

The Role of the Regulator:
Reflections on Forty Years of Research and Learning
about Energy, Economics & the Environment
By Jacqueline Lang Weaver ©

Institute for Energy Law
68th Annual Oil and Gas Conference
Houston TX
Feb. 17, 2017

Thank you all for the honor of addressing you at this Deans of Oil and Gas Practice lecture. I am delighted to be here with so many of my colleagues in academe and practice who have contributed so many insights to my own education about oil and gas and energy law, both in the United States and internationally.

I officially retired from the University of Houston Law Center last month, as I had planned for several years. Cleaning out my office has caused me to reflect on just how improbable my career has been as a law professor. I never even wanted to be a lawyer, much less a law professor. I started work as an economist for Humble Oil and Refining, now Exxon Company, when I first moved to Houston. I went to law school at night solely to get a good background to a career in business. My experience at Exxon was that the business folks had a lot more fun than the lawyers! And, my father was an international project manager in the engineering construction industry who would tell wonderfully exciting stories about trips to the Soviet Union before it broke up, Saudi Arabia, Ivory Coast and elsewhere.

But in those days in the early 1970s, there was no clear way to move up the management ladder at Exxon with a working spouse who also had a career, so I turned to teaching at the University of Houston Law Center when my first son was born. I had always loved teaching, but this academic stuff—writing articles and books: how would I like that part of the road to tenure? I had never even served on a law review. But a bonanza of topics loomed in the rich mix of the three EEE's--energy, economics and the environment--that were especially interesting to an economist who had loved studying institutional economics. The regulation of common resources, like aquifers and oil fields, has long been of interest to economists, political scientists and lawyers—and won Elinor Ostrom a Nobel prize in economics for her study of how actors in common pool situations can voluntarily agree to self-regulate use of a resource to prevent the destruction of the common resource.

I began teaching while the U.S. still felt the brunt of the OPEC oil embargo and the Iranian revolution. With the U.S. locked into energy shortages and unfriendly geopolitics, it bothered me that Texas did not have a compulsory unitization statute that every other state had and that was universally embraced as the best way of increasing the ultimate recovery of oil in a field. And then I discovered that Texas had an anti-unitization statute in its Natural Resources Code. The Texas Railroad Commission (RRC) could prevent waste, but not by requiring unitization. Why didn't the federal government step in during this time of energy crisis to ensure that operators produced the oilfields at MER rates. (I am obviously not a native Texan, to even

ask this question, but surely if federal highway funds were cut off from states without such a statute, Texas would have relented.)

The Tragedy of the Commons, a well-known consequence of the Rule of Capture, was a natural object for study. And so, while many of you probably best know me for the Smith and Weaver treatise on the *Texas Law of Oil and Gas*, my real interest in research derives from the economics courses that I studied at Harvard and UCLA. How do markets, politics, and institutions and their key players interact to give us good, and sometimes really bad, policies?

Why did Texas legislators have such an antipathy for compulsory unitization to the extent that our waste prevention statutes to this day contain that anti-unitization statute? The story I unearthed had everything you could hope for:

- A brilliant villain—William Farish, head of Humble Oil whose superior technical skills led to a proposal to unitize the giant East Texas field that was being produced chaotically and with staggering waste.
- An enduring romance—the Texas legislature and executive branch were in love with the Texas independent producer, an embrace that persists to this very day.
- And a hero regulator, William Murray of the Railroad Commission, who, after WWII, issued a series of orders that had the effect of unitizing many of our biggest oil fields in Texas.¹

This love affair with the independent created a crazy prorationing system that nurtured the little guy in a hothouse cocoon of massive, unnecessary well drilling under Rule 37 and legalized drainage of oil towards their small tracts, resulting in high-cost production and a legacy of environmental damage that remains today. Politicians loved all those hothouse wells—lots of jobs. Texas quite late adopted a Mineral Interest Pooling Act that could have curbed this massive over-drilling decades earlier. But, the U.S. Supreme Court had, unfortunately, endorsed the Texas embrace of independent operators, holding that little operators with little wells “needed” a certain minimum allowable to be profitable. Thus, a welfare system for the Texas independent became entrenched at both the state and federal levels. Much of this occurred during or in the aftermath of the Great Depression when jobs and economic recovery were so important to President Roosevelt and his New Industrial Recovery Act

This love affair was at the heart of the 86% factor article that I wrote later, during another geopolitical event involving oil and the Mideast.² The Railroad Commission refused to increase the Maximum Efficient Rate of recovery in the East Texas field to 100% when requested to do so by the U.S. Department of Energy during Desert Storm (our first invasion of Iraq). Any increase would proportionately benefit the larger operators with the non-marginal wells; the little guys with the little wells would be proportionately disadvantaged. Only one of the three

¹ The entire story appears in JACQUELINE LANG WEAVER, *UNITIZATION OF OIL AND GAS FIELDS IN TEXAS: A STUDY OF LEGISLATIVE, ADMINISTRATIVE AND JUDICIAL POLICIES* (Johns Hopkins Univ. Press for Resources for the Future 1986).

² Jacqueline Lang Weaver, *The Politics of Oil & Gas Jurisprudence: The Eighty-Six Percent Factor*, 33 *WASHBURN L. J.* 492 (1994).

Railroad Commissioners, the one who had been an academic at Rice University in the political science department (and ambassador to an African country), dared to vote to raise the field's MER. He could find absolutely no scientific basis that waste would result from such a decision that was so clearly in the national interest.

In my search for the levers of power that might overcome the institutional craziness of the Texas regulatory regime, I encountered a hