, last Friday, April
16 12th, Chevron released its report on the
17 incident. And I think it's worth noting that
18 much of what was contained in that report is
19 in agreement with the Chemical Safety Board's
20 report, and it outlined the very vigorous
21 steps Chevron undertook and continues to
22 undertake to implement changes within its

1 global refining system and other operations
2 worldwide.
3 This type of response is an
4 example of the priority refineries place on
5 safety, and of their commitment to identify
6 areas needing improvement and quickly
7 implementing changes to address those areas,
8 and sharing their conclusions with other
9 refiners, regulators and the public.
10 The one area that I did want to
11 just touch upon, which has not been addressed
12 here, and gets to an issue of transparency and
13 information sharing, is the area of risk
14 management plans, which all refineries, in
15 California and elsewhere, prepare, that look
16 exhaustively at the risks present in the
17 refineries and develop plans for response
18 which are then shared with the local
19 governments. That is an area where the
20 refiners feel a lot of attention is paid and
21 those plans have proved very effective.
22 And with that, I just would like

1 to thank you again for the opportunity to
2 speak to you this evening. Thank you.
3 CHAIRPERSON MOURE-ERASO: Thank
4 you very much, Mr. Hull.
5 The next person that is addressing
6 us is Mr. Mike Smith, the safety
7 representative of the United Steel Workers
8 Local 5. Mr. Smith?
9 MR. SMITH: Hello. Thank you for
10 the opportunity to speak as part of this
11 panel. USW Local 5 would like to thank the
12 CSB for coming out and doing the
13 investigation. While here, the investigation
14 team has been great, and the interim report is
15 a sign of how hard they have worked and how
16 deep they have dug into this incident. We
17 look forward to the final report, as well as
18 the recommendations to follow. We as workers
19 rely on that depth to find all root causes
20 which, identified and corrected, lead to a
21 safer workplace and community that surrounds
22 it.

1 We support the recommendations
2 presented this evening. We believe that there
3 are City, County and State laws that are in
4 place, that can be enforced as well as
5 strengthened to prevent these types of
6 incidents from happening. The current
7 environment, one which relies too heavily on
8 the industry or API making its own rules and
9 then failing to follow those rules, is not
10 working. Strengthening the oversight on the
11 refining sector is a must.
12 (Applause.)
13 MR. SMITH: This is not just a
14 Chevron Richmond issue. Local 5 also
15 represents workers at the Shell and Tesoro
16 refineries here in the Bay Area. We want to
17 stress that this is an industrywide problem.
18 (Applause.)
19 MR. SMITH: These management
20 system failures are present at all refineries
21 across California.
22 (Applause.)

1 MR. SMITH: We also support and
2 appreciate the local legislators, such as
3 Assemblymember Skinner, Congressman Miller,
4 Senators Hancock and DeSaulnier, in their
5 quest to improve refinery safety. We are
6 hoping that these recommendations are taken
7 seriously by all parties and that we can learn
8 from this incident. We look forward to
9 working with industry, legislators and the
10 community to get to a better place.
11 Thank you.
12 (Applause.)
13 CHAIRPERSON MOURE-ERASO: Thank
14 you very much, Mr. Smith.
15 Our next speaker is Mr. Ron
16 Espinoza. He's the subdirector of District 1
17 of the United Steel Workers International
18 Union. Mr. Espinoza?
19 MR. ESPINOZA: Thank you. I
20 appreciate the opportunity to speak.
21 I have worked in this industry for
22 over 25 years, and then I went to work for the

1 international union. Through those years, and
2 every year, you hear of deaths from employees:
3 explosions, injuries, that continue to happen
4 in an industry that prides themselves on
5 safety.
6 I want to talk for a second about
7 API 754, Leading and Lagging Indicators. We
8 do not think that it, as it is currently, is
9 adequate. It needs worker and regulator
10 participation, and community participation
11 with industry in identifying these indicators.
12 (Applause.)
13 MR. ESPINOZA: And what I would
14 like to say, and I'm listening to everyone on
15 this panel, and I certainly don't feel quite
16 as capable as they are, but I want to talk
17 about the fact that we call on Chevron to lead
18 in setting a premier standard for
19 environmental and safety excellence. And in
20 the refinery manufacturing that they do, for
21 too long that has not occurred, and we want
22 them to put an end to the lagging that has

1 happened in the past.
2 (Applause.)
3 CHAIRPERSON MOURE-ERASO: Thank
4 you, Mr. Espinoza.
5 Our next speaker is Greg Karras,
6 who is the senior scientist of the Communities
7 for a Better Environment. Mr. Karras?
8 (Applause.)
9 MR. KARRAS: Thank you, Mr. Chair.
10 I've submitted written testimony. I will
11 summarize it to be brief. And I have two
12 slides to show.
13 Thank you for including community
14 expertise on this panel. I have 30 years
15 practical experience in pollution prevention
16 engineering and industrial environmental
17 investigation, focused in the energy sector
18 and oil refining in particular. I've
19 published peer-reviewed work, and have the
20 honor to work with the disproportionately
21 impacted, deeply motivated and highly
22 organized communities of Richmond and West

1 Contra Costa County.
2 I believe the findings of your
3 draft interim report and strongly support,
4 more than support, each of your
5 recommendations. CBE believes each
6 recommendation is urgently needed, and
7 respectfully urges you to adopt all of them
8 tonight.
9 However, I hope you will consider
10 two additional actions. First, your interim
11 findings, we believe, support an urgent need
12 to require inherently safer systems based on
13 a hierarchy of controls at the Richmond
14 refinery. Additional evidence from Chevron's
15 post-incident repair permits -- and I'm
16 summarizing this chart -- further supports
17 this urgent need. Note, if you can see them,
18 points 1, 2 and 12 in this chart. There are
19 20 points of known publicly disclosed
20 corrosion damage in the crude unit as of last
21 year, before Chevron repaired it, and these
22 are from Chevron's data.

1 Point 1 indicates the four sidecut
2 pipe section that failed in this incident,
3 where your findings demonstrate that an
4 inherently hazardous combination of more
5 corrosive feed stock and less corrosion
6 resistant pipe metal that was involved in this
7 incident was, at best, extremely difficult to
8 manage.
9 Points 2 and 12 indicate sections
10 of atmospheric overhead piping where Chevron
11 reported finding internal corrosion pitting
12 severe enough to indicate -- now, this is
13 piping that was damaged in the fire, and cut
14 out and removed, and only then was it
15 inspected thoroughly and internally.
16 Apparently, only then could it be inspected
17 for this kind of internal pitting damage.
18 Each of these pipes, according to
19 Chevron's documents, the internal corrosion
20 was severe enough to indicate a potential
21 failure risk before the next scheduled
22 turnaround. Had the fire not occurred because

1 of one pipe in this area, this one small area
2 of the refinery, it might have occurred from
3 at least two others soon.
4 And this is an example in a small
5 part of a refinery with thousands of miles of
6 piping and thousands of pieces of equipment,
7 where there were a few places, at least three
8 before this incident occurred, that were a big
9 hazard apparently. And two of them may have
10 been not just extremely difficult, but
11 impossible to completely safely manage.
12 So the point here is that there is
13 an urgent need, at least at this refinery, and
14 we believe industrywide, for your inherent
15 safety recommendation. I'd like you to
16 consider, tonight, classifying it as urgent.
17 Second, in your ongoing
18 investigation and final report on this
19 incident, I hope you will consider completing
20 your analysis on material input substitution.
21 The second slide shows evidence for this. It
22 shows the increase from 1989 to the incident

1 last year in -- the black is the -- well, I'll
2 start with the red. That's sulfur content, or
3 the percentage increase in sulfur content, in
4 the crude oil. Black is in the gas oil
5 derived from the crude. And the gray
6 background that starts to disappear as you
7 move towards the right of the chart, that
8 depicts your own staff's findings on the data
9 of the corrosion of the pipe wall of the four
10 cut pipe section that failed.
11 As sulfur increased in the crude,
12 it increased in the gas oil distilled from
13 that crude and running through the pipe, and
14 sulfitic corrosion began to thin the wall of
15 the pipe more than four times faster than
16 before that dramatic sulfur increase around
17 1998,'99.
18 Thus Chevron's feed stock switch
19 played a key role in this incident. The
20 material input substitution, technical term
21 for this causal factor, is central to inherent
22 safety and is at or near the top of pollution

1 prevention safety hierarchies of controls.
2 And this evidence demonstrates specifically
3 for this incident what I think is a
4 universally applicable principle, that feed
5 stock quality must be considered if we hope to
6 drive catastrophic incident risk as low as
7 reasonable possible.
8 Now, in case you've heard from
9 what I've heard from the industry, at least
10 informally, that "Oh, no, we can't even talk
11 about changing our crude, because the only
12 choice is to close all the refineries and take
13 everyone's jobs and devastate the economy," I
14 want to say a couple words about that.
15 First, the idea that we can't even
16 investigate this because something terrible
17 will happen is like saying the world is flat.
18 "If we go check out whether that's true, we'll
19 fall off the edge, so don't even investigate
20 it," right?
21 In my opinion, if the industry
22 really believed that it would have no reason

1 for calling cheaper, lower quality refinery
2 feed stock, quote "opportunity crudes," close
3 quote. Instead, a more reasonable analysis
4 and a more holistic one would look at the
5 substantial evidence that preventing
6 catastrophic climate change may, in fact,
7 require leaving about half of currently
8 recoverable known reserves in the earth.
9 And that raises a question that we
10 in this community have been rasing explicitly
11 and repeatedly: Why not refine the least
12 polluting and least hazardous part of what's
13 left?
14 (Applause.)
15 MR. KARRAS: So why is this
16 important? You know, flat world theories
17 didn't stop us before. We investigated.
18 Among other things, Columbus discovered the
19 New World. And when Bay Area refineries
20 claimed that it would be so unsafe that they
21 would just blow up if we controlled their
22 flaring, we investigated, workers and

1 communities together.
2 And we ended up with a finding
3 that by preventing unnecessary flaring, we
4 would make refineries safer. And now we have,
5 since 2005, the first comprehensive flare
6 prevention rule in the country, which is
7 spreading nationwide. Workers and communities
8 did it here together because we stood up to
9 and investigated, in that case, the concern
10 that the refinery would blow up instead of
11 shut down.
12 Now we're finding, here and also
13 in the L.A. area, communities and labor
14 leaders are finding that we should be -- and
15 we're beginning to -- work more closely
16 together than ever. We're stronger together,
17 and we believe that will be necessary to,
18 among other things, get the CSB's
19 recommendations implemented here.
20 But we can't duck. If we're going
21 to do that, and build trust among communities
22 and workers, we cannot duck the crude quality

1 issue. It's coming here to us. It has come
2 here to us, and it's not gone. Help us by
3 standing with us and saying "Let's check it
4 out. Let's talk about it. Let's have a
5 public discussion."
6 (Applause.)
7 MR. KARRAS: In my opinion, in its
8 ongoing investigation and final report
9 regarding this incident, the Chemical Safety
10 Board should consider completing its analysis
11 of inherently safer chemical inputs for
12 refineries.
13 (Applause.)
14 MR. KARRAS: Thank you.
15 CHAIRPERSON MOURE-ERASO: Thank
16 you very much, Mr. Karras. We appreciate it.
17 The next person that we have
18 addressing the meeting today is Doctor Mike
19 Wilson, who is the director of the Labor
20 Occupational Health Program of the University
21 of California in Berkeley. Dr. Wilson?
22 DR. WILSON: Doctor Chairman and

1 Members of the Board, thank you for the
2 opportunity to provide some brief remarks this
3 evening. And again, thank you for your
4 thorough and, I think, far-reaching report.
5 Our program, the Labor
6 Occupational Health Program, is part of the
7 Center for Occupational and Environmental
8 Health at U.C. Berkeley that was established
9 30 years ago by the Legislature to engage the
10 University in health and environmental
11 problems facing the State of California. This
12 is certainly one of them.
13 In studying your report, and in
14 hearing from labor, community, and emergency
15 services stakeholders on behalf of the
16 Governor's Refinery Task Force over the last
17 several months, I would like to convey one
18 overarching point in my comments this evening,
19 which we've heard actually many times. And
20 that is that we have before us, I think,
21 convincing evidence that California and the
22 nation are in imminent need of a modern,

1 fully-funded comprehensive regulatory
2 framework to oversee the refinery industry.
3 (Applause.)
4 DR. WILSON: You have presented
5 evidence here that that framework would be
6 most effective if it motivated investment by
7 the industry in doing three things in order.
8 First, characterizing and publicly
9 reporting on the nature of sulfidation
10 corrosion damage throughout the industry.
11 Second, rebuilding major sections of our
12 refineries using inherently safer, more
13 energy-efficient technologies that are readily
14 available. And three, integrating continuous
15 improvements in plant safety into the core
16 business operations of the refineries.
17 Your report, I think, has provided
18 the factual justification for California to
19 develop such a regulatory framework. You've
20 done this by demonstrating convincingly that,
21 first, we have a corrosion problem in this
22 industry that I believe is imminent, and that

1 that problem presents an imminent threat to
2 public safety because management, at least at
3 Chevron, has largely chosen to ignore that
4 problem despite 10 years of urgent and
5 repeated warnings from Chevron's own technical
6 personnel, from the United Steel Workers
7 Union, and I would add from the Communities
8 for a Better Environment. Meanwhile, major
9 sulfidation failure incidents have continued
10 to occur regularly at Chevron facilities in
11 California, Utah, Texas and Mississippi.
12 You've pointed out that we have a
13 physical engineering problem in the industry,
14 but of even greater concern is that you've
15 shined a light on a deeper cultural problem in
16 the industry's management, and on that I would
17 point out that since August 6th and up until
18 January 15th, where we have the data, the
19 State's refineries have experienced another 41
20 less publicized upset events that include
21 fires, spills, accidental releases and others,
22 some of which endangered workers and members

1 of the public.
2 I would suggest to you that
3 Chevron's management, and most likely that of
4 the other refineries in the State, based on
5 the evidence, is responding as a rational
6 economic actor to the legal framework in which
7 it operates. That framework, as we've heard
8 this evening, and as you've characterized in
9 your report, at present is overly permissive.
10 It requires very little, if any, genuine
11 transparency or accountability to the public.
12 It doesn't engage the expertise of workers or
13 the community, nor does it motivate the kinds
14 of investments that are needed to apply
15 inherently safer technologies.
16 In a more rigorous regulatory
17 framework, I would expect that Chevron's
18 management would begin to respond in a timely
19 and competent way to the safety problems that
20 are identified by their own personnel, by the
21 steel workers, and by the community. Your
22 report touched on the importance of

1 transparency, on accountability and meaningful
2 worker and community engagement as key
3 elements of a comprehensive regulatory
4 framework, and I would say that those elements
5 need to develop in concert with each other.
6 We know that transparency alone is
7 not enough, and that safety performance needs
8 to be required, not simply encouraged, as you
9 have articulated. I would argue, however,
10 that transparency is a good place to start.
11 It raises the stakes for poor management. It
12 makes regulatory oversight more effective, as
13 we heard from Chief Widess of Cal OSHA, and it
14 sets the bar for industry. It puts pressure
15 on the laggards, and it allows the best
16 performing companies to make their successes
17 public.
18 I would point out that
19 transforming industrial sectors is not new to
20 California. As a single example, over the
21 last 40 years California's per capita
22 electricity use is now 50 percent compared to

1 that of the rest of the U.S. The California
2 Energy Commission reports that that flattened
3 trajectory over the last 40 years has
4 prevented the construction of 25 coal-fired
5 power plants in the midwest.
6 That is the result of California
7 regulations, of incentives, of manufacturing
8 specifications over many years, along with
9 other government actions. And I think we are
10 fully capable of embarking on a similar
11 trajectory, a much more rapid trajectory, in
12 the refinery industry. And as Chairman Moure-
13 Eraso noted in his opening remarks, build a
14 regulatory program that could serve as a
15 national model.
16 I'll close by saying that ensuring
17 industrial safety in dangerous industries is
18 a basic and necessary function of government,
19 and doing so requires government to assert the
20 full force of its regulatory authority.
21 (Applause.)
22 DR. WILSON: We have seen in

1 multiple settings that doing so in nearly all
2 cases also improves the efficiency and
3 competitiveness of the effective industry. So
4 again, I want to thank you for your work, and
5 for your presentations tonight, and for your
6 professionalism.
7 (Applause.)
8 CHAIRPERSON MOURE-ERASO: Thank
9 you very much, Doctor Wilson. In the
10 interests of time, I think we would like to
11 move directly to public comments. I would
12 like to ask that this be moderated by the CSB
13 Managing Director, Doctor Horowitz, who has
14 been coordinating and managing the CSB
15 investigations, specifically this
16 investigation of Chevron. So I'm going to ask
17 him to basically moderate the public comment.
18 So, Doctor Horowitz.
19 DR. HOROWITZ: Thank you, Mr.
20 Chairman. We ask our commenters to adhere to
21 a limit of one minute each, please, in the
22 interests of time.

1 PARTICIPANT: What the hell, man?
2 We've got to sit here all night?
3 DR. HOROWITZ: All right. Well,
4 we'll do the best we can. We'll see if we
5 have everybody. Who's here? And the first
6 commenter is Doctor Henry Clark. Doctor
7 Clark, are you here?
8 (Applause.)
9 DR. CLARK: Thank you. Doctor
10 Henry Clark, Executive Director of the West
11 County Toxics Coalition that works with
12 communities living with refineries from
13 Richmond to Texas, Louisiana, Nigeria, Africa,
14 internationally. So we know these issues and
15 problems.
16 I live in North Richmond, next to
17 the Chevron refinery, on the front line of the
18 chemical assault as we say, some of the
19 problems, experiences, that people experienced
20 with this August the 6th fire, and you heard
21 our Supervisor John Gioia mention.
22 Well, I was born and raised next

1 to the refinery. I can remember clearly the
2 flaring situation that Greg Karras referred
3 to. Those energy waves from the flares would
4 hit my house and my community and rock our
5 houses like we were caught in an earthquake.
6 Going back to 1991, we were engulfed in black
7 toxic smoke for an entire week over the North
8 Richmond community, which is primarily Afro-
9 Americans and Latinos.
10 Now, if you don't understand what
11 environmental justice is all about, then
12 you're really not going to come to totally the
13 right conclusions. Environmental justice, or
14 environmental justice, environmental racism --
15 President Clinton signed an Executive Order,
16 12898, on environmental justice, which most of
17 the laws, city and state laws, about these
18 issues are based on, basically saying that
19 nobody, no people, regardless of race, class
20 or whatever, should bear a disproportionate
21 impact from environmental policies and so
22 forth.

1 Well, the fact is, is that it's a
2 little too late, because we are already
3 disproportionately impacted. We are already
4 overburdened.
5 (Applause.)
6 DR. CLARK: And so to protect us
7 now, you have to take some serious actions.
8 And all of these measures that you're talking
9 about, inherently safer processes, and this
10 and that? Well, I can remember, and Greg
11 Karras from CBE can remember this. Over about
12 30 years ago, we made some recommendations,
13 similar recommendations to the refinery and
14 the industry, pretty much saying the same
15 things that you're saying today, here. Okay?
16 (Applause.)
17 DR. CLARK: Saying pretty much the
18 same thing. But you know, they weren't
19 listened to. And so the bottom line is this,
20 here. It's that you can have all of these
21 recommendations, which is all good, you know.
22 But it sounded like anything, any laws, or

1 scripture, or whatever, that says some great
2 things, but they mean nothing if you don't put
3 them into practice.
4 (Applause.)
5 DR. CLARK: And that's the main
6 thing right, that industry has not put these
7 measures into practice. Why? Because of the
8 fact that -- it was said -- there's no
9 punishment behind it. A few dollars for a
10 fine and penalty out of a company that's
11 making billions of dollars? Come on, now.
12 (Applause.)
13 DR. CLARK: You know, this issue
14 has been going on for a very long time. Yes,
15 the industry, Chevron and all the rest of
16 them, say that "Yeah, workers have the
17 authority to shut down a unit if they see it's
18 problematic." Sure, that may be in theory.
19 But that doesn't happen, because those workers
20 know that the company's main concern and
21 bottom line is making those profits. And just
22 like in this case here, that you see, that the

1 workers knew about it and could have closed it
2 down, but they didn't, because they know that
3 management was not going to like that.
4 So we need to get serious, period,
5 about holding these companies accountable.
6 And a few pennies is not going to get to the
7 issues right here.
8 (Applause.)
9 DR. CLARK: These companies like
10 Chevron and many others, they want to be
11 considered to have some personhood. Well, if
12 they want to be a person, then send them to
13 jail when the violate the law, just like
14 anybody else.
15 (Applause.)
16 DR. CLARK: Then you'll have some
17 real accountability. And like Mr. Karras
18 said, it's that you need to consider the type
19 of oil, or the product that's being processed
20 in that refinery. Because we sounded the
21 alarm a long time ago about that. We sounded
22 the alarm when Chevron was proposing their

1 reformulated fuel project. We told them about
2 the higher sulfur content. They denied it,
3 and said they weren't using it, didn't plan to
4 use it. But we come to find out, the cat is
5 out of the sack now, they were already using
6 it.
7 So we need to get serious. We're
8 talking about life and death issues here,
9 period. You need to put that in the mix. You
10 need to consider that in the context of
11 environmental justice, these companies like
12 Chevron, they are already violating the spirit
13 and the principles of Executive Order 12898.
14 You need to hold them accountable, because
15 they are killing people, period, and making
16 people sick.
17 (Applause.)
18 DR. CLARK: And we're not going to
19 take it no more, and we want our City and
20 County officials to have some backbone. You
21 can close down liquor stores in our community
22 when they're posing a threat or a nuisance.

1 Why can you have this authority with the small
2 businesses, but when it comes to these big
3 companies you can't do nothing about them?
4 You can't hold them accountable to the law?
5 It's because they have bigger dollars, huh?
6 Is it because they buy politicians like you
7 heard before?
8 The same thing that communities
9 are saying with the Keystone Pipeline, that
10 you're going to have problems with destroying
11 Native American land and polluting those
12 communities that we work with in the Houston
13 area and Louisiana.
14 Because the bottom line is, is
15 that what that's all about, just like here, is
16 corporate control over politicians, like the
17 Koch Brothers that you've heard about that own
18 refineries in the Houston area, and they're
19 paying 100 dollars a barrel now for oil from
20 Venezuela, and they could get the oil for 25
21 dollars a barrel from this dirty crude oil
22 coming from Alberta, Canada and other places.

1 So you know, the cat is out of the
2 bag. When you want to be serious, you include
3 those recommendations that Greg Karras
4 mentioned about the crude, and really protect
5 our communities. Otherwise, you know, it's
6 just another dog and pony show.
7 (Applause.)
8 CHAIRPERSON MOURE-ERASO: Thank
9 you very much.
10 DR. HOROWITZ: All right. Thank
11 you. Next is Mr. Kim Nibarger of the United
12 Steel Workers.
13 MR. NIBARGER: Good evening. My
14 name's Kim Nibarger, and I'm a health and
15 safety specialist for United Steel Workers,
16 and I will abbreviate my comments in light of
17 the time.
18 First, we don't view this as a
19 Chevron problem. It's an industry problem.
20 Second, the broken widget, the sulfidation
21 corrosion of the pipe, is a long-known problem
22 in the refining industry, as you pointed out

1 in your report. The problems allowing this
2 event to happen seem to be underlying in
3 nearly every refinery in the country.
4 We need to identify not just the
5 cause, but what allowed these events to
6 happen. If we recall the report that the
7 Chemical Safety Board did on the Texas City BP
8 refinery, we will find numerous of those
9 events also took place in this accident.
10 It appears from your report that a
11 number of people tried to alert Chevron to the
12 fact that this pipe needed to fall under
13 increased scrutiny or have the metallurgy
14 upgraded. Although a management of change
15 process was completed for the initial crudes
16 containing higher sulfur content, it does not
17 appear that a question of concern about
18 increased corrosion over time from the use of
19 a higher sulfur crude was raised or addressed.
20 More recommendations were made, from 100
21 percent component inspection to replacing the
22 line, all rejected by Chevron management.

1 This is the same as operators
2 raising the issue of shutting the unit down
3 when the leak was first discovered, and being
4 overruled by Chevron management. We often
5 hear of, and speak about, safety culture. But
6 as you can see from these examples, it does no
7 good to have the authority without the power.
8 A safety culture works when there is a
9 harmonious environment. It does not work
10 where one entity holds the power over the
11 other participants.
12 Currently, the process safety
13 management standard governing oil refineries
14 says that its purpose is to prevent or
15 minimize the consequences of catastrophic
16 releases of toxic, reactive, flammable or
17 explosive chemicals. Really, all it requires
18 you to do is develop a written plan on how you
19 will meet the element challenges in the
20 standard.
21 There is nothing requiring you to
22 do it well, or to really define what you

1 intend to accomplish, so meeting the
2 requirement of the standard, having a written
3 plan and following it, may serve no benefit
4 other than to avoid penalties. If you are
5 following your plan even though it is a poor
6 plan, you have done nothing wrong, or at least
7 citable, in the eyes of the regulators.
8 Unless the regulator is well
9 versed in process safety, they may not
10 recognize how poor the plan is or what RAGAGEP
11 for a particular operation or equipment may
12 be. Even if they do, it's not a violation of
13 the standard. It's not enforceable to require
14 an employer to develop and follow an effective
15 plan.
16 It would really make the standard
17 more productive if employers were required to
18 comply with a level based on described,
19 recognized and generally accepted good
20 engineering practices, RAGAGEP, to ensure that
21 operating risks were as low as reasonably
22 practicable, ALARP -- and we've heard a lot of

1 talk about that tonight -- and hazards are
2 identified and eliminated or mitigated. When
3 the practice improves, the plan improves to
4 meet the current practice.
5 But it must be mandatory. It must
6 be regulated. It cannot be undefined in any
7 way, or it will not get done. It also needs
8 to be transparent with employee involvement,
9 regulated, enforced participation, not the
10 consult language that's in the standard now.
11 The Norwegian Petroleum Safety
12 Authority, the PSA, has a safety case in
13 place, and they have had it in place since the
14 mid-1970s. This tripartite model of industry,
15 regulator, and union share authority in making
16 decisions that govern the safety of the
17 offshore oil industry. They also require that
18 risk must be managed to ALARP.
19 It's time for us to stop trying to
20 tweak a standard that is not working as it was
21 intended, or at least hoped. It's time for a
22 system overhaul, and that will require

1 regulator, labor and industry working
2 together. It will require involving the
3 communities around these facilities. It will
4 require a true commitment to make the industry
5 safer, not just different.
6 You have the ability to fund this
7 through the language in the California Labor
8 Code 7870. You just need to have the
9 Legislature approve the expenditures from the
10 fees that will be put into place, or can be
11 put into place, from this practice.
12 We encourage and welcome the
13 opportunity to work toward that change, and we
14 also look forward to the final version of the
15 report including the follow-up elements
16 highlighted at the end of this report.
17 Thank you.
18 (Applause.)
19 DR. HOROWITZ: Thank you, Mr.
20 Nibarger. Next is Andre Soto.
21 MR. SOTO: Good evening, Members
22 of the Board, as well as the staff, for coming

1 out here to our community in Richmond. It's
2 really been critical to our community that you
3 have been here, because much of what you've
4 heard tonight are that we in the community
5 have known or suspected much of this stuff for
6 many years.
7 But you have finally shined a
8 light on it with incontrovertible evidence
9 that Chevron is not a good actor in our
10 community. They're not taking care of this
11 refinery. They're running it into the ground.
12 They're putting workers at risk. They're
13 putting the community at risk. And at the
14 same time, they're corrupting our politics and
15 trying to buy off individuals in the community
16 and non-profits in our community by spreading
17 around cash. And we all know. All those of
18 us who live in the community know this.
19 But what I really wanted to thank
20 you about is some of the recommendations
21 you've already started to provide for us.
22 Because you're providing a light on the path

1 that we as a community need to take to hold
2 our elected officials accountable and
3 implement these kind of changes. Because the
4 failure to implement these changes means our
5 community is going to continue to be at risk.
6 As we speak here right now, we are
7 at risk because of all those clamps out there.
8 You've heard tonight all the citations of Cal
9 OSHA. Chevron is appealing all these, and
10 it's expected to take four years before they
11 make any of these changes recommended. So you
12 know, I want to thank you publicly, and I look
13 forward to your final report.
14 But more importantly, it's really
15 that this incident has brought you guys here.
16 It's brought the panelists, all the interests
17 and the panelists, including the workers and
18 the community, together, and that's how we're
19 going to really solve this problem. And I
20 think that one of the things that really give
21 me a lot of pride from being here in Richmond
22 is that, because of the pains that we have

1 suffered for 100 years by being next to this
2 refinery, we are on the front lines of trying
3 to change the way refineries operate, the way
4 refineries are regulated, and empower
5 communities and the people, and not just cave
6 in to corporate power.
7 You guys are helping us to get
8 there, so thank you very much.
9 (Applause.)
10 DR. HOROWITZ: Thank you. Cho
11 Culeo? No. Robin Lappe?
12 MS. LAPPE: Thank you. I
13 appreciate all of the information that the CSB
14 and Cal OSHA and the other members here have
15 given to the community. My concern is what is
16 going to happen to our health.
17 We now know in the community,
18 we're distributing a paper on dioxin, which is
19 one of the severe chemicals that was emitted
20 from this fire. I myself had cataracts that
21 did not need surgery for four years until I
22 came in contact with this cloud, with these

1 particulates of crude oil.
2 I've had two surgeries, and yes I
3 have better eyes, but how long they'll last
4 me, I don't know. I've had stomach problems.
5 I know many people in the area -- I know my
6 blood pressure went sky high, my 14 year old
7 grandson had high blood pressure after contact
8 with this cloud.
9 There's a lot the community does
10 not know about our physical well-being. We're
11 hearing so much about Chevron. We're hearing
12 about how they're going to be fined, and how
13 they're going to change, and this and that,
14 but we're not hearing about our health. We're
15 not hearing about where we can go to get all
16 the help that we need.
17 The doctors didn't really help us
18 in this thing. I do know that Kaiser is
19 backed by Chevron, and those doctors did not
20 really want to help us. Many of us that I've
21 talked to -- and I've talked to hundreds of
22 people in this community, and we did not get

1 the care that we really, really needed. This
2 is what the community needs to hear.
3 What can you do to help us now?
4 Yes, we can fix the pipeline. Yes, we can put
5 regulations and regulatory committees out
6 there. But what is going to happen to the
7 people of Richmond and the people that were
8 underneath this massive cloud that reached all
9 the way to Livermore? There's more people
10 affected in this thing than you can imagine.
11 There are still people coming forward now that
12 don't even realize what's going on in our
13 bodies.
14 (Applause.)
15 MS. LAPPE: They have these blood
16 pressure and cholesterol things. Some are
17 developing cancers already because they had
18 preexisting conditions. We've got to hear, in
19 the community, what can you do to help us?
20 What can you do now, CSB and Cal OSHA, to set
21 in place either clinics or someplace where we
22 can get the absolute help that we need?

1 Because I've been told by my own
2 doctor, when I finally got to see him, that
3 I'm going to die in less than 30 years,
4 probably, from cancer, but there's nothing in
5 this cloud that is going to affect me or hurt
6 me.
7 Kaiser told us, not from the
8 beginning of this thing but three weeks into
9 it, they distributed a paper into the
10 community: "These chemicals will only last for
11 24 hours in your body." Twenty-four hours.
12 They sent that paper out three weeks later.
13 What did that do to me? It put me at a big
14 risk. It put my faith in my own doctors at
15 risk.
16 My own doctor did not even want to
17 see me for almost two to three weeks. When I
18 went to the emergency room at Kaiser, they
19 told me "Your blood pressure is elevated."
20 They signed a paper and sent me out. I needed
21 a breathing treatment that I couldn't get. I
22 was told a week later by the allergy

1 department at Kaiser "Did they give you a
2 treatment, Robin?" And I said "No." She said
3 "Your breathing is down by two thirds." She
4 said "I'm amazed that you're still up and
5 walking."
6 I've had swollen vocal cords from
7 this. I was an avid singer. I can't sing
8 now. If I wanted to, I can't. Because I can
9 do maybe one song, and that's it. There goes
10 whatever I had. It's heartwrenching to me.
11 It's heartwrenching that my health has been so
12 affected, and the community has been so
13 affected by this.
14 I plead with the CSB and with Cal
15 OSHA, and anybody involved in this, do
16 something more for us, for the community, to
17 help us understand the dioxin chemical and the
18 things that we're going through ever since
19 we've come in contact with this.
20 Thank you so much.
21 (Applause.)
22 DR. HOROWITZ: Thank you. Dorothy

1 Wigmore?
2 MS. WIGMORE: So my name's Dorothy
3 Wigmore. I'm here representing an
4 organization called Worksafe, which is a non-
5 profit advocacy group that speaks on behalf of
6 and with and in coalition with workers and
7 community groups around occupational health
8 and safety issues.
9 And in the training that I've had
10 as what they call an occupational hygienist,
11 as well as an ergonomist, I've learned a
12 variety of things that take me back, perhaps,
13 to my interest in books. And that is, I pay
14 attention to history.
15 And I happen to have in my hand a
16 little booklet called Our Lives Are At Stake:
17 Workers Fight For Health And Safety from the
18 Shell strike of 1973. And I'd like to read
19 you two things that are in there, and we're
20 using them in our workers' Memorial Day report
21 this year, at least this one quote.
22 Remember, this is from 1973, and

1 it's about a different refinery, but it's a
2 refinery in this part of the world. And a
3 worker says:
4 "They run the plant until it
5 falls apart. They operate on the
6 theory of running the calculated
7 risk. By calculated risk, they
8 mean that they will run a unit
9 until it falls apart, then repair
10 it fast. This is cheaper to do
11 every six months or three months
12 than preventive maintenance. And
13 they also run the risk of
14 shortmanning units, not having
15 enough men" -- because usually
16 it's men -- "on a unit to operate
17 it properly, but just enough so
18 that they can correct an upset
19 condition without going off-
20 specification. They feel they can
21 run with fewer people."
22 And in the paragraph below that,

1 they refer to a January 1968 explosion at
2 another Shell Chemical plant in Texas, where
3 the investigation revealed that the pipe
4 carrying sulfuric acid and -- this should
5 probably be polypropylene. It doesn't have
6 the right word here -- under 450 pounds of
7 pressure per square inch had been allowed to
8 corrode to the point that its walls were as
9 thin as beer cans.
10 I want to make a number of points
11 here that are linked, and the first is this
12 was no accident, from everything I've heard.
13 And in fact, I would urge the Board to be very
14 careful about the language that it's using.
15 I hear the word "risk" used when we're really
16 talking about hazards. I hear the word
17 "control" used when we're really talking about
18 prevention.
19 And as an occupational hygienist -
20 - I may have a falling out with some of my
21 colleagues on this -- I don't use the term
22 hierarchy of controls. I talk about

1 prevention, because it gets to the hazard. If
2 you're controlling something, it means the
3 hazard is still there. And if we're really
4 going to deal with some of the issues that
5 have come up here, I think the Board has to
6 start making sure that it's using the word
7 "prevention" more than I saw it in the
8 document from the quick look that I've had at
9 it.
10 The second thing that I wanted to
11 say is that, in going back to the history
12 stuff, what's happening here is not unique to
13 Chevron. It's not unique to refineries. It's
14 something that, in my almost 35 years of
15 occupational health and safety work, is
16 something that I hear all the time: preventive
17 maintenance isn't done. You keep the line
18 working despite whatever the hazards are, and
19 you ignore the warnings and the advice of the
20 people who know most, the workers on the job.
21 It also combines with what I have
22 unfortunately come to see as a real arrogance

1 of managers and industry. And I think that's
2 part of what we've heard about in the report
3 here.
4 I would suggest that the Board, in
5 the report that it puts together, particularly
6 for the final report, that it looks at some of
7 the history of these kinds of things. It
8 looks at things like the EPA report about the
9 ExxonMobil Baton Rouge refinery which came out
10 earlier this year. Exactly the same issues,
11 inspections not done, and issues of thickness
12 of the pipes. I think that that's important,
13 both to build your case that something has to
14 be done and to make it clear that this is at
15 least an industry kind of issue, and not just
16 something that has to do with one particular
17 player in the field.
18 Thirdly, I would like you to -- in
19 terms of paying more attention to prevention,
20 I'd recommend a paper that we wrote,
21 Prevention Pays, and I would recommend also
22 that you look at what is called the Injury and

1 Illness Prevention Program regulation here.
2 With my experience on the Canadian side of the
3 border, both in terms of writing regulations
4 and enforcing them, it's great that California
5 has an IIPP, but I recommend you look at some
6 of the regulations about prevention programs
7 in other jurisdictions. And I'd be happy to
8 point you to some of them. One of them I
9 helped to write, in Manitoba.
10 And one of the things that I think
11 is missing is a requirement for evaluation.
12 But you might want to look at the California
13 one itself, and see where -- and just, as I
14 say, compare it with some others.
15 I would refer you, if you're going
16 to do work around leading indicators and
17 lagging indicators, it's a term that I've run
18 across in meatpacking plants and discussions
19 of ergonomics, and all kinds of other places.
20 They get used, but they don't get paid
21 attention to. And I would recommend you look
22 at the work of the Institute for Work and

1 Health in Ontario that's done a lot of good
2 research around this.
3 I also recommend that, if you're
4 going to use the term "as low as reasonably
5 practicable," the original term is "so far as
6 is reasonably practicable." It comes from the
7 1949 case of Edwards v. The National Coal
8 Board in England. And I learned this in my
9 occupational hygiene training, and it has a
10 very specific legal meaning that I don't think
11 you really appreciate, and I'm going to try
12 and -- excuse me, can I ask you to -- as a
13 former Dalhousie graduate, could I get someone
14 to hold this for me? Because I can't talk and
15 do the demonstration at the same time.
16 It won't hurt. Thank you.
17 DR. AMYOTTE: Dalhousie?
18 MS. WIGMORE: I'm a Dalhousie
19 grad, 1972. Political Science.
20 So what "as low as reasonably
21 practicable" means is that there has to be a
22 gross disproportion between the hazard, and

1 the cost of the hazard, or the cost of the
2 problem, and the cost of fixing it. It cannot
3 be an even balancing that often is used. So
4 there has to be both a gross disproportion.
5 And the greater the hazard, the greater the
6 distance between the cost of fixing something
7 and the cost of leaving it as it is before it
8 is not reasonably practicable to do something.
9 It's an economic argument for fixing hazards.
10 So I would recommend that you look
11 at that. And as for safety culture, I would
12 recommend that you look at the work of Kaj
13 Frick, Michael Quinlan and Per Jensen, who
14 talk about occupational health and safety
15 management systems. I think that that is --
16 there is just as much disagreement about what
17 those are as there is about what a so-called
18 safety culture is, but I think that they're on
19 the right track in terms of looking at the
20 essential ingredients of these things.
21 And finally, I would suggest that
22 you look at the literature that says that

1 enforcement is actually what leads to change
2 in terms of occupational health and safety in
3 workplaces. And on that, I would refer you to
4 the work of Emile Tompa, for one.
5 If the laws aren't -- and the
6 other thing, I guess, is that the laws are
7 great, but if the agencies that are supposed
8 to be enforcing them either are not allowed to
9 or are unable to enforce the law, the workers
10 that rely on them and the communities that
11 effectively rely on them won't be getting much
12 satisfaction and won't be getting what they
13 deserve. Cal OSHA needs resources to do this,
14 not just for these hazards but for a lot of
15 others.
16 (Applause.)
17 MS. WIGMORE: And I have one other
18 note here. Oh, yes. In terms of worker
19 participation, I recommend that you look at
20 the model of committees, and where the joint
21 health and safety committees have to get
22 responses back from management about why

1 things are not being done within -- in
2 Manitoba, it's within 30 days. There have to
3 be reasons why, that kind of thing.
4 And there are other examples in
5 this country of links between joint health and
6 safety committees and community groups, and I
7 suggest you might want to look at New Jersey
8 as one place where that kind of thing has been
9 looked at.
10 My last question is -- these are
11 just off the top of my head based on what I've
12 heard, and I haven't really been able to read
13 the report.
14 DR. HOROWITZ: Thirty seconds,
15 ma'am, please.
16 MS. WIGMORE: I'm just asking, can
17 I submit written comments, and by when?
18 DR. HOROWITZ: Yes. Submit them -
19 -
20 MS. WIGMORE: By when?
21 DR. HOROWITZ: Any time you like.
22 You can send them right to me. I'll give you

1 my business card.
2 MS. WIGMORE: Okay. That's the
3 best I can do at the moment.
4 DR. HOROWITZ: Thank you.
5 (Applause.)
6 DR. HOROWITZ: There are about 30
7 folks who are signed up, so I ask you to keep
8 your comments as brief as possible. Next is
9 Diane Bailey. Diane Bailey, are you here?
10 Diane Bailey is not here. Julia
11 Max? Julia Max, are you here?
12 MS. MAY: May.
13 DR. HOROWITZ: Julia May, sorry.
14 MS. MAY: I'm Julia May. I'm one
15 of CBE's senior scientists, and I want to
16 thank you, because this investigation is the
17 most excellent one I've seen in the 25 years
18 of engineering analysis I've done in both
19 Northern and Southern California, or across
20 the country in other regions.
21 Thank you. Also thanks to the
22 steel workers and the refinery firefighters

1 who are fighting to keep us all safe without
2 the support of Chevron corporation and the
3 other refineries. They deserve a lot of
4 credit.
5 (Applause.)
6 MS. MAY: I've worked for a number
7 of years, through the '90s, in the Bay Area.
8 Right now I'm working for CBE on Southern
9 California refineries, and I'm here to tell
10 you that our members in Southern California
11 are listening tonight to your hearing. This
12 is important to them, too. They're watching
13 on the web.
14 And the risks you've identified,
15 community members in Wilmington, where there
16 are five refineries and the highest
17 concentration of refineries in the State of
18 California, they're appalled at the risks that
19 you've identified and they have the same
20 problems that people are talking about here in
21 Richmond. They really want you to adopt this
22 report and support the communities statewide.

1 On inherently safer systems, in
2 the Bay Area CBE and labor and the community
3 members worked on many different inherently
4 safer systems, including a phase-out of
5 anhydrous ammonia at Chevron here in the early
6 '90s. That's a familiar chemical nowadays
7 with what happened in Texas. In Southern
8 California, about 10 years later, a phase-out
9 of anhydrous hydrogen fluoride, an unnecessary
10 and deadly chemical.
11 So communities are fighting for
12 very specific inherently safer systems, as
13 well as the flare minimization that Greg
14 talked about. Now we're seeing a backsliding.
15 We're very concerned. We're hearing about a
16 cutting of the trained workforce that is
17 needed desperately right now to deal with the
18 backlog of maintenance problems.
19 And we're also at the same time
20 seeing, for example, Valero wants to bring,
21 right now, tar sands crude oil into L.A. and
22 the Bay Area by rail. We're not waiting for

1 the Keystone pipeline; they want to do it now.
2 That could mean a doubling of sulfur content
3 in the crude oil and an increase of the
4 corrosion risk.
5 So I have those comments, and a
6 couple of questions. I don't know if I may
7 ask a question. If I cannot, then I'll just
8 ask you to please take this into
9 consideration.
10 Number one, has the Chemical
11 Safety Board considered that, in addition to
12 these imminent dangers, we're also facing, at
13 any moment, major earthquakes in both the Bay
14 Area and L.A.? You know, in your beautiful
15 presentation, you were showing the poking of
16 the pipe as a danger for those fragile,
17 corroded pipes. Imminent earthquake danger
18 makes this risk even more urgent.
19 Secondly, I would say that we
20 wanted to know if you were considering
21 requiring, as an inherently safer system, an
22 increase of the workforce so that the steel

1 workers could deal with this backlog of
2 maintenance problems, another imminent hazard.
3 (Applause.)
4 MS. MAY: Thank you very much.
5 (Applause.)
6 DR. HOROWITZ: Thank you. Joel
7 Britton? Joel Britton?
8 Joel Britton? No. Mike Parker?
9 MR. PARKER: Good evening, ladies
10 and gentlemen. My name's Mike Parker. I'm a
11 member of the Richmond Progressive Alliance.
12 I first wanted to thank the Board for bringing
13 an incredible sense of hope to the community
14 of Richmond.
15 For years, people in Richmond have
16 struggled trying to improve the safety and
17 health of the community, and particularly in
18 dealing with the impact of Chevron, and have
19 been met with a phalanx of experts hired by
20 Chevron's money to tell us that we were wrong,
21 that the refinery was run as safely as
22 possible, that there was really nothing more

1 that could be done, and that people would
2 either have to accept the loss of jobs or they
3 would have to live with what they have. And
4 you've given the lie to that, and I want to
5 thank you.
6 I also want to thank you for your
7 introducing the notion of root cause analysis,
8 the idea that it isn't just enough to say
9 "Well, the pipe was corroded." We have to ask
10 "Why was the pipe corroded?" We have to ask
11 "Why wasn't the pipe replaced?" "Why didn't
12 Chevron figure out what to do before?" Et
13 cetera.
14 I think we have to apply, though,
15 the root cause analysis to other things that
16 affect this situation. So for example, we are
17 told that there are only seven OSHA inspectors
18 for 1,600 locations. Why is that? Did nobody
19 notice earlier that there were only seven OSHA
20 inspectors for 1,600 locations? Well, of
21 course people noticed, and of course nothing
22 ever got done.

1 Why is it that the City of
2 Richmond allowed, for years, Chevron to do
3 whatever it wanted to do at that refinery?
4 And even recently, after this fire, Chevron
5 decided on its own that it would rebuild the
6 crude unit exactly the way it was using a 25
7 year old process, rather than listening to the
8 community demands that, if they were going to
9 rebuild that crude unit, it should be rebuilt
10 to new, safer standards.
11 (Applause.)
12 MR. PARKER: Why could they get
13 away with that? The reason that they could
14 get away with that was because they
15 intimidated the City under the law, saying
16 that because they weren't changing the process
17 the City only had ministerial powers, and if
18 they tried to do anything else in terms of
19 regulations of Chevron, and in terms of how it
20 rebuilt this refinery, there might be a
21 lawsuit.
22 And believe me, a Chevron lawsuit

1 is something for every city and county to
2 fear. That's why regulations aren't enforced.
3 The truth is that the reason that we don't
4 have a strong OSHA, the reason that we don't
5 have a city which is able to use the tools it
6 has, is because Chevron spends millions,
7 millions of dollars, buying politicians. They
8 buy them in the City of Richmond, and they
9 pay the money to support those politicians
10 statewide and nationally who will underfund
11 any regulatory agencies.
12 That's why. So let's use the root
13 cause analysis and say if we're going to solve
14 this problem, we also have to deal with the
15 fact that Chevron has political and social
16 power, and that the only way to counter that
17 is to do the things that Mayor McLaughlin
18 talked about, which is, we mobilize the
19 community. We mobilize this nation to say
20 that people must come first.
21 And if we don't do that, if we
22 don't do that, then I'm afraid that all of

1 these excellent recommendations, which I fully
2 support, by the Chemical Safety Board will
3 essentially go the same way as the
4 recommendations of those great Chevron
5 engineers and workers who told Chevron "Hey,
6 we got a problem here," and they chose to
7 ignore them. These will end up getting
8 ignored too, unless we attack the question of
9 Chevron's political and social power.
10 Thank you.
11 (Applause.)
12 DR. HOROWITZ: Thank you. Andy
13 Katz, are you here? Andy Katz?
14 MR. KATZ: Good evening, Board
15 Members. My name is Andy Cats. I'm a clean
16 air attorney for Breathe California. We're a
17 lung health organization. And I want to thank
18 you for the Chemical Safety Board's very
19 serious and diligent response in investigating
20 this incident and in presenting the community
21 and government agencies with some very
22 important recommendations.

1 I think what is very important
2 about those recommendations is the emphasis on
3 prevention, the emphasis on improving the
4 culture of safety and introducing an improved
5 culture of safety. And I'd like to comment
6 about some of the most important aspects to
7 improve prevention of future hazards.
8 I think corrosion audits and the
9 urgency of those audits cannot be
10 underemphasized. There has to be an
11 increased, and very urgent, corrosion audit
12 done at refineries. I think there's a very
13 important need to ensure that these corrosion
14 risks are found and fixed before another
15 catastrophic incident occurs.
16 I think that we've heard a lot
17 about the culture of safety and the problems
18 around that. It's very important that workers
19 be empowered to report what they see around
20 them. Workers are on the front lines, and are
21 in the best position to be able to report
22 those incidents to their management and to Cal

1 OSHA, and there has to be a culture
2 industrywide to make sure that incidents are
3 reported before another catastrophic incident
4 occurs.
5 Likewise, that means that
6 emergency shutdowns have to be a part of that
7 ability, for workers to be able to report the
8 need to do emergency shutdowns, or be
9 empowered in the right protocols to be able to
10 institute those on their own with the right
11 protocols.
12 The deferred maintenance issues
13 are very serious, and like those corrosion
14 audits we need to have a direct responsibility
15 for implementing those.
16 Inherently safer technology has to
17 be required, and in that regard I commend the
18 Chemical Safety Board for recommending that
19 the industrial safety requirements be required
20 on both the local and state levels.
21 Finally, I want to commend the
22 Board for including feed stock in inherently

1 safer technology. Some of the data around
2 corrosion and the relationship between feed
3 stock is very, very informative about how to
4 prevent future incidents from occurring.
5 For recommending for the Chemical
6 Safety Board on how to direct some of these
7 interagency groups, I think the Chemical
8 Safety Board's recommendation about the
9 interagency collaboration, especially about
10 the role of Air Districts, is very vague. And
11 while the need for more OSHA inspectors is
12 very clear, the need for the Legislature to
13 take action to require inherently safer
14 technology, more direction is needed.
15 What happens when agencies come
16 together to collaborate? I urge the Chemical
17 Safety Board to spell out what that
18 collaboration looks like. What are the
19 deliverables? What are the outcomes? And how
20 is transparency improved from doing this?
21 Sometimes when agencies come
22 together in interagency working groups,

1 transparency gets lost because when they come
2 out with a decision, they're not reporting in
3 the normal process. How will interagency
4 collaboration improve transparency rather than
5 obfuscate it? So I'd encourage the Chemical
6 Safety Board to take that seriously and
7 encourage public participation in that
8 process.
9 Thanks again.
10 DR. HOROWITZ: Thank you, Mr.
11 Katz.
12 (Applause.)
13 DR. HOROWITZ: Bishop Andre
14 Jackson, are you here?
15 BISHOP JACKSON: I'd like to say
16 good evening to everyone, to the Board, and to
17 the public, and to the community. It's just
18 a blessing to be here today.
19 You know, I had a lot to say, and
20 I wrote down some things, but I really feel
21 like I'm standing in the gap for the 25 or 30
22 thousand people that don't have the time to be

1 here, and that are not here, and I think a
2 little documentation is better than
3 conversation.
4 I have documentation here to where
5 when you talk about the 15,000 who went to the
6 hospital, mainly you're talking about maybe
7 Doctors Hospital or Kaiser and the County.
8 But I have records of over 113 different
9 doctors and different hospitals where people
10 went to that basically you're probably not
11 even counting. The number might be 30,000, or
12 35,000 people that actually went and saw
13 doctors in different places.
14 So you know, it's one lady, I'll
15 just call her name Miss M, she had reported
16 that she hadn't heard the shelter in place.
17 She evaluated her health being at 6 between a
18 scale of 1 and 10, and after the fire her
19 health went down to a 2. Ringing in the ears,
20 eye irritation, sinus draining, irritation,
21 shortness of breathing.
22 Mr. B, he heard the siren ringing,

1 and he was at a scale of 1 to 10, he had prior
2 existing conditions. His rate after the fire
3 went down to a 2 with chest pains, loss of
4 appetite, dizziness, fatigue, sleeping,
5 chronic coughs.
6 On, and on, and on, and on. So
7 you know, we can fix these pipes and the
8 regulations and whatever, but how can you fix
9 what's already happened? Prevention is one
10 thing, but I mean, it's already happened.
11 (Applause.)
12 BISHOP JACKSON: And I could
13 mention one name of Miss Sherry, because she's
14 a personal friend of mine, she's been to the
15 hospital 15 times. She'll never be the same.
16 She'll never be able to function the way that
17 she used to function. And just like I said,
18 we can fix these pipes, but when people get
19 sick, people die, how can you fix that?
20 So I would like just to see the
21 time that you guys spend on bringing all this
22 here, and what did it cost? You know, the

1 cost to be here? Why don't we maybe have --
2 you know, where we kind of like turn it around
3 and have some respect for the community. And
4 you guys might have to stay here maybe two or
5 three days to hear just the community, just
6 spill on you, and hear the pure facts of
7 what's going on here in the City of Richmond.
8 And we thank you. God bless you.
9 (Applause.)
10 DR. HOROWITZ: Thank you. Sylvia
11 Greywhite?
12 MS. GREYWHITE: Good evening. My
13 name is Sylvia Greywhite, and I'm a member of
14 CBE and Local 350. And my voice is kind of
15 rough today, and it's been like that for a
16 while. And we know why. Usually my voice is
17 very loud, but now for some reason I can't
18 really talk the way I want to talk.
19 But I do want to say, first of
20 all, that I'm very, very happy that you're
21 here. I'm really thankful that you're here.
22 I have prayed to our creator YHWH that he

1 would see and have pity on us. Because we
2 need help here. We really need help. We have
3 been held hostage by a community's government
4 that has not responded to our needs. We have
5 just been ruined. Our community has been
6 ruined because of what has gone on here, and
7 nobody seems to want to take a stand to
8 correct anything that has gone on. That's why
9 I'm really, really thankful. My prayers have
10 been answered, that you've come to help us,
11 because we do need help.
12 And I've looked at the emergency
13 planning and reporting, and I saw where you
14 have this statement that says "the California
15 Code of Regulations requires that owners and
16 operators of hazardous waste facilities make
17 arrangements to familiarize local hospitals
18 with the properties of hazardous waste handled
19 at the facility and the types of injuries or
20 illnesses which could result from fires,
21 explosions or releases at the facility."
22 Now, that has not happened. That

1 has not happened. I, myself, had to go to an
2 emergency facility, not the first day of the
3 fire but three days after the fire. We had
4 bad days. This was the term for it, when they
5 have -- anyways.
6 On the third day after the fire, I
7 had to go to take my friend to the hospital,
8 and I got sick on the way there. And I had to
9 go myself to see the doctor. And you know
10 what they did for me? They took my blood
11 pressure, told me to take an aspirin and a
12 cough drop, and that was it. They had no idea
13 of what was in my body, or what was causing me
14 to feel the way I was.
15 So that information has not been
16 shared with the hospitals. And I'd like to
17 really emphasize that I'm really, really happy
18 that we are addressing the safety issues,
19 okay? But I got sick before the fire
20 happened. I was working for a company in
21 Oakland, and this is like -- I had to retire
22 in 2011 because of this. I would get up every

1 morning and leave home at 7:00. I had to be
2 at work at 8:00. And by 7:15, I would be
3 sick, just from driving and breathing in my
4 car.
5 I'd have to stop -- at that time,
6 because I was employed, I had to stop, I would
7 stop at Kaiser Hospital for attention. They
8 would keep me there for probably half the day.
9 I'm just letting you know how they take you in
10 emergency. They let you lay down for all day
11 long, and they watch you. They may give you
12 an EKG, and if that's okay, they think you're
13 okay.
14 So at 12:00, I'd go to work. And
15 I'm sure my work got tired of that, too,
16 because I certainly did. But they never found
17 any reason for my problems, because they never
18 did test me for what was going on. There has
19 been no communication between the hospitals
20 and Chevron. They have just hidden this from
21 us, so we're not being taken care of.
22 So the CSB is currently evaluating

1 ways to ensure that hospitals have the
2 information necessary to properly evaluate and
3 treat individuals that may be exposed to
4 releases from facilities in Contra Costa
5 County. What I would suggest, first of all,
6 is to have a test. Because when you ask for
7 tests, they don't give you tests.
8 I asked Kaiser for a test for
9 toxicity, because I was aware at that point
10 that there was a problem with the
11 environmental toxins and things in our food
12 and our water and everything. They told me --
13 they had a board meeting, in fact, and sent me
14 a five page letter saying that it was not
15 justified. There was no reason for me to have
16 a test of that kind.
17 And even recently, I asked for a
18 test from Doctors Hospital. They don't have
19 that in their lab. They don't have those kind
20 of tests. So we need to have testing done so
21 that people will know what is in our bodies.
22 We are testing Chevron's pipes, we are testing

1 everything with Chevron, but who is testing
2 us? Nobody knows what we're suffering and
3 going through.
4 (Applause.)
5 MS. GREYWHITE: And we're not
6 being healed, because the hospitals and
7 doctors are not aware, or don't know how to do
8 it, or know what to do. So they treat you for
9 a symptom, and that's what happens. But if we
10 had naturalpathic, homeo, holistic doctors,
11 then they would detox you.
12 And that's the only reason I'm
13 still standing here, is because I did have a
14 friend who turned me on to a naturalpathic
15 doctor who did start a detoxification process
16 on me and sort of helped me to deal with it.
17 But because I am old, I'm 71 years old, I'm
18 not able to deal, my immune system's not able
19 to deal with the situation. And you're going
20 to find that.
21 Now, I had a job, but what good is
22 a job if you can't go to it? And there are a

1 lot of people here in Richmond who have that
2 same problem. They have been employed, or
3 they're able to be employed, but they're too
4 sick to get to work.
5 So we've got to do something, and
6 we need to do it right away. And judging from
7 what has happened, you know, Chevron's been
8 there for over 100 years. And if they're
9 still -- we're still in a situation where
10 we're trying to make them do something
11 correctly and right, then to me that means
12 that there's no point. And at this point,
13 I've had enough. And so my slogan now is
14 "Chevron, stop the fracking and start packing.
15 Get on out of here. We don't need you."
16 (Applause.)
17 MS. GREYWHITE: There are a lot of
18 cities in America who don't have Chevron in
19 their backyard, and they are doing marvelous.
20 And their people are healthy. We can do the
21 same thing.
22 DR. HOROWITZ: All right. Thank

1 you, ma'am.
2 (Applause.)
3 DR. HOROWITZ: Next is Steve
4 Zeltzer.
5 MR. ZELTZER: My name is Steve
6 Zeltzer. I'm with United Public Workers For
7 Action and California Coalition for Workers
8 Memorial today. And it's very interesting
9 we're having this forum tonight, this
10 presentation, because of what happened not
11 only in Boston but in Waco, Texas, where there
12 was another explosion and there had been no
13 investigations of that plant for decades.
14 And the workers there were too
15 terrified to say anything. They're non-union,
16 so they're afraid to stand up for their
17 rights. So there's terrorism in this country,
18 but the corporate media doesn't talk about the
19 Chevrons and these other companies that are
20 terrorizing people in this country.
21 Because it's organized terrorism.
22 They knew that plant was going to blow up,

1 because they weren't doing the proper
2 maintenance. They're criminally negligent.
3 It's criminal malfeasance.
4 (Applause.)
5 MR. ZELTZER: Nobody's talking
6 here on this panel about criminal penalties
7 and putting these executives in jail.
8 (Applause.)
9 MR. ZELTZER: If you or I did
10 this, we would go to jail. But Chevron and
11 the executives apparently have freedom,
12 freedom to get away with this. We'll put it
13 off for another study. Maybe in 20 years we
14 can have another study.
15 Well, actually, the question of
16 criminal prosecution is critical, and
17 California OSHA can criminally prosecute. And
18 Chief Widess doesn't mention that. In fact,
19 she said that they have a problem with
20 inspectors, there are only seven inspectors
21 for the oil industry in California. Well, I
22 have a question. Why the Hell is she giving

1 them a license to reopen that if they don't
2 have enough inspectors to inspect it?
3 (Applause.)
4 MR. ZELTZER: Question: if you
5 don't have enough inspectors, there are only
6 160 inspectors in California for 18 million
7 workers. Governor Brown is very concerned
8 about jobs. He went to China. How about
9 hiring some workers to inspect these
10 facilities?
11 (Applause.)
12 MR. ZELTZER: And make the oil
13 companies pay. But I, frankly, don't believe
14 that we're going to make Chevron a better oil
15 company. Chevron, like the banks, are in the
16 business of making a profit. They're not in
17 business of taking care of the sick people in
18 Richmond. We should require that they build
19 a hospital, a public hospital in Richmond, for
20 anybody who's been sick.
21 (Applause.)
22 MR. ZELTZER: They have the money

1 to do that. Instead of giving crumbs to some
2 non-profit agencies, 50 million dollars for a
3 hospital for the people in Richmond who
4 they've contaminated and poisoned, and the
5 children here in the schools, where you have
6 50 percent asthma. What are they doing about
7 that?
8 Well, I think your board needs to
9 investigate that. These hospitals in Northern
10 California where people are being contaminated
11 and sickened are not doing studies,
12 epidemiological studies, about where people
13 live and how they get sick and why they're
14 getting sick. We need to have liability for
15 these companies, so they have to pay for the
16 people who they're sickening.
17 (Applause.)
18 MR. ZELTZER: The fact of the
19 matter is, this should be part of your study.
20 But frankly, the industry controls that. And
21 that's why the accident in Waco and what
22 happened here will happen again and again,

1 until, frankly, we have public control of the
2 energy industry. We need to have the working
3 people and the public in charge of the energy
4 industry, and not these criminals that are
5 really destroying the world.
6 (Applause.)
7 MR. ZELTZER: Thank you.
8 (Applause.)
9 DR. HOROWITZ: Thank you. Next is
10 Roger Lynn, CBE. Mr. Lynn?
11 MR. LYNN: Good evening Chairman,
12 Members of the Board. My name is Roger Lynn.
13 I'm an attorney with Communities for a Better
14 Environment. I'll keep this quick, just three
15 things.
16 First, I want to highlight one
17 recommendation from the interim report, and
18 that is the requirements for inherently safer
19 systems. Over here, the industrial safety
20 ordinance has too many shoulds and considers.
21 It doesn't have enough shalls. The industrial
22 safety ordinance has to be amended to require

1 inherently safer systems.
2 (Applause.)
3 MR. LYNN: Second, higher sulfur
4 crude. We all know more sulfur means more
5 corrosion, more corrosion means more refinery
6 incidents. Going forward, please focus on the
7 feed stock quality, what refineries refine and
8 what they should not refine.
9 And third, finally, last but not
10 least, to the investigative staff, thank you.
11 You folks have been here since day one of this
12 incident. You've been willing to listen to
13 all the other agencies, community and the
14 workers. And your recommendations are top
15 notch. Board, please accept their
16 recommendations, all of them.
17 Thanks.
18 (Applause.)
19 DR. HOROWITZ: Thank you. Jeff
20 Ritterman. I think he left. I saw him
21 earlier. He's gone, okay. Off to treat some
22 patients, I guess. All right. Llana Garcia?

1 MS. GARCIA: Good evening,
2 Chairman, Board Members and staff. My name is
3 Llana Garcia. I'm an attorney and legal
4 fellow with Communities for a Better
5 Environment, and I'm coming here tonight from
6 Huntington Park in Los Angeles County. I'm
7 here representing our community members in the
8 Southern California region, and in particular
9 in Wilmington.
10 Wilmington is a community which,
11 as my colleague Julia May mentioned, is home
12 to not just one but five refineries. And it
13 is a community that, I'd also have you know,
14 has 30 percent of its residents fall below the
15 poverty line, and it's 85 percent Latino.
16 It's this community that I ask you to keep in
17 mind when adopting your staff's
18 recommendations this evening, and in
19 maintaining transparency from this point
20 forward and making public the final report and
21 recommendations.
22 And we want to thank the staff for

1 its very keen process-oriented safety
2 recommendations, which address many of the
3 shortcut problems, like the overuse of clamps,
4 the lack of documentation and accountability
5 regarding whether or not to address or ignore
6 maintenance and preventative safety
7 recommendations made from front line laborers.
8 We've heard from many of the workers in the
9 Southern California refineries that these are
10 critical problems, so we want to thank you for
11 those recommendations.
12 And tonight, as my colleagues have
13 mentioned, I also want to stress that you
14 consider the imminent threat that's presented
15 by higher sulfur crudes like tar sands, and I
16 want to draw attention to the fact that this
17 is a pressing issue for community members in
18 Southern California, and has actually been the
19 subject of a lot of recent media coverage in
20 the Los Angeles Times and other sources.
21 Our Southern California workers
22 and communities, like many throughout the

1 state and across the country, urgently need
2 protective measures to ensure that the safety
3 recommendations that have been made are not
4 weakened by the absence of an adequate focus
5 on the feed stock crude quality. This is an
6 integral part of a truly inherently safe
7 systems approach to refinery safety, and it
8 would be a tragic missed opportunity to ignore
9 the issue of tar sands.
10 Our members in Wilmington are
11 incredibly concerned with recent statements by
12 corporate leaders, such as those at Valero,
13 that they plan to bring tar sands crude for
14 refining in the Southern California
15 refineries. To reference the call to action
16 that was made by the Richmond Mayor earlier,
17 these are community members who are presently
18 going door to door to alert family members,
19 residents, neighbors of ExxonMobil,
20 ConocoPhillips, Tesoro, and Valero of the
21 hazards that are coming their way.
22 Now, we know, based on the staff's

1 own investigations into other Chevron
2 facilities, like that at El Segundo, that the
3 same sulfidation issues that caused the
4 Chevron fire here are already present in our
5 Southern California refineries as well, and
6 therefore we cannot stress enough the
7 importance of integrating the feed stock
8 quality assessments as part of the inherently
9 safer systems in the recommendations that have
10 been made by the staff.
11 Our communities already suffer
12 from consistent black smoke plumes in their
13 neighborhoods, close to their homes, their
14 schools, and the areas where the public
15 gather. We simply cannot afford a fire such
16 as that which occurred here in August.
17 I want to thank you for seriously
18 considering our community concerns and
19 adopting your staff's recommendations this
20 evening. Thank you.
21 (Applause.)
22 DR. HOROWITZ: Thank you. Marilyn

1 Langlois. I think I saw her earlier. Yes,
2 there she is.
3 (Applause.)
4 MS. LANGLOIS: Good evening. I'm
5 a member of the Richmond Progressive Alliance.
6 My name is Marilyn Langlois. And we met with
7 members of the investigation team shortly
8 after the fire.
9 I really want to thank you all for
10 being here. I know it's late. We're all
11 tired. But this is really important to us,
12 both to those of us who are still here and
13 also to those who couldn't come tonight. I
14 live here in the community, and really we need
15 to take a look at this.
16 I want to thank the investigative
17 team for its really excellent investigation
18 and report, and I really like that animated
19 video you did of a reenactment of the
20 incident. Maybe you could put that on YouTube
21 for everybody to see at home.
22 (Applause.)

1 MS. LANGLOIS: Thank you. It
2 really helps to envision --
3 INVESTIGATOR TILLEMA: We already
4 did, actually.
5 MS. LANGLOIS: -- what it was
6 actually like. And to the Board Members, I
7 urge you to accept and adopt this report.
8 It's an excellent report which paves the way
9 for making a major and necessary shift in the
10 way refineries are operated and regulated
11 throughout the country, not just here in
12 Richmond.
13 There are four themes I've heard
14 this evening that I just want to emphasize
15 briefly. Number one, prevention. And in
16 terms of prevention, I urge you to include in
17 the report, in your recommendations, one of
18 the really inherently safer systems from a
19 preventive standpoint of view, which would be
20 to limit the quality of crude oil, limit the
21 sulfur content from the outset.
22 (Applause.)

1 MS. LANGLOIS: Then you wouldn't
2 have as much corrosion.
3 The theme of transparency. We
4 heard tonight that the pipe that failed, over
5 the last 10 years there had been six times
6 there had been recommendations for inspections
7 that were ignored. There were four times
8 recommendations for upgrade that were ignored,
9 just on that pipe alone. So how many other
10 pipes are there in the refinery where the same
11 thing has happened? There have been ignored
12 inspections, ignored upgrades. And they're
13 out there, operating, ready to blow. Let's
14 stop that.
15 The other theme, worker
16 empowerment, very, very important. We've
17 heard from the steel workers and others that
18 the workers alerted management to a lot of
19 problems before incidents happened, and they
20 were ignored. We need to have the workers
21 heard. They are clearly the experts, as many
22 have said.

1 And finally, enforcement. We have
2 to now get the corporate dollars out of
3 politics, so that we'll have elected officials
4 at all levels who will have the guts to put in
5 place a robust and well-funded regulatory
6 framework that includes criminal prosecution -
7 -
8 (Applause.)
9 MS. LANGLOIS: -- for cases like
10 this where there's been willful negligence.
11 There's no excuse for a multi-billion dollar
12 corporation to put the lives of Richmond
13 residents at risk by its failure to adopt and
14 implement inherently safer systems at all
15 times.
16 Thank you very much.
17 (Applause.)
18 DR. HOROWITZ: Thank you. And
19 that video you mentioned is available on
20 YouTube.com/USCSB, and also on CSB.gov, along
21 with our report, that's on CSB.gov. That's
22 YouTube dot com, forward slash, U-S-C-S-B.

1 And you can get our full report -- it's at the
2 front, but you can also download it and send
3 it to your friends from our website, CSB.gov.
4 All right. Why don't we try --
5 (Off-mic comment.)
6 DR. HOROWITZ: Yes. There will be
7 a transcript made, ma'am, and that will be on
8 our website in a few weeks. You can access
9 that at CSB.gov.
10 I think the -- my understanding is
11 that the television station is going to make
12 an archive of the actual broadcast, and that's
13 KCRT, I believe. Is that correct? Okay.
14 Thank you.
15 (Off-mic comment.)
16 DR. HOROWITZ: Go ahead, sir.
17 MR. CAMPBELL: I know it's late,
18 so I don't want to hold everybody up, but --
19 DR. HOROWITZ: Just say your name,
20 because I don't have it on the list.
21 MR. CAMPBELL: David Campbell,
22 Secretary and Treasurer for Steel Workers

1 Local 675 in Southern California. I want to
2 say that I agree with my steel worker brothers
3 and some of the community members who have
4 explained that this is an industrywide
5 problem. It's not just a problem in
6 California; it's a problem nationwide.
7 (Applause.)
8 DR. HOROWITZ: Okay, thank you.
9 Mr. Campbell, thank you for traveling up for
10 the meeting.
11 How about Alexandria Anderson?
12 (Applause.)
13 MS. ANDERSON: U.S. Chemical
14 Safety Board, distinguished panel members, my
15 name is Alexandria Samantha Anderson. I'm a
16 resident of the City of Richmond. I'd like to
17 thank you all for being here tonight, and for
18 your thorough and professional work. It has
19 been an honor to be here and to listen to your
20 recommendations. I hope that you adopt them
21 tonight.
22 I have a message more for the

1 people of the City of Richmond. That is that
2 the U.S. Chemical Safety Board is not
3 necessarily a traditional regulatory body. If
4 we want to see changes made, then we need to
5 go to the Richmond City Council, the Contra
6 Costa County Board of Supervisors, but these
7 individuals are not the people to go to. We
8 have to put political pressure on our local
9 government.
10 (Applause.)
11 MS. ANDERSON: That's what we have
12 to do, as well as our state and our national
13 government. But in particular, our local and
14 our state government. And we understand that
15 Chevron's a multinational corporation, and
16 multinational corporations in this day and age
17 have a thing about regulatory capture. I
18 won't go into it, but -- excuse me, I'm a
19 little nervous.
20 But we need to ensure that we are
21 putting the maximum amount of pressure on the
22 Richmond City Council and on Contra Costa

1 County. Thank you very much.
2 (Applause.)
3 DR. HOROWITZ: Thank you. How
4 about Inn Vilayngeun? Sorry, it's not very
5 clear. I-N-N, V-I-L-A-Y-N-G-E-U-N, perhaps?
6 No? Okay. All right. Rose Cuelo?
7 MS. CUELO: I'd like to thank you
8 for coming and listening to us. I'm a
9 resident of San Pablo, but I did live in
10 Richmond for a long time.
11 My concern is that if you have an
12 accident, you do something to correct it so it
13 doesn't happen again. August the 6th was not
14 the first accident that Chevron had. They've
15 had several. So going back to the latter part
16 of '99, or the early part of 2000, they had
17 accidents then and they haven't done anything.
18 The community has suffered.
19 You talk about -- you can't -- I'm
20 not saying you, but they can't shut the
21 refinery down to make the repairs as needed,
22 because it would be a hardship on them, but

1 what about the community? Chevron is shutting
2 us down, because they're killing us. I've
3 gone from a size 16 down to an 8, and I don't
4 know whether I'm dying or what, you know? And
5 like the lady said, she's concerned about her
6 health, too.
7 But what is Chevron doing about
8 it? Nothing. And maybe now that you're here,
9 they'll listen to you guys. Because they're
10 not listening to us, as a community. They're
11 doing what they want to do, and all they're
12 doing is getting fined, getting a slap on the
13 wrist, and doing the same thing that they've
14 been doing for years. And they're killing us.
15 That's all I have to say.
16 (Applause.)
17 DR. HOROWITZ: How about Kenji
18 Warren? Is he here?
19 MR. WARREN: Good evening,
20 everybody. One, I would like to thank as well
21 the investigators for your work. It seems
22 that it was done with great integrity, and I

1 appreciate it as a resident of San Pablo and
2 someone who works in Richmond, and I would
3 urge the Chemical Safety Board to adopt the
4 recommendations, and furthermore the
5 recommendations from Communities for a Better
6 Environment.
7 The only thing that I would maybe
8 ask is the recommendation that the plant, the
9 refinery, be shut down immediately --
10 (Applause.)
11 MR. WARREN: -- and that the
12 workers be allowed to make the changes that
13 you're recommending.
14 Thank you very much.
15 (Applause.)
16 DR. HOROWITZ: Okay. Next is
17 Frank Cambra.
18 MR. CAMBRA: Thank you for the
19 opportunity to speak to the Board and the
20 panel tonight. My name is Frank Cambra, and
21 I'm a former employee of Chevron. I worked
22 for Chevron for 25 years, and I feel obligated

1 to be here tonight as I was here eight months
2 ago at the onset of the study. Some of you
3 may have been at that meeting, and at that
4 meeting I gave some of my background, and I'd
5 like to do that. At the sake of being
6 repetitive, I'll tell you a little bit about
7 myself.
8 I would like to address the
9 incident that occurred, and I would like to
10 make two predictions and three
11 recommendations, and then I'll be done.
12 Frank Cambra, graduate of U.C.
13 Berkeley with a Master of Engineering in
14 structural engineering. While I was attending
15 Berkeley, I was working for Chevron as a co-
16 op, and I did an investigation of cooling
17 towers that were subject to collapse. One had
18 just collapsed in Pascagoula. A second we had
19 repaired in El Paso, Texas. And then the
20 third in El Segundo, which was subject to
21 collapse, and I investigated it and made
22 recommendations to repair it. And on the

1 recommendations to the chief of engineering at
2 El Segundo, I was told point blank "Son, you
3 don't understand oil field economics. There's
4 no money to repair this tower. Maybe next
5 year."
6 And a year later, while I was in
7 graduate school at Berkeley, the tower
8 collapsed. It was an Ecodyne Redwood cooling
9 tower, and pieces of the tower went for 100
10 yards in all directions. And it was at that
11 point that I decided that, following my Master
12 of Engineering, I would get a Master of
13 Business Administration with an emphasis in
14 economics. I was not going to have a Chevron
15 manager tell me I didn't understand economics
16 again.
17 And that was the onset of 25 years
18 with Chevron. Sadly, it didn't get better.
19 I was discharged from Chevron in Kazakhstan on
20 the Second Generation Project where we were
21 building the largest oil plant of the day in
22 the world. I think it was 200,000 barrels of

1 oil per day of sour crude. And there were
2 many problems, but among them was the
3 compaction of roadways, and I wanted to comply
4 with API standards. And I was told "This is
5 not California. This is Kazakhstan. We do
6 not have to comply with API standards." And
7 I was appalled.
8 And that was one of a number. I
9 don't have enough time to go into some of the
10 others. And that's why I'm here tonight.
11 Now, in respect to your work, if you recall,
12 eight months ago, I asked you one question:
13 will you do your job?
14 And I'm here to say that the U.S.
15 Chemical Safety Board has done their job, and
16 I commend you. I think your recommendations
17 are outstanding, and I can only hope that they
18 will be endorsed and embraced by Chevron
19 management. I have some doubts. I think they
20 will be resistant. They will try to spin it
21 and change it to accommodate their own
22 requirements.

1 But I do commend you, and I
2 commend others that have also made
3 presentations tonight on their assessments,
4 and I feel that I am being a bit redundant in
5 what they had to say. But as I see it, your
6 technical assessment and your regulatory
7 recommendations are excellent.
8 We have a case of they built the
9 plant, they connected it to a pipeway.
10 Somewhere in the connection between plant and
11 pipeway, an eight inch piece of carbon steel
12 was utilized in a jumpover, a connection of
13 two plants, that was in effect inadequate for
14 that type of service. Carbon steel in
15 hydrogen sulfide service. I said this eight
16 months ago. Really? Carbon steel in hydrogen
17 sulfide service is not acceptable, and that's
18 kind of known throughout industry.
19 Well, we talked about flagging on
20 inspection. I heard about that. Yes,
21 flagging on inspection, "We test wall
22 thickness and we have to make repairs, we have

1 to do maintenance." Why wasn't that pipe
2 flagged for its age? The pipe was 40 years in
3 service. It was known to be carbon steel.
4 And yet I don't hear anything in our safety
5 management of flagging for age. Take that
6 into consideration, if you will.
7 I'd like to make two predictions.
8 The first prediction, sadly, and it's been
9 alluded to earlier, we live in a seismically
10 active area. We know, USGS is telling us, we
11 have a Hayward Fault, and we're on it right
12 now. When that fault erupts, we will have a
13 magnitude 7 earthquake in this Bay Area. It's
14 going to happen.
15 And Chevron knows that their tank
16 farm on the Richmond hill is inadequate to
17 sustain that type of an earthquake. Those
18 tanks are going to rupture. Those tanks are
19 going to spill their contents. The crude, the
20 product and everything in that tank, every
21 full tank in that farm is going to fail. And
22 they know that. And there's reasons to

1 understand that going back to the Richmond
2 field studies where earthquake simulation was
3 conducted back in the 1980s, okay?
4 Second prediction, and I'm
5 speaking from my knowledge of working for
6 Chevron on these activities. There's going to
7 be a hydrogen sulfide release in Kazakhstan
8 from their rich sour gas injection in the next
9 10 years. It's going to happen, and it's
10 going to be horrific, the amount of hydrogen
11 sulfide that's going to get released from the
12 sour gas injection system. The injection pipe
13 operates at 9,000 psi. It's already been
14 compromised once during its commissioning,
15 okay?
16 To conclude, three
17 recommendations, and I think they've already
18 been discussed, for the most part.
19 One, there's no need for sour
20 crude at Richmond. Stop placing sour crude
21 through the Richmond refinery. That should be
22 a recommendation.

1 (Applause.)
2 MR. CAMBRA: Certainly until they
3 have proven without a doubt that there is no
4 other piping risk that exists at Richmond.
5 Second, a million dollar fine from
6 OSHA is a slap on the wrist. Chevron's net
7 profit per hour is a million dollars. And
8 they're going to fight that fine of one
9 million dollars with five or ten million just
10 to get it off the books. Imagine. That's
11 going to happen.
12 DR. HOROWITZ: Just briefly, if
13 you will?
14 MR. CAMBRA: Thank you. And the
15 last recommendation I have, or second
16 recommendation I have, is to shut down this
17 crude unit number four.
18 (Applause.)
19 MR. CAMBRA: We do not need
20 processing of distillate at crude unit number
21 four. That's how you get management's
22 attention. We talked about -- I'll be brief -

1 - inherently safer systems. What we need is
2 inherently safer management. That's what's
3 missing. Management hasn't endorsed the
4 people like myself or the people from the
5 steel workers who come in and identify a
6 problem. No, they fire them. Got rid of the
7 problem, didn't I?
8 (Laughter.)
9 MR. CAMBRA: And the last
10 recommendation, and this is really for the
11 City's consideration. We should -- you know,
12 Richmond refinery built in 1902. This was a
13 wilderness. This was the end of civilization.
14 Today, it's the center of a metropolitan area.
15 (Off-mic comment.)
16 MR. CAMBRA: Thank you.
17 And as the center of a
18 metropolitan area, our risks are much greater
19 than they were in 1902. So my recommendation
20 is, we need to move with the times. We need
21 to convert Richmond from a refinery to a
22 blending and marketing plant.

1 (Applause.)
2 MR. CAMBRA: We need the energy,
3 but the times demand change away from refining
4 here in this community.
5 Thank you.
6 DR. HOROWITZ: Thank you. Paula
7 Shields, perhaps? I'm not sure about that.
8 Victoria Sawicki? Maybe you could say that
9 for me.
10 MS. SAWICKI: Okay. Victoria
11 Sawicki. I am a resident --
12 DR. HOROWITZ: Thank you. How do
13 you spell that, ma'am?
14 MS. SAWICKI: S-A-W-I-C-K-I.
15 DR. HOROWITZ: Okay.
16 MS. SAWICKI: I'm a resident of
17 Richmond. I'm also on the Meiklejohn Civil
18 Liberties Institute. It's a human rights
19 organization.
20 You know, I've been to so many
21 community meetings about Chevron in the last
22 10 years. I have seen and read different

1 studies, reports have been made. Your report
2 was fantastic. I appreciate the honesty and
3 the straightforwardness. I've heard about
4 regulations that have been violated, safety
5 procedures that have been ignored, and workers
6 that have not been listened to. It's not only
7 in the United States. I believe it's all
8 over.
9 And you know, on the one hand when
10 I hear a Henry Clark, or a Marilyn, or the
11 young gentleman that stood up and said he
12 wants to close the plant, the youth speaking
13 up like that, I'm inspired. But then, when I
14 hear OSHA, the woman from OSHA, you know, what
15 can she do? She can't do anything. EPA has
16 not done anything. All of the departments
17 have failed the citizens of Richmond. They
18 have failed the citizens of West, Texas.
19 (Applause.)
20 MS. SAWICKI: When Steve Zeltzer
21 got up and said the corporations have the
22 right to do this and do that, they had the

1 right to kill. And they could have killed
2 those 19 employees that we saw in that video.
3 They could be dead now. They have the right.
4 They have the right. What can you do? You've
5 worked hard, you did your best, you put the
6 truth out there. Now, what are you going to
7 do? You can't do anything. It's up to us.
8 You know, and I feel like --
9 (Applause.)
10 MS. SAWICKI: You know, it's
11 frightening. Because I know Henry Clark has
12 been fighting for decades, decades, and
13 there's been some improvement but really
14 things are getting worse right now. And you
15 know, you hear Chevron, they send out all this
16 literature in the mail about what a great
17 neighbor they are. Lies, lies and lies.
18 You know, the first community
19 meeting, you guys weren't here. The one right
20 after the big cloud and the big fire. People
21 -- this place was packed. And this one woman
22 -- you know, Chevron was up there with all

1 their suit coats and their ties, and they're
2 giving their little spiel. And the community
3 kept saying "There was an explosion, there
4 was," and they're "No, no, no."
5 But we were right. They were
6 wrong. We've been lied to and lied to so
7 much, it's just -- we've had enough. It's
8 just ridiculous. And I don't know what this
9 is going to accomplish, what this meeting here
10 is going to accomplish. Chairperson Rafael,
11 you eloquently said, twice I believe, that
12 human beings are precious. Really, they are.
13 I believe this woman here that spoke was in
14 tears, and the other woman that doesn't know
15 what's happening within her body. How many
16 children couldn't breathe and had to be rushed
17 to the hospital?
18 But you're not seeing that today,
19 see? We're all here, and we're all tired
20 right now. And you know, how are we going to
21 -- I agree with you that people are precious.
22 What do we do with people that don't think the

1 way that we do? Does Chevron think this woman
2 is precious? Do they think that the community
3 is precious? What about the workers? The
4 workers that were ignored, are they precious?
5 Do they matter? Are they listened to? No.
6 Nope.
7 So the point is, actions speak
8 louder than words. I'm tired of Chevron's
9 words. I'm sure the rest of the community is,
10 too. What does Chevron really care about?
11 You know, it's not about -- you've had some
12 sort of -- I don't know, the way you put it,
13 some upper management decisionmaking process
14 has to be examined.
15 Well, you know what it is? They
16 don't care about the community. They care
17 about one thing, and that is money. They care
18 about profit. They could have fixed that
19 pipe, but they chose not to because they
20 didn't want to spend the money. And all the
21 other pipes that are in there, they do not
22 want to spend the money. And the only way

1 that we're going to change things is not by
2 trying to kind of talk them into being a good
3 oil company, which I believe is impossible.
4 And I just want to -- last thing. The right
5 to breathe clean air is one of the most basic
6 human rights.
7 (Applause.)
8 MS. SAWICKI: Thank you.
9 (Applause.)
10 DR. HOROWITZ: Thank you. Roberta
11 Spruckerman, or Speakerman? What was that,
12 ma'am? Speakerman.
13 MS. SPEAKERMAN: Hello. I did
14 want to thank you for what you put out, partly
15 because I would get -- this is not my field,
16 and I would get so frustrated with what I knew
17 was happening but I couldn't put my finger on
18 it. And now I'll have a way to do some of
19 that.
20 One of the things -- I thought
21 about the Pinto. Remember the Ford Pinto?
22 There it was. You know, cost-benefit

1 analysis. And that's what this feels like.
2 And it's everywhere within the system. And
3 for you, if there's any place that you are
4 thinking you might soften your word or couch
5 your terms diplomatically, the industry's
6 response should make you aware that it's going
7 to be denied. "No, safety is our first, most
8 important thing." I mean, so make it as
9 strong as you can. And I never had an
10 breathing problems until I moved to Richmond,
11 and now I do.
12 And the last thing is the
13 transparency issue. Because nothing was
14 shared with Kaiser, they had no idea what to
15 tell the people who were coming there.
16 That's it. Thanks again for your
17 work.
18 (Applause.)
19 DR. HOROWITZ: Thank you.
20 CHAIRPERSON MOURE-ERASO: Mr.
21 Horowitz, do you think that we could find by
22 a show of hands how many more statements we

1 have? Because we need to take the vote before
2 the day is over.
3 DR. HOROWITZ: Mr. Chairman, I
4 have about 10 who are still signed up, sir.
5 Let me just take a -- I'll call the names that
6 are here, and if you show your hand, okay?
7 Michael Leedy, are you here?
8 Okay, he is here.
9 And Bill Pinkham, are you here?
10 Bill Pinkham is not here. Okay.
11 And how about Eduardo Martinez,
12 are you here?
13 (Off-mic comment.)
14 DR. HOROWITZ: Okay. How about
15 Sylvia Hopkins?
16 She is here? Okay, you are here.
17 Great.
18 And Mary Flanagan?
19 You are here. Okay. And Steve
20 Ongerth?
21 You are here. We just spoke a
22 moment ago. Sorry about that.

1 Melvin Willis?
2 Melvin Willis is here. Sandy
3 Satyrn?
4 She left, okay. How about Dan
5 Berman?
6 Dan Berman is here. And so, Mr.
7 Chairman, we have one, two, three, four, five,
8 six. That's seven.
9 CHAIRPERSON MOURE-ERASO: Let's go
10 for it.
11 DR. HOROWITZ: Okay. All right.
12 Michael Leedy, why don't you go first?
13 CHAIRPERSON MOURE-ERASO: I will
14 beg that the speakers please look at your
15 watch and just put a limit of three minutes to
16 your remarks. We will be happy, and the
17 people behind you will appreciate it.
18 MR. LEEDY: Good evening,
19 everyone. I'm a 34 year Richmond resident.
20 I was a board member on the West County Toxics
21 Coalition, and I served on the local Emergency
22 Planning Committee in the '90s. I was also a

1 staff member of CBE. I made recommendations
2 for the RMPP, the risk management prevention
3 plan, concerning anhydrous ammonia and
4 hydrogen sulfide.
5 I wholly endorse the
6 recommendations of the Chemical Safety Board
7 staff, and in addition I'd like to ask that
8 you put in the recommendations from Mr.
9 Espinoza, Mr. Karras, Mr. Wilson and Ms. May,
10 in particular concerning threats with respect
11 to the earthquake hazards that we have in this
12 area and the release of dangerous chemicals.
13 So the incident that we had on
14 August 6th was pretty symptomatic of what
15 happens with multinational corporations, and
16 they're putting our communities at risk to
17 drive their corporate profits. And basically
18 what they did, they took a gamble and they
19 rolled the dice in our community, and they put
20 our community at risk.
21 They took a calculated risk that
22 the accident would not occur, and they ignored

1 a lot of recommendations, recommendations by
2 experts in their environs, their workers. And
3 they presented these recommendations, and they
4 ignored them. So they rolled the dice again,
5 but they got caught this time.
6 And they made the calculated risk
7 that, even if they got caught, that they'd be
8 able to bully the public officials and the
9 regulators to manage this, using their high
10 priced lawyers and their expensive public
11 relations folks.
12 So after all this, basically what
13 it came down to is money. They took a risk
14 that, if they didn't need to -- even if they
15 had a spill and they had to do the public
16 relations cleanup and the other things that
17 went along with it, all of the money that they
18 had to spend with that, they would still be in
19 a situation -- they felt that they could still
20 take that risk and, even with the potential
21 risks -- and by the way, it wasn't the kind of
22 risk that -- the risk could have been a lot

1 worse because of the wind factor -- let me
2 just settle down a little bit. Let me just
3 settle down.
4 They didn't think that, even with
5 all of the potential risks that we had with
6 the incident in Richmond, and with the
7 problems that we had because -- all right.
8 DR. HOROWITZ: Take your time.
9 MR. LEEDY: I'll stop.
10 DR. HOROWITZ: All right.
11 MR. LEEDY: One second. What we
12 need is to institute fines and penalties that
13 will -- at a magnitude that will give the
14 corporate managers pause before they roll the
15 dice on our community. And secondly, it's
16 high time that we install and enforce severe
17 criminal penalties for the corporate criminals
18 that put our communities at risk. We need to
19 have enforceable rules and criminal penalties
20 and fines that make it much more risky for
21 them to even consider taking these kinds of
22 risks in our community.

1 Sorry about the -- thank you very
2 much.
3 DR. HOROWITZ: All right. Thank
4 you.
5 (Applause.)
6 DR. HOROWITZ: And we go to
7 Eduardo Martinez, please.
8 MR. MARTINEZ: Since my time is
9 limited, I will skip all the preamble and get
10 down to the points that I want to make. And
11 one of them is that, well, I own an old '87
12 Chevy pickup truck, and it has to go to a
13 special place to be smogged. If it doesn't
14 pass, I can't drive it.
15 (Applause.)
16 MR. MARTINEZ: Even if I were to
17 take it to court and say "You know, this smog
18 test was bogus and I want to drive it anyway,"
19 I can't do it. Likewise, Chevron should not
20 be able to operate their plant --
21 (Applause.)
22 MR. MARTINEZ: -- just because

1 they want to contest your findings. So you
2 should recommend that Chevron not operate the
3 plant, even if it's in litigation, until it's
4 repaired.
5 (Applause.)
6 MR. MARTINEZ: Just the same way I
7 have repaired my truck.
8 The other thing is that Chevron
9 loves litigation. They have tried to rob our
10 community of thousands, millions of dollars
11 through asking for property taxes back. We
12 need to make it difficult for them to waste
13 our money in litigation, somehow, and we also
14 need to make them responsible for the health
15 impacts that they make on our citizens. We
16 need to put into the recommendations a
17 community benefit agreement in which Chevron
18 puts money into the community so that we can
19 take care of the damage that they caused.
20 Thank you.
21 DR. HOROWITZ: Thank you. Next is
22 Sylvia Hopkins.

1 MS. HOPKINS: Yes, I live in
2 Atchison Village, close to Chevron. I'm a
3 member of CBE and RPA.
4 I have heard that there's been, in
5 the industry, a style adopted recently, a
6 practice, where managers of refineries are
7 there for two years. And they get a promotion
8 next time if they do well while they're there,
9 and that includes keeping costs down.
10 I wonder if you could, somewhere
11 in your report or in your recommendations, if
12 part of safety could be that the manager needs
13 to live nearby and be there for a much longer
14 period of time, like they used to be. I think
15 that might help things.
16 (Applause.)
17 MS. HOPKINS: Thank you. And my
18 next recommendation is that Chevron be caused
19 to build a hospital here and everybody gets
20 health care.
21 (Applause.)
22 DR. HOROWITZ: Thank you. Mary

1 Flanagan is next.
2 MS. FLANAGAN: Hi. I urge the
3 Board to accept the report. And I'm a
4 teacher. I've been in this district eight
5 years. I'm a proud member of United Teachers
6 of Richmond. And I'm particularly concerned
7 about the daily effects of Chevron emissions
8 on the children. Teachers are aware that just
9 one byproduct of the refinery process, which
10 includes mercury, benzene, et cetera, just one
11 byproduct, lead, seriously affects infant and
12 child development.
13 Children are affected by even
14 small amounts of lead, and the lead's already
15 in the soil. And lead ingested by children
16 can cause lifelong learning disabilities,
17 issues of aggression. And that's not really
18 documented in our district. It's very, very
19 hard to get the kids through the process of
20 being diagnosed and identified.
21 Richmond still has lead in the
22 soil from lead additives in the gasoline

1 process that was discontinued in the '70s.
2 The lead doesn't dissipate, it doesn't go
3 anywhere, and there's a long Mother Jones
4 article about this massive issue of
5 contamination, and another issue is that 30
6 percent of the kids at my school have asthma
7 medication. We're about a mile from the
8 refinery.
9 It's essential to have outside
10 regulation on the Chevron refinery. Richmond
11 has had many, many explosions, fires and leaks
12 over the last 40 years, and Antonia Juhasz
13 documents this in her book, The Tyranny of
14 Oil.
15 And isn't it true that Chevron
16 minimally updated and renovated their refinery
17 over the last 40 years? The refinery's over
18 100 years old, but if Chevron did extensively
19 renovate they would have been subject to the
20 criteria written into the 1972 Federal Clean
21 Air Act, and that act stipulates that
22 particular safety and filtering improvements

1 be put in place when Chevron or a corporation
2 spends money renovating, as soon as the
3 refinery is rebuilt or extensively renovated.
4 But Chevron did not extensively
5 renovate or rebuild the refinery. They
6 continued to use the old refinery, minimally
7 renovating, so that they avoided being subject
8 to the provisions of this 40 year-old Clean
9 Air Act. And they would not invest that
10 money, and thereby they seriously endangered
11 and harmed the residents of Richmond, and the
12 children, more than one generation of
13 children.
14 Chevron must not be allowed to
15 self-regulate. Children's health is not their
16 priority. Safety is not their priority. I
17 urge you to adopt the CSB report and
18 recommendations. Thank you.
19 (Applause.)
20 DR. HOROWITZ: Thank you. Steve
21 Ongerth? Spell it for me one more time, if
22 you would?

1 MR. ONGERTH: Why don't I just
2 pronounce it for you? My name is Steve
3 Ongerth.
4 DR. HOROWITZ: Can you give me the
5 spelling for the court reporter?
6 MR. ONGERTH: O-N-G-E-R-T-H.
7 DR. HOROWITZ: O-N-G. Okay, thank
8 you. Sorry about that.
9 MR. ONGERTH: Okay. Well, I am a
10 union member and an environmentalist. I'm a
11 member of the Industrial Workers of the World.
12 I'm also a union ferryboat deckhand.
13 I grew up in this community. I
14 graduated from high school, and our ceremony
15 was held in this very auditorium in 1989. And
16 the issues at Chevron were issues then. I'm
17 also a graduate of U.C. Berkeley, but I think
18 I really got my education in the campaign to
19 save Headwaters Forest.
20 And I just recently wrote a book
21 which is about to be published about very
22 similar conditions that existed in the timber

1 industry, where timber corporations were
2 exploiting workers and destroying the
3 environment, and the conditions in the timber
4 mills were atrocious.
5 I think it's kind of an
6 interesting coincidence that this incident
7 happened in West, Texas because before I lived
8 here, I lived in Ennis, Texas, which is not
9 too far away from West, Texas. And while
10 we're having this discussion tonight, a worker
11 was killed in Santa Rosa when glass fell on
12 him.
13 And I have to say that I do
14 appreciate the work that the Board has done.
15 I think it's a tremendous step forward, and I
16 think the recommendation should be adopted.
17 But it's very interesting. Almost 99 percent
18 of the people here agree. The only person who
19 doesn't agree is the person who's saying that
20 the industry should regulate itself. I think
21 we've seen the results of that. It's not very
22 good.

1 But I think, as much as I think
2 these recommendations are a good start, I
3 think we need to really look at the elephant
4 in the room, and that is the fact that we have
5 an economic system where the wealth is
6 privatized and held by the few, and the costs
7 are outsourced to the community and to the
8 environment, and it is not working. In fact,
9 it is killing the planet. So I think this
10 cannot continue.
11 It's about time, and I think it's
12 great to see that we are finally starting to
13 evolve and develop a backbone. We need to do
14 more than that. We need to put an end to this
15 murderous system. We need to be in control,
16 not the industry. Because the results are not
17 only dangerous, they're killing us, and
18 they're killing us every day. And it hasn't
19 stopped in 100 years, and until we get
20 stronger and more organized it's going to
21 continue.
22 So once again, I think it's time

1 that these recommendations be a start, but we
2 have a lot more work to do. Thank you very
3 much.
4 (Applause.)
5 DR. HOROWITZ: Thank you. Melvin
6 Willis?
7 (Applause.)
8 MR. WILLIS: Good evening. My
9 name's Melvin Willis. I'm out here
10 representing ACCE. It stands for Alliance of
11 Californians for Community Empowerment.
12 First, to start off with, I love
13 all the recommendations that were made. It's
14 finally good that this is being realized, not
15 only just at a local level but from a national
16 standpoint, for people to come all the way
17 from Washington, DC just to come here and do
18 a thorough investigation and see what the
19 problem is, and not only apply it to this
20 situation over here, but recommendations that
21 should be applied to refineries all across the
22 United States. And I really appreciate that

1 we can get some sort of blessing out of this
2 curse.
3 But I just want to say that, you
4 know, just echo the fact that 10 years ago, on
5 the date of the refinery fire, they had a
6 recommendation that it should be replaced. I
7 was 12 years old then. I've kind of sprouted
8 up since then.
9 (Laughter.)
10 MR. WILLIS: So we can see how
11 time can really play a factor when it comes to
12 many things, including wearing and tearing.
13 And you can imagine, if that's happening in
14 that crude unit, how many other -- actually,
15 there's 2,000 clamps, so we've got 2,000 other
16 units that need to be addressed as well.
17 So this is a great step for things
18 to get done. I appreciate you guys coming out
19 here. I think you should accept these
20 recommendations. They're great
21 recommendations, with Greg Karras's
22 recommendation that you put it as urgent.

1 Because if we've got 2,000 clamps, and Mayor
2 McLaughlin said there were about 14
3 explosions, this is an urgent matter that
4 needs to be addressed quickly, and we can't
5 let time go by. Because weather conditions
6 made it to where nobody died, but who knows
7 what will happen the next time, if there is a
8 next time. Hopefully there's not.
9 Thank you.
10 DR. HOROWITZ: Thank you. Dan
11 Berman?
12 MR. BERMAN: Hello. My name is
13 Dan Berman, and I've worked on and off in the
14 area of occupational health and safety,
15 including with Brother Rafael. We both worked
16 for the Oil, Chemical and Atomic Workers,
17 closely with Anthony Mazzocchi.
18 And I think that's where he gets
19 some of his ideas of holding these open
20 sessions. Because that's how the Oil,
21 Chemical and Atomic Workers first got the
22 Occupational Safety and Health Act passed.

1 They had these open sessions for people
2 throughout the union, in each of the ten
3 districts of the union.
4 In any case, I wanted to speak on
5 two things. I think what we're really talking
6 about is about democracy. And I don't mean
7 just democracy in the sense of elections and
8 so forth, but also democracy at the place
9 where people work. And what happens if people
10 don't have the right to protest, the right to
11 raise hell, the right to blow the whistle as
12 workers and as intelligent people in the
13 plant? Nothing gets done.
14 I want to cite one case that Steve
15 Zeltzer, who testified here earlier, he's gone
16 home, but he put it on Labor Video Project.
17 There's a woman named Becky McClain who worked
18 for Pfizer. She was a molecular biologist.
19 She noticed she was getting sick. She was
20 also on the safety committee. A non-union
21 shop in Deep Water, Connecticut.
22 So they said "Don't keep listing

1 these hazards." She couldn't help herself,
2 because it was so blatant. So she filed an
3 OSHA complaint. She wanted some sort of
4 response. The lady from Federal OSHA came
5 down from Boston -- and then she got fired
6 immediately.
7 So the lady from Federal OSHA said
8 "I don't think you're going to win this case."
9 They only deal with one case in 200. They
10 just have no -- "we have no staff, no way to
11 deal with this."
12 Well, what happened is, she took
13 the company to court in April of 2010. She
14 won a 1.4 million dollar judgment in the
15 federal court. It was upheld in the Second
16 Circuit last October, so the company's going
17 to have to pay up.
18 Now, of course, Pfizer is the
19 biggest pharmaceutical company in the land, or
20 in the world, and so it doesn't really mean
21 much to them except as a matter of principle.
22 But she stood up for her rights. Her husband

1 supported her completely. They don't have any
2 kids, so they didn't have to worry as much
3 about where the next meal was going to come
4 from, although -- and so that's what happens
5 sometimes.
6 And as fewer and fewer workers
7 have unions to represent them, and it's down
8 to seven percent in the private sector, which
9 is the sector she was in, they don't even have
10 the semblance of protection. And so that's
11 something to worry about: democracy.
12 And the second thing is, I was
13 wondering about -- this is what Tony Mazzocchi
14 said one time. We were having this
15 discussion. The refinery industry and Oil,
16 Chemical and Atomic Workers had refineries all
17 over the country. They used to have
18 turnarounds that lasted a month just every
19 year, and they would shut everything down and
20 they'd work on it when the refinery wasn't in
21 operation. That's why they had fewer
22 explosions in those days: they took the time

1 out.
2 The second issue was, the people
3 who worked on the refinery every day did the
4 turnaround, so they knew where the problem
5 was. They wouldn't allow the company to bring
6 in, you know, non-union, ignorant workers that
7 don't know very much about the process just
8 because it was cheaper. And this has always
9 been an issue in that industry.
10 DR. HOROWITZ: Just briefly,
11 please, Mr. Berman.
12 MR. BERMAN: I'll let you --
13 that's enough. I'm done.
14 DR. HOROWITZ: You can finish your
15 comment.
16 MR. BERMAN: My only point is you
17 need trained people. Just as you need to be
18 trained to drive a bus, you should be trained
19 to sit in the control room, and you shouldn't
20 have to sit in there for 12 or 14 hours in a
21 row, because you're going to get tired, and
22 it's a fatigue problem.

1 Thank you.
2 (Applause.)
3 DR. HOROWITZ: Thank you. Elliot
4 Hughes, and he is the last.
5 MR. HUGHES: Hi. My name's Elliot
6 Hughes. I used to live in Richmond, but I
7 moved to Oakland. I was kind of -- I have
8 lung problems, and I was badly affected by the
9 refinery fire.
10 I just wanted to make this point.
11 And I'm really nervous, actually. I don't
12 ever really speak in front of large crowds.
13 But I'm also a member of the Industrial
14 Workers of the World, and I'm an
15 environmentalist and a unionist.
16 What I see, the negligence that
17 Chevron has had over this refinery, is just
18 atrocious. And I want to say, if it comes to
19 that they want to start this refinery back up
20 with 2,000 clamps on it, the community and the
21 workers need to unite together and even take
22 direct action to make sure that this refinery

1 does not run conditions that may be unsafe for
2 the workers, the communities, or the
3 environment as a whole.
4 So, thanks.
5 (Applause.)
6 DR. HOROWITZ: Thank you. That's
7 it, Mr. Chairman.
8 CHAIRPERSON MOURE-ERASO: Thank
9 you, Doctor Horowitz.
10 So I would like to pass the gavel
11 to Richard Loeb, the General Counsel of the
12 CSB, to conduct the vote for us.
13 MR. LOEB: I need a motion. But
14 would you like me to take the --
15 CHAIRPERSON MOURE-ERASO: The
16 whole thing. You're the lawyer.
17 MR. LOEB: Well, then, I guess the
18 question then, which the Board -- would you
19 like to make the motion?
20 MEMBER GRIFFON: I can make a
21 motion, yes.
22 MR. LOEB: Thank you.

1 MEMBER GRIFFON: I would move that
2 the Board approve the interim investigation
3 report on the Chevron Richmond refinery fires,
4 and all the recommendations, and the
5 associated video.
6 MEMBER ROSENBERG: I second that
7 motion.
8 (Applause.)
9 MR. LOEB: I will call the vote.
10 Doctor Rosenberg?
11 MEMBER ROSENBERG: Aye.
12 MR. LOEB: Mr. Griffon?
13 MEMBER GRIFFON: Aye.
14 MR. LOEB: Doctor Moure-Eraso?
15 CHAIRPERSON MOURE-ERASO: Yes.
16 (Applause.)
17 MR. LOEB: In that case, we have
18 three votes in favor, and it is unanimously
19 passed.
20 (Applause.)
21 CHAIRPERSON MOURE-ERASO: I have
22 some very fast closing remarks. I only have

1 thanks to give. Thanks to the public that has
2 stayed here to the last minute and accompanied
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12 So thank you very much, and good
13 night.
14 (Applause.)
15 (Whereupon, the meeting was
16 concluded.)
17
18
19
20
21
22

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U.S. CHEMICAL SAFETY BOARD

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CHEVRON RICHMOND REFINERY

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PUBLIC MEETING

+ + + + +

WEDNESDAY,

JANUARY 15, 2014

+ + + + +

U.S. CHEMICAL SAFETY BOARD MEMBERS PRESENT:

RAFAEL MOURE-ERASO, Ph.D., Chairperson, U.S. Chemical Safety Board
MARK GRIFFON, Member, U.S. Chemical Safety Board
BETH J. ROSENBERG, Sc.D., M.P.H., Member, U.S. Chemical Safety Board

STAFF PRESENT:

DANIEL M. HOROWITZ, Ph.D., Managing Director
RICHARD C. LOEB, General Counsel
*HILLARY COHEN, Communications Manager
DON HOLMSTROM, Director, Western Regional Office
*AMY McCORMICK, Contracting Officer
AMANDA JOHNSON, Investigator
DAN TILLEMA, Team Lead

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1 P R O C E E D I N G S

2 (6:30 p.m.)

3 CHAIRPERSON MOURE-ERASO: And

4 that's kind of a reflection of the magnitude

5 that these problems can have. In here, we

6 have problems with the air. In Charleston,

7 West Virginia, they have serious problems with

8 the water.

9 Before we go any further

10 (inaudible), it's necessary that we review the

11 safety exits. If nothing happens to us and

12 everything is normal, you will leave the

13 building the way you entered.

14 But if something goes wrong, you

15 have to be aware that there is two exits here,

16 two emergency exits, in addition to the two

17 ones that are in the front over there. We are

18 supposed to do that in the safety meeting.

19 I would like to introduce my

20 fellow board members and the people that are

21 here on the panel. I am Rafael Moure-Eraso.

22 I am chairperson of the U.S. Chemical Safety

1 Board.
2
3 And with me I have, to my left,
4 Dr. Beth Rosenberg, CSB board member. I have,
5 to my right, Mark Griffon, which is also a CSB
6 board member. The three of us are, at this
7 time, the board of the Chemical Safety Board.
8 Also with me here, to my right, is
9 the General Counsel of the Chemical Safety
10 Board. And, you know, he is going to be
11 helping us to deal with any legal or any
12 matters that relate to how to run the meeting.
13 Mr. Richard Loeb is here, sitting to my right.
14 Also here is the investigative
15 team with the director of our Western office
16 is sitting to my left and our medical director
17 and our communications director is sitting to
18 my right. We'll go into details in those
19 presentations when they are to speak.
20 I don't know if all of you were
21 able to see an agenda. There is an agenda of
22 how we're going to proceed that I am going to

1 read as follows, the agenda.
2 The first thing I would like to do
3 is I am going to give you some introductory
4 remarks from the Chair. I am sure you all
5 know that we released the last draft of our
6 federal report, this precisely one that we are
7 looking today, at a press conference here on
8 December the 16th, 2013.
9 The objective of that press
10 conference and releasing the report then was
11 to ask for public comment on the contents of
12 the report and specifically on the
13 recommendations of the report.
14 And the comments are in and can be
15 reviewed on the CSB Website with our specific
16 responses that we have to the comments that
17 were presented.
18 The period that we asked for
19 people to send comments were from December
20 16th through January 3rd. And we got a
21 substantial amount of comments that we
22 reviewed.

We have considered and we have incorporated suggestions from these comments in the final report that we are discussing today.

The comments that we received were from the State of California, from California OSHA, I'm sorry, from Federal OSHA, from the Chevron Company, from the University of Texas A&M, the Mary K. O'Connor Center for Process Safety.

We have comments from the American Petroleum Institute for the United Steel Workers Local 5 which is the one that represents the workers here in Richmond and also comments from the United Steelworkers International.

We have comments from the Center for Chemical Process Safety, from the American Institute of Chemical Engineers. We have comments from the American Fuel and Petrochemical Manufacturers, the American Chemical Council, the Western States Petroleum

1 Association, the California Refinery Action
2 Collaborative and from 15 individuals that it
3 was their statement.
4 The work of our staff has been the
5 diligent and difficult work of trying to
6 understand and incorporate the suggestions
7 that we thought that were relevant into our
8 final report.
9 That report today is going to be
10 presented officially. And we are then voting,
11 the Board is going to vote for approval or
12 disapproval of the recommendations as they
13 appear in the report.
14 The reasons that we are here, that
15 we deployed to this problem and initiated
16 these investigations, is because we believe
17 that we have a fundamental refinery safety
18 problem in the United States.
19 In 2012 alone, the CSB tried 125
20 significant process safety incidents at the
21 U.S. petroleum refineries. Seventeen of these
22 took place in your State, in California. The

1 current regulatotry system clearly is not
2 working to make these facilities as safe as is
3 possible for you.
4 Refineries account for the highest
5 number of reportable accidents among the
6 facilities who are covered by the EPA risk
7 management program rules in the whole United
8 States. Refinery is the Number 1 industrial
9 group that has the most frequent accidents
10 that are reportable in their R and P.
11 We have examined a Swiss MS.
12 REYNOLDS: report. Swiss Re is a great
13 insurance company that looks at production
14 worldwide. And this company reported, with
15 data from 2005, that the dollar cost of losses
16 for accidents in U.S. American refineries was
17 almost three times that same cost of losses
18 from refineries from the European Union. So
19 we do have a problem in refineries.
20 In the world of the CSB, six of
21 our current 13 ongoing CSB investigations are
22 in U.S. refineries.

1 The OSHA, after our recommendation
2 on the BP Texas City explosion in 2005,
3 initiated a new emphasis program on process
4 safety management that looks at refineries.
5 And we took a sample of refineries
6 in the United States. And they have serious
7 problems of compliance with the process safety
8 management to be in this study that is called
9 the Emphasis Program for refineries.
10 All of these facts are presented
11 in detail, properly annotated, in the CSB
12 investigation report that we are voting on
13 today and that can be found outside.
14 Our CSB report finds that the
15 regulatory system in the U.S., we find it
16 wanting. The CSB report today calls for
17 sweeping changes in the way refineries are
18 regulated in California.
19 Our investigation team will
20 outline this report to you in detail. I urge
21 you to listen carefully to the special
22 recommendations that the Board will consider

1 for the State of California to establish a
2 more rigorous safety management regulatory
3 framework for petroleum refineries.
4 You will be hearing about what
5 will be a new approach in this country for
6 refinery regulation, the Safety Case regime.
7 The principles the Safety Case framework
8 actually use regulatory systems in the United
9 Kingdom, in Australia and in Norway.
10 The applications of similar
11 principles of the Safety Case regime are also
12 found in the United States. You will look at
13 the safety management of the Nuclear
14 Regulatory Commission and of NASA principles
15 of Safety Case are applied there. And they
16 are now conforming to the U.S. experience of
17 safety management.
18 By adopting our recommendation of
19 the Safety Case regime, the State of
20 California could become the National test bed
21 for refinery safety regulation designed to
22 prevent catastrophic failures.

1 Over the years, the CSB has
2 gathered a lot of data on the root causes of
3 biochemical accidents and has evaluated the
4 opportunities of the refinery and chemical
5 industry regulatory system.
6 I believe all of us on the Board
7 appreciate the work of our investigatory team
8 that has focused on this root cause and has
9 looked at all the issues that I am presenting
10 to you today.
11 We also would like to applaud the
12 work of the government of California
13 interagency task force for their proactive
14 approach to protect workers and public safety
15 in California following our interim report
16 last April and for the progress that they have
17 us on our recommendations to this particular
18 report.
19 Now, I would like to call on my
20 colleagues of the CSB Safety Board for any
21 opening remarks. So Member Rosenberg?
22 MEMBER ROSENBERG: Thank you.

1 Good evening. The CSB found that Chevron had
2 been warned at least seven times over a decade
3 that pipes were subject to sulfidation
4 corrosion and they should be inspected and, if
5 necessary, replaced.
6 All three board members, as well
7 as Congressman Miller, agreed that the pipe
8 failure was really a management failure to
9 heed any warnings of its own employees and
10 evidence from experts. Chevron's management
11 failure has yet to be explained.
12 And now we are proposing a
13 different regulatory regime which has been
14 widely touted as a new, improved safety
15 regime.
16 There are many appealing aspects
17 of the Safety Case regime which you will hear
18 about tonight. While I do not oppose trying
19 to implement some of the positive aspects of
20 the Safety Case regime in California, I have
21 reservations.
22 The idea of industry making the

1 case to a competent regulator that it can
2 carry out its business safely and having labor
3 provide checks and balances is a very nice
4 model if all three parties have somewhat equal
5 power. Safety Case regime can work if labor,
6 Government and industry are balanced.
7 I have real concerns that if we
8 implement the Safety Case regime, we will
9 simply be duplicating the same power relations
10 of weak labor, weak Government and strong
11 industry in a different format.
12 In the offshore oil industry in
13 the U.K., Safety Case has shown to improve
14 safety, not so on onshore facilities.
15 Dr. Nancy Leveson, an MIT
16 professor of engineering systems who served on
17 the Baker Panel that was convened by the CSB
18 in the aftermath of the BP Texas City incident
19 in 2005, says in her public comments that,
20 "The available evidence indicates that the
21 Safety Case offers no superior protection
22 against process safety incidents."

1 In fact, the poor use of Safety
2 Case has been faulted in numerous accidents.
3 An independent review of the 2006 loss of the
4 RAF Nimrod which resulted in 14 fatalities
5 leveled harsh criticisms of the Safety Case
6 regime including that, "The Safety Case regime
7 has lost its way, led to a culture of paper
8 safety at the expense of real safety."
9 Rory O'Neill, long time labor
10 activist in the U.K., editor of Hazard
11 Magazine and good friend of the United
12 Steelworkers, in a recent email sarcastically
13 referred to the magic Safety Case because it
14 was falling so far short of expectations.
15 In an email yesterday, O'Neill
16 said the Safety Case is, "Amounting to
17 enormous piles of paper submitted to an agency
18 with few and rapidly declining resources to
19 scrutinize them and fewer still to detect
20 compliance."
21 On the other hand, what we have
22 now is not working. And you deserve something

1 better. I understand your eagerness to try
2 something new. This report is a very good
3 start to exploring a new possibility about
4 what a Safety Case regime could be.
5 But the public comments, as well
6 as what I've learned about Safety Case in the
7 last year, give me pause. there is much more
8 to learn from other countries that have a
9 Safety Case regime about how it actually works
10 in practice. I'm uneasy with the fact that
11 Safety Cases are not public documents. So you
12 and I can't see them.
13 Three months ago, I asked you
14 Judith Hackitt, the head of HSE which is U.K's
15 OSHA, about the role of labor in Safety Cases.
16 She said that Safety Cases are mainly
17 negotiations between companies and the
18 Government, and labor isn't really involved,
19 nor is the public.
20 I cannot, in good conscience,
21 recommend something where labor and
22 communities might be weakened in any way.

1 Further, even if you decide to implement the
2 Safety Case regime, it will take years to
3 train regulators in industry and figure out
4 how it dovetails with regulations. Safety
5 Case regime is a long term plan. You need
6 more immediate remedies that have not been
7 implemented.
8 Contra Costa County has been
9 touted as a model program in refinery safety,
10 yet there were failures.
11 The CSB investigators know the
12 gaps in the safety program and made two
13 recommendations in our previous report but
14 left some gaps without remedies.
15 These include the need for more
16 resources to allow reasonable staffing levels
17 with adequate salaries for inspectors and for
18 inspectors to have direct enforcement
19 authority rather than having to refer
20 violations they find to the district attorney
21 with a recommendation for enforcement. The
22 CSB could investigate this problem quickly and

1 make appropriate recommendations.
2 The issue of timely abatement has
3 been brought up in this state. Currently, the
4 employer is not obligated to correct a
5 violation if the employer files an appeal.
6 And we know litigation can take years. If the
7 violation presents a serious hazard, it makes
8 no public health sense for a known hazard not
9 to be corrected.
10 Washington State has a version of
11 the timely abatement and even when an appeal
12 is filed while still giving employers due
13 process rights. OSHA supports this.
14 Assembly member Nancy Skinner and
15 Senator Loni Hancock passed such a bill last
16 year that was vetoed by the Government. But
17 thankfully, they have not given up and will
18 re-introduce it. We at the CSB should be
19 involved in this effort.
20 These few issues of resources for
21 Contra Costa County inspectors expanding
22 enforcement authority and timely abatement are

1 remedies that the CSB could make
2 recommendations on now.
3 So to summarize, this report is a
4 very, very good start in illustrating the
5 benefits of Safety Case regime. The staff is
6 to be commended for their excellent work thus
7 far.
8 I don't think we, that is both the
9 staff and the Board, have had time to
10 adequately examine the down sides of Safety
11 Case regimes in practice and how we can
12 prevent them from occurring here.
13 More importantly, there are clear
14 short term remedies that need our immediate
15 attention to protect workers and the public.
16 Thank you.
17 (Applause)
18 CHAIRPERSON MOURE-ERASO: The
19 statement of Board Member Griffon is next.
20 MEMBER GRIFFON: Thank you, Mr.
21 Chairman. Good evening. I'm excited to be
22 here in Richmond once more to discuss some

1 possible solutions which could go a long way
2 to preventing another incident like the one
3 that took place in August 2012.
4 I want to start by stressing what
5 I mentioned in the meeting that we had in
6 April of 2013. These type of incidents at
7 refineries around the U.S. are far too common.
8 I also say, again, that I believe
9 a significant factor contributing to the
10 incidents in the refinery sector is the age of
11 the facilities.
12 The fact that was stressed in the
13 U.K. health and safety executive study, which
14 showed that 50 percent of the major hazard
15 loss of containment events were primarily due
16 to aging plant mechanisms such as corrosion,
17 erosion and fatigue. Any regulatory solution
18 we consider must consider this important
19 factor.
20 Chevron was clearly aware of a
21 corrosion problem and yet repeated warnings
22 were dismissed. If Chevron management had

1 listened to their own experts, this incident
2 may have been prevented.
3 I am very interested in gaining a
4 better understanding of what appears to have
5 been management's failures. And as Dr.
6 Meshkati from the University of Southern
7 California noted in his comments to the CSB,
8 the oil refinery industry's safety culture,
9 and its senior management safety consciousness
10 and genuine commitment are the keys to moving
11 above and beyond the bare minimums achieved by
12 regulatory compliance.
13 These type of management failures,
14 it seems to me, are independent of the
15 regulatory framework in place. I look forward
16 to our final report on Chevron which will
17 cover these organizational questions.
18 So, we're here tonight to discuss
19 the regulatory findings and recommendations
20 for the County and the State.
21 When we first made our decision to
22 investigate the incident, a big factor was the

1 effect the incident had on the community and
2 the effectiveness of the Contra Costa County
3 Health Services model. After all, this model
4 was a model held up and touted by the CSB for
5 years.
6 In the CSB, their report, an
7 entire section was dedicated to describing the
8 Contra Costa model. And yesterday, someone in
9 Charleston, West Virginia, was calling for
10 implementation of CSB recommendations for
11 Kanawha County to adopt a model like the
12 Contra Costa County.
13 We need to know if this model
14 didn't work. And we need to, if possible,
15 make recommendations to improve the
16 effectiveness of the Contra Costa Industrial
17 Safety Ordinance.
18 The draft regulatory report makes
19 many very interesting findings with regard to
20 deficiencies in the current process safety
21 regulations and provides a good description of
22 an alternative model for Safety Case.

1 While the staff deserves credit
2 for their extensive research, the report
3 leaves many questions unanswered. Comments
4 received from a wide spectrum of stakeholders
5 and experts in just the past several weeks
6 indicate more study is needed.
7 The American Fuel and Petroleum
8 Manufacturers said the CSB should continue to
9 study and analyze different regulatory
10 regimes.
11 Professor Michael Baram of Boston
12 University said discussing implementation
13 issues would also correct an obvious imbalance
14 in the report. And Mike Wright of the United
15 Steelworkers said a great deal more work needs
16 to be done before a Safety Case system can be
17 fully considered as a regulatory model for
18 California.
19 I agree with these comments. It
20 also seems clear that many of the elements of
21 Safety Case may have applicability to the
22 current regulatory approach. This raises the

1 question should the CSB advocate for total
2 reform of the regulatory regime to a Safety
3 Case regime? Or should we propose to
4 strengthen the current regulatory approach?
5 I would argue this is not an
6 either/or proposition. We can and should do
7 both. In the near-term, I think it is
8 important to put forward options that
9 strengthen the current regulatory approaches.
10 For example, it seems to me that
11 an adequately resourced agency with a
12 sufficient number of highly qualified
13 inspectors is needed in the current system as
14 well as a possible Safety Case regime.
15 And also, it seems reasonable to
16 me to give the current regulator the authority
17 to require generally accepted best practices.
18 Perhaps such a change does not require a
19 regime change.
20 Considering recommendations to fix
21 the current regulatory approach may require
22 further work on the part of the CSB. But it

is also much more likely to have a more immediate effect on improving safety for California, and Contra Costa County refineries and the communities near the refineries.

It is critical that the CSB consider these more immediate options for both Cal/OSHA and the Contra Costa Health Services.

I believe the Safety Case approach is a very interesting model which may be the future for process safety for highly hazardous facilities in California and in the United States. However, it is also clear to me that much more needs to be studied, especially with regard to implementation.

The draft report focuses on the strengths of the Safety Case approach abroad but falls short in addressing obstacles or challenges to implementing such a regime in California or the United States.

Please don't misinterpret my statement to be against the concept of Safety Case. In fact, quite the opposite is true.

1 I believe it has some very appealing
2 attributes.
3 But I also believe that for this
4 report to have the greatest impact it needs to
5 be more complete. The report needs to address
6 the criticisms head on and include a complete
7 assessment of challenges and potential
8 obstacles to implementation in California.
9 To close, I would like to say we
10 have a unique opportunity to consider reforms
11 of process safety, not only in California but
12 across the Nation.
13 The multi-agency working group
14 established under the Executive Order 13650
15 specifically asked for input on whether OSHA
16 and EPA should consider implementation of a
17 Safety Case regulatory model.
18 Additionally, OSHA has an open
19 request for information regarding the PSM,
20 process safety management requirement. A
21 strengthened CSB report could provide near-
22 term solutions as well as a path toward

1 broader reform. Thank you.
2 (Applause)
3 CHAIRPERSON MOURE-ERASO: Thank
4 you, Member Griffon. Following the agenda, we
5 have another request from the various elected
6 officials and the representatives to address
7 this group.
8 The first person that I would like
9 to give their statements is Mayor McLaughlin,
10 Mayor of the City of Richmond. So Mayor
11 McLaughlin?
12 (Applause)
13 MAYOR MCLAUGHLIN: Hello.
14 Welcome, everyone. I want to welcome you all,
15 the community, everyone here, the
16 organizations.
17 I want to thank the CSB for
18 holding your public meeting here. I want to
19 thank the CSB staff for your long, hard hours
20 in investigating this and, of course, the
21 Board in their review and investigation of all
22 the matters that are related to the oil

industry's problems and impact to that.

We feel, in Richmond, and we know other areas of the Bay, and other areas of California and our Nation suffer from it as well.

Now, the Richmond Chevron Refinery is the second largest oil refinery in the State of California and the largest in the Bay area. And in Richmond, our residents have suffered decades of severe consequences from its presence.

For too long, we've lived in the shadow of this polluting industry, suffering the impact of what comes out of the smoke stacks. And it's rained into our air and into our lungs. And we've suffered the impact of incidents that have sent us into our homes sheltering in place.

So I'm here today to stand with community members, community organizers, and responsible members of the scientific community to say that it's essential that the

1 oil industry be held accountable to us.
2 Children in Richmond already
3 suffer disproportionately from severe asthma.
4 They are hospitalized for this condition at
5 twice the rate of children throughout the
6 County.
7 After August 6th, 2012, the day of
8 the fire, time and time again I have heard
9 testimony from residents about how the fire
10 has impacted their lives, burning eyes,
11 breathing difficulties, other respiratory
12 problems and concerns about other very, very
13 serious symptoms as well.
14 In fact, we know over 15,000
15 residents went to local hospitals with a host
16 of serious symptoms. And, of course, 19
17 workers nearly escaped with their lives. So
18 we know that this was a horrible incident. We
19 know that the horrible black plume of toxins
20 spread across Richmond and way beyond.
21 It's great that the CSB staff has
22 recommended such a progressive and aggressive

1 approach to safety. That is what is needed in
2 our community that has suffered for too long
3 with the risk and health impact of this
4 refinery.
5 So I'm very grateful to the CSB
6 staff for its work on investigating the fire
7 of 2012 which, by the way, was only the most
8 recent of dozens of incidents that have
9 occurred from Chevron Richmond refinery over
10 the past 20 years.
11 They are recommending, as you
12 heard, the Safety Case regime which is already
13 used in European countries. It's used by the
14 U.S. Nuclear Regulatory Commission, and it's
15 used by NASA. It needs to be used by the oil
16 industry as well.
17 It shifts the focus to prevention,
18 and it shifts the burden to the industry. We
19 want the industry to show us how major hazards
20 and risks will be reduced as low as reasonably
21 practicable. The industry needs to move from
22 a reactive approach to a preventative

1 approach. And that's exactly what's being
2 recommended.
3 Now, these recommendations are
4 very important to us here in Richmond.
5 Because we have a long history of an
6 environmental justice movement. And this new
7 Safety Case is absolutely what is needed.
8 And we should not move forward
9 with any permits for any projects of any oil
10 industry, I should say, not only of any
11 projects here at the Richmond Chevron
12 Refinery. We should not move forward with any
13 permits until the Safety Case regime is
14 implemented.
15 (Applause)
16 MAYOR MCLAUGHLIN: And I want to
17 say that that's already being worked on in
18 terms of the Industrial Safety Ordinance. I
19 know the Health Department in the County is
20 working and the community groups. And I will
21 be supporting that we intensely insert into
22 this ordinance the Safety Case regime.

1 And I know we have our Vice-Mayor
2 and Council Member, Council Member Rogers,
3 Vice-Mayor Beckles, that are on our committee
4 to review the ISO, the Industrial Safety
5 Ordinance. And that is what I know I will be
6 looking for in that ordinance.
7 So I want to end with basically
8 saying, you know, in Richmond, we're on the
9 cutting edge of a lot of progressive issues.
10 And that's because we want nothing short of
11 environmental justice, economic justice and
12 social justice.
13 We have no choice. This is our
14 home. We're the ones that hear the sirens.
15 We're the ones that are forced to pull our
16 kids off the streets when the sirens go off
17 and come into the homes and, you know, duct
18 tape the doors and the window and stay in our
19 homes, as if we're in prison, until we're told
20 all's clear, never knowing how much harm is
21 out there, what the toxins are, what the risk
22 is to us, and our children and grandchildren.

We're the ones that cannot stand by and let an incident like what happened on August 6th, 2012, ever, ever happen again.

Chevron is a multi-billion dollar company. It has the means to do what is right in a preventative way. So we know they can do a whole lot better. We call on the Board to please know that this is right for our community.

We will move ahead anyway, regardless. But we call on you to do what is necessary for our rights, our safety and our health. And so we will move forward to do the right thing for our community with the elected officials who are committed to stand by our community.

We thank you for your investigation. We hope you vote to move forward with all the recommendations. And with that, we call on Chevron to do better, because we demand it of you.

(Applause)

1 CHAIRPERSON MOURE-ERASO: Thank
2 you very much, Mayor McLaughlin. The next
3 person is the Vice-Mayor Beckles.
4 (Off microphone discussion)
5 VICE-MAYOR BECKLES: Good evening,
6 everyone. So glad to see so many faces here
7 tonight supporting our community. That's
8 really a beautiful thing. So my name is
9 Jovanka Beckles. I'm the current Vice-Mayor
10 of the City of Richmond.
11 You know, for many years the only
12 places that people of color could afford or
13 were welcome in were the areas that others
14 regarded as too dangerous or too unpleasant.
15 So it's no surprise that the
16 makeup of the community closest to Chevron is
17 disproportionately people of color and low
18 income individuals. It's also no surprise
19 that we have to fight so hard to get Chevron
20 to take the steps that truly protect these
21 communities.
22 Now, how many of you know that,

1 you know, if this corporation might be a
2 little bit more motivated if its executives
3 lived right next to the refinery. How many of
4 you --
5 (Applause)
6 (Off microphone discussion)
7 VICE-MAYOR BECKLES: Exactly.
8 But in reality, the social factors that lead
9 the world of the community are not really
10 relevant.
11 The fact is that there is now a
12 community in close proximity to a very
13 dangerous operation. And the needs of people
14 must always come first or we all lose our
15 humanity.
16 We are not just talking about the
17 big events like that of August 12th that could
18 have blown up this community. And it did
19 considerable health damages to our community.
20 But we're talking about the smaller events
21 that don't make the news, the leaks or the
22 flaring that put greater amounts of toxic

1 chemicals into the air of people who are
2 already suffering from high asthma rates.
3 The Chemical Safety Board has
4 identified the problem as not just one of
5 Chevron's neglects. The CSB is saying that we
6 don't have a regulatory system that actually
7 protects us from the dangers inherent in the
8 refinery process.
9 The Board is recommending a
10 doctrine of a more rigorous safety management
11 program for refineries in California,
12 specifically, well, the talk of the framework
13 that's already being done in the U.K.
14 However, as a member of the
15 committee, the safety ordinance committee, I'm
16 insisting, I'm insisting that the Safety Case
17 procedures be implemented in the ISO for
18 Contra Costa County.
19 Now, this would be the first step.
20 We realize that. Board Member Rosenberg is
21 actually correct, because without a stronger
22 (inaudible) that represents the people and not

1 corporations can this protect us.
2 So I thank you all so much for
3 being here and a big, big thank you, big thank
4 you to the Chemical Safety Board for your work
5 on behalf of us. And we certainly hope you
6 will vote on behalf of us. Thank you.
7 (Applause)
8 CHAIRPERSON MOURE-ERASO: Thank
9 you, Vice-Mayor Beckles. I would like to go
10 now to Barbara Johnson from the Office of
11 Congressman George Miller. Ms. Johnson?
12 (Off microphone discussion)
13 MS. JOHNSON: Thank you very much
14 for the opportunity to bring Congressman
15 Miller's message to you here tonight. It's a
16 little lengthy, so I'll get right to it.
17 "Dear Chairman Moure-Eraso,
18 Members Griffon and Rosenberg, I want to thank
19 the CSB for coming back to Richmond. I regret
20 that I'm unable to be there this evening, as
21 we have votes in Washington, D.C. today.
22 "I'm grateful to the CSB for

1 breaking ground on the discussion over Safety
2 Case model as a possible alternative to the
3 existing regulatory framework that is failing
4 to prevent all too frequent major accidents,
5 and fires and releases from oil refineries.
6 "There are objective indicators
7 worth noting. Financial losses at U.S.
8 refineries which pour into insurance data have
9 been three times higher than in European Union
10 countries and the Far East.
11 "What is new and different about
12 the Safety Case is that facilities must
13 demonstrate to an expert regulator that they
14 have assessed major accident hazards, have put
15 in place barriers and safety management
16 systems and that these systems are working.
17 Importantly, this demonstration is tied to
18 consent to operate.
19 "According to experts, the Safety
20 Case model has reduced major accidents at
21 offshore oil platforms. However, what is of
22 particular interest is this, have major

1 accidents been reduced at the oil refineries
2 after the Safety Case regime was implemented.
3 It would be helpful if CSB could provide that
4 data to clarify that point.
5 "While this report lays a valuable
6 foundation for further discussion on processes
7 and safety reforms, I would be remiss if I did
8 not note that there are near-term
9 opportunities for improvement in Cal/OSHA and
10 the Contra Costa County Health Services
11 programs that were excluded from the CSB
12 report. I would respectfully ask that you
13 consider these changes prior to finalizing
14 this report.
15 "Before we examine the role of
16 regulators, it's important to keep in focus
17 that the root cause of the August 6th, 2012,
18 fire was, at its core, a management systems
19 failure.
20 "We know that there was failure to
21 conduct inspections with 100 percent of piping
22 at risk for sulfidation corrosion as called

1 for in Chevron's internal procedures and in
2 industry guidance. Why did management fail to
3 adopt these recommendations from its
4 metallurgists and materials engineers?
5 "Chevron is filled with
6 extraordinary engineering expertise, but to
7 this day it remains puzzling how knowledge
8 about catastrophic failures caused by
9 sulfidation corrosion, coupled with red flags,
10 were not credited in the decision making
11 process that allowed paper-thin piping to
12 remain in use.
13 "It has been nearly a year since
14 Cal/OSHA assessed nearly a $1 million fine
15 against Chevron. It is the largest fine in
16 Cal/OSHA's history.
17 The agency issued 25 citations,
18 including 11 in the most serious category
19 designated as willful and serious. Those
20 include Chevron not following its own policies
21 to replace the corroded pipe, not implementing
22 its own emergency procedures and pervasive

1 violations in leak repair procedures such as
2 the failure to replace pipe clamps at the
3 turnaround or sooner.
4 "Clamps are commonly used as
5 temporary repairs to allow refineries to fix
6 leaking pipes without having to shutdown the
7 operation. But they are just that. They're
8 temporary.
9 "Cal/OSHA found Chevron left
10 clamps in place far longer than the previous
11 turnaround in violation of well-accepted
12 industry guidance. Cal/OSHA ordered the pipe
13 clamps to be replaced by March 4th, 2013.
14 "Yet ten months later, I'm advised
15 that some of the clamps put on valves and
16 pipes carrying hydrocarbons and hydrogen have
17 yet to be replaced and that Chevron will not
18 replace these until the next turnaround in
19 late 2014.
20 "This begs a number of questions.
21 Why is this the case nearly a year after
22 Chevron was cited? Who has assessed whether

1 there is an acceptable risk of keeping these
2 clamps in place?
3 "Under the California labor code,
4 an employer is not obligated to correct a
5 Cal/OSHA safety violation if they file an
6 appeal. Chevron appealed its citations on
7 February 19th, 2013, and the legal requirement
8 to correct these violations has now been
9 blocked until the litigation is completed.
10 Litigation can take years to resolve.
11 "The California model is not the
12 only model. Oregon and Washington State both
13 require timely abatement when an appeal is
14 filed while giving employers due process
15 rights.
16 "Assembly Member Nancy Skinner and
17 Senator Loni Hancock have passed a bill last
18 year that requires employers to correct
19 serious and willful safety violations while
20 litigating appeals unless they can demonstrate
21 to Cal/OSHA or a judge that the health and
22 safety of workers will not be adversely

1 affected by postponing the abatement.
2 "This framework ensures affected
3 workers and their unions have a voice in that
4 decision. Regrettably, this bill was vetoed
5 by the Governor.
6 "I would respectfully add that the
7 CSB, prior to finalizing this regulatory
8 report, assess the issue of timely abatement
9 and consider making recommendations to the
10 Legislature and the Governor on this matter.
11 "This should not be a new issue,
12 as my staff raised this issue with the CSB
13 last October. Further, timely abatement will
14 be an issue whether or not Safety Case regime
15 is adopted.
16 "An employer's ability to
17 effortlessly block timely abatement during the
18 pending of an appeal is at fundamental odds
19 with worker and public protection.
20 "The failure to close this
21 loophole and require abatement while employers
22 litigate led to the needless deaths of two

1 barge track workers near Pleasanton last year.
2 "In the opinion of many experts,
3 Contra Costa has the best Industrial Safety
4 Ordinance at the County level anywhere in the
5 country.
6 "When the fire broke out on August
7 6th, 2012, and a shelter in place order was
8 issued, the CSB deployed to assess what went
9 wrong but also advised my office that, in
10 light of this release, they wanted to see if
11 the Industrial Safety Ordinance and Contra
12 Costa's Health Services program had
13 opportunities for improvement.
14 "I was pleased that CSB provided
15 Contra Costa County and the City of Richmond
16 with two recommendations regarding the Safety
17 Case ordinance, ISO, in its interim report.
18 "I understand Supervisor John
19 Gioia and Richmond City officials are working
20 diligently to implement these recommendations,
21 particularly strengthening requirements for
22 process hazard analysis and demonstrating the

1 use of inherently safer systems.
2 "CSB staff has identified other
3 gaps in the Contra Costa safety program.
4 However, recommendations were not included in
5 the regulatory report before us today. These
6 include the need for Contra Costa Health
7 Services to have direct enforcement authority
8 under the Industrial Safety Ordinance.
9 "Since enforcement under the ISO
10 has to be referred to the district attorney
11 and his office has to decide whether to bring
12 such action in court, enforcement actions are
13 rare at best.
14 "When inspectors do find
15 violations, they are generally limited to
16 issuing recommendations. By contrast, Contra
17 Costa Health Services has authority to
18 directly enforce the California Accidental
19 Release Program regulations.
20 "It is logical to expand the
21 County's enforcement authority and also cover
22 the ISO. Now, the CSB assessed whether the

1 ISOs could be more effective if Contra Costa
2 Health Services had the authority to bring
3 enforcement actions on its own instead of
4 making recommendations when violations are
5 identified.
6 "If so, it's timely to issue a
7 recommendation that could strengthen," I'm
8 sorry. "If so, is it timely to issue a
9 recommendation that could strengthen the
10 enforcement?
11 "The need for added resources to
12 assure comprehensive facility inspections, the
13 hazardous materials program has a budget of
14 only $1.2 million and was allocated a mere
15 five employees to carry out inspections in the
16 seven major facilities covered on the ISO plus
17 38 other facilities covered under CalARP.
18 "As a result, hazardous materials
19 program officials can only inspect a fraction
20 of the operating units in refineries.
21 "CSB's report identified low
22 salaries as a barrier to fill in vacant

1 positions. Due to low salaries, one in five
2 positions has been vacant for three years. It
3 would be helpful if CSB could assess and make
4 specific recommendations regarding appropriate
5 levels of staffing, options for funding
6 sources, such as increasing fees, and the need
7 for adequate salaries to attract and retain
8 qualified engineers.
9 "The cornerstone of the Safety
10 Case is the authority for regulators to
11 require operators to raise the bar on safety
12 performance as new technology, scientific
13 findings and management systems are developed.
14 "CSB identified a weakness in the
15 County hazards materials program which limits
16 its compliance reviews to the regulations and
17 does not generally go beyond these, even when
18 there's well established data that shows that
19 the risk can be feasibly reduced.
20 "It would be helpful if CSB could
21 provide recommendations that would strengthen
22 the ISO by authorizing the hazardous materials

1 program officials to require refineries to
2 adopt best industry practices or standards as
3 part of its toolkit.
4 "In conclusion, I want to thank
5 CSB for coming back to Richmond, sharing its
6 expertise and ideas for reforms. I believe
7 the Safety Case merits consideration by the
8 state. And I'm pleased that the Governor's
9 Refinery Task Force will be studying it
10 carefully.
11 "At the same time, I would ask
12 that the CSB strengthen the recommendations in
13 this draft regulatory report by making
14 findings and recommendations to require timely
15 abatement as part of the California labor code
16 and to improve the Industrial Safety
17 Ordinance.
18 "These added measures, if adopted,
19 would provide near-term protections that
20 workers and residents need and deserve.
21 Sincerely, George Miller, Member of Congress."
22 Thank you very much for your time.

(Applause)

CHAIRPERSON MOURE-ERASO: The next elected official is a representative of Supervisor, John Gioia, Mr. Terrance Cheung.

MR. CHEUNG: Good evening, Supervisor Gioia regrets he cannot be here this evening. He's in Sacramento attending to some county matters.

"Dear Chairman Moure-Eraso and Members Griffon and Rosenberg, I want to thank the U.S. Chemical Safety Board for its thorough investigation and interim recommendations regarding the August 2013 Chevron fire.

"The protection of residents and workers around refineries can be improved and more needs to be done to stop major fires, accidents and releases. Our community deserves nothing less than the safest facilities possible.

"As a member of the California Air Resources Board, the Bay Area Air Quality

1 Management District and the Contra Costa
2 County Board of Supervisors, I appreciate the
3 proactive role taken by the CSB to make
4 recommendations to improve our local
5 regulations with a goal of improving safety.
6 "Let me assure you that the March
7 2013 interim report's recommendations to
8 strengthen our local industry Industrial
9 Safety Ordinance to require the use of
10 inherently safer systems have been taken
11 seriously.
12 "A joint committee of city and
13 county officials has worked to draft
14 amendments to the ISO to implement your
15 recommendations. And I expect that those
16 amendments will go before the Board of
17 Supervisors and City Council in the next
18 months for adoption.
19 "The December 2013 draft final
20 report discussion on whether a better
21 regulatory model, such as a Safety Case
22 regime, could improve refinery safety

1 performance is important and should be
2 considered.
3 "The frequency of major refinery
4 accidents in the U.S., including here in
5 California, makes it timely to re-examine
6 whether there are more effective regulatory
7 models.
8 "However, there are some other
9 immediate opportunities to improve our local
10 Industrial Safety Ordinance that you may want
11 to consider in your recommendations.
12 "Many refinery safety experts,
13 including your own CSB staff, believe that
14 Contra Costa County has the most effective
15 Industrial Safety Ordinance in the United
16 States.
17 "CSB staff has identified other
18 areas that could be strengthened in our local
19 Industrial Safety Ordinance but are not
20 included in your draft report. I believe your
21 report should consider further discussion and
22 recommendations regarding these issues.

1 "First, the most effective
2 enforcement would be accomplished if Contra
3 Costa County Health Services had direct
4 enforcement authority under the ISO.
5 "Currently, enforcement of the ISO
6 is referred to the district attorney who has
7 the discretion to bring enforcement actions in
8 Court. Under the existing provisions of the
9 ISO, violations discovered by inspectors are
10 generally addressed through recommendations.
11 "Contra Costa Health Services does
12 have direct authority to enforce the
13 California Accidental Release Program
14 regulations, CalARP. It would make sense to
15 expand the county's enforcement authority to
16 include the ISO to correspond with its direct
17 enforcement authority under CalARP.
18 "Second, additional resources are
19 needed to assure comprehensive inspections, as
20 the County Hazardous Materials Program
21 officials can only inspect a fraction of the
22 operating units in refineries.

1 "The existing $1.2 million
2 Hazardous Materials Program budget only
3 supports five professional staff to conduct
4 inspections of the nine major facilities
5 covered under the ISO and the other 36
6 facilities covered under the California
7 Accidental Release Prevention Program.
8 "CSB staff has identified low
9 salaries as a barrier to filling the long
10 vacant positions and the need for individuals
11 with sufficient expertise.
12 "Having CSB make specific
13 recommendations regarding the need for
14 additional resources and appropriate levels of
15 staffing and salaries would help support local
16 action to raise the fees needed to properly
17 fund the vital program.
18 "Third, potential expansion of the
19 ISO to authorize improvements which go beyond
20 the regulations. The existing Industrial
21 Safety Ordinance limits its compliance review
22 to the regulations.

1 "I would ask that the CSB further
2 analyze and consider recommendations to
3 strengthen the ISO by authorizing Contra Costa
4 Health Services to require refineries to adopt
5 the best industry practices or standards as
6 opposed to simply asking such facilities to
7 consider such improvements.
8 "Let me briefly address the
9 Governor's work group on refinery safety. To
10 his credit, Governor Brown has established a
11 work group to look at refinery safety. The
12 work group issued a draft report in July of
13 2013 that included many recommendations to
14 address refinery safety and responding to
15 refinery accidents.
16 "A task force composed of federal,
17 state, local agencies has been formed to
18 address the findings of the report. The task
19 force will be making changes to the
20 regulations that will include addressing the
21 findings from the CSB's interim report on the
22 August 2012 Chevron fire investigation. The

1 task force will also be investigating the
2 implementation of the Safety Case regime for
3 California.
4 "I thank the CSB for supporting
5 the effort of the task force by loaning a CSB
6 employee to assist the task force.
7 "In conclusion, I want to thank
8 you for all your efforts to improve the safety
9 of workers and community and sharing your
10 staff, and expertise and thoughts.
11 "I encourage the Chemical Safety
12 Board to build upon the foundations set forth
13 in your August 2013 draft report by making
14 additional recommendations where the ISO can
15 be strengthened immediately.
16 "The issuance of your final report
17 presents an immediate opportunity to make
18 further recommendations to improve the current
19 regulatory structure to achieve near-term
20 improvements in safety.
21 Yours very truly, Supervisor John
22 Gioia, Contra Costa County." Thank you.

1 (Applause)
2 MR. CHEUNG: An electronic copy of
3 this was sent to Hillary early this afternoon.
4 CHAIRPERSON MOURE-ERASO: Thank
5 you. Thank you to Mr. Gioia and to you, Mr.
6 Cheung. I appreciate your presentation.
7 And the last person from elected
8 officials that I have here is an old friend
9 from CSB, Mr. Jim Rogers. And he has a
10 question.
11 (Off microphone discussion)
12 MR. ROGERS: Thank you. My name
13 is Jim Rogers. I'm a member of the Richmond
14 City Council, also a member of the joint
15 city/county committee that is charged with
16 developing recommendations to improve our
17 current county ISO.
18 I want to comment on, there are a
19 number of very thoughtful comments that I
20 heard, but one of them I just want to
21 emphasize. It's really worth repeating.
22 One of the comments we heard

1 tonight was that regardless of the plan, if
2 there's not people keeping after it,
3 enforcing, bird-dogging, whatever, it's not
4 going to work very well. I don't care whether
5 it's process safety management, whether it's
6 Safety Case, whatever it is, it's not going to
7 work well.
8 And the reality is that the
9 political system with refineries is that we
10 have an explosion, people pay attention. And
11 it's really important, I think, not just to
12 pay attention in the year or two after we have
13 the explosions, and the fires and the
14 releases, but to pay attention every year.
15 Because these things are a time
16 bomb ticking. And it's important that we
17 don't forget about it. You know, maybe we go
18 two, or three, or four years, five years,
19 whatever, with no incident. Well, it's still
20 a problem. And we still need to be vigilant.
21 So I'm proud that our community's
22 here, and there is concern about this. There

is a lot of thought going into it. And it's a topic that needs a lot of thought.

And I think we're here tonight, we have people who are clearly only interested in safety. And there's different opinions about the Safety Case idea as far as whether it's actually ready for prime time or that it needs to be looked at, et cetera, et cetera.

We have a very good ordinance in the ISO. As a county supervisor many years ago, as the author of the precursor which was the Good Neighbor Ordinance that was replaced by the ISO, and I think that even though it is a good ordinance, compared to other parts of this Country, it obviously didn't get the job done on August 6th.

So we need to make changes. We have made progress in the committee. We have adopted many of the recommendations that we've heard so far from the CSB. I at least am hearing some tonight that I wasn't aware of. And I will be taking those back to the

1 committee for looking at including them.
2 A couple of those would be getting
3 a better way to ensure that we do have
4 adequate enforcement. And to me it's pretty
5 simple. Chevron simply needs to pay for it.
6 And that's just the end of the story.
7 If there's regulation, whether
8 it's a question of more bodies or better paid,
9 more highly qualified bodies, whatever it is,
10 Chevron needs to pay for it.
11 And the CSB is right on target
12 that you should have people who have the same
13 level of professionalism and training as the
14 people in the industry side that they're
15 dealing with. I think that's a great
16 recommendation and one that we should be
17 supporting.
18 The timely abatement issue is one
19 which we need to look at. I believe we have
20 the authority to do that as part of our police
21 power here. And I will certainly be
22 recommending that to the committee.

1 The direct enforcement by County
2 staff is another good idea. Again, I will be
3 bringing it up to the committee as a
4 suggestion for something that we should
5 pursue.
6 When we are looking at these
7 issues, I think it's important to remember
8 (phonetic) that are a lot of very complicated
9 details.
10 And we've heard tonight that there
11 are people like Congressman Miller, some of
12 the union leaders who were mentioned earlier,
13 your Board has some different ideas about a
14 very complicated question about whether the
15 Safety Case regime is ready to be rolled out.
16 And I certainly respect those differences.
17 I think that if we're going to try
18 and move forward with this, I think that it's
19 important that we move forward in a united
20 front.
21 I think if we move forward in a
22 situation where some people are saying, yes,

1 we're ready for Safety Case and then a
2 majority of your Board says, no, you're not
3 quite ready, Congressman Miller doesn't think
4 we're ready, I frankly don't think that's
5 going to go very well.
6 And so my suggestion would be to
7 really do a full court press, try to work
8 through these issues, try to deal with some of
9 the flaws that were seen in the report,
10 provide perhaps some of the safeguards so that
11 the Safety Case doesn't become just another
12 paper shuffle as is what obviously happened
13 prior to August 6th.
14 There was lots of documentation
15 that things that should have been
16 investigated, should have been looked at under
17 our ordinance, in fact weren't.
18 And it wasn't a problem with the
19 ordinance. The ordinance said they were
20 supposed to be looked at and analyzed in a lot
21 of detail. And they weren't. They got a one
22 line, quick run over.

1 So I'm in favor of us moving
2 forward together. I think at the end of the
3 day that the Safety Case regime is a more
4 promising way to go. And I think that we
5 should be moving towards that.
6 At the same time, as Supervisor
7 Gioia indicated in his statement, that doesn't
8 mean that we can't move forward immediately
9 with the short term changes to our ISO to
10 improve that.
11 So I appreciate your time,
12 appreciate your effort. And I will be looking
13 forward to moving forward with the committee
14 and bringing recommendations back to the city
15 and the county to strengthen our ISO as much
16 as possible in the short term and hopefully to
17 have a united front where we can move forward
18 with the state and implement the Safety Case
19 regime.
20 CHAIRPERSON MOURE-ERASO: Thank
21 you very much.
22 (Applause)

1 CHAIRPERSON MOURE-ERASO: The next
2 part of the agenda is we are going to at last
3 hear from the horse's mouths, the people that
4 have been working for two years to put this
5 together and have done a tremendous job in
6 presenting us with two rule reports and have
7 a third on in preparation on the explosion of
8 August 2012. It is the investigative team of
9 the Chevron incident.
10 I would like to introduce our
11 director of the western office of the CSB that
12 had the investigative team under his
13 responsibility. And his name is -- a lot of
14 you have interacted with him -- is Mr. Don
15 Holmstrom.
16 And I would like to ask him to
17 introduce the members of the investigative
18 staff and to proceed with their presentation
19 of the report. So, Mr. Holmstrom?
20 MR. HOLMSTROM: Thank you,
21 Chairman Moure-Eraso. Good evening, thank you
22 for attending tonight's presentation on CSB

1 staff's presentation on the Richmond Refinery
2 accident.
3 My name is Don Holmstrom. I'm the
4 U.S. Regional Office Director. Our offices
5 are in Denver, Colorado.
6 Joining us here tonight is the
7 lead investigator, Dan Tillema, and also
8 Investigator Amanda Johnson. We will be
9 presenting findings and conclusions from our
10 draft regulatory report.
11 The report discusses the
12 regulatory gaps that exist relating to the
13 oversight of petroleum refineries in the U.S.
14 and in California. And it proposes the Safety
15 Case regime as a regulatory alternative to
16 control major hazards and reduce risk.
17 We would like to thank everyone
18 who submitted comments on the draft report to
19 the CSB. We carefully reviewed all the
20 comments and implemented changes accordingly
21 which are reflected in the report being voted
22 on by the Board this evening. And I believe

there's copies of those comments as well as the staff response that were available on the tables outside.

In tonight's presentation, members of our investigation team will present our key investigative findings followed by our proposed recommendations.

The Board will have the opportunity to ask the investigation team questions. We will then hear statements by the public. Finally, the Board will vote on whether to adopt the draft Chevron Regulatory Report and propose recommendations.

The need for regulatory change was prompted by the August 6th, 2012, Chevron incident. The seemingly small controllable leak in the crude units for (inaudible) pipe resulted in a very large fire at the Chevron Richmond Refinery that burned for hours.

The pipe that was leaking was actually extremely thin due to sulfidation corrosion. This was not known to the

1 operations and emergency response personnel
2 who initially responded to the leak.
3 The severe thinning occurred
4 because the leaking pipe component had a very
5 low silicon content which greatly increased
6 the sulfidation corrosion rate of the steel.
7 This incident endangered the lives
8 of 19 Chevron fire fighters and operators. It
9 also impacted this community, causing over
10 15,000 residents to seek medical attention.
11 Over the last decade, there have
12 been considerable problems and significant
13 deadly incidents at petroleum refineries. In
14 2012 alone, the CSB has tracked 125
15 significant process safety incidents at U.S.
16 petroleum refineries. Seventeen of these
17 major incidents occurred in California.
18 The United States is experiencing
19 significantly more incidents at its refineries
20 in comparison with other countries.
21 Specifically, the U.S. has experienced
22 financial losses from refinery incidents that

1 are at least three times that of industry
2 counterparts in other countries.
3 The CSB has investigated some of
4 these major refinery incidents. CSB
5 investigated incidents that resulted in
6 multiple fatalities including the 1999 Tosco
7 Avon Refinery that resulted in four fatalities
8 -- that was in this County, Contra Costa
9 County, California -- the 2005 BP Texas City
10 Refinery incident that resulted in 15
11 fatalities, a 2005 Valero incident that
12 resulted in two fatalities, the 2010 Tesoro
13 Anacortes Refinery incident that resulted in
14 seven fatalities.
15 These are just a small fraction of
16 the refinery incidents that have occurred over
17 the last 15 years.
18 I will now turn over the
19 presentation to Investigator Dan Tillema to
20 discuss the key findings and conclusions of
21 the CSB's draft Chevron Regulatory Report.
22 Dan?

1 INVESTIGATOR TILLEMA: Thank you,
2 Don. CSB identified, in its Chevron
3 investigations, many causal findings that
4 allowed the core SICA (phonetic) piping at
5 the Chevron Richmond Refinery to rupture.
6 These findings highlight
7 regulatory gaps in the U.S. and California.
8 First, Chevron did not perform damage
9 mechanism hazard review to fully evaluate all
10 damage mechanisms in the refinery.
11 Second, the numerous
12 recommendations made over the years to replace
13 or inspect the Coresight(phonetic) deadlines
14 were never implemented. It just points to
15 organizational failures within Chevron.
16 Chevron also did not thoroughly
17 evaluate its process safeguards, such as
18 equipment material construction, to ensure
19 that they were effective.
20 Inherently safer design was never
21 employed prior to the incident to reduce the
22 risk from sulfidation corrosion, despite the

1 company's expertise in this area.
2 Finally, Chevron's corrective
3 actions developed from MOCs in incident
4 investigations did not effectively identify
5 and control process hazards.
6 In our presentation, we will show
7 how these process safety gaps causal to the
8 Chevron incident reflect California regulatory
9 weaknesses that could be best addressed
10 through the transition to a more rigorous,
11 performance based, regulatory approach already
12 in place around the world and in some U.S.
13 industries.
14 During the course of the Chevron
15 investigation, the CSB has found that the U.S
16 and California process safety regulatory
17 systems are ineffective which allowed
18 Chevron's process safety failures to occur.
19 The following slides identify the
20 CSB's key regulatory findings and conclusions.
21 Key Finding 1, the existing U.S. and
22 California process safety regimes rely on a

1 safety and environmental management system
2 framework that is primarily activity based
3 rather than goal based, risk reduction to as
4 low as reasonably practicable, CalARP or
5 equivalent.
6 The PSM standard does not
7 effectively establish goals to prevent
8 accidents or reduce risk. Only two of the 14
9 elements of the PSM standard, process hazard
10 analysis and mechanical integrity, contain
11 some goal setting components.
12 Key Finding 2, the existing
13 regulatory regimes for petroleum refineries in
14 the United States and California are static.
15 They're unable to adapt to innovation, newly
16 defined hazards and technical advancement.
17 Throughout the existence of the
18 Chemical Safety Board, the CSB has made a
19 number of process safety related
20 recommendations to both Federal OSHA and the
21 EPA.
22 However, none of these

1 recommendations have been implemented by these
2 agencies. In fact, there have been no
3 substantive changes made to the PSM or RMP
4 regulations in the past 20 years.
5 Key Finding 3, the existing
6 regulatory regimes for petroleum refineries in
7 the U.S. and California do not ensure
8 continuous improvement by effectively
9 incorporating lessons learned from major
10 accidents, nor do they have the authority to
11 require companies to address newly identified
12 safety issues as a result of such incidents.
13 In addition, these regimes do not
14 effectively bless or promote industry use of
15 major accident performance indicators to drive
16 industry to reduce risk or measure progress.
17 Key Finding 4, the existing U.S.
18 and California regimes do not require the use
19 or implementation of inherently safer systems
20 or the hierarchy of control.
21 Under both the PSM and RMP
22 regulations, an employer must control hazards

1 when conducting a process hazard analysis for
2 PHA of a covered process. However, there is
3 no requirement to address the effectiveness of
4 the controls or the hierarchy of control.
5 These are important concepts when
6 focusing on preventing hazards. Thus, a PHA
7 that meets the regulatory requirement may
8 inadequately identify or mitigate major hazard
9 risk.
10 Key Finding 5, the existing U.S.
11 and California regimes do not effectively
12 involve the workforce in hazard analyses and
13 prevention of major accidents.
14 For example, the CSB has found
15 that staff who were aware of sulfidation
16 corrosion impact, and others who were highly
17 knowledgeable and experienced in sulfidation
18 damage mechanism causes and hazards, were not
19 involved in the most recent crude unit PHA and
20 did not affect decisions concerning control of
21 sulfidaton corrosion during the turnaround
22 process.

1 Key Finding 6, the existing U.S.
2 and California regimes do not grant the
3 regulator the authority to accept or reject a
4 company's hazard analysis, risk assessment or
5 proposed safe guards prior to permission being
6 granted to the company who operates, which is
7 key for prevention.
8 Under the current system, the
9 regulator typically verifies compliance with
10 regulations reactively, that is following a
11 complaint or accident.
12 There is no requirement under the
13 current systems to submit PHAs to the
14 regulator. And the regulator is not
15 responsible for accepting the quality of the
16 PHA or the effectiveness of the proposed
17 safeguards.
18 And finally, Key Finding 7, the
19 existing U.S. and California regimes do not
20 employ the requisite number of staff with the
21 technical field knowledge and industry
22 experience to provide sufficient direct safety

1 oversight of petroleum refineries. CSB found
2 that there is a significant discrepancy in the
3 compensation between California regulators and
4 the Chevron Richmond Refinery personnel that
5 they interact with.
6 The CSB has addressed this issue
7 in our reports and is encouraged that the
8 California State Legislature has approved
9 funding for at least 15 new positions at
10 Cal/OSHAS's process safety unit.
11 The CSB's attempt to improve the
12 current PSM standards have been unsuccessful.
13 The regulation creation and regulation
14 updating process is too slow and burdensome to
15 be able to adequately respond to new technical
16 hazards and findings in the petroleum refining
17 industry.
18 The Safety Case regime requires
19 continuous risk reduction and is therefore a
20 better approach to preventing major accidents
21 at petroleum refineries.
22 The alternative, the occurrence of

a potentially catastrophic incident, is just not an acceptable outcome for society.

In addition, the Safety Case regulatory approach is already used to regulate major hazards in the United States. Both the nuclear industry and NASA use Safety Case-like regulatory approaches. These approaches require risk reduction with specific targets similar to as low as reasonably practicable.

I will now turn the presentation over to Investigator Amanda Johnson to discuss the Safety Case regime.

INSPECTOR JOHNSON: Thank you, Dan. Noted process safety expert, Andrew Hopkins, defines the Safety Case as a verifiable case that the company makes to the regulator.

The Safety Case includes identification of hazards and their control, demonstration by the company to the regulator that its process safety strategy properly

1 manages risk and adoption of industry best
2 practices by the company.
3 The CSB has identified several key
4 features of the Safety Case regime shown in
5 this graphic. The first key feature we will
6 discuss is duty holder safety responsibility.
7 The duty holder must prepare a
8 written case for safety, known as the Safety
9 Case report, that identifies the hazards, and
10 risks and describes how they will be reduced
11 to as low as reasonably practicable, or ALARP.
12 The Safety Case report must
13 demonstrate how inherently safer design
14 concepts have been applied in the design
15 decision statement.
16 Safety Case reports are meant to
17 be evergreen documents that request continuous
18 improvement in risk reduction. Regulators
19 review the Safety Case report and must accept
20 them for the facility to operate.
21 In the United Kingdom, the
22 regulator reviews the Safety Case report at

1 least once every five years or sooner as
2 significant changes are made to a facility.
3 The second key feature is
4 continuous risk reduction to as low as
5 reasonably practicable or ALARP. The owners
6 and operators of covered facilities must
7 reduce risks to ALARP and demonstrate to the
8 regulator how they have done so in the Safety
9 Case report.
10 Typically, the definition of ALARP
11 is determined by best practice. So
12 ultimately, the regulator can require the
13 company to go above best practice to achieve
14 ALARP. This can occur when the industry best
15 practices are overly permissive and lack
16 minimum requirements to prevent hazards.
17 The third key feature of the
18 Safety Case regime is adaptability and
19 continuous improvement. This allows the
20 regulator to go above and beyond current
21 industry standards without requiring rule
22 making.

1 The adoption of the Safety Case
2 regulatory regime in California would allow
3 regulators to require inherently safer
4 material construction. For example,
5 regulators could require that carbon steel
6 systems and sulfidation corrosion environments
7 be upgraded to control damage mechanism
8 hazards, all without required rule making.
9 The fourth key feature of the
10 Safety Case regulatory regime is active
11 workforce participation. The Safety Case
12 regime provides for the election of safety
13 representatives and creation of safety
14 committees.
15 It also uses a triparthied
16 approach with active and equal participation
17 from the regulator, industry and labor. This
18 ensures that all factors of the workforce are
19 involved in continuous risk reduction.
20 This needs to be noted in the
21 Chevron interim report, the important role
22 transparency plays between industry and the

1 public in improving health and safety for the
2 facility and the surrounding communities.
3 The CSB recommended that
4 California establish a multi-agency process
5 safety regulatory program for all California
6 petroleum refineries to further include public
7 accountability and transparency.
8 Under the current system, key
9 records and corrective actions related to
10 refinery mechanical integrity inspection and
11 repair work arising from PHAs, turnarounds and
12 maintenance related shutdowns are not
13 currently made available to the public.
14 The CSB has found the public is
15 largely in the dark under the current case.
16 Under the Safety Case, many regimes collect
17 and require indicating data and companies are
18 required to make Safety Case report summaries
19 publicly available.
20 These are high level documents
21 that are published online and summarize safety
22 assessments, hazardous materials, hazards and

1 control measures, potential major incidents,
2 emergency response and safety management
3 systems.
4 The fifth key feature of the
5 Safety Case regime is the use of process
6 safety indicators. Currently, OSHA primarily
7 relies on recordable injury and illness rates.
8 These are personal safety measurements that
9 are not sufficient to measure the potential of
10 a major process safety incident.
11 The Safety Case regime allows
12 regulators to collect and analyze computer
13 data, release the data to the public, use the
14 data to target inspections and drive
15 continuous improvement.
16 The sixth key feature of the
17 Safety Case regime is regulatory assessment,
18 verification and intervention. The Safety
19 Case authorizes regulators to review and
20 accept or reject Safety Case reports.
21 The regulator can place a great
22 emphasis on inherently safer design and a

hierarchy of control when deciding to accept or reject a Safety Case report.

The regulator also has the power to reject a Safety Case report if a company has not reduced risk to ALARP or as low as reasonably practicable.

And finally, the regulator can conduct (inaudible) and inspections to ensure that a company is following the Safety Case report.

The final key feature of the Safety Case regime is ensuring a well funded and qualified regulator is in place with skill sets such as chemical engineering, metallurgical and corrosion expertise, and human factors, among others. This is essential to having a highly functioning Safety Case regime.

The regulator must be able to interact with equal technical company management. The regulator must also be able

1 to independently and sufficiently evaluate
2 risks identified by the company. To do this,
3 the regulator must retain technically
4 competent, experienced and well-trained staff
5 to correctly evaluate Safety Case reports.
6 Implementing the Safety Case
7 regime in California will take some time and
8 will not be an easy process. To ensure
9 effective implementation on the Safety Case
10 regime, major stakeholders must be committed
11 to the project.
12 The Safety Case report must be
13 treated as an evergreen document that
14 accurately reflects the new process hazards
15 and risks. And the Safety Case report must
16 not be treated as a check the box activity by
17 companies.
18 The transition to a Safety Case
19 regime must also be carefully planned and
20 managed. It may take several years to
21 effectively implement.
22 That concludes our investigation

presentation. Donald Holmstrom will now read the team's proposed recommendations.

MR. HOLMSTROM: Thanks, Amanda. The team proposes to the Board the following recommendations.

Recommendation Number 1 to the California State Legislature, the Governor of California, develop and implement a step-by-step plan to establish a more rigorous safety management, regulatory framework for petroleum refineries in the State of California based on the principles of the Safety Case framework in use in regulatory regimes such as those of the United Kingdom, Australia and Norway, and as described in this report and with the following minimum components.

A, a case for safety written by the duty holder or the employer, if you will, that includes a systematic analysis and documentation of all major hazards and effective control methods implemented to reduce those risks to as low as reasonably

1 practicable, or ALARP.
2 B, a thorough view of the Safety
3 Case report by technically competent
4 regulatory personnel that requires
5 modifications and improvements to the document
6 as necessary prior to acceptance.
7 C, audits and preventative
8 inspections by the regulators to verify
9 effective implementation of the Safety Case
10 elements.
11 D, a risk management approach that
12 requires analysis and effective implementation
13 of safeguards using the hierarchy of controls
14 to protect people and the environment from
15 major accident hazards. The effectiveness of
16 the safeguards will be demonstrated through
17 the use of leading and lagging process safety
18 indicators.
19 E, ability to adapt and implement
20 safety requirements in response to newly
21 identified hazards, advances in technology,
22 lessons learned from major accidents and

1 improved safety codes without the need for new
2 rule making.
3 F, determines when new or improved
4 industry strengths, standards and practices
5 are needed and initiates programs and other
6 activities such as forums to develop the
7 timely development and implementation of such
8 standards and practices.
9 G, used as a triparthied type
10 model where the regulator, the company, and
11 the workers and their representatives play an
12 equal and essential role in the direction of
13 preventing major accidents.
14 H, a regulatory model and
15 accompanying guidance based on the U.K.'s
16 Safety Committee regulations, 1977, and the
17 Health and Safety Consultation Employees
18 regulations, 1996, which set out the legal
19 framework for the rights and responsibilities
20 of workers and their representatives on health
21 and safety related matters, and the
22 establishment of safety representatives and

1 the establishment of safety committees to
2 serve health and safety related functions.
3 The elected representative should
4 have a legally recognized role that goes
5 beyond consultation and activities such as the
6 development of the Safety Case report, process
7 hazard analysis, management of change,
8 incident investigation, audits and the
9 identification and effective control of
10 hazards.
11 The representative should also
12 have the authority to stop work that is
13 perceived to be unsafe or that presents a
14 serious hazard until the regulator intervenes
15 to address the safety concern.
16 Workforce participation and
17 practices should be documented by the duty
18 holder and submitted to the regulator.
19 I, requires the reporting of
20 information to the public to the greatest
21 extent feasible, such as a summary of a Safety
22 Case report, a process hazard analysis, a list

1 of safeguards implemented and standards
2 utilized to reduce risk and process safety
3 indicators that demonstrate the effectiveness
4 of the safeguards in the management systems.
5 J, an independent, well funded,
6 well staffed, technically competent regulator.
7 K, a compensation system to ensure
8 the Safety Case regulator has the ability to
9 attract and retain a sufficient number of
10 employees with the necessary skills and
11 experience to ensure regulator or technical
12 competency, periodically conducting market
13 analysis and bench marking review to ensure
14 the comparison system remains competitive with
15 the California petroleum refineries.
16 Recommendation Number 2 to the
17 California State Legislature and the Governor
18 of California. Work with a regulator,
19 petroleum refining industry, labor and other
20 relevant stakeholders in the State of
21 California to develop and implement a system
22 that collects, tracks and analyzes process

safety leading and lagging indicators from operators and contractors to promote continuous safety improvement.

At a minimum this program shall, A, require the use of leading and lagging process safety indicators that actively monitor the effectiveness of process safety management systems and safeguards for major accident prevention, including leading and lagging indicators that are measurable, actionable and standardized.

Require that the reported data be used for continuous process safety improvement and accident prevention.

B, analyze the data to identify trends and poor performers and publish annual reports with the data at the facility and corporate level.

C, require companies to publicly report required indicators annually at the facility and corporate level.

D, use process safety indicators,

one, to drive continuous improvement for major accident prevention by using the data to identify industry and facility safety trends and deficiencies. And two, to determine appropriate allocation of regulatory resources and inspections.

And E, be periodically updated to incorporate new learnings from worldwide industry improvements in order to drive continuous major accident safety improvements in California.

Recommendation Number 3, to the Federal Chemical Facility Safety and Security Working Group and to the Occupational Safety and Health Administration.

This report highlights significant advantages of the Safety Case regime over the existing process safety management standard to prevent potentially catastrophic chemical accidents that are relevant to OSHA's response to Executive Order 13650.

In the development of OSHA EO

1 response, incorporate a written plan that
2 includes the evaluation of the issues raised
3 in the findings, conclusions and
4 recommendations in this report concerning
5 Safety Case regime.
6 The CSB notes that the Safety Case
7 has now been listed by the Federal Working
8 Group as one of the options for reform under
9 the Executive Order and that they are
10 currently seeking public input.
11 That concludes our investigation
12 presentation. We would now like to take any
13 questions from the Board. Thank you.
14 CHAIRPERSON MOURE-ERASO: Thank
15 you.
16 (Applause)
17 CHAIRPERSON MOURE-ERASO: As it is
18 our custom, and after the presentation of the
19 staff, the Board members ask questions of the
20 staff about the report. So I would like to
21 start with Board Member Griffon if you have
22 any questions for them.

1 MEMBER GRIFFON: I'll keep it
2 brief, because I think we probably have quite
3 a few people that want to make public
4 comments.
5 I was looking at your slide. I
6 wish I had the slide number, talking about
7 publicly reported process safety indicators
8 data. And I wondered what do we know about
9 the performance of, did we look at any of
10 these metrics with regard to refineries?
11 I know there's some stuff in here
12 on the offshore experiments. But if it's
13 detailed indicator data, did we look at this
14 for refineries? And what did it show, or
15 should we include it in the report?
16 MR. HOLMSTROM: The report looks
17 at the different countries and the indicators
18 or reports on it, for Norway, for example, it
19 reports that Norway has noted a significant
20 decrease in hydrocarbon releases offshore.
21 The PSAs, the regulatory agency
22 that manages safety both onshore and offshore

in Norway also has some preliminary numbers from onshore that look favorable. But they have not released those.

In conversation with them, they said that they believe the regime is headed in the right direction. But they do not have their, system for implementing those indicators has not been in place long enough for them to publish definite numbers in that regard.

In the United Kingdom, they have a much more lengthy period of using indicators offshore. They have, for example, tracked hydrocarbon releases which would be an issue that would be both an issue for offshore oil and gas production and onshore processing.

And they found offshore that they've noted a decline in the number of hydrocarbon releases that's fairly significant over a number of years. Onshore, the COMAH has put into, which is the onshore program for major accident prevention, they put in place

1 an indicator program that's being implemented
2 over time.
3 The first phase of that
4 program is to require that the onshore duty
5 holders or employers collect data internally
6 that will be revealed to COMAH when they visit
7 the facility or if there's an intervention or
8 inspection.
9 And they plan by, I think, 2015 to
10 have a program in place where they'll report
11 that data to the regulator which currently
12 isn't in effect.
13 So the offshore program's much
14 more developed. I think one of the major
15 underpinnings that has been raised earlier was
16 that there's some significant difference
17 between onshore and offshore safety.
18 Particularly it involves production systems,
19 offshore versus refining offshore.
20 A lot of the same equipment,
21 there's separation that's occurring, there's
22 exchangers, there's valves, there's pressure

1 vessels, control valves, et cetera. So
2 releases offshore of hydrocarbons on a
3 production platform would have some of the
4 similar process safety issues as you would
5 have in a process plant. And so we think that
6 those sorts of examinations are issues
7 offshore.
8 Certainly, all those countries we
9 just named believe the Safety Case is an
10 appropriate regime onshore or offshore and has
11 implemented it in both areas, sometimes in
12 steps over time.
13 But certainly, as it exists now,
14 the system is fairly widespread throughout the
15 world, we would note, including recently the
16 Presidential Oil Spill Commission which was a
17 bipartisan commission recommending the Safety
18 Case for offshore production in the United
19 States.
20 MEMBER GRIFFON: And just a
21 follow-up, Don. Is there any reason why the
22 refinery sector seems to be lagging the

1 offshore in reporting stuff currently, or were
2 there programs put in place --
3 MR. HOLMSTROM: I think the
4 programs were put in place later, as we
5 understand it. And we can, you know, we can
6 certainly provide you with that data. We have
7 an actual document related to the
8 implementation of the COMAH program.
9 And the other issue is COMAH
10 typically, I'm sure if you submitted an
11 inquiry to them they could provide that data.
12 But they have actually much broader coverage
13 under the COMAH program than just oil
14 refineries, not only chemical plants but
15 beyond even what's covered under the process
16 safety management program in the United
17 States.
18 For example, they cover chemical
19 storage facilities, storage tanks, large
20 storage tanks. We're obviously investigating
21 one of those right now in West Virginia.
22 They also cover power plants. We

investigated the Clean Energy incident. So it's a much broader coverage of what they consider to be higher hazard facilities than is covered under, currently on our PSM and RMP in the United States.

MEMBER GRIFFON: And my last question is did we, I know this is difficult given the locations of these regimes, but in preparation for this meeting I was attempting to review a full Safety Case report. And I think I stumbled upon one that I could get my hands on.

Most of them, as you said in your presentation, the summary reports are publicly available, but the full reports aren't. I found one for offshore.

I was just curious if it's (inaudible), and I understand it's international travel. But did we get an opportunity to review any Safety Cases for refineries or actually get, you know, on scene and see how they're actually implemented?

1 You know, as I went through this
2 offshore one, it strikes me also, it makes me
3 wonder about the worker involvement component.
4 There's some very high level analysis in a lot
5 of these documents. And it strikes me that,
6 you know, how are the workers really going to
7 be "involved" in blessing these things, so to
8 speak?
9 So I'm not sure. I think maybe in
10 these regimes the worker involvement component
11 is a bit overstated. And it might be an
12 improvement, but I just wonder about that, if
13 you've have visited any of these facilities
14 yet?
15 MR. HOLMSTROM: Okay. I'm glad
16 you brought up both of those points. Because
17 I think, while there may be different views on
18 these issues, I think the recommendations
19 address them explicitly.
20 So let me first say that, in terms
21 of the question of the Safety Case, we have
22 received, I think, a good part of, there's a

1 couple of Safety Cases from one of our
2 contractors who works in Australia. And we
3 have reviewed a couple of those.
4 But you're right, the Safety Cases
5 are not typically, as a whole, made public.
6 And one of the issues is Safety Case reports
7 can have confidential business information and
8 trade secrets in them. So that's one issue.
9 And there are Safety Case summaries that are
10 published online.
11 The second issue is the
12 involvement of the workforce. We've had
13 extensive, as you might imagine, conversations
14 with a number of unions in Australia, Norway
15 and the United Kingdom.
16 And it's very clear that they're
17 involved in a number of activities that lead
18 up to the development of the Safety Case. And
19 it's also clear that they're very supportive
20 of the Safety Case.
21 I know there was some commentary
22 earlier about possible concerns about the case

1 from unions, but if they interviewed, for
2 example, leaders of the RMP Union and Unites
3 in the United Kingdom, they clearly are
4 supportive.
5 In fact, one of the concerns that
6 those unions had was that, in a recent UE
7 initiative to implement a version of the
8 Safety Case, they defended their regime, as
9 did the industry, as being highly effective.
10 And the trade association, Oil and
11 Gas UK in the United Kingdom, defended the
12 regime as being very effective as well as both
13 of the unions I mentioned. So, in all
14 conversations, they're supportive. And
15 actually, in a CSB forum they've been very
16 supportive.
17 In terms of the participation
18 element and also the Safety Case transparency,
19 we recognize that there may be differences
20 there. But we have made it very clear in the
21 recommendations that there should be
22 significant transparency.

1 In fact, the recommendations call
2 for the involvement of the workforce in the
3 development of the safety case.
4 If there's any ambiguity or
5 differences there, clearly the recommendations
6 are calling for that, as well as a number of
7 the other elements that would lead up to the
8 development of the Safety Case.
9 The second question is about
10 transparency. We believe there is a
11 significant degree of transparency. But if
12 there may be disagreement to the extent or how
13 deep that is, we have made it very clear on
14 the recommendations that there should be
15 transparency to the public to the greatest
16 extent feasible.
17 So one of the things that's true
18 about the Safety Case is there's a number of
19 elements that one could take out of the Safety
20 Case and implement in another regime.
21 Transparency could be one. It's
22 not necessarily inherent to the Safety Case.

1 Worker participation and real empowerment's
2 not inherent, necessarily, to just the Safety
3 Case.
4 But the Safety Case as a whole
5 brings up all these strands together and I
6 think creates a stronger binding, if you will,
7 for an overall regime.
8 And clearly, in our
9 recommendations we're making it very clear
10 that we believe that transparency should be to
11 the greatest extent feasible.
12 What has always been the issue
13 with transparency -- and we deal with it all
14 the time in the CSB, because we receive all
15 kinds of documents, we like to make a number
16 of them public -- is questions about
17 confidentiality, confidential business
18 information and trade secrets.
19 And so like, for example, in our
20 BP Texas City investigation, we made public
21 about 150 documents, somewhere around there.
22 And we went through a CBI process. So we know

1 these documents can be released.
2 But sometimes it's more time
3 consuming, because you have to go through a
4 process to review any confidential business
5 information which, at least in our view under
6 typical legal analysis, it's a fairly narrow
7 analysis. And sometimes it becomes more
8 expansive when it becomes a back and forth
9 over what that is.
10 So those would be the only
11 limitations. So that's the intention of the
12 recommendations, is not to have any
13 limitations. And I think our recommendations
14 make it very clear that the workforce in this
15 triparthied and their representatives, the
16 union, should be involved in the development
17 of the case as well as all the supporting
18 documents.
19 And including, which we think is
20 even more critical and which is identified by
21 the unions in the United Kingdom, Australia
22 and Norway is very critical, is participation

1 as elective representatives represented by the
2 Government which goes much further than
3 anything that exists currently in the United
4 States where they have the authority to
5 address hazards, conduct investigations. And
6 that authority is recognized by the regulator.
7 Also, we recommend in the report
8 the authority to stop unsafe work, and also we
9 recommend that that work cannot commence,
10 which is the case in a couple of the countries
11 that have the Safety Case, until the regulator
12 intervenes. So we did address it in the
13 recommendation statement.
14 MEMBER GRIFFON: Thank you, thank
15 you.
16 CHAIRPERSON MOURE-ERASO: Board
17 Member Rosenberg?
18 MEMBER ROSENBERG: Okay. You sort
19 of addressed it, but I'm going to harp on it,
20 because it is what I harp on.
21 I believe that the single most
22 important criterion for a safe workplace is

1 the voice of labor. And I would like to know
2 from you why you think that a Safety Case
3 regime will give workers more power in this
4 country than they have now, the fear of
5 retaliation will be less.
6 MR. HOLMSTROM: Sure. I think
7 some of us who, you know, participated in the
8 development of the concept of the Safety Case
9 on the staff level, worked in plants and are
10 very familiar with the world of worker
11 participation.
12 I think that what we hear from
13 unions such as the Steelworkers and others, is
14 that current regime has the word developing
15 procedures for participation. But it's not
16 real empowerment. And it doesn't provide
17 workers with the ability to actively affect
18 safety.
19 What we noted in this
20 investigation is that workers and union
21 representatives pointed out in previous
22 incidents that there were problems with

1 sulfidation corrosion, and those issues
2 weren't addressed.
3 Clearly, under the Safety Case,
4 elected worker representatives would have the
5 power not only to raise that to the company,
6 they would have a regulatory recognized power
7 to raise that to the regulator.
8 And they would also have the power
9 to shutdown on safe work until the regulator
10 intervened. That is a much greater power than
11 exists.
12 Currently, the power that exists
13 in the United States is largely a result of
14 the strength of the group within the plant as
15 well as the, you know, regulatory mechanisms
16 that exist and in collective bargaining
17 agreements.
18 And those are certainly important
19 mechanisms for worker participation. But we
20 think, and we certainly heard, and we had
21 extensive conversations with workers in
22 Norway, United Kingdom, Australia and other

1 countries, that these elected representatives
2 was the key element for them and the safety
3 committees.
4 They've also established broader
5 groups. Within the United Kingdom, for
6 example, there's an organization called Step
7 Change for Safety which is, it's a triparthied
8 group consisting of the regulator, affected
9 companies and the trade unions and worker
10 representatives, a bunch of worker
11 representatives.
12 They've produced a lot of
13 guidance. They have a number of training
14 sessions for worker representatives. And they
15 have also written guidance, I think, which we
16 have circulated internally that's under the
17 sponsorship of the HSE of how to improve
18 worker representation and worker empowerment.
19 I don't think we've seen anything
20 like that in the United States that's
21 comparable, where actual workers are writing
22 documents under the auspices of OSHA, or EPA

1 or any other regulatory agency where they're
2 actually making recommendations and conducting
3 advocacy on the behalf of workers. And
4 they've spoken very eloquently to us about how
5 critical that is and how it's stabilized.
6 MEMBER ROSENBERG: Thank you.
7 CHAIRPERSON MOURE-ERASO: Thank
8 you. I have one question also. I don't know
9 if it's a logical question, you know. I have
10 been aware watching, the two years worth of
11 this investigative group, this investigative
12 team at Chevron, the exhaustive effort to make
13 recommendations that the investigative team
14 feels are priorities based on the facts that
15 we're investigating.
16 They have been practice for
17 organization, the CSB, to make recommendations
18 based on investigated facts and findings.
19 Today, there has been a number of additional
20 recommendations that, very interesting
21 recommendations that have been presented by a
22 number of the elected officials at this point.

1 And they have been suggested today at this
2 meeting.
3 However, to my knowledge, they are
4 not based on the specific findings that we're
5 investigating in this report, since there is
6 still a third pending report in Chevron.
7 Do you think, I'm asking the team,
8 would it be possible to investigate those new
9 recommendations that are presented here as
10 something that we should consider that could
11 inform, I mean, that we can investigate our
12 findings that could inform the suggestions,
13 recommendations that we are here in this long
14 distance being discussed today?
15 MR. HOLMSTROM: Well, that's a
16 good question. In every investigation we try
17 to make a distinction between causal findings
18 due to what actually occurred and what we
19 might call audit findings and things that are
20 problems or issues in the investigation.
21 And we try to focus on those
22 things that are the most closely related to

1 causation. Certainly in the course of our
2 investigation, there are things that have been
3 presented to us that are issues that people
4 have raised.
5 As a group of investigators who
6 are scientifically minded, we try to steer
7 tightly to those things that we think have
8 some causal relation. And we have tools like
9 logic trees, and Aximaps and cause and effect
10 diagrams that help guide us in that area.
11 We certainly think that some of
12 the issues tonight that have been raised are
13 important. And in fact, some of them, as we
14 stated in our interim report, we plan to
15 address.
16 One of those was the issue of the
17 history of using clamps in the facility. We
18 stated in the interim report that we're
19 concerned that that's a safety culture issue.
20 It's also, obviously, a process safety issue.
21 And the investigation team, Dan
22 and his team, are taking steps and have been

1 taking steps to collect information on that.
2 And we have set up interviews for February to
3 find out information about that issue in terms
4 of clamps.
5 And just so you're aware, we're
6 looking, you know, putting a clamp on a piece
7 of piping or equipment typically represents
8 what we would believe is a process safety
9 failure, a mechanical integrity failure.
10 And so it should be analyzed. Why
11 did that happen, why did you have a release or
12 a leak or anything that wasn't detected and
13 fixed prior to being put on a clamp? And so
14 that's also a cultural issue. Why were there
15 so many clamps?
16 Well, they're looking not only at
17 the clamps that had a due date and weren't
18 replaced, which I think were the ones that
19 OSHA looked at, but the broader issue is a
20 larger number of clamps. And how does that
21 issue impact a reflection of safety cultures?
22 So that's certainly something

1 we're going to look at. And certainly, as
2 part of that, there'd be a question of the
3 existing clamps that, you know, what is their
4 status, not only from an abatement perspective
5 but also a process safety perspective.
6 What is the plan for removing the
7 clamps, fixing mechanical integrity issues,
8 and what is the history there? And how does
9 that relate to any potential recommendations,
10 either related to process safety culture or
11 other issues?
12 So certainly we're going to be
13 examining that issue as a broader cultural
14 issue. And how it connects to this incident
15 is, when the initial small leak occurred, the
16 first inclination of evidence we have was that
17 people were considering placing a clamp on the
18 leak.
19 So certainly, as a cultural issue,
20 that leak, consider a clamp. With a clamp you
21 remove insulation, and that's when the serious
22 release occurred. So I don't know if that --

1 CHAIRPERSON MOURE-ERASO: No, no.
2 Because this is just a question. I would like
3 to now go to the public comments phase of
4 this. I would like to ask our Managing
5 Director, Dr. Daniel Horowitz, to please try
6 to manage the public comments.
7 DR. HOROWITZ: Okay. That is a
8 difficult assignment, Mr. Chairman, but I'm
9 happy to do it.
10 A number of people have signed up.
11 Could we have a show of hands of people who
12 have not signed up but who are interested in
13 commenting as well? Just a handful, okay.
14 Well, why don't we forge right ahead.
15 And we can start with Alice
16 Busching Reynolds, Deputy Secretary for
17 California State EPA. Ms. Reynolds?
18 MS. REYNOLDS: Yes.
19 DR. HOROWITZ: Thank you.
20 MS. REYNOLDS: Good evening, Mr.
21 Chair and members of the Board.
22 DR. HOROWITZ: Do you mind, and

1 I'm going to ask this of all the commenters to
2 please spell out your name for the court
3 reporter, who is essentially transcribes this?
4 (Off microphone discussion)
5 MS. REYNOLDS: Good evening, Mr.
6 Chair and members of the Board. My name Alice
7 Reynolds. My last name is spelled R-E-Y-N-O-
8 L-D-S. I'm the Deputy Secretary for Law
9 Enforcement and Counsel at California
10 Environmental Protection Agency. I'm also a
11 member of a California interagency refinery
12 task force.
13 And first I wanted to thank you
14 for the opportunity to speak with you today.
15 Refinery safety is something that is obviously
16 very important to the state.
17 And the task force values the
18 careful attention that the CSB staff gave to
19 this investigation. And we have appreciated
20 the opportunity to collaborate with staff over
21 the past months.
22 In the aftermath of the August

1 6th, 2012, fire at the Chevron Refinery, like
2 CSB, California also took action. We convened
3 a working group on the primary safety led by
4 the Governor's office.
5 The working group included
6 participants from 13 agencies and departments.
7 It met over a period of nine months with
8 industry, labor, community, environmental,
9 academic, local emergency response and other
10 stakeholders.
11 And the group issued a draft
12 report entitled Improving Public and Worker
13 Safety at Oil Refineries in July of 2013. The
14 Governor's working group expects to release
15 the final report later this month.
16 The report states the findings of
17 the working group, and it also does more than
18 restate existing practices and problems. It
19 includes goals that are not out of reach and
20 not unrealistic.
21 There are real achievable ways to
22 improve public and worker safety through

enhanced refinery oversight and also to strengthen emergency preparedness in anticipation of any major incident.

The working group findings reflected significant concerns about ongoing refinery practices and prevention of major accidents.

All of the investigations of this incident have identified incomplete or inadequate policies and procedures at the Richmond Refinery and failure to evaluate pipe safety problems during the process hazard analysis and failure to act on internal reports about hazards.

The working group identified four main areas in need of improvement, a need for improved coordination between agencies, including improved data, and information sharing and improved oversight of refineries.

The second area is to strengthen emergency response and preparedness, including needed improvements in hazardous material area

1 plans and air monitoring.
2 The third area is the need for
3 changes in safety prevention, including needed
4 improvements to the Cal/OSHA Process Safety
5 Management Program and the California
6 Accidental Release Prevention Programs for
7 risk management and program regulations as
8 well the need for greater resources from
9 enforcement of these regulations.
10 Fourth, the need for enhanced
11 community education and alerts, including
12 greater public and worker input into decision
13 making.
14 These findings led to a series of
15 recommendations. And to implement the
16 recommendations, an interagency refinery task
17 force was created at Cal/EPA. The first
18 meeting of the task force was held in August
19 2013 with two additional meetings this fall
20 and multiple meetings of work groups.
21 There are nine state agencies or
22 departments represented along with partners

1 from U.S. EPA, seven local unified program
2 agencies or (inaudible) and four air pollution
3 control districts.
4 The task force has formed two work
5 groups, one on emergency preparedness and
6 response and one on safety and prevention.
7 These work groups have created work plans, and
8 time lines and are working to revise existing
9 regulations and guidelines.
10 And we're also planning for public
11 meetings early this year in the Bay area of
12 Southern California and Kern County.
13 Additionally, while the working
14 group was completing its process, several
15 enforcement actions were also proceeding
16 following the July 2012 incident.
17 Approximately six months after the
18 incident, on January 30th, 2013, Cal/OSHA
19 issued 25 citations to Chevron, including 11
20 willful, serious citations and almost $1
21 million in civil penalties.
22 On August 5th, 2013, the

1 California Attorney General and the District
2 Attorney for Contra Costa filed a criminal
3 action and plea agreement against Chevron
4 stemming from the August 6th incident.
5 In response to the complaint,
6 Chevron agreed to pay $2 million in fines and
7 restitution and pleaded no contest to six
8 misdemeanor counts. The U.S. Environmental
9 Protection Agency also issued findings of
10 violation in December of 2013.
11 We look forward to continuing to
12 work with the Chemical Safety Board as well as
13 labor, business, environmental groups and the
14 community to do our utmost to assure that
15 California refineries take stronger action to
16 eliminate fires or releases that threaten
17 workers and communities. Thank you.
18 CHAIRPERSON MOURE-ERASO: Thank
19 you.
20 DR. HOROWITZ: Thank you, Ms.
21 Reynolds. Next is Dr. Gina Solomon, also of
22 Cal/EPA. And do, please, spell your name for

1 the court reporter.
2 DR. SOLOMON: Absolutely. Good
3 evening, Mr. Chairman, members of the Board.
4 My name is Gina Solomon. My last name is
5 spelled S-O-L-O-M-O-N. And I'm the Deputy
6 Secretary for Science and Health at the
7 California EPA. And I'm also one of the
8 members of the interagency refinery task
9 force.
10 And I wanted to talk a little bit
11 about what we are doing concretely right now
12 to try to fix our current system. I wanted to
13 also mention, I heard in the initial comments
14 there was this issue of where the burden for
15 safety lies in the different systems.
16 And I want to emphasize that the
17 burden for assuring safety, even in our
18 current system, lies on the industry, as
19 members of the Board well know. And, of
20 course, the burden for trying to assure that
21 that really happens is on the agencies.
22 And so we've identified a whole

1 series of things that we can implement now to
2 fix the standards that we have while we look
3 at other models that are out there.
4 And so the first steps that we're
5 taking closely follow recommendations made by
6 CSB in your interim report. So thank you very
7 much for that guidance. We're moving forward
8 with an effort to amend both the PSM and the
9 Cal/ALARP regulations to require the conduct
10 of root cause analysis following significant
11 incidents or releases.
12 And root cause analysis needs to
13 involve workers in the process and also be
14 made publicly available so that community
15 members can better understand the causes, the
16 root causes of incidents if they do occur.
17 But the other pieces are even more
18 focused on prevention, the issue of corrosion,
19 obviously central to the Richmond fire. The
20 Governor's working group identified the need
21 to require damaged mechanism hazard reviews as
22 a component of process safety.

1 So refineries would be required to
2 more systematically assess and address issues
3 like corrosion. And so we are moving forward
4 with that recommendation.
5 We also are looking at human
6 factors such as fatigue, for example -- not
7 metal fatigue but people fatigue, both are
8 important -- by requiring that management
9 change procedures, look at management
10 organizational change, staffing changes,
11 reorganization, operations, maintenance,
12 health and safety or emergency response.
13 And those issues will be
14 incorporated as we move forward with our regs.
15 In addition, we're incorporating some goal
16 based continuous improvement approaches that
17 really are very much consistent with those
18 that we see in Safety Case regimes.
19 So we're going to go ahead with a
20 proposal to put those into our existing
21 regulatory framework. One of these is
22 including a requirement for periodic safety

1 culture assessments.
2 So this involves both workers, so
3 bottom up, and also management, top down,
4 culture of safety within individual companies.
5 And there are tools that are out there to
6 measure that. So we think we can do this.
7 Additionally, we're working on
8 applying the concept of inherent safety as
9 recommended by CSB to refineries. It's
10 another distinctive component that's
11 consistent with the Safety Case.
12 We're looking at terms such as
13 ALARP, as most reasonably practicable, and
14 other terms in situations where we, you know,
15 in the PSM regulations. And then we're also
16 looking at, in situations where inherent
17 safety cannot be achieved for good reasons,
18 then we're looking at regulatory requirements
19 like the hierarchy controls or layer
20 protection analysis that will assure that
21 we're moving toward this culture of continuous
22 improvement which we agree is exactly where we

1 need to be going.
2 The Governor's report identified
3 the Safety Case regime along with some other
4 issues as topics for future investigation.
5 And we are committed to doing that future
6 investigation.
7 We are acting immediately to
8 incorporate some elements of the Safety Case
9 regime. But other pieces, the wholesale
10 adoption of the Safety Case, would require a
11 major shift in California law, obviously, and
12 would also require some extensive additional
13 resources for regulatory agencies that we're
14 also working on. And that's what my
15 colleague, Dr. Wilson, will be speaking about
16 as well.
17 And so we also are going to be
18 looking at whether the Safety Case can be
19 implemented in a transparent way with
20 appropriate worker involvement and appropriate
21 public access.
22 So as we undertake this

1 evaluation, we're very interested in
2 continuing to work with CSB, to continue to
3 consult with you as we share the common goal
4 of moving towards safer design, safer
5 technology and enhanced protection to prevent
6 incidents like this from happening again in
7 the future.
8 If we can possibly do anything
9 then we'll do that. So thank you very much
10 for your time this evening.
11 DR. HOROWITZ: Thank you, Dr.
12 Solomon. And next I think we'll have Dr.
13 Michael Wilson who is the chief scientist with
14 the Department of Industrial Relations. And
15 please do spell your name, even though it's
16 Wilson.
17 DR. WILSON: Thank you. It's Mike
18 Wilson, W-I-L-S-O-N. Chairman Moure-Eraso,
19 and members Rosenberg and Griffon and CSB
20 staff, on behalf of the California Department
21 of Industrial Relations and DIR Director
22 Christine Baker, thank you for your leadership

in responding to the challenge of ensuring the safety and security of the Nation's process industries.

And thank you for your work here in California and your investigative work of the Richmond Chevron pipe rupture and fire.

We would also like to extend our appreciation for the support that you have offered California by deploying CSB process safety expert, Mr. Bill Hoyle, from Washington, D.C. to California. I cannot overstate how important Mr. Hoyle's expertise has been to California and our efforts to date. Thank you.

As you know, the Department of Industrial Relations oversees state programs that are charged with protecting the health and safety of California's 18 million workers. Worker health and safety is often, of course, inextricably linked to that of the community.

DIR is home to Cal/OSHA where California's process safety management unit

1 resides, overseen by state-wide district
2 manager, Clyde Trombettas.
3 The DIR office of the director
4 together with our Cal/OSHA PSM unit is
5 participating in the leadership of the
6 Governor's interagency refinery task force
7 which was convened by Governor Brown
8 immediately following the incident at Chevron.
9 And as you've heard from the
10 Deputy Secretaries Solomon and Reynolds, the
11 task force consists of 13 state and local
12 agencies and departments and has basically
13 been charged by Governor Brown with
14 evaluating, and where necessary making changes
15 to the state's regulatory structure to ensure
16 that what happened here does not happen again
17 in California.
18 We appreciate that the resources
19 of the Chemical Safety Board are limited. We
20 know that it represents a significant
21 commitment on the part of the Board to
22 undertaken an investigation such as you've

1 done here. That is, one that uncovers not
2 only what happened at Chevron technically but
3 why.
4 Understanding the why of an event
5 requires answering complicated questions about
6 a plant's safety culture, its systems of
7 values and priorities, its mechanisms for
8 meaningful worker participation and for
9 transparency and accountability with the
10 community.
11 It requires understanding how a
12 plant decides when, and where and how much to
13 invest in maintenance and safety. The answers
14 to these questions are extraordinarily
15 valuable, because they are the factors that
16 dictate the path that an industrial facility
17 will follow.
18 That path can lead ultimately to a
19 catastrophic incident as we've seen here and
20 it can lead to the highest possible level of
21 attention to protecting worker, community and
22 environmental health.

1 I can assure you that the efforts
2 of your team, led by Dan Tillema and Don
3 Holmstrom, that you've taken to answer these
4 kinds of questions and bring light to the
5 underlying drivers of the Chevron fire are of
6 great value to our work here in the State of
7 California.
8 In responding to the Chevron
9 incident in our work with the Governor's task
10 force, the Department of Industrial Relations
11 has focused on three priorities. And I'll
12 mention each of those just briefly in the
13 context of your recent report.
14 Our first priority following the
15 incident was to take immediate action to
16 investigate potentially eminent worker and
17 community health and safety hazards at the
18 Chevron facility and throughout the California
19 refinery sector.
20 In early 2013, our Cal/OSHA PSM
21 unit, under Mr. Trombettas' direction,
22 inspected 2,000 pipe clamps in use at the

1 Chevron facility, launched a statewide
2 leak/seal special emphasis program targeting
3 the state's refineries and conducted 3,600
4 hours of inspections at nine refineries
5 statewide.
6 This year, we're defending our 25
7 citations at Chevron and about a million
8 dollars in civil penalties. And we're
9 enforcing the terms of Chevron's three year
10 probation pursuant to Contra Costa County's
11 criminal misdemeanor settlement.
12 This includes reviewing corrosion
13 reports for about 300 piping systems at
14 Chevron with our partners at Contra Costa
15 Health Services and U.S. EPA. We'll be
16 conducting ultrasonic verification testing on
17 a subset of piping to confirm the veracity of
18 these reports.
19 Our second priority is that we're
20 talking steps to increase funding to our PSM
21 unit. We recognize that overseeing process
22 safety requires resources.

1 Facilities that handle large
2 quantities of hazardous materials, often under
3 high temperature and pressure, employ hundreds
4 and sometimes thousands of workers. They're
5 often situated in close proximity to populated
6 areas and they're extraordinarily complex,
7 both technically and organizationally.
8 Major incidents are relatively
9 infrequent. But when they do occur, we have
10 seen time and again they have major
11 consequences for worker and community health
12 and safety. As your report describes, these
13 facilities therefore require special
14 regulatory oversight.
15 California is unique among U.S.
16 states in that we've developed our own process
17 safety management standard and have committed
18 resources in our PSM unit implementing that
19 standard.
20 California is the only state and
21 the only OSHA program nationally with a
22 dedicated PSM unit whose technical staff focus

1 exclusively on process safety. We're proud of
2 that fact, and we also acknowledge the immense
3 challenges our PSM staff are up against.
4 In answer to these challenges, the
5 California State Legislature directed Cal/OSHA
6 to adopt a means of assessing annual fees from
7 refineries to support regulatory oversight.
8 Governor Brown included authority in his 2013
9 state budget for Cal/OSHA to assess these fees
10 each year based on an individual refinery's
11 crude oil input as a proportion of the state's
12 goal of production.
13 We finalized emergency regulations
14 to take this action last year, and we are now
15 using these fees to increase the operational
16 capacity of our PSM unit. This steady source
17 of funding, supported by the industry itself,
18 is critical to efforts to modernize process
19 safety in California. And we believe the same
20 could be said for the U.S. as a whole.
21 Funding is our third priority.
22 We recognize that the state's

1 process safety regulations are in need of
2 modernization. As you've made abundantly
3 clear, the process safety management standard
4 is over 20 years old and much has changed in
5 our understanding of process safety.
6 We're seeking to do two thing in
7 our revisions, and you've heard earlier from
8 Dr. Solomon. One is provide a framework
9 within which the industry will continually
10 improve its safety performance.
11 Second is to provide our PSM
12 technical staff with the best possible tools
13 and information they need to do their job in
14 protecting worker and community health and
15 safety.
16 As we've found, many of the PSM
17 improvements we're contemplating have already
18 been put in place by leading companies in the
19 refinery sector.
20 And many of them have been
21 informed by improvements in the Federal PSM
22 standard that are under consideration by

1 Federal OSHA as part of President Obama's
2 Executive Order 13650 on improving chemical
3 facility safety and security written in the
4 wake of the West Texas disaster. We look
5 forward to working with the Obama
6 Administration in support of the Executive
7 Order.
8 As we work on regulatory changes,
9 we appreciate the Board's calling attention to
10 the Safety Case approach which has been
11 implemented by refineries operating in the
12 U.K., Australia and Norway.
13 Through the task force we are
14 establishing a work group to collect and
15 review data on the Safety Case regime and its
16 potential applications in California.
17 And in the interim, as Board
18 members Rosenberg and Griffon have noted,
19 we're evaluating the ways in which our changes
20 to the PSM standard can incorporate key
21 elements of a Safety Case approach today.
22 In closing, I'll say that our

1 objective here in California is to craft a
2 modern regulatory framework, a national model,
3 within which the state's refineries will
4 prioritize and continually improve their
5 safety, health and environmental performance
6 consistent with the highest industry standards
7 worldwide.
8 That concludes my remarks. And
9 once again, thank you for your
10 professionalism, and for your good work and
11 for you attention this evening.
12 CHAIRPERSON MOURE-ERASO: Thank
13 you.
14 DR. HOROWITZ: Thank you. And
15 next I think we'll have Randy Sawyer, the
16 Director of the Contra Costa Hazardous
17 Materials unit. We heard you were unwell, so
18 happy to see the Safety Case has restored you
19 to health.
20 (Laughter)
21 MR. SAWYER: I should hope so.
22 But bear with me. My voice may go away for a

1 moment. Good evening. My name's Randy
2 Sawyer, S-A-W-Y-E-R. And thank you, Chairman
3 Moure-Eraso and members of the Board for
4 allowing me to speak this evening.
5 My job is the chief environmental
6 health and hazardous materials officer for
7 Contra Costa County. Contra Costa County is
8 home for four petroleum refineries and several
9 medium to small chemical facilities. Contra
10 Costa hazardous materials staff implements the
11 City of Richmond and the County's Industrial
12 Safety Ordinances.
13 These ordinances go beyond the
14 requirements of the California XRE's
15 prevention program, OSHA, Cal/OSHA's process
16 safety management and U.S. (inaudible)
17 management.
18 The ordinance requires a regular
19 facilities review from the (inaudible) system,
20 expanse on human factors. It requires root
21 cause analysis as part of an incident
22 investigation. It requires facilities to

1 perform a safety culture assessment. And all
2 the processes and processed unit within the
3 refinery are subject to the ordinance.
4 The county adopted the ordinance
5 in January of 1999, and the City of Richmond
6 adopted the ordinance in January 2002. During
7 the 1990s there wasn't any average of a high
8 severity accident annually in Contra Costa
9 County. Since the ordinance was adopted by
10 the county, there's been only one high
11 severity accident, the August 6th, 2012,
12 Chevron fire.
13 There have been other less severe
14 accidents, but there has been general decline
15 in these accidents since 1999. I believe that
16 you can compare the success in industrial
17 safety favorably to the Safety Case being
18 implemented by the United Kingdom's health and
19 safety executive.
20 Even with this success, the August
21 6th, 2012, fire occurred. The Chemical Safety
22 Board, in their interim report on the

1 investigation of the fire, made a number of
2 recommendations to improve the Industrial
3 Safety Ordinance.
4 The City of Richmond and the
5 county staff have been working together and
6 making the necessary changes to address the
7 recommendations.
8 The Chemical Safety Board has been
9 willing to review drafts of these changes to
10 make sure that we are addressing their
11 findings and recommendations. I think these
12 changes will make the requirements of the
13 ordinance stronger.
14 I also remember the State's
15 refinery safety task force in which you've
16 heard more details from earlier speakers this
17 evening.
18 I thank the Board and their staff
19 for raising the question is there a better way
20 to prevent accidents such as the August 6th,
21 2012, fire and proposing a possible solution
22 to this question.

I believe that this question needs to be addressed. I believe that all accidents are preventable. I also believe that the actions being taken by the city, county and state, when implemented, will improve the existing programs of the prevention of refinery accidents.

Is this enough to do? Where additional changes need to be made, such as the implementation of the Safety Case regime, will need to be determined.

It is my belief that, no matter what the regulatory requirements are, ultimately it comes down to the safety culture within the facility and how successful the facility will be in preventing such accidents.

If the facility has a good safety culture, it will not matter. The regulatory requirements of the facility would do, the facility would then do whatever it's required to do ending such accidents. I thank you this evening for allowing my comments.

1 CHAIRPERSON MOURE-ERASO: Thank
2 you, Randy, appreciate it.
3 DR. HOROWITZ: Thank you. Next is
4 Ann Werboff, of the United Steelworkers. Ms.
5 Werboff, are you here?
6 (Pause)
7 MS. WERBOFF: Hi, my name is Ann
8 Werboff. That's spelled W-E-R-B-O-F-F. And
9 I represent the United Steelworkers Local 675.
10 Our union has 5,000 members in
11 Southern California and Nevada. Our members
12 work at the five refineries in the Greater Los
13 Angeles area, including the Chevron El Segundo
14 Refinery.
15 We are here today because what
16 happened at the Chevron Richmond Refinery
17 could just as easily have happened in the El
18 Segundo Refinery.
19 We believe that corrosion is
20 widespread in the industry, as evidenced by
21 the large number of temporary piping repairs
22 that are not permanently repaired for years.

1 Further, the industry's own
2 insurers acknowledge an accident rate that is
3 three times higher for U.S. refineries than
4 those cited in other countries. Clearly, our
5 current accident prevention programs here in
6 the U.S. are not as effective as they are
7 elsewhere.
8 The key findings in the Richmond
9 incident, that the pipe ruptured due to
10 sulfidation corrosion and that Chevron
11 management was aware of this corrosive pipe,
12 were also found to be true for the El Segundo
13 Refinery.
14 The El Segundo Refinery is located
15 at one end of a downtown business district and
16 is within six blocks of the town's elementary
17 and high schools. If this incident had
18 occurred there, the impact on the workers and
19 the local communities in El Segundo and the
20 neighboring city of Manhattan Beach would have
21 been very similar to that of Richmond. And
22 that is the reason we are here today, that I

1 came up from Los Angeles.
2 So the CSB has recommended the
3 Safety Case approach to reduce risks. And we
4 feel there are three components that need to
5 be included to be effective which have been
6 raised here today. And we want to support
7 them.
8 One is the active funding and
9 resources including personnel for regulatory
10 agencies. As a Safety Case system involves
11 Government inspection teams to ensure industry
12 compliance, sufficient resources must be
13 provided. And one potential source of
14 revenues could be these uncovered employers.
15 The second is the triparthied
16 approach, you know, in which workers and their
17 representatives are on equal footing with
18 industry and regulators.
19 Workers have intimate knowledge of
20 the plant in which they work and are the first
21 ones to respond to and be potentially hurt by
22 incidents or near misses. So a new regulatory

1 framework must ensure a meaningful role for
2 workers.
3 And thirdly, for the question of
4 accountability of industry, because again, it
5 is industry, not regulators, who are
6 responsible for safe workplaces. A properly
7 regulated Safety Case approach would put the
8 burden for safe workplaces where it belongs,
9 on the owners and the managers of the work
10 sites.
11 And we want to thank you for
12 letting us provide comments this evening.
13 CHAIRPERSON MOURE-ERASO: Thank
14 you very much.
15 (Applause)
16 DR. HOROWITZ: Thank you. Next is
17 Ron Chittim of the American Petroleum
18 Institute. Mr. Chittim?
19 MR. CHITTIM: Good evening, my
20 name is Ron Chittim, C-H-I-T-T-I-M. And I'm
21 a senior policy advisor with American
22 Petroleum Institute. API appreciates the

1 opportunity to be here tonight to provide
2 comments on the CSB draft regulatory report.
3 The API represents more than 550
4 companies involving all aspects of the oil and
5 natural gas industry. API members are
6 significantly affected by the efforts of the
7 CSB and are regularly called upon to respond
8 to and implement CSB's recommendations.
9 While API applauds CSB's continued
10 efforts to fulfill its core mission by
11 conducting investigations of accidental
12 releases and timely sharing of its findings,
13 API has a number of concerns about the CSB
14 recommendation to California related to the
15 establishment of the Safety Case approach.
16 The API believes the current OSHA
17 process safety management regulations are
18 effective and that an overhaul in PSM standard
19 is unwarranted.
20 The PSM standard is a consistent
21 and well understood framework that has been
22 used by manufacturing facilities for over 20

1 years. Changing to Safety Case would add
2 complexity and uncertainly with no
3 demonstrated benefit.
4 Even now, Federal OSHA is working
5 to enhance and improve the existing PSM
6 standard. OSHA is requesting information from
7 stakeholders regarding potential revisions to
8 the PSM standard. These efforts to improve
9 the PSM standard should be explored before the
10 introduction of an entirely new and different
11 regulatory approach.
12 To the extent CSB sees areas for
13 improvement, API encourages CSB to continue
14 its focus on enhancements to the current PSM
15 standard.
16 One avenue to identify potential
17 improvements for the PSM program effectiveness
18 is for CSB to look at the NSTB/FAA model for
19 lessons learned that can be applied to CSB's
20 interactions with other Government agencies.
21 Concerning criticisms that the
22 current PSM standard lacks adaptability and is

1 slow to respond to needed safety changes, we
2 must note that, unlike other countries, such
3 as Norway or the U.K., in the U.S. new
4 regulations and regulatory revisions must go
5 thorough notice and comment rule making which
6 just takes time.
7 Of particular concern to API is
8 the lack of meaningful data that demonstrates
9 that the Safety Case approach produces better
10 safety performance than the PSM standard.
11 In fact, CSB acknowledges that
12 there have been few objective studies
13 conducted on the impact of the Safety Case
14 regulatory approach on safety performance,
15 onshore and offshore.
16 The CSB draft report also
17 recognizes that the existing data mainly
18 relates to offshore operations which increases
19 API's concern about applying Safety Case to
20 refineries.
21 If Safety Case or other regulatory
22 regimes are to be considered, all the relevant

U.S. regulatory bodies should first collect meaningful data that can be used to justify further consideration of regulatory alternatives.

A major difference that we should note in the two regulatory programs is the role of the regulator. For OSHA, the regulator performs more of an enforcement type role, whereas in the Safety Case approach, the regulator performs more of an acceptance or permissioning role where a site's case is accepted by the regulator.

The Safety Case approach would require a significant increase in the number of technically competent, well-resourced regulators to review the hazards identified in the site's case and to evaluate the effectiveness of the controls used to manage the risks.

This difference in the roles would be costly, very difficult to implement, without a clear and corresponding benefit.

1 But in either case, as has been stated several
2 times today, it is the site operator that
3 ultimately determines how to ensure safe
4 operations.
5 So in conclusion, as CSB correctly
6 notes, Safety Case is not perfect and no
7 regulatory system will be perfect in its
8 implementation.
9 In light of this acknowledgment,
10 API thinks the CSB should focus its limited
11 resources on incident investigations and
12 reports rather than expending resources
13 advocating for new regulatory programs.
14 API thinks the current PSM program
15 is effective but can be made better and that
16 the OSHA request for information needs to be
17 carried out and the results analyzed which may
18 lead to improvements in the PSM standard.
19 Additionally, API thinks there's
20 lack of data at this point to support the
21 adoption of a Safety Case in the U.S. Safety
22 is a continuous improvement journey. And we

1 acknowledge more can be done to improve safety
2 under the current PSM system.
3 The effectiveness of any safety
4 program is only as good as the commitment made
5 in its preparation, its implementation and its
6 execution. And the site operator is
7 ultimately responsible to ensure safe
8 operations. Thank you for your attention.
9 (Applause)
10 DR. HOROWITZ: Thank you, Mr.
11 Chittim. And I do want to remind our
12 listening audience, watching audience on KCRT
13 that you're welcome to submit your comments by
14 email as well. And you can send those to
15 csbmeeting@csb.gov or to public@csb.gov. And
16 we'll be happy to read those comments or
17 summarize them and provide them into the
18 record.
19 And we did receive one online
20 comment from Mr. Rick Hind, the Legislative
21 Director of Greenpeace in Washington, D.C.
22 And he writes, "Thank you for holding this

1 meeting."
2 And he, to get right to his
3 question, says that in the CSB's draft report
4 you recommended that California implement new
5 chemical facility rules to prevent these
6 disasters by requiring them to use the safest
7 chemical processes available.
8 The EPA has the authority under
9 the Clean Air Act, Bhopal Amendment, 112R I
10 believe he means, to require safer chemical
11 processes at plants like Chevron, nationwide.
12 And he notes that EPA is currently considering
13 rule making in this area.
14 And he asks, "Will you also
15 recommend that the EPA implement new chemical
16 facility rules to prevent future disasters by
17 requiring them to use the safest chemical
18 processes available as you recommended for
19 California?"
20 And I wonder if I could ask the
21 team, because it's an important question, how
22 does the Safety Case system handle the issue

1 of inherently safer technologies? And perhaps
2 how is it handled in the United Kingdom, for
3 example?
4 MR. HOLMSTROM: Yes, the CSB has
5 actually distributed to a number of people the
6 assessment guidelines that are used by
7 inspectors for onshore facilities within the
8 United Kingdom.
9 And inherent safety is one of the
10 basis of assessments for the Safety Case in
11 the United Kingdom for high hazard facilities.
12 In fact, in the United Kingdom, if you look at
13 the specific guidelines they actually look at
14 the design stage which is currently not under
15 the purview across the safety management
16 standard or through the existing plan.
17 So they engage in conversations
18 about inherent safety when the plant is being
19 designed which I think most people would
20 recognize is the most effective time period to
21 implement inherent safety before the plant is
22 designed and built.

1 And they've looked at inherent
2 safety throughout the life cycle of the plant
3 including not only just inherent safety but a
4 hierarchy of control. Inherent safety in the
5 hierarchy of controls is the most preferred
6 control mechanism. Because at its strongest,
7 it substitutes or eliminates the hazard.
8 But there are a number of other
9 controls that are effective for controlling
10 hazards that are much more respected, for
11 example, engineering or design rather than
12 relying on administrative controls, such as
13 following a procedure or responding to an
14 alarm which the CSB has noted, in many
15 investigations.
16 (Inaudible) control when things
17 have failed that operator accident or
18 responding to alarms is often identified in
19 PHAs as a control measure. For example, that
20 was true in the BP Texas City case in the high
21 level that occurred in the blowdown drum that
22 controls air.

1 The safeguards were listed as
2 operator action and alarms which are the
3 lowest and the least effective controls. And
4 there's nothing in the current process safety
5 management standard that would require
6 strengthening those particular safeguards.
7 So we identified, on the other
8 hand, on the Safety Case, that they actually,
9 as part and parcel of how they accept their
10 cases, we find inherent safety to be a key
11 element.
12 DR. HOROWITZ: Okay, thank you.
13 And those of you who are watching on TV,
14 csbmeeting@csb.gov. Let's go back to our
15 audience here in the room.
16 And next is, I apologize in the
17 pronunciation, Lipo Kentasa (phonetic),
18 representing the Asian Pacific Environmental
19 Network.
20 MR. KENTASA (phonetic): It's Lipo
21 Kentasa and --
22 DR. HOROWITZ: Okay.

1 MR. KENTASA: (Inaudible).
2 DR. HOROWITZ: Okay, thank you.
3 Please go ahead, sir.
4 MR. KENTASA: Hello, all the
5 Board. I'm Camo (phonetic) and also the
6 resident of Richmond. And my name is Lipo
7 Kentasa. And I'm a member of APEN.
8 I don't have anything to add
9 except just wanted to thank you for the Board
10 and the staff who do the investigation. And
11 we support your recommendation all the way.
12 And this is something for us who
13 are resident here want to hear for many, many
14 year, long time ago. We want to see this
15 recommendation be. Not only want to see the
16 recommendation, we want to see the
17 implementation right now as what we want to
18 see. And we want to thank you.
19 CHAIRPERSON MOURE-ERASO: Thank
20 you.
21 (Applause)
22 DR. HOROWITZ: And next is Dr.

1 Henry Clark of the West County Toxics
2 Coalition. Nice to see you again, Dr. Clark.
3 DR. CLARK: Good evening, members
4 of the U.S. Chemical Safety Board. Welcome
5 to Richmond.
6 West County Toxics Coalition is
7 one of the oldest environmental justice
8 organizations in the country. We've been
9 around for about 30 years. We've worked with
10 communities not only here in Richmond but
11 throughout the United States as well as our
12 community in West Texas, okay.
13 First of all I want to say, in
14 regard to this Safety Case model that you
15 have presented to us, it sounds pretty
16 decent. I will say that , most of the
17 provisions.
18 I am concerned about the trade
19 secret part of it, you know. This community
20 here, especially in the environmental justice
21 groups here that have been dealing with
22 Chevron over the years, you know, we've

1 always had a problem with the refinery or
2 regulatory agencies, how a trade secret that
3 denied relevant information to us to make
4 some determination as to the impacts of
5 refinery expenses on our community.
6 So I don't see why we would choose
7 to accept a trade secret aspect of this
8 proposal. And we've always rejected it
9 before. So I'm not convinced on that part.
10 The other issue of concern is this
11 committee that you referred to with the
12 workers and other people on it. And you've
13 been focusing on the labor aspect of it, that
14 labor may not have adequate resources to have
15 a technical person there to evaluate this
16 case.
17 Well, you know, as far as I'm
18 concerned, the company should provide the
19 resources for labor and anybody else that's
20 part of that committee to have the
21 appropriate technical people there to be able
22 to assess that proposal. Otherwise, it's

1 nonsense, okay.
2 And you referred to a regulator.
3 I don't quite understand what you mean in
4 that regard. We have a lot of regulatory
5 agencies that do inspections there at
6 Chevron.
7 You have the Bay Area Air Quality
8 Management District. From what I understand,
9 it has a permanent inspector there at the
10 refinery on a daily basis. You have Mr.
11 Randy Sawyer from the county that's doing
12 some inspections there.
13 Plus EPA, from what I understand,
14 does a, I believe it may be every five years,
15 but like an overhaul, overall inspection of
16 refineries. And so when you refer to the
17 regulator having some authority to do
18 something, what do you mean? Are you meaning
19 that all of those regulatory agencies
20 individually or collectively are in some way,
21 what are you actually talking about?
22 You know, and in terms of the

1 enforcement part of it over there, Council
2 member Jim Rogers indicated enforcement is
3 really important in this whole process.
4 Because we've seen this here a revolving door
5 syndrome of regulators working for some
6 regulatory agency today, and then tomorrow
7 they're working for Chevron or some other
8 company.
9 And we don't want that type of
10 nonsense to continue to occur. We want some
11 real enforcement. And I'm concerned, you
12 know, the bottom line is that the buck stops
13 with the local people, our decision makers
14 that issue permits to Chevron and other
15 companies to operate.
16 They definitely need to be in the
17 process and decisions need to have the
18 necessary resources to do whatever necessary
19 evaluations that needs to be done to protect
20 the public health and safety of residents in
21 this city.
22 Now, the other point is this here,

1 you know. We're talking about trying to do
2 some things to protect public health and
3 safety through this here Safety Case model.
4 But there's the other point here
5 that I think we're sort of overlooking. Even
6 on a daily basis, even say Chevron or any
7 other company came up with a plan, you know,
8 with this committee and all of that. You
9 know, this deal really doesn't get to the
10 overall problem. Because there's such a
11 thing as environmental justice, okay.
12 And under former President
13 Clinton's Executive Order 12898 on
14 environmental justice which the City of
15 Richmond has also adopted a similar
16 environmental justice order, as well as the
17 State of California. And most environmental
18 justice laws are based on President Clinton's
19 Executive Order which basically says that no
20 community or people should be
21 disproportionately impacted by environmental
22 policies, okay.

1 Well, the fact is that communities
2 here like North Richmond where I come from
3 and others here already are. We're already
4 disproportionately impacted. So in terms of
5 when Chevron got a big major modernization
6 project coming up, like right now the draft
7 environmental impact report's supposed to be
8 out, I believe, next month. And the city and
9 Chevron is expecting the project to hopefully
10 be approved by July.
11 Yet we're talking about, even if
12 this here safety model is adopted, you know,
13 years before it's implemented. So what does
14 that do for this major expansion or
15 modernization that is happening right now at
16 Chevron in our community, you know?
17 That in spite of the fact that all
18 of these environmental justice laws that are
19 on the books say that we should not be
20 disproportionately impacted, yet, you know,
21 they're trying to come around the corner
22 through the back door and still increase the

1 disproportionate impact by some cap and trade
2 pollution trading scheme which would allow
3 them to increase greenhouse gas emissions and
4 associated toxins that would create a hot
5 spot, in spite of the fact that the City of
6 Richmond here has adopted the precautionary
7 principle and this environmental justice
8 argument.
9 So that's just being nipped in the
10 bud. That's why the local power here in our
11 City Council should enforce the regulations
12 and the laws that they have adopted.
13 And if you're for environmental
14 justice and the arguments that you have
15 adopted, then you should draw the line,
16 period, and not allow the ongoing
17 disproportionate impact on communities of
18 color here in the city, like my community in
19 North Richmond, period.
20 Otherwise, we just still up here
21 talking and playing games and, you know,
22 putting on the dog and pony show for the

1 cameras. And our people in our community
2 continue to suffer and die from asthma and
3 cancer.
4 So we want to see some real
5 action. I wanted to see, you know, this
6 precautionary principle enforced here in
7 Richmond, the environmental justice laws on
8 the book enforced here in Richmond and stop
9 the ongoing pollution of our community, and
10 our people and putting us at risk.
11 The other point that was mentioned
12 is about these listening sessions that's
13 going on around the country here under the
14 Executive Order 13650 that President Obama
15 just signed after the West Texas disaster
16 here, you know.
17 So here again, that's all
18 irrelevant to the refinery and other chemical
19 companies here in our community. And so here
20 again, we're going to be waiting for years
21 before those recommendations are looked at
22 and put into practice.

1 Also that here again, leaves us
2 vulnerable and which, in my opinion, is where
3 the city council should step in and enforce
4 their laws on the environmental justice.
5 One other point on the enforcement
6 for the other document, again, we'll mention
7 that the district attorney has enforcement
8 authority here in Contra Costa County which
9 the District Attorney is an elected official
10 and has been doing little or nothing to hold
11 Chevron or companies accountable.
12 The July 26th, 1993, sulphuric
13 acid disaster at General Chemical Company has
14 sent over 20,000 people to local hospitals.
15 Now, the DA and the county was on the hot
16 seat after that. They were threatening to
17 file criminal charges against General
18 Chemical Company.
19 But the company paid a $5.5
20 million fine rather than face criminal
21 charges. And money went to build the Center
22 for Health in the North Richmond community.

1 I noticed that none of these
2 hearings or anything, the DA or any
3 representative is here, you know. And the
4 community and the city, we need to put the DA
5 also on the hot seat to enforce these
6 criminal charges.
7 These people, you have all these
8 residents already at the refinery. You mean
9 to say that they didn't know that Chevron had
10 all these patched up pipes and that was, you
11 know, corroded. But, you know, they had the
12 authority to do something then. But they
13 didn't do nothing, period.
14 The bottom line is, is this here.
15 Far as the West County's Toxins Coalition is
16 concerned, we want protection of our
17 community. We ain't playing no softball,
18 we're playing hardball. We're not going to
19 accept no more disproportionate impact,
20 putting our community and our people at risk,
21 period.
22 If you and the city and these

1 other regulations don't do the job, we'll do
2 the job. Because as we said, you know, ain't
3 no power like the power of the people.
4 Because the power of the people don't stop,
5 period. And we're going to stop this
6 nonsense.
7 (Applause)
8 DR. HOROWITZ: Thank you, Dr.
9 Clark. Next Greg Karras, Communities for
10 Better Environment.
11 MR. KARRAS: Thank you, good
12 evening. I'm Greg Karras, K-A-R-R-A-S,
13 senior scientist with Communities for a
14 Better Environment, CBE.
15 I want to thank you for your
16 continued service to our community tonight
17 and suggest an answer to perhaps the most
18 divisive argument the industry has raised
19 against your reports, proposed
20 recommendations.
21 Before I do that, just to be
22 clear, CBE has joined with the Refinery

1 Action Collaborative in supporting the report
2 and the recommendations in writing. We still
3 support that and urge your adoption tonight.
4 We see the strengthening
5 recommended amendments, probably most
6 specifically laid out by Congressman Miller
7 and Supervisor Gioia as being consistent
8 with, further to and maybe even prerequisite
9 for fully implementing the Safety Case that
10 we don't see.
11 And we understand the
12 recommendation to be an advisory one that the
13 State of California, Dr. Wilson and his
14 colleagues, would be charged with actually
15 fleshing out and developing with hopefully
16 full participation of the public, community
17 and the workers.
18 So on that basis, we do, Richard,
19 still feel that it's appropriate to adopt
20 tonight with those amendments and with the
21 either/or if you want.
22 We also really appreciate, I

1 really appreciate the emphasis on the root of
2 the problem being an imbalance of power. Oil
3 corporations get to decide to cut corners.
4 Workers and communities who live there, where
5 the bankers around the companies don't live,
6 bear the brunt of it. That's what we need to
7 fix.
8 And in that spirit, I would say
9 that the solution is very closely tied to the
10 most divisive argument that, to sort of quote
11 the way your staff put it on Page 104,
12 "There's no will in the U.S. to ensure that
13 regulators have the tools, resources and
14 competence to effectively regulate."
15 So I want to suggest that that's
16 at the nub of some of the friendly debate
17 we're having tonight and that there's an
18 answer to that I'd like to suggest.
19 Where I come from, your father
20 might come home dirty and shaking late one
21 night and try to explain to his kids about
22 the explosion at the plant that killed his

1 co-workers that day.
2 First time that happened to me I
3 was about six years old. The workers are a
4 part of the community, right. And before
5 Chevron's higher sulphur crude slate
6 accelerated the corrosion that burst the pipe
7 that led to the disaster last August, CBE
8 warned public officials about the higher
9 sulphur crude increasing incident risk. So
10 did workers. We're part of the same
11 community.
12 Now, and you've heard some about
13 this from other speakers, so I'll be brief,
14 Chevron proposes a project that could further
15 increase the sulphur content of the crude,
16 the corrosiveness of the crude.
17 At the same, it's fighting to get
18 a delay in fixing the corrosion clamps that
19 are widespread problems and safety violations
20 throughout the refinery.
21 CBE is following up on the court
22 orders that we've won demanding that Chevron

1 be transparent and that there be a full
2 review of the implications of that project.
3 That's our role.
4 The workers in the workers union,
5 meanwhile, have joined into that appeal on
6 the side of OSHA fighting Chevron in this
7 case to try to make sure those clamps get
8 replaced in that safety hazard.
9 Again, we sometimes have slightly
10 different roles. We sometimes have friendly
11 differences of opinion. Workers are part of
12 the community. We're in this together.
13 And statewide, the combination of
14 aging infrastructure that we agreed is a big
15 part of it, and the shift to even more
16 corrosive crude, is a ticking time bomb.
17 This is an urgent situation.
18 Communities are grappling with it in oil
19 projects in multiple communities here in the
20 Bay Area right now.
21 That's unfortunately not that
22 unusual in this state where wholesale oil

1 switch is going on in this, as you know,
2 somewhat broken regulatory system. We're
3 grappling with it.
4 Here in the Bay Area the
5 refineries' workers' union has joined us
6 through the Refinery Action Collaborative to
7 tell all of the local agencies that are
8 reviewing these projects that are going
9 forward that we want to see transparency,
10 full disclosure of changes in the crude slate
11 and their impacts.
12 That just happened last month
13 formally. That's noteworthy for several
14 reasons. But ultimately, it would not have
15 happened except that workers are part of the
16 community.
17 So the answer to this question, do
18 we have the will, the 10,000 or so refinery
19 workers in California are part of communities
20 numbering in the millions. And together we
21 have the will to protect our health, our
22 safety, our lives and our children. Big oil

1 is wrong about that. Please adopt this
2 report tonight.
3 (Applause)
4 DR. HOROWITZ: Thank you, Mr.
5 Karras. And next is Guy, is it Bjerke?
6 (Off microphone discussion)
7 DR. HOROWITZ: Oh, how did I get
8 that right? Please do spell it though,
9 because --
10 MR. BJERKE: I will.
11 DR. HOROWITZ: -- they're not all
12 as good as I am.
13 MR. BJERKE: All right. Thank you
14 very much. Hello, my name's Guy Bjerke, B-J-
15 E-R-K-E. And I'm with the Western States
16 Petroleum Association.
17 Thank you for providing an
18 opportunity for us to comment on the U.S.
19 Chemical Safety and Hazard Investigation
20 Board's regulatory report.
21 The Western States Petroleum
22 Association is a non-profit trade association

1 representing companies that explore for,
2 produce, refine, transport and market
3 petroleum, petroleum products, natural gas
4 and other energy supplies in California,
5 Arizona, Nevada, Oregon, Washington and
6 Hawaii.
7 Our members operate the major
8 refineries in California and are committed to
9 safe and reliable operations and open to
10 suggestions to enhance the safety of our
11 industry, our workers and our neighbors.
12 Learning from incidents is an
13 essential element of the process safety
14 management framework. And the U.S. Chemical
15 Safety Board reports have been important
16 sources of lessons learned.
17 WSPA submitted written comments
18 with the American Petroleum Institute on
19 January 3rd. And I agree with the comments
20 presented to you earlier tonight by Ron
21 Chittim of API.
22 Today, I just wanted to make a

1 couple specific comments on your report's
2 recommendations that California replace its
3 current process safety management regulatory
4 scheme with an alternative regulatory regimen
5 known as the Safety Case.
6 In short, WSPA believes your
7 recommendations concerning changes to
8 regulatory oversight can be integrated into
9 the existing PSM and risk management program
10 regulatory framework.
11 By so doing, we can accomplish
12 additional safety gains and continually
13 foster better relationships with employees
14 and communities without introducing any
15 unintended consequences and burdens
16 associated with a complete overhaul of the
17 existing regulatory framework.
18 Changing the regulatory approach
19 to the Safety Case without a better
20 understanding of what one gains from the
21 action will add complexity and uncertainty
22 with no demonstrated benefit that is readily

1 understood.
2 This added complexity may even
3 increase risk due to conflicting priorities
4 created by potential overlay of new
5 regulations. Efforts to improve the existing
6 PSM regulatory program should be explored
7 before pursuing the introduction of an
8 entirely new and different regulatory
9 approach.
10 For example, we believe that
11 industry could better achieve the proposed
12 benefits of the Safety Case from additional
13 skilled regulators at the state level who can
14 more actively participate in assuring
15 effective implementation of existing PSM and
16 RMP programs, secondly, by improving
17 processes to effectively manage risk through
18 assessment safeguards and mitigation.
19 Our members are actively working
20 and cooperating with the Governor's task
21 force. They are actively working and
22 cooperating with the City of Richmond, with

1 the County of Contra Costa in improvements to
2 the industry safety ordinance. And we
3 believe that better integrating the PSM and
4 RMP requirements will achieve the goals
5 outlined in this report.
6 To the extent the CSB sees other
7 areas for improvement, WSPA stands ready to
8 dialogue. And we appreciate the meeting that
9 we had with Don, Amanda, earlier this year to
10 discuss the report. We appreciate the
11 efforts the staff has taken to reach out to
12 our industry to include us in the discussions
13 and in the process.
14 WSPA would like to thank the CSB
15 for coming out tonight, for hearing and
16 taking input. And we look forward to working
17 with you to improve the safety of our
18 industry. Thank you very much.
19 DR. HOROWITZ: Thank you. And
20 next we have a question email from Mr. John
21 Morawetz. And he is the Health and Safety
22 Director for the International Chemical

1 Workers Union.
2 And he welcomes the report. He
3 says the presentation of the Safety Case
4 deserves significant deliberation before
5 acceptance. And he asks a question.
6 And he writes, "From tonight's
7 presentation and initial reading of Andrew
8 Hopkins, Australian Professor, a leading
9 proponent of this model, one of the key
10 elements is employee involvement which is a
11 part of the CSB recommendation for
12 triparthied review.
13 "How does the CSB believe the
14 Safety Case will be effective in non-union
15 facilities where it is unlikely there will be
16 meaningful worker involvement or ability to
17 raise suggestions that are not welcome by
18 some of their supervisors or in direct
19 opposition to stated supervisor positions?"
20 And I know we looked at this both
21 from the standpoint of the unionization rate
22 at the 15 California refineries as well as

1 how it might work in non-union facilities.
2 So I wonder if the team would like to answer
3 Mr. Morawetz's question?
4 MR. HOLMSTROM: Well, first of
5 all, it's in our report that the unionization
6 rate in California refineries is, I think,
7 over 75 percent. And we know that the
8 unionization rate in, I think, Norway is well
9 over 50 percent. The U.K. is 20-some
10 percent, Australia I think is similar.
11 And so there is already, I think,
12 a basis for workers who are represented to
13 use that representation in the course of
14 participating in a more rigorous safety
15 management regime.
16 The other thing I would add to
17 that is that the Safety Case applies worker
18 empowering and participation elements that
19 would apply to facilities where workers were
20 not represented.
21 And what we heard actually from
22 the union representatives in the U.K. and in

1 Norway, although offshore Norway is mostly, I
2 think, almost entirely unionized, is that
3 even in those facilities, because they
4 interact, workers and representatives get
5 together in groups like Step Change for
6 Safety. They interact, and they feel that
7 they have important exchanges with them, and
8 develop better relations and understand some
9 of the advantages and disadvantages of their
10 various positions.
11 And they feel they can work
12 together to improve safety. So they think
13 overall it is a positive reform, because it
14 empowers workers in both union and non-union
15 locations.
16 That's what we hear from unions in
17 the United Kingdom and Norway. Obviously
18 they would feel, when they expressed to us
19 that they have more significance, more say
20 and more influence when they're represented.
21 Because they have the power of their
22 membership behind them.

1 DR. HOROWITZ: Thanks. Next is
2 Kim Nibarger of the United Steelworkers.
3 MR. NIBARGER: My name's Kim
4 Nibarger, N-I-B-A-R-G-E-R. Good evening, Mr.
5 Chairman, fellow Board Members.
6 I'm a health and safety specialist
7 for the United Steelworkers International
8 Union. We're the union that represents the
9 operators and proprietary maintenance
10 employees at the Chevron Richmond Refinery.
11 Our members are responsible for
12 approximately two-thirds of domestic oil
13 production in this country in over 70
14 refineries. We also represent many more
15 workers in highly hazardous chemical plants
16 which fall under many of the same safety
17 regulations.
18 A Safety Case requires, as does
19 the OSHA process safety management PSM
20 standard, a written plan that the company is
21 required to comply with. As proposed by the
22 CSB, the Safety Case requires that the

1 company manage identified risks, keep as low
2 as reasonably practicable or ALARP.
3 PSM requires companies to follow
4 practices that are recognized and generally
5 accepted good engineering practices, RAGAGEP.
6 And so the union reviewed a number
7 of accidents in the petroleum industry dating
8 back to the early days of PSM. We noted one
9 commonality. Companies had a failure to
10 execute. They did not follow their written
11 plans.
12 It's the obligation of the company
13 to operate in a responsible manner. With
14 that in mind, the International Union had
15 some comments about the implementation and
16 workability of the recommendations contained
17 in this report.
18 The advent of the implementation
19 of the process safety management standard
20 gave all of us in the refining business great
21 hope of improving safety in the industry.
22 For a few years, accidents seemed

to be on the decline, having just experienced the terrible accidents in the U.S. at Phillips Chemical complex and the ARCO Channelview Refinery.

Refiners seemed intent on developing plans to meet the intent of the performance based PSM standard. The early OSHA inspections at PSM regulated facilities seemed to follow a more prescriptive format, that which the compliance officers were used to performing.

That seemed to push the refiners to obtaining documentation to support the elements of the standard. For example, training used to be pretty effective hands-on, face to face. And that was turned into computer based training.

It was easier to generate a sign-in list by completing a trackable computer program that to be sure every individual got their name on a physical piece of paper.

Management of changes were easier

to pull up for the regulator if it was a check the box activity on the computer rather than a rigorous exercise performed in the field with operators and engineers on what will the potential downfall be if we make this change and how can it be remedied.

Process hazard analyses were in the review cycle and too often, when reviewing potential hazards, the consensus was, well, that doesn't happen here. It hasn't happened here, so it was dismissed as not being able to happen.

That same attitude is taking place with risk analysis. Because it had not happened in the facility, the risk was assumed to be acceptable, even though research would have told you it had happened at several other refineries.

Managing risk has turned into taking a risk. The companies have written plans on how they are to meet the elements of the PSM standard. A Safety Case would

1 require a written plan by the company on how
2 they would manage risk to as low as
3 practicable.
4 If refiners are not following
5 their current written plans, what makes you
6 think they will follow the written Safety
7 Case?
8 There are some good elements in
9 the PSM standard, and there are good elements
10 in the Safety Case. The Safety Case should
11 certainly be explored and considered. But
12 there may be more immediate benefit in trying
13 to beef up the elements of the PSM standard
14 that are weak.
15 And we have a list of some of the
16 things that we think need to be beefed up.
17 In the meantime, we cannot let the perfect be
18 the enemy of the good or forego useful
19 incremental changes in the search for a more
20 major change.
21 There are many things that Federal
22 OSHA, Cal/OSHA and currently through the

1 county Industrial Safety Ordinance could do
2 to improve the regulation of oil refineries
3 and other high hazard plants short of
4 adopting a full Safety Case framework.
5 It may be easier improving what is
6 in place, considering the litigious
7 environment we now face with nearly every
8 OSHA citation going to a solicitor under
9 contest and sometimes waiting years for a
10 trial date.
11 Meanwhile, the workers are exposed
12 to the hazards the company was cited for
13 while they fight over a legal interpretation.
14 More focus needs to be put on
15 including the workforce in helping the
16 company make improvements to safety for the
17 workers and the community.
18 The Safety Case language we have
19 reviewed from the U.K. has the same weak
20 consult language as does the PSM standard.
21 The USW would recommend convening an expert
22 panel to review the first recommendation and

1 explore the advantages and drawbacks of
2 implementing the Safety Case or adding some
3 clarity to and expanding the current PSM
4 standard to include some form of the Safety
5 Case.
6 We fully support the second
7 recommendation in this report on leading and
8 lagging indicators and have expressed our
9 willingness to work with the industry on that
10 matter so long as the process is fair and
11 gives us and other stakeholders a significant
12 voice.
13 As for the third recommendation,
14 the International Union is fully engaged in
15 responses to the request for information for
16 Executive Order 13650 and would like to see
17 the kind of improvements we are seeking in
18 OSHA's PSM standards to be rapidly
19 incorporated and embraced.
20 We look forward to working with
21 the CSB, the State of California and the
22 refiners nationwide to make this industry as

1 safe as it can be. Thank you.
2 (Applause)
3 DR. HOROWITZ: Thank you, Mr.
4 Nibarger. And Lionel Trepanier, I believe it
5 is, emails. And he's been very persistent in
6 getting his email through from the Utah Tar
7 Sands Resistance in a lengthy email, Mr.
8 Chairman.
9 So I think, with your permission,
10 we'll include it in the record. And I'll
11 just summarize his comment which is that they
12 generally agree with and support the CSB's
13 recommendations for substantial changes to
14 the way oil refiners are regulated.
15 But they must "vigorously
16 protest," their words, that the CSB is not
17 making similar recommendation in Utah. And
18 he notes Chevron's sulfidation incident in
19 Utah as well as other refinery incidents that
20 have occurred there and notes that Utah has
21 only six compliance inspectors in process
22 safety management.

1 And they support the CSB's
2 recommendation, and they ask for it to be
3 extended to the Government of Utah.
4 Next is Sandy Saeteurn from the
5 Asian Pacific Environmental Network. Thank
6 you. Could you spell your name please?
7 MS. SAETEURN: Yes. First name is
8 Sandy, last name is Saeteurn, S-A-E-T-E-U-R-
9 N, and Sandy Saeteurn, Richmond resident and
10 community organizer for the Asian Pacific
11 Environmental Network, APEN.
12 For those of you who aren't
13 familiar with APEN, we're an organization
14 that's 20 years old. Our mission is to
15 organize low income immigrant and refugee
16 communities here in Richmond, Oakland, as
17 well as across the State of California on
18 environmental justice issues.
19 And first off, APEN would like to
20 thank the CSB for conducting a thorough
21 investigation and providing real solutions
22 and recommendations that the community can

rally behind.

And today, we're here not only with our Richmond fellow residents and the community here, but we have our brothers and sisters from our neighboring refinery cities.

And we're all here tonight because we want the same thing. We want environmental protections. We want justice. And so we're all scared, of course. I know I'm scared. I grew up here in Richmond, lived right across the street from the refinery, had to deal with a lot of incidents that, you know, me as a kid growing up here shouldn't have to be dealing with.

I had tons of health issues growing up. And now I'm raising a family here. So I definitely am concerned. I know all of our community members are as well. And we look to all of you, the regulatory agencies, our elected officials and the Government to do your job and protect us.

So tonight, as a Richmond resident

1 and an APEN representative, I'm proud to say
2 I, we, support the Safety Case regime. We
3 urge the Board to adopt the staff
4 recommendations, and we also look forward to
5 more imitation and engagement on the
6 development of strong health and safety
7 models. Thank you.
8 DR. HOROWITZ: Thank you.
9 (Applause)
10 DR. HOROWITZ: And next we have a
11 question email from Charlotte Brody, who is
12 the Vice-President for the BlueGreen
13 Alliance.
14 And she writes, "Do you agree that
15 one of the key components for the effective
16 use of the Safety Case is parity of power
17 that allows triparthied safety management and
18 decision making? If you do, how do you think
19 we get there in our current regulatory
20 environment?"
21 And she writes, "Thank you for
22 your work and for this public meeting."

1 Would anyone like to address that question,
2 as to how do you achieve the triparthied
3 system?
4 MR. HOLMSTROM: Well, I mean, we
5 think that, as we say in our report, that the
6 elements are already there. That in
7 California you have, I mean, you've heard
8 from, I think, the two major locals, both in
9 the comment period and also here tonight,
10 engage very eloquently about issues they're
11 facing that the two unions have.
12 So I think that that element is
13 certainly strong and very committed to
14 improving the system.
15 I think we've heard from the
16 regulators here tonight that they're also
17 committed to improving the system. And I
18 think the comment that I heard earlier about
19 having the will to change is an important
20 one.
21 And I think there's always a lot
22 of reasons to not take action. But I think

1 what I observe from the various parties here
2 in California ever since we engaged out here
3 last August was a strong will to change, and
4 improve and prevent these incidents from
5 occurring from a number of different
6 stakeholders.
7 And we've heard that from industry
8 as well. We've heard a strong desire from
9 industry that these incidents are not
10 acceptable from their perspective. And
11 they're going to do everything they can to
12 prevent them.
13 So I think that, from the will
14 standpoint, I think it's off the charts from
15 what we've seen. And that's been our
16 experience. And I think, as one speaker said
17 earlier, it's at the execution stage. And I
18 think that's where we're at right now. And
19 that's obviously always a critical stage,
20 when people (inaudible).
21 DR. HOROWITZ: Thank you. And
22 we'll go back to the room. Next is Nicole

1 Heath of the Contra Costa Hazardous Materials
2 Program, I guess it is. Ms. Heath, are you
3 here? Ms. Heath? Well, maybe not.
4 Next is Gail Bateson, Worksafe.
5 Ms. Bateson?
6 MALE PARTICIPANT: She's over in
7 the comment section.
8 DR. HOROWITZ: Oh, there you are.
9 MS. BATESON: Thank you, good
10 evening. My name is Gail Bateson. It's
11 spelled B-A-T-E-S-O-N. I'm the executive
12 director of Worksafe. We're a statewide
13 advocacy group.
14 But I wanted to mention that I
15 also previously worked for almost two decades
16 with the Oil, Chemical and Atomic Workers
17 Union on their PSM curriculum and also with
18 the Labor Occupational Health Program
19 developing their human factors curriculum to
20 implement the countywide Industrial Safety
21 Ordinance.
22 I'd like to begin by thanking the

1 CSB members, and Chair and the staff for
2 coming out to the community, and not only for
3 that but for the work that you do and for
4 your work to really get through these
5 investigations, to find the root causes of
6 incidents but also for your consideration of
7 some new perspectives and approaches to
8 prevention.
9 Overall, while I think the Safety
10 Case approach is appealing, I actually agree
11 with several of the written comments on the
12 Website that point out that there are some
13 important underlying conditions that must be
14 in place before we can move away from the PSM
15 standard and embrace more of the Safety Case
16 approach, in particular, Steve Gill of the
17 U.K., and Naj Meshkati and many of the
18 comments made by Ms. Rosenberg.
19 I think at best it's a very long
20 term goal. And given the current state of
21 Cal/OSHA I think we're far from ready,
22 although I certainly appreciate the steps

1 outlined by Mike Wilson earlier. I think we
2 need to take a real assessment of where we
3 are right now.
4 But there are some short term
5 immediate recommendations that, if enacted,
6 could lay the foundation for, down the road,
7 integrating more of a Safety Case approach.
8 And a couple of these are, first,
9 to recommend to the Governor that California
10 reform its labor code to require the timely
11 abatement of serious violations. This was
12 raised by Congressman Miller.
13 This is a law that exists in
14 Oregon, and Washington and really throughout
15 the country through the IMAGE (phonetic)
16 program. And it's working very well at all
17 three locations. And we know this because we
18 have, through our office, interviewed the top
19 officers of all three of those programs.
20 So it really helps a great deal to
21 have that kind of recommendation coming from
22 the CSB to the Governor.

1 A second related point is that CSB
2 had a recommendation that Chevron make
3 certain changes in all of their (inaudible)
4 facilities. Now, I understand this is fairly
5 typical recommendation you make. It's
6 important to note that in California we still
7 do not ever have a repeat citation policy
8 which really ties the hands of the agency
9 when it finds similar violations at other
10 facilities in California, such as the people
11 who came up here from Los Angeles.
12 So having a repeat policy that's
13 at least as effective as Federal OSHA, with
14 Cal/OSHA's enforcement agency much more teeth
15 right away, not only across the refineries
16 but across the chemical plants and all the
17 facilities in California. Federal OSHA's
18 repeatedly raised this with Cal/OSHA through
19 its annual FAME audits.
20 We have had a lot of talk about
21 different regulatory regimes. But they will
22 really only work with effective enforcement

1 and adequate staffing.
2 And it's important to mention that
3 Cal/OSHA does have a couple of very special
4 strong tools. One is it actually does have
5 authority under its PSM to address inadequate
6 process hazard analyses and to cite the
7 companies for these. And they have done that
8 on some occasions. So that authority exists.
9 California is also unique to have
10 what we call orders prohibiting use, OP use
11 (phonetic). And as you know, that was used
12 in the Chevron Refinery to shutdown a unit
13 for eight months. So there're some really
14 great tools we have.
15 But what we really need is more
16 adequate staffing. And I think that we need
17 more than just more inspectors in this
18 isolated PSM unit but also throughout the
19 agency for when the citations get appealed.
20 Then you need to have the legal unit and
21 other experts come in and defend. So it just
22 can't be the PSM unit itself.

1 So if you look at what Federal
2 OSHA thinks we should have on benchmarks for
3 Cal/OSHA for inspectors it's 805. If you
4 look at what we should have if we had the
5 equivalent of what Oregon or Washington has,
6 we'd have close to 900.
7 But what do we have, in fact, 165,
8 and no real plan to change that except for
9 the latest budget which has 12 new safety
10 engineers, which I assume are going to the
11 PSM unit.
12 So we really need specific
13 instructions from you of what would be
14 adequate staffing if we're going to look for
15 the more aggressive safety regime approach.
16 Similarly, we commend your
17 recommendation to move for the more
18 triparthied model. But again, we agree with
19 some of the comments by Naj Meshkati about
20 the importance. In order to have true
21 employee involvement, that above that you
22 have to have genuine management commitment

1 and a safety culture.
2 And that means not just have the
3 operating plants here in California, but at
4 the parent company at the international level
5 where the major financial decisions are made
6 about investments in maintenance and
7 operations.
8 Employees may be participating on
9 some of these teams to do PHAs and some of
10 the follow-up recommendations so it can look
11 like there's employee involvement. But as
12 the interim CSB report showed, upper
13 management at Chevron often ignored internal
14 recommendations.
15 Years ago when I was working for
16 OCAW, I learned from workers at the Richmond
17 Refinery about how draft PHA reports were
18 always far more detailed with all kinds of
19 specific findings and recommendations.
20 But when the final PHAs were
21 reviewed and issued, as they generally do by
22 the legal department, they were much more

1 general and much less useful in terms of
2 pinpointing what the actual problems were.
3 So the problem was not employee
4 involvement but management commitment to
5 addressing hazards in a serious way.
6 Finally, I support the concept of
7 leading and lagging indicators. It's a great
8 idea that can be done immediately. It can
9 provide a more comprehensive set of factors
10 to consider when targeting inspections. And
11 Cal/OSHA already has the discretion in their
12 mandate to do that.
13 So finally, I just wanted to say,
14 and I think Henry mentioned it too about the
15 General Chemical spill, if anyone was around
16 here for that, California should expand this
17 initiative not only to protect people living
18 near refineries but also chemical plants that
19 kind of alter the whole jurisdiction of PSM.
20 And again, I want to thank you for
21 coming out tonight to Richmond to hear from
22 the community.

1 DR. HOROWITZ: Thank you, Ms.
2 Bateson.
3 (Applause)
4 DR. HOROWITZ: Next is Eduardo
5 Martinez representing the Richmond
6 Progressive Alliance. Mr. Martinez?
7 MR. MARTINEZ: Good evening. My
8 name is Eduardo Martinez, M-A-R-T-I-N-E-Z.
9 Environmental and community organizations,
10 residents of Richmond and Contra Costa
11 County, thank you for your investigation of
12 the Chevron fire and Chevron's managerial and
13 organizational culture that allowed the fire
14 to happen.
15 We thank you for your
16 recommendations to improve the safety
17 practices of the oil industry in the United
18 States. We welcome the Safety Care regime as
19 a method to shift from a system of crises
20 management to a system of best practices for
21 safety.
22 What we have today is a static

1 regulatory system that is managed by a strong
2 industry, a weak labor force and a weak
3 Government representation.
4 We see the strength of the oil
5 industry and the influence they wield in
6 public opinion and policy with their lobbiers
7 and their advertising. We see their strength
8 in the millions of dollars they spend on
9 local elections.
10 We see the weakness in unions when
11 industry is able to ignore their efforts and
12 their recommendations. We see the weakness
13 of unions when Government interferes with
14 their efforts to exert their power.
15 We see the weakness of our
16 Government when our legislators are unable to
17 hold the industry accountable, when our
18 Government can only fine Chevron less than
19 what they spend in a local election for
20 criminal actions for the fire created by
21 negligence.
22 So Richmond is in a special place

in that the city issues permits to Chevron projects. Under the current system, these permits have been approved on the words of Chevron representation. But that must end.

Chevron must finance independent regulators chosen by the city with guidance of unions and local environmental groups. And if Chevron does not meet the Safety Case requirements, the regulators should have the power to stop any processing in the sections that fail the inspections.

Concern was voiced over a weak Safety Case regime, but the flexibility of the Safety Case regime would enable changes which is not the case now.

The Contra Costa community has awakened. We will make sure that we have a strong Safety Case regime by pushing our Government to do the right things necessary for safety and by supporting our unions.

The unions are our first line in defense against the excesses of industry. As

1 citizens, community members, we'll monitor
2 the actions taken by all involved in ensuring
3 our safety. Let's make this happen, thank
4 you.
5 (Applause)
6 DR. HOROWITZ: Thank you, Mr.
7 Martinez. And next we'll go to Diane Bailey
8 of the Natural Resources Defense Council.
9 Ms. Bailey?
10 Good evening, Chairman Moure-
11 Eraso, and Board members and staff. My name
12 is Diane Bailey. I'm a scientist with the
13 Natural Resources Defense Council. And we're
14 also members of the Bay Area Refinery Action
15 Collaborative.
16 I'm here today in strong support
17 of the CSB recommendations, including the
18 Safety Case. We're very grateful that you
19 came here to this community tonight and that
20 you're making a very serious effort to
21 address and improve refinery safety.
22 I want to echo and highlight just

1 briefly some of the comments that you've
2 already heard tonight. First, I'll note
3 Board member Griffon's comments about how
4 it's really not an either/or choice between
5 the Safety Case and regulation. We need
6 both. And we agree.
7 We support the staff's
8 recommendations on the Safety Case with many
9 of the strengthening recommendations that
10 you've heard here tonight, particularly from
11 the representatives of Congressman Miller and
12 Supervisor Gioia's office.
13 These were things like improved
14 enforcement, for example, giving the Contra
15 Costa County more authority for direct
16 enforcement, providing sufficient resources
17 for more qualified inspections and
18 inspectors, requiring the refineries to adopt
19 best practices and also timely abatement.
20 These are just some of the
21 strengthening provisions that I think that
22 you've heard a lot tonight. We really need a

1 proactive approach to refinery safety to
2 replace the current reactive approach.
3 Chevron, in its comments, says
4 that the current safety measures are working
5 just fine, and they support the status quo.
6 However, as your staff noted, in
7 2012 we saw 125 refinery safety incidents, 17
8 of which were in California, including the
9 August 6th, 2012, fire at Chevron Richmond.
10 And that sent 15,000 residents to the
11 hospitals as we've heard so much. And that's
12 the status quo, and the status quo must go.
13 As California faces the import of
14 ever dirtier, and more corrosive and more
15 dangerous crude oils, it is now more
16 important than ever that refinery safety be
17 improved.
18 I'll note that we strongly
19 support the many comments that the
20 steelworkers have made. We think that the
21 voice of the workers at refineries is really
22 essential to informing this process and

1 continuing to improve safety measures.
2 It's essential that the oil
3 industry be held accountable. We cannot let
4 the incident of August 6th, 2012, ever, ever
5 happen again. This is what the community
6 deserves. Thank you.
7 (Applause)
8 DR. HOROWITZ: Thank you, Ms.
9 Bailey. And next we go to Ross Nakasone, I
10 believe it is, of the BlueGreen Alliance.
11 Did I say that correctly, sir?
12 MR. NAKASONE: The BlueGreen
13 Alliance, yes.
14 (Laughter)
15 MR. NAKASONE: Ross Nakasone with
16 the BlueGreen Alliance, N-A-K-A-S-O-N-E.
17 DR. HOROWITZ: Yes, thank you.
18 MR. NAKASONE: Good evening. I'm
19 the California policy organizer with the
20 BlueGreen Alliance. The BlueGreen Alliance
21 (inaudible) via email is a national non-
22 profit that unites ten of the largest unions

1 here in the United States as well as four of
2 the larger environmental groups as well,
3 including NRDC and the Sierra Club.
4 We also are a partner in the
5 Refinery Action Collaborative of the Bay
6 Area. And we support the analysis and
7 direction of the CSB report on the Chevron
8 incident.
9 And specifically we commend the
10 report for accurately recognizing that
11 Chevron management repeatedly neglected to
12 respond to warnings, concerns and
13 recommendations issued by workers and
14 technical staff at the Richmond facility.
15 Even though Richmond Chevron
16 workers recommended employing inherently
17 safer systems due to management of change
18 process, Chevron management ignored those
19 recommendations.
20 We also commend the report's
21 acknowledgment that the California process
22 safety management standard needs to be

1 strengthened in order to prevent such
2 disasters from occurring again. (Inaudible)
3 referencing sulfidation corrosion as has been
4 discussed before.
5 And we also agree with the report
6 in recognizing that Cal/OSHA's ability to
7 sufficiently inspect the facilities and
8 report regulations is hampered by severe
9 under-staffing and under-funding of the
10 agency.
11 And so in accord with all of that,
12 I'd like to highlight the three
13 recommendations that would make an effective
14 system, and you've heard them before.
15 But I think they're worth
16 mentioning again, adequate financial and
17 personnel resources for Government agencies
18 to ensure more robust enforcement and
19 oversight and strong enforceable
20 requirements, including job protection, to
21 ensure meaningful worker involvement in
22 directing or preventing future accidents and

1 to clear focus and outcomes that are measured
2 by group safety rather than box checking.
3 Again, thank you so much for all
4 your work and the staff's work. It's really
5 quite a tremendous effort. And thank you for
6 your leadership.
7 DR. HOROWITZ: Thank you very
8 much.
9 (Applause)
10 DR. HOROWITZ: Next we'll go to
11 Andres Soto of Communities for a Better
12 Environment and the Richmond Progressive
13 Alliance. Mr. Soto, are you here? Oh, there
14 you are.
15 MR. SOTO: Good evening, Mr. Chair
16 and members of the Board, for coming here to
17 Richmond. I would like to thank you very
18 much, as well as for the work of your staff,
19 the diligent work that they've been doing to
20 examine really the causes of this.
21 And essentially it validates what
22 we in the community have been saying for

1 years, that Chevron and, by extension, the
2 industry in general, the WSPA folks and API
3 folks, that they put profits ahead of health
4 and safety.
5 They put profits ahead of the
6 health and safety of the community members,
7 of the labor force, and they squeeze every
8 penny that they can to enrich their
9 shareholders.
10 I had the benefit of attending the
11 Chevron shareholders meeting in 2013 in San
12 Ramon at their headquarters, their corporate
13 headquarters. I had to pass through a
14 phalanx of security, metal detectors, all
15 sorts of things.
16 And then once I got inside there,
17 it was really a parallel universe. Their
18 world is not the same as our world. And
19 those of us who are in the community and have
20 lived here in the shadow of these refineries,
21 have endured the flaring, endured the
22 consistent pollution, not just the episodic

1 pollution but also the persistent pollution
2 that has injured our community, not only
3 through cancers and asthma and all other
4 sorts of autoimmune diseases, but also the
5 way they have injured our democracy.
6 And particularly, this gets to the
7 question of the political will to actually
8 enforce some of these changes, make these
9 changes and make them enforceable as your
10 staff has recommended.
11 We, here in Richmond, just in the
12 last election, Chevron spent $1.2 million
13 which is more than the record fines they paid
14 for this incident. And that's in a local
15 city council election. Imagine what they're
16 spending in Sacramento, not to mention
17 Washington and all the other state capitals.
18 So that's the challenge that you
19 guys have presented to us and that we are
20 going to take on. And that's the challenge
21 that we are going to have to present to our
22 elected officials, you know.

1 We need the transparency of this
2 regulatory scheme, not just for the workers
3 but for the community. This issue, this
4 hiding behind the skirt of trade secrets is
5 really not a system that is going to impact
6 our community in a positive way.
7 And we have to strip that away.
8 Because these guys trade this stuff back and
9 forth. They're a cartel. We know that
10 because of the way they're planning their
11 bringing in of the North Dakota Bakken and
12 the tar sands into the Bay Area via rail, the
13 rolling pipelines, and the dangers that
14 presents.
15 That's not your bailiwick right
16 now. I guess that would be the NTSB, your
17 counterparts. But, you know, that makes our
18 lives complicated here.
19 But here in the Bay Area, we're
20 very lucky, because we have a long history of
21 experience in learning about this stuff. The
22 information presented in these reports has

1 been tremendously educational to our
2 community and to this region in general.
3 And so I want to thank you. I
4 urge you to adopt the recommendations of your
5 staff. If you need to take these necessary
6 recommendations or amendments that seem to
7 really reinforce what everybody is saying,
8 then go ahead and do that.
9 But I think we want to begin
10 implementing the Safety Case right here in
11 Richmond, right now. We want to do it
12 through our Industrial Safety Ordinance in
13 Richmond and Contra Costa County.
14 We need to have one in Pittsburgh,
15 because of the WesPac project and then,
16 ultimately, in Solano County because of
17 Venetia and, of course, our counterparts in
18 Southern California.
19 So I'll leave it at that. But
20 because of your great work, we want to
21 present you guys with some plaques of our
22 thank you for your great work.

1 (Applause)
2 CHAIRPERSON MOURE-ERASO: I
3 gratefully would like to say that we accept
4 them, with a lot of pride.
5 (Laughter)
6 CHAIRPERSON MOURE-ERASO: This is
7 one of the best reactions that we get from a
8 community for our work. And we are very,
9 very proud to have received this from you.
10 Thank you.
11 MR. SOTO: Well, thank you very
12 much. And once again, thank you to you and
13 your whole team.
14 (Applause)
15 DR. HOROWITZ: Thank you, Andres.
16 And next up is John Bresland, representing
17 Process Safety Risk Assessment. And Mr.
18 Bresland is a long time former CSB Board
19 member and also made the journey from West
20 Virginia with me, I guess, today, although
21 not on the same airplane.
22 MR. BRESLAND: Yes. It seems much

1 safer to be here at the --
2 (Laughter)
3 DR. HOROWITZ: It does indeed.
4 MR. BRESLAND: I don't have any
5 plaques for you. Maybe I brought a message
6 that they don't quite appreciate us as much
7 as the one that can (phonetic).
8 Good evening, my name is John
9 Bresland, spelled B-R-E-S-L-A-N-D. I'm a
10 former chairperson and Board member of the
11 Chemical Safety Board. I had the pleasure of
12 serving the CSB for ten years.
13 I appreciate this opportunity to
14 make a statement regarding the CSB's
15 recommendation that California implement what
16 is known as the Safety Case.
17 I have over 40 years experience
18 with process safety, both in industry and
19 with the U.S. Government. Throughout my
20 career, including my tenure at the CSB, I've
21 focused on effective ways to prevent or
22 minimize the consequences of process safety

1 accidents such as fires, explosions and toxic
2 releases.
3 I know that incidents like these
4 hit close to home. As a CSB Board member I
5 met with families whose lives were forever
6 changed because of catastrophic accidents.
7 I understand the fear, the anger
8 and the uncertainty that grips the workforce
9 and the surrounding community following these
10 types of events.
11 I share the common desire of
12 workers, employers, elected officials and
13 communities to ensure that the facilities
14 operate safely. And most importantly, I
15 recognize that changes are required to
16 prevent process safety accidents from
17 occurring.
18 Calls for regulatory changes are
19 appropriate. It is important, however, to
20 ensure that we do not make decisions in haste
21 or simply for the purpose of change. To be
22 credible, findings and recommendations

1 arising from incident investigations must be
2 grounded in rigorous scientific and
3 engineering principles.
4 Arguments used to support them
5 must be supported by data and evidence that
6 has been subjected to rigorous technical
7 scrutiny.
8 Only then can we be certain that
9 we've identified the true root causes of an
10 incident and have developed effective
11 recommendations to prevent a recurrence.
12 Unfortunately, the CSB Safety Case
13 recommendations fall far short in this
14 regard. There is no empirical evidence that
15 the Safety Case is more effective at
16 preventing process safety incidents than
17 other regulatory approaches, including
18 California's process safety management
19 standard.
20 The CSB admits as much when it
21 states in the report that, "There have been
22 few objective studies conducted on the impact

1 of the Safety Case regulatory approach on
2 safety performance."
3 As a result, the CSB is left to
4 promote the benefits of a regulatory regime
5 unfamiliar to U.S. regulators and industry
6 alike through what is little more than a
7 limited survey of anecdotal reports and
8 personal opinions.
9 I'm not alone in my concern. A
10 number of highly regarded safety experts have
11 urged the CSB not to approve this
12 recommendation.
13 Dr. Nancy Leveson, for example,
14 has worked in the area of system safety for
15 34 years. She is currently a professor of
16 aeronautics and astronautics and a professor
17 of engineering systems at the Massachusetts
18 Institute of Technology.
19 In the area of public accident
20 investigation, she served as a senior
21 consultant for the Commission on Deep Water
22 Horizon and as a member of the Baker Panel.

1 Dr. Leveson has written a letter,
2 mentioned already this evening, has written a
3 letter to the CSB which expresses her strong
4 reservations about the Safety Case. And I
5 have a copy of her letter for introduction
6 into the record for this evening's meeting.
7 Dr. Leveson states that there is
8 insufficient objective evidence that the
9 Safety Case is superior to other regulatory
10 approaches or that it more effectively
11 promotes and improves process safety.
12 Careful evaluation in comparison
13 of the efficacy of the available approaches,
14 including the Safety Case, simply has not
15 been done.
16 She adds, "Most papers addressing
17 or promoting the use of the Safety Case
18 regimes ignore the fundamental question of
19 whether a Safety Case regime is effective,
20 let alone more effective than other
21 approaches.
22 Unfortunately, the draft

1 regulatory report suffers a similar
2 deficiency in that CSB has offered little
3 more than personal opinions regarding the
4 effectiveness of the Safety Case regime
5 supported by reference to other personal
6 opinions.
7 A far more thorough empirical
8 analysis is required before the CSB should
9 recommend such a sweeping change. In fact,
10 Dr. Leveson believes that, if anything, the
11 weight of the available evidence indicates
12 that the Safety Case offers no superior
13 protection against process safety incidents.
14 She observes that (inaudible)
15 Safety Cases have been faulted in numerous
16 accident reports. For these reasons, Dr.
17 Leveson very recently confirmed to me her
18 belief that, "This idea of using Safety Cases
19 in the U.S. is a very odd one."
20 I'm also concerned that the CSB
21 has not adequately considered or disclosed
22 the burdens and potential consequences of the

1 fundamental change that it is proposing. The
2 CSB report fails to consider the very real
3 potential for diminished safety reforms
4 during a transition to the Safety Case.
5 The Safety Case cannot be achieved
6 by executive directive. It can only be
7 implemented through legislative action. It
8 will take years to implement and comes at a
9 significant cost.
10 Every dollar spent by the State of
11 California to implement the Safety Case
12 approach is a dollar that is not spent on
13 other efforts including the existing process
14 safety programs.
15 Every hour spent by an inspector
16 learning how to implement the Safety Case is
17 an hour not spent on an on-site inspection.
18 Without clear empirical data showing a
19 guaranteed benefit, these tradeoffs are not
20 acceptable.
21 Dr. Leveson again shares my
22 concerns. She is worried that the agency

1 does not fully appreciate the resources that
2 the State of California would need to
3 implement the Safety Case recommendation.
4 Dr. Leveson believes that the
5 effective implementation of the Safety Case
6 would require California to allocate millions
7 of dollars to the hiring and training of a
8 significant number of additional regulators
9 and inspectors.
10 I believe that the CSB needs to
11 first conduct a rigorous technical study of
12 the different regulatory regimes so that it
13 can develop a meaningful data on which it can
14 then base a recommendation.
15 If there is a demonstrated benefit
16 to the Safety Case, elected officials and
17 regulators can then make an informed decision
18 about whether its benefits outweigh the
19 costs.
20 But the CSB is aware Federal OSHA
21 is working to improve the PSM standard
22 through a recently issued request for

1 information.
2 Furthermore, President Obama has
3 signed an Executive Order establishing a
4 federal multi-agency chemical facility and
5 safety and security working group with a
6 mandate to further improve chemical facility
7 safety and security in coordination with
8 owners and operators.
9 With these efforts underway, a
10 better approach would be for CSB to study the
11 Safety Case while exploring efforts to
12 improve the existing process safety
13 management program.
14 And for these reasons, I
15 respectfully oppose the CSB recommendation
16 directed to the State of California to
17 implement the Safety Case. Thank you for the
18 opportunity to speak here this evening.
19 DR. HOROWITZ: Thank you. Was
20 there a --
21 (Applause)
22 DR. HOROWITZ: -- a letter that

1 you wanted to --
2 MR. BRESLAND: I'll get it for
3 you.
4 DR. HOROWITZ: Okay. George R.
5 Monterrey, Mr. Monterrey?
6 MR. MONTERREY: Yes, my name is
7 George Monterrey. And it's spelled M-O-N-T-
8 E-R-R-E-Y. And thank you, CSB Board, for
9 letting me speak here tonight.
10 I represent PEC, Pittsburgh Ethics
11 Council. And in Pittsburgh we are upset that
12 our city council would consider a dangerous
13 product like WesPac and not notifying us
14 about this project.
15 WesPac is trying to refurbish and
16 build a huge storage and transfer terminal
17 for crude oils brought in by rail and barge
18 on an old and decrepit PG&E plant that has
19 not been in service for two decades.
20 And, it being so close to our
21 homes, schools, parks and churches, we stand
22 in support of the Chemical Safety Board's

1 recommendation for Safety Case regime before
2 any crude oil related project can start up.
3 If we have the Safety Case regime
4 now, WesPac's dirty crude by rail could not
5 go forward. So Pittsburgh would like you to
6 adopt the Safety Case regime.
7 And in closing, the gentleman that
8 spoke, all the gentleman that spoke for the
9 petroleum industry, they're still for the
10 crude.
11 (Applause)
12 DR. HOROWITZ: Thank you, Mr.
13 Monterrey. Next is Mr. Roger Lin of CBE.
14 Mr. Lin?
15 MR. LIN: Good evening, members of
16 the Board. I'm Roger Lin, L-I-N. I'm an
17 attorney with Communities for a Better
18 Environment. Thank you again for coming to
19 Richmond. I won't keep you long, just three
20 really quick points.
21 First, your staff's thorough and
22 extensive work correctly (phonetic) done by

1 the current refinery safety system is broken.
2 We need systems in place that would never
3 allow Chevron management to ignore the advice
4 of its own safety inspectors.
5 Second, the Safety Case regulatory
6 regime properly shifts risk management
7 responsibility to the company and its
8 employees and requires continuous risk
9 reduction. This community needs the Safety
10 Case.
11 Most of all, and in all due
12 respect to the prior chairperson of the CSB,
13 it replaces the relatively insignificant
14 fines that are basically like chump change to
15 the refineries with an actionable license to
16 operate. We need this.
17 Third and finally, to effectively
18 implement this new regulatory regime, it's
19 essential to obtain real and meaningful
20 community and worker participation. These
21 are the eyes and ears that will assist
22 regulators to ensure effective

1 implementation.
2 And as the Board's highlighted
3 tonight, the opinion of workers and community
4 must be given the same participatory weight
5 as industry and regulators.
6 If there are any doubts about the
7 effectiveness of this participation, remember
8 that this community, this community busted
9 Chevron for trying to hide the company's
10 switch to refining a lower quality oil feed
11 supplement.
12 And the Court of Appeal agreed
13 with us. We can get there without
14 litigation. But first we have to have that
15 equal weight participation.
16 Finally, this problem is real,
17 urgent and just as big, if not bigger, than
18 the required solution. Thank you again for
19 your time. Please adopt your staff's
20 recommendation. As I said, they're a great
21 start.
22 (Applause)

1 DR. HOROWITZ: Thank you, Mr. Lin.
2 Melvin Willis, ACCE. Mr. Willis? Thank you.
3 MR. WILLIS: Good evening, members
4 of the Board and staff, Melvin Willis, W-I-L-
5 L-I-S.
6 The last time you guys were out
7 here and came up with those great
8 recommendations for modernizing refineries as
9 nationwide recommendations, I sat here before
10 you and told you that when those
11 recommendations were made on the pipe that
12 exploded in 2012, happened in actually 2002.
13 I was 12 years old when those recommendations
14 were made.
15 And then in 2012, ten years later,
16 it was still left unattended, you know, pure
17 negligence. And nothing was done at the age
18 when I turned 22.
19 This is definitely something that
20 is really needed. I've heard arguments
21 saying that the current standards are okay
22 today but clearly not, if under those same

1 standards 15,000 people went to the hospital
2 and almost 19 workers have lost their lives
3 under those standards.
4 So just, you know, I don't want to
5 take any more of your time. You guys have
6 heard it all.
7 But one thing that I would ask
8 that be put on these recommendations for your
9 consideration is that when you recommend
10 these to the cities, states and other
11 entities that you say that these
12 recommendations should be immediately
13 adopted. Thank you very much.
14 (Applause)
15 DR. HOROWITZ: Thank you, Mr.
16 Willis. And next we will go to Mr. Andy
17 Katz. Mr. Katz, are you here?
18 MR. KATZ: Good evening, Board
19 members. My name is Andy Katz. I'm a
20 director at the East Bay Municipal Utility
21 District, and I'm a Clean Air advocate for
22 Breathe California, a public health

1 organization.
2 And we're here to support the
3 community, and the workers and the Chemical
4 Safety Board's recommendations. And I
5 encourage you to adopt the report in front of
6 you.
7 Your report is supported by your
8 findings. And your findings are supported by
9 the facts. Your report very well illustrates
10 the failures in the current system, the
11 failure of the facility to prevent the
12 disaster on August 6th, 2012, a failure to
13 perform adequate maintenance and the failure
14 to implement inherently safer technology that
15 would have prevented the sulphide corrosion
16 that was a major cause of the refinery
17 explosion.
18 The report goes into a number of
19 excellent issues. It discusses the
20 coordination between the agencies,
21 transparency and the empowerment of workers
22 through the triparthied system.

1 It's important to emphasize what
2 you've talked about in terms of regulator
3 competence and resources. But what's most
4 important about the Safety Case is ensuring
5 that there will be inherently safer
6 technology as a core component of the Safety
7 Case.
8 The demonstration to the regulator
9 that there must be the safest standard
10 achieved, that's a major improvement compared
11 to the current system and will help keep the
12 community safe, help keep the community
13 healthy and protected from future disasters.
14 I fully encourage the authority to
15 adopt the report in front of you to ensure
16 that we have the community's health and
17 safety protected.
18 I also encourage you to look at
19 the recommendations made by the elected
20 officials, Mayor McLaughlin, Vice-Mayor
21 Jovanka Beckles, Supervisor John Gioia and
22 Congressman Miller and follow through with

1 their recommendations in a subsequent report.
2 Because the issues have been
3 raised, such as Cal/OSHA improvements, the
4 ability for Cal/OSHA to be able to abate
5 violations in a faster fashion, inter-agency
6 roles, especially the ability of local
7 agencies to be able to take enforcement
8 actions, and many of those other suggestions
9 documented in their written letters.
10 It's very important to follow-up
11 on these issues. And I encourage those to be
12 looked at in a forthcoming report following
13 adoption of your current report tonight.
14 The follow through of the Chemical
15 Safety Board would be much appreciated. All
16 of your great work today, you fully deserve
17 the plaques that you were given tonight and
18 hopefully much more appreciation that those
19 symbolize.
20 Your independent voice and your
21 technical capacity has brought a real change
22 to the conversation, a real call to action.

1 And I thank you so much for providing those
2 resources and that momentum to this
3 community. Thank you.
4 (Applause)
5 DR. HOROWITZ: Thank you very
6 much, Mr. Katz. And now we'll go to Mike
7 Parker of the Richmond Progressive Alliance.
8 Mr. Parker?
9 MR. PARKER: Mike Parker, P-A-R-K-
10 E-R. It's a funny thing about regulation and
11 politics. Change only happens really in
12 spurts in response to incidents when the
13 public is focused on it and paying attention.
14 The net result of asking for
15 delays, and dragging things out and
16 perfecting things before things happen is, in
17 reality, a way to kill things. That's
18 because the public will not continue to focus
19 on this because there will be other incidents
20 and other problems that will happen.
21 Therefore, what I'm saying is that
22 the calls for delay by and large are calls

1 for maintaining the status quo. And that's
2 the one thing we cannot afford in the system.
3 So I urge adoption of what you
4 have here and it's clearly safer. After all,
5 it's only a recommendation. It just starts
6 the process somewhere else. This isn't the
7 final answer. All these things can be worked
8 out as it goes through the process. And then
9 we move on.
10 And we then move on to the kinds
11 of issues that were raised by Ms. Rosenberg
12 and Mr. Griffon, which is that any regulation
13 will fail is there are not two things.
14 The first is that if unions are
15 weak, they cannot protect the workers in
16 those plants who have to be the people who
17 are the onsite inspectors. And if they have
18 to be the whistle blowers and if the unions
19 cannot protect them as whistle blowers, we
20 have no safety regime at all.
21 Because outside regulation can
22 only go so far. There have to be people

1 onsite who know the process and are working
2 with it. And they have to be protected.
3 Secondly, even if the regulators
4 are trained and paid well, and I'm all for
5 doing that, they will still be a revolving
6 door with the industry, as we've seen with
7 the banking industry and every other
8 regulation that's taken place in this
9 country, unless the political authority that
10 is behind these regulators is concerned first
11 with the needs of the people rather than the
12 needs of the corporation.
13 When Chevron controls the
14 Government through its campaign
15 contributions, its lobbying activities and
16 various other ways of buying community
17 support, it doesn't really matter if we have
18 good trained regulators.
19 We still will get the same thing.
20 Namely, we'll get Chevron doing what it wants
21 to do in the name of higher profits.
22 So it would be good if the report

1 would note that problem and put in there that
2 something has to be done about the
3 contributions and the political power that
4 Chevron and the oil industry have as a result
5 of their money.
6 Only then, only when the public
7 understands that that really is their safety,
8 that they elect people who are willing to
9 represent the people rather than the
10 corporations, can we really make these kinds
11 of operations safe. Thank you.
12 FEMALE PARTICIPANT: Bravo.
13 (Applause)
14 DR. HOROWITZ: Thank you, Mr.
15 Parker. And how about Tarnel Abbott, Mr.
16 Tarnel? Ms. Abbott?
17 MS. ABBOTT: Yes. That's Tarnel
18 Abbott, it's T-A-R-N-E-L A-B-B-O-T-T. Thank
19 you very much for --
20 DR. HOROWITZ: And representing
21 the Richmond Progressive Alliance also,
22 ma'am?

1 MS. ABBOTT: Yes.
2 DR. HOROWITZ: Thank you.
3 MS. ABBOTT: But I'm also
4 representing myself as a citizen of this
5 city, resident, long-term resident. I do
6 want to thank the CSB for coming to Richmond
7 and spending a lot of time on this issue.
8 I was pretty close when the fire
9 happened. And I also sought medical
10 attention. But because I did not go to an
11 ER, I went the next day and saw my doctor, my
12 visit was not recorded or counted.
13 I'm probably not the only one. So
14 let me say that 15,000 people went to get
15 medical help, it's at least 15,000 and maybe
16 more.
17 The toxic load in Richmond is
18 severe. It's from the Richmond Refinery,
19 it's from the port, it's from other
20 industrial sources. The people in this
21 community have an over-burden, a health over-
22 burden, an overload.

1 I worked for 22 years at the
2 Richmond Public Library as a librarian. And
3 I lost so many colleagues to cancer that it's
4 absolutely heart breaking, young people. And
5 it's continuing.
6 I do think Chevron is partly to
7 blame for that. My son had asthma, and I can
8 tell you now that he moved away, he doesn't
9 have asthma anymore.
10 In terms of the trade secrets,
11 Chevron has used proprietary information to
12 basically not allow testimony in a public
13 courtroom. And so I would be very wary about
14 that.
15 In terms of enforcement, the prior
16 speaker, Mr. Parker, said it beautifully,
17 because Chevron spends so much money on the
18 local elections it's very hard for the local
19 body to be the objective regulator that they
20 need to be.
21 They need to do the regulations,
22 but somehow the real teeth have to be

1 separated from the corruption of the
2 democratic process that happens when
3 elections are bought. And they are bought.
4 It's utterly shocking and
5 disingenuous when industry expresses fear
6 that the Safety Case approach might even
7 create more risk. That is just the most
8 ludicrous thing I've heard.
9 As I see it, the Safety Case
10 approach is something that strives towards
11 prevention of accidents, and because it sends
12 up the inclusion of the workforce into the
13 recommendations.
14 And they are the ones on the front
15 line who do know what's needed. I think
16 these are very good recommendations, and I
17 urge you to adopt it. Thank you very much.
18 (Applause)
19 DR. HOROWITZ: Thank you very
20 much. And next we'll go to Jeff Kilbreth,
21 Richmond Progressive Alliance. Mr. Kilbreth?
22 MS. ABBOTT: He's gone.

DR. HOROWITZ: He's gone, okay. And Roger Lin, well, this is a duplicate. Did you have an additional comment or perhaps you just signed up twice?

(Off microphone discussion)

DR. HOROWITZ: He left. Okay, very good. And next is Martin MacKerel, Sunflower Alliance, Mr. MacKerel?

MR. MACKEREL: Thank you. Yes, it's Martin MacKerel, A-C, capital K-E-R-E-L.

DR. HOROWITZ: Oh.

MR. MACKEREL: You can say it either way, that's fine.

DR. HOROWITZ: Okay.

MR. MACKEREL: So, yes, I'm with the Sunflower Alliance and 350 Bay Area working on climate and environmental justice.

I did have one comment for the gentleman from WSPA and API. Please stop exploring for fossil fuels. We already have five times the amount in service than we can

1 safely burn. Thank you.
2 So regarding the Safety Case
3 regime, so I mean, look at some of the stuff
4 that's happened lately. We have the
5 explosion a year and half ago. We've been
6 seeing these bomb trains with Bakken shale
7 oil, just can't stop exploding, back two the
8 last couple of weeks.
9 We have this just absolutely
10 ridiculous disaster in West Virginia. It's
11 clear that there's a lot of industry that's
12 just out of control and that, across the
13 board, regulation is inadequate.
14 And I really hope that this can be
15 part of a sea change of how society interacts
16 with industry and really make the case. We
17 need to absolutely change the way we look at
18 things and have safety first.
19 And I think there's, you know,
20 this idea that somehow the Safety Case regime
21 would be more dangerous, it's ludicrous. And
22 I think there's one thing in there, if I

1 understand it correctly, that I think I see
2 why the corporations really don't like it,
3 which is to say that if things are unsafe the
4 regulators have the power to stop production.
5 That's what -- am I incorrect on that?
6 FEMALE PARTICIPANT: That's true,
7 but they don't do it.
8 MR. MACKEREL: Of course they
9 don't do it. So we're going to have to push
10 them on that. But the power is there.
11 So, I mean, Chevron could just
12 brush off a million dollar fine. Stopping
13 production would actually hurt them, and
14 actually they would have to stop with the
15 rest of the issues.
16 But at any rate, I think, you
17 know, we're in a crazy time right now. We're
18 facing myriad really complex crises. And
19 it's a time where we need, we need unlikely
20 heroes.
21 And we have, for example, here in
22 the Bay Area, the Bay Area Air Quality

1 Management District, which is kind of an
2 oddball regulatory agency, has really stepped
3 up to the plate and been really far sighted
4 about helping to regulate greenhouse
5 emissions and have a plan for the future,
6 actually reducing them.
7 And so I hope that, on this front
8 of chemical, you know, regulation, that the
9 CSB can do a similar thing. Thank you very
10 much.
11 (Applause)
12 DR. HOROWITZ: Thank you, Mr.
13 MacKerel. Next we have Ethan Buckner of
14 Forest Ethics. Mr. Buckner?
15 MR. BUCKNER: Hi there. My name's
16 Ethan Buckner. It's E-T-H-A-N B-U-C-K-N-E-R.
17 I'm the U.S. organizer for Forest Ethics.
18 And first I'd like to thank the CSB staff for
19 your tireless work -- it may be tired at this
20 point --
21 (Laughter)
22 MR. BUCKNER: -- to draft this

1 report, the interview today. And I strongly
2 urge the CSB to adopt this report.
3 And there are many reasons why
4 adopting a Safety Case regime is critical to
5 protect workers, and communities and
6 environments. And I'd like to highlight one
7 particular aspect of the CSB's
8 recommendations that's essential, especially
9 here in the Bay Area and across the United
10 States.
11 The need for regulatory regime is
12 adaptable and continuously improved. If
13 regulations cannot keep up with a rapidly
14 expanding and changing industry, cities like
15 Richmond, Pittsburgh, Venetia, Rodeo,
16 communities that all here in the Bay Area are
17 facing proposals for expanded infrastructure,
18 will be at much greater risk for repeats of
19 the August 12th fire or worse.
20 We need regulations that can
21 specifically address the rapid increase of
22 unconventional, dirty and dangerous crude oil

being brought here into the Bay Area, including tar sands from Alberta, noting that the (inaudible) has a significantly higher sulphur content than traditionally applied crude. And it's been identified that sulfidation was a significant cause of corrosion to the pipes in the 2012 fire, and also oil coming from North Dakota's Bakken fields which is highly volatile and dangerous, as pointed out by a letter just released this past week by the Department of Transportation and evidenced by countless derailments and explosions, notably the Lac-Megantic explosion that leveled the small town and killed 47 people.

It's an industry that's intent on maximizing profit at the expense of community and worker health and safety. And we need a strong regulatory regime to counter that.

We can't afford a reactive approach of refinery regulation if this approach is demonstrably ineffective. We

1 cannot afford to wait for another disaster.
2 We must take bold action to protect the
3 health and safety of workers and communities.
4 So I urge the CSB to approve this
5 report. And I urge municipal and regional
6 decision making bodies, particularly the
7 Contra Costa County Board of Supervisors and
8 the Bay Area Air and Quality Management
9 District to withhold any permit, to withhold
10 any oil expansion permit until Safety Case
11 regime is effectively adopted and
12 implemented. Thank you very much for your
13 work.
14 (Applause)
15 DR. HOROWITZ: Thank you. And
16 next is Stephanie Harvey, I believe,
17 Communities for a Better Environment. Ms.
18 Harvey? Is Ms. Harvey here?
19 (Off microphone discussion)
20 DR. HOROWITZ: Okay. And then
21 we'll go to Katrina Ruk, Council of
22 Industries. Ms. Ruk?

1 MS. RUK: Yes.
2 DR. HOROWITZ: Is it Rok or Ruk?
3 MS. RUK: It's Ruk.
4 DR. HOROWITZ: Oh, okay.
5 MS. RUK: Ruk, sorry. And it's
6 Katrinka, K-A --
7 DR. HOROWITZ: Katrinka, I'm
8 sorry.
9 MS. RUK: Yes. I have a letter
10 I'll give you.
11 DR. HOROWITZ: Okay.
12 MS. RUK: I want to say good
13 evening and --
14 DR. HOROWITZ: Could you just
15 spell it for the --
16 MS. RUK: K-A-T-R-I-N-K-A.
17 DR. HOROWITZ: R-U-K?
18 MS. RUK: R-U-K.
19 DR. HOROWITZ: All right, thank
20 you.
21 MS. RUK: I want to thank you for
22 having the opportunity to speak today. I am

1 Executive Director of the Council of
2 Industries.
3 We are based in Richmond, and
4 we're a trade organization that represents
5 members in the West County area, industrial
6 facilities and other businesses. I also live
7 in Richmond, for the past 25 years.
8 Calls for regulatory changes to
9 improve industrial safety are appropriate as
10 that scenario where continuous improvement is
11 always warranted.
12 However, it's important that
13 proposals for a change in the safety regime
14 are considered and applied at the appropriate
15 level of Government to ensure that we do not
16 make decisions in haste or simply for the
17 purpose of change.
18 It is not that the Safety Case is
19 wrong or inherently flawed as a regulatory
20 approach. But it does need to be applied to
21 a broad level of industrial facilities to
22 ensure the best outcome in improving

1 industrial safety.
2 The CSB's report addresses its
3 recommendations to the State of California
4 rather than local or regional jurisdictions,
5 since the complexities of this issue are best
6 suited to be assessed at the state and
7 federal level.
8 It is unnecessary for the city to
9 act on its own, given the role that the State
10 is playing. Indications are that Cal/OSHA is
11 already working with the CSB regarding these
12 recommendations, and both the city and Contra
13 Costa County should be considered as
14 important stakeholders in the State's
15 process.
16 For the city to take ownership of
17 the complexity and cost of such a regulatory
18 overhaul, and the ultimate administration of
19 the safety regime that is unique to the City
20 of Richmond, would result in additional
21 layers of regulation with no guaranteed
22 benefit.

1 This approach would also undermine
2 the focus the city has on implementing the
3 recommendations the CSB already made to
4 Richmond in Contra Costa County to revise the
5 Industrial Safety Ordinance.
6 Industrial safety is a complex and
7 serious issue. Clearly by the amount of time
8 you all have spent on this, it shows that it
9 needs to be managed at the appropriate level
10 of government.
11 The city does not currently have
12 the capability, and it would be complicated
13 for the city to develop the capability to
14 manage a safety program that is not aligned
15 and consistent with other Government safety
16 oversight programs.
17 The Council of Industry believes
18 the City of Richmond and Contra Costa County
19 should participate in the Cal/OSHA process to
20 consider the CSB's recommendation to adopt
21 the Safety Case rather than pursuing local
22 adoption. Thank you for allowing me time to

1 speak.

2 DR. HOROWITZ: Thank you, Ms. Ruk.

3 Next we go to Joseph Pillao (phonetic). Mr.

4 Pillao, are you here, sir?

5 MR. PILLAO: Joseph Pillao, I'm

6 speaking for myself. I live in Richmond. I

7 want to thank the CSB for all its hard work

8 and voluminous information.

9 The Safety Case requires a five

10 part process. And I believe a fatal flaw has

11 been demonstrated tonight. We've heard from

12 labor, we've heard from the community. Where

13 is the 800 pound gorilla?

14 Chevron representatives are in

15 this auditorium. They chose not, they chose

16 not, they have not the character to come

17 forward tonight and address the findings and

18 recommendations of your report. What we'll

19 get tomorrow is their usual pablum of

20 (inaudible).

21 And there's a second

22 problem, absence in this room. The CSB

1 report acknowledges that the solution to the
2 safety problem is essentially political.
3 Government at various levels will be required
4 to adopt and enforce new safety rules. This
5 will be very difficult and is demonstrated by
6 the absence.
7 In the audience tonight you don't
8 see Chevron's chief political apologists,
9 Councilman Nat Bates and Councilman Corky
10 Booze. And without the change in the
11 political regime, all of these
12 recommendations will, when suggested, go to a
13 committee where all the issues die. Thank
14 you.
15 (Applause)
16 DR. HOROWITZ: Thank you, Mr.
17 Pillao. Next we will go to Roberta
18 Sweckerman (phonetic) or Swickerman
19 (phonetic). Ms Sweckerman? Roberta
20 Sweckerman?
21 (No response)
22 All right. And how about Sylvia

1 Gray-White? Is there a Sylvia Gray-White.
2 MALE PARTICIPANT: She's here.
3 (Pause)
4 MS. WHITE: Good evening. My name
5 is Sylvia Gray-White. I'm a member of CBE
6 and the RPA. And I live in Richmond,
7 California.
8 I wanted to first thank
9 the Chemical Safety Board for developing a
10 much needed way to increase our safety. And
11 I'm in total agreement with moving forward
12 with this procedure.
13 What is the real cost of Chevron
14 to the City of Richmond, California? We've
15 all heard numerous reports about how over
16 15,000 people sought medical treatment after
17 the August 6th, 2012, fire.
18 But have you heard any reports
19 that over 15,000 people received proper and
20 adequate treatment? No, you didn't hear
21 that. Because it didn't happen. How can
22 they treat you if they don't know what

1 chemicals are in your body, even though the
2 law requires that all companies that cause
3 chemical emissions inform the medical
4 community what the chemicals are and the
5 possible health issues that may occur?
6 Chevron has not done this. Can
7 you make them do this? If you ask for a test
8 for chemical toxicity, your doctor will say
9 he doesn't know what to test for. And he
10 doesn't.
11 I had to go for treatment three
12 days after the fire. The air was just that
13 polluted. We had three Spare the Air dates
14 after the fire.
15 The medical staff at Doctors
16 Hospital took my blood pressure which was
17 much higher than usual, they told me to take
18 an Ibuprofen and a cough drop. That was it.
19 They had no idea, and I had no
20 idea what was in my body. Even the Bay Area
21 Air Management District wouldn't tell us what
22 is in our bodies. They only test the air one

1 day a week. Yet we breathe 24 hours a day,
2 seven days a week.
3 The day of the fire was not one of
4 the days that they monitored. They don't
5 even test for chemicals like benzine which
6 are emitted every day. My daughter has
7 Hodgkin's Lymphoma. The multiple safety data
8 sheet says specifically that benzine causes
9 Hodgkin's Lymphoma.
10 She recently had a successful bone
11 marrow transplant to get rid of the cancer.
12 She is still healing though, because of the
13 effect of seven straight days of chemotherapy
14 included in the bone marrow transplant
15 procedure.
16 This challenge has been a part of
17 her life and my life for the past eight
18 years, just from breathing the air before the
19 fire. Her illness developed before the
20 August 6th, 2012, fire.
21 I had to retire from my job
22 because of getting sick from breathing the

air in Richmond, before the fire also. I have many friends and relatives who are also suffering from the daily polluted air.

The current emission regulation standards are not strict enough. Please investigate this and remedy. There is no adequate monitoring of the rules that are in place.

It has also been reported that no deaths occurred as a result of the fire. How can you say that when there's no reference to the chemicals emitted and no one is monitoring them.

Before the fire, Richmond citizens have been getting sick and dying. Richmond is said to have the highest cancer rate in California.

I found out last year that Chevron has representatives on the Board of Directors for both Doctors Hospital and Kaiser Hospital. They should be working together to reduce the physical challenges, but that is

1 not happening, because they don't want
2 Chevron's name to be implicated.
3 No one is being tested for heavy
4 metals emissions, not even employees of
5 Chevron. Testing of heavy metals should be
6 required for all refinery employees and
7 should be provided for all Richmond citizens.
8 Because even if the pipes inside are up to
9 standard, we still have to breathe the air
10 going in and coming out of the refinery.
11 I live way across town in East
12 Richmond Heights and took a heavy metals hair
13 analysis test last year which showed I have
14 lead, mercury and arsenic in my system in
15 spite of my daily detoxing, according to my
16 (inaudible) doctor. Reports with that, the
17 hair analysis test is good, because it does
18 record what is stored in your body cells.
19 I've lost over $100,000 because of
20 Chevron, because I couldn't get to work. I
21 get sick driving to work, stop by Kaiser
22 Emergency a couple of hours and then go to

work around noon. I had to retire.

How much is Chevron costing other Richmond families? Richmond reportedly is underemployed. I believe that Chevron emissions play a major part in this.

Heavy metals exposure affects you physically and mentally. If it happened to me, it could happen to everybody else.

Chevron has violated our rights, our civil rights. We are all entitled to life, liberty and the pursuit of happiness. Breathing air full of toxic chemicals has drastically reduced our quality of life, even in (inaudible). It's bound our liberty, consequently, there is no happiness.

We have had 27 Spare the Air days in the last few months. Citizens are prohibited from burning anything in their fireplaces on these days unless it is their only source of heat.

Yet, during the same period, there are no restrictions on Chevron. Smoke is

still polluting the air 24 hours a day, seven days a week. Why? This has gone on far too long and has hurt and destroyed so many, many people.

We need drastic changes in operation, monitoring and enforcement. I'll say that again in case you didn't hear it. We need drastic changes in operation, monitoring and enforcement.

Thank you once again, though, for your acknowledgment of how much our city has suffered and seeking to restore our community and our health. Thank you.

(Applause)

DR. HOROWITZ: Thank you. And next is Claudia Citren.

MS. CITREN: I guess I'll be last one, so thank you for bearing with Richmond. And I'm Claudia Citren, C-I-T-R-E-N. I'm a Richmond resident.

First of all, I'm glad that someone of the committee thought of giving

1 you an award. You deserve it, not only for
2 bearing with us, but also for educating the
3 community.
4 And that's the point I wanted to
5 get to which was brought up earlier about
6 transparency. If you run against walls with
7 government, and if it's even difficult for
8 our Congresswoman, Ms. Miller, to establish
9 changes, continue what you're doing with the
10 community.
11 I hope you're impressed by the
12 sheer presence of non-profit agencies, I had
13 no idea. Continue involving social media.
14 Be transparent.
15 I did an experiment yesterday. I
16 called EPA, Clean Air Board, I called all of
17 the agencies who should know about Chevron by
18 now. And I asked can you tell me which
19 chemicals were released?
20 I have 25 phone numbers now. And
21 one of the executive secretaries, after I
22 told her that I would call the Governor's

1 office, which I did, got behind and she
2 called me back. And she said, yes, there's a
3 lot of documents out there. It's at the
4 bottom of a document.
5 If you manage to continue to
6 educate the community, if you manage to
7 continue to counsel the representatives of
8 Richmond in how to proceed, you're going to
9 have a lot of experts here.
10 And if you continue to work on
11 transparency, if you continue to fight for
12 what the Richmond residents want, what the
13 general public is by law allowed to know, we
14 can do what you can't do. And we will do
15 what you can't do. And I hope that makes
16 your work a lot easier.
17 Because, and I'll finish, because
18 we are in an age where corporations are
19 afraid of the general public. Because we can
20 do what you can't do. So keep involving us
21 and keep counseling. Thank you.
22 (Applause)

1 DR. HOROWITZ: Thank you, Ms.
2 Citren. And is there anyone here who did not
3 sign up who'd like to speak now? Just come
4 up to the mic if you haven't talked. Sir,
5 yes. Come up, sir.
6 MR. GREAVES: My name is Steve
7 Greaves. I'm a pre-school teacher here in
8 Richmond. I've taught for ten years here in
9 the city.
10 DR. HOROWITZ: Could you spell
11 your name, sir?
12 MR. GREAVES: G-R-E-A-V-E-S.
13 DR. HOROWITZ: Thank you.
14 MR. GREAVES: So I have about 45
15 students each year, half of them in the
16 morning and half in the afternoon.
17 And probably more than half of my
18 children, when they are absent, their parents
19 say it's because of asthma. And the children
20 were all born in this community. Four are in
21 a nearby community.
22 And I think that's a factor to

1 look at too in terms of the disproportionate
2 pollution that people have to suffer in this
3 community. Thank you.
4 DR. HOROWITZ: Thank you, Mr.
5 Greaves.
6 (Applause)
7 DR. HOROWITZ: Anyone else who
8 would like to speak who hasn't spoken?
9 (No response)
10 CHAIRPERSON MOURE-ERASO: I would
11 like to continue the agenda, but first we're
12 getting five minutes. So let's reconvene in
13 five minutes please.
14 (Whereupon, the foregoing matter
15 went off the record at 3:49 p.m. and went
16 back on the record at 3:53 .m.)
17 CHAIRPERSON MOURE-ERASO: Okay,
18 the next item on the agenda, and I think we
19 can do here, Ben (phonetic), please. Ben,
20 would you, here.
21 The next item of the agenda is
22 we're going to proceed with the vote on the

1 report. So to get to this voting, I would
2 like to start.
3 I move that the Chemical Safety
4 Board vote to approve the Report Number
5 2012031 California and the following
6 recommendations included therein.
7 The first recommendation is
8 2012031CAR21 that refers to the Safety Case.
9 The second recommendation is 20120311CAR22
10 that refers to indicators of safety. And the
11 third one is 2012031 California R23 that
12 refers to a recommendation to OSHA to
13 consider the Safety Case in their
14 deliberations on the Executive Order in
15 chemical safety.
16 So in order for to have discussion
17 on this, I need to have a second to this
18 move.
19 MEMBER ROSENBERG: I second.
20 CHAIRPERSON MOURE-ERASO: Okay, we
21 heard a second from Member Rosenberg. So do
22 we have any discussion?

1 MEMBER GRIFFON: Yes. I'd just
2 like to make a motion to postpone the vote on
3 this report until the CSB more fully
4 addresses some serious issues raised both in
5 the public comments submitted to the Agency
6 as well as the comments made tonight.
7 Specifically, this motion to
8 postpone directs the staff, through the
9 Chairman, to do the following.
10 The CSB staff shall be directed to
11 investigate and make recommendations with
12 respect to the effectiveness of oversight and
13 enforcement by the State of California and
14 the Contra Costa Health Services.
15 One, does Cal/OSHA have sufficient
16 authority to require timely abatement of
17 hazards associated with serious and willful
18 violations?
19 Two, should Contra Costa County
20 Health Services have direct enforcement
21 authority under the Industrial Safety
22 Ordinance?

1 Three, does Contra Costa County
2 Health Services have sufficient resources to
3 conduct comprehensive inspections and retain
4 technically qualified personnel?
5 Four, does Contra County Health
6 Services have sufficient authority to require
7 facilities to undertake feasible risk
8 reduction measures such as best practices
9 which go beyond minimum regulatory
10 requirements?
11 Two, the staff shall convene a
12 multi-disciplinary expert panel selected by
13 the full Board, similar to the Baker panel
14 established after the BP Texas City incident,
15 to provide the Agency with an assessment of
16 the following topics regarding regulatory
17 process safety in refineries in California.
18 One, to address questions raised
19 in the comments received by the CSB, the
20 panel shall assess the available process
21 safety performance data to evaluate the
22 effectiveness of the Safety Case regulatory

1 model for refineries.
2 Two, assess the challenges of
3 making Safety Case operational and effective
4 with regard to the following topics. A, what
5 is the role of transparency and community
6 involvement under this regime?
7 B, how are workers empowered as
8 part of the triparthied model? Have there
9 been retaliatory actions taken against
10 workers for their involvement and what
11 protective measures are in place?
12 C, are safety committees mandatory
13 or optional in non-union work places? How
14 are safety committee members selected and
15 under what authority?
16 D, is there a public database of
17 incident and near-miss reporting? How are
18 process safety performance indicators
19 developed and used? Are these made public?
20 E, how are standards for minimum
21 levels of risk set? ALARP goes into the
22 risks beyond minimum levels.

1 F, what are the enforcement
2 methods used by regulators under the Safety
3 Case? For example, what are the enforcement
4 tools beyond withdrawal of consent to
5 operate?
6 G, What are the key transition
7 issues that were addressed facilities in
8 operation at the time Safety Case was adopted
9 abroad in other regimes?
10 Finally, the panel shall be
11 established and complete its assessment
12 within 120 days. Such assessment shall be
13 considered by the CSB and incorporated in the
14 Chevron regulatory report as appropriate.
15 And that's my motion to postpone.
16 CHAIRPERSON MOURE-ERASO: But, you
17 know, there's a little problem here. We have
18 a motion on the floor that has been moved
19 appropriately and has been seconded.
20 MEMBER GRIFFON: Right.
21 CHAIRPERSON MOURE-ERASO: And what
22 you are saying is that we postpone the vote.

1 I mean, that doesn't, it's not directs on the
2 motion's on the floor that has been seconded?
3 MEMBER GRIFFON: It's a procedural
4 recommendation to postpone for a definite
5 period of time, according to Robert's Rules.
6 CHAIRPERSON MOURE-ERASO: Well, I
7 mean, how do you propose that the motion that
8 has been seconded be addressed, that either
9 you are approving it, or disapproving or how
10 are we going to do it. You know what I'm
11 saying? What we should do is to postpone
12 action on this. That is --
13 MEMBER GRIFFON: That's right.
14 I'm sorry, could you say your opinion on the
15 record, General Counsel?
16 MR. LOEB: You have two competing
17 motions right now. You have the first
18 motion, it was the motion that you moved and
19 that was seconded by Member Rosenberg. You
20 can take a vote on that.
21 And then you have a second motion.
22 And the second motion, we haven't had a

1 second on that yet. So you have a second
2 motion.
3 MEMBER GRIFFON: The first
4 motion's the main motion, that's a procedural
5 motion.
6 MR. LOEB: There're two competing
7 motions here.
8 CHAIRPERSON MOURE-ERASO: Well,
9 you know, what do the Robert's Rules or Order
10 arguing here? What I would like to, let's
11 cut to the chase here.
12 We have a report that has been
13 presented with two or three specific
14 recommendations. There has been some
15 suggestions, we included your suggestions
16 here. But a lot of other things need to
17 happen for having a vote on the specific
18 issues of this investigation.
19 So what I would need to deal with
20 this is, since this is the second part of a
21 three part report, what I propose is that we
22 vote this second recommendations of this

1 report as we have here.
2 And other recommendations that you
3 are making here to do additional
4 considerations, we consider in the third
5 report. And we evaluate it the way that you
6 want to evaluate it in the third report.
7 Because it seems to me that what
8 we have here in front of us is the results of
9 the specific investigation with non-specific
10 results with three recommendations.
11 So if anything additional has to
12 be considered, you have up here three pages
13 of additional considerations that you want to
14 happen.
15 Why don't we postpone that, as you
16 suggest, to be considered in the third report
17 that will be the final report of Chevron,
18 with that for consideration.
19 MEMBER GRIFFON: You know, for the
20 recommendations to Contra Costa and those
21 other regulatory recommendations that may
22 have some merit. But, I mean, the second

1 whole part of that is for further information
2 to consider Safety Case.
3 There are questions on the Safety
4 Case. And to move this report forward, with
5 outstanding questions out there, I think, I
6 just want to, I think Jim Rogers put it
7 right. I want to be in a place where we can
8 all come to agreement on this and get behind
9 the report.
10 And I think a little more work may
11 be not insignificant. But more work and a
12 more balanced report will get us there.
13 CHAIRPERSON MOURE-ERASO: Well, if
14 you feel so strongly about the difficulties
15 with the report as it's written, you have the
16 choice of voting no, you know. And then we
17 can come to a head.
18 But, you know, you are proposing
19 three pages of additional work that is going
20 to go to the staff, personally, to be
21 considered in this investigation. That is a
22 list of things that could perfectly be

1 addressed on the third report that is not
2 finished.
3 It seems to me that, I don't see
4 any reason that if you feel like you cannot
5 agree on what we are saying in this report
6 and these recommendations here, if you vote
7 no, I don't know what the other vote is going
8 to be. And then move again into a proposal
9 to consider the third report.
10 MEMBER GRIFFON: I mean, I don't
11 want to get into the Robert's Rules too much
12 either. But the motion to postpone does take
13 precedence. And that should be, once that's
14 on the table, if it's seconded, once that's
15 on the table that's what's discussed.
16 But, you know, I think that the
17 idea here is, I don't want to be in a
18 position to vote no. I want to be in a
19 position to vote to postpone for a definite
20 time to address these specific things where I
21 can come forward and be in a position for all
22 of us to vote yes.

1 CHAIRPERSON MOURE-ERASO: But you
2 are proposing this as an amendment to the
3 motion that I made?
4 MEMBER GRIFFON: It's not an
5 amendment. It's a procedural motion.
6 (Off microphone discussion)
7 CHAIRPERSON MOURE-ERASO: Yes.
8 But, I mean, do I have to accept the
9 procedural motion that he's proposing?
10 (Off microphone discussion)
11 CHAIRPERSON MOURE-ERASO: Well, do
12 you have a second?
13 MEMBER GRIFFON: I can't second my
14 own motion. But --
15 MEMBER ROSENBERG: I second the
16 motion.
17 CHAIRPERSON MOURE-ERASO: Okay, so
18 we have a second. Okay, so we are going to
19 work within the procedures of the change that
20 you have recommended.
21 MEMBER GRIFFON: That's a, hold
22 on, a procedural motion that's seconded

(inaudible)?

MEMBER ROSENBERG: Yes.

CHAIRPERSON MOURE-ERASO: Okay, so we vote the procedural motion first. Could you please conduct the vote?

MR. LOEB: The vote is on procedure. Just to be clear, there is a motion on the floor made by the Chairman a moment ago to adopt the report and three recommendations. That was seconded by Member Rosenberg.

There is a second motion. the motion is a motion to postpone the first one. That was also seconded by Ms. Rosenberg. So the first vote will be on the motion to postpone as read by Member Griffon. So we should proceed with that. Member Griffon?

MEMBER GRIFFON: Aye.

MR. LOEB: Member Rosenberg?

MEMBER ROSENBERG: Aye.

MR. LOEB: Mr. Chairman?

CHAIRPERSON MOURE-ERASO: No.

MR. LOEB: The motion to postpone has the vote. And that motion passes.

CHAIRPERSON MOURE-ERASO: So that negates the vote, the motion that I made first?

MR. LOEB: The second motion, which was seconded, both motions were seconded. But the second motion preempts the first motion.

MEMBER ROSENBERG: The goal is to make the report stronger. That's the goal, in short order.

(Off microphone discussion)

CHAIRPERSON MOURE-ERASO: Okay, so thank you to the Board members for their involvement and their work. And I think you have, if there is no more motions to consider, I declare this meeting adjourned.

(Whereupon, the meeting in the above-entitled matter was concluded at 4:07 a.m.)

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C E R T I F I C A T E

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Neal R Gross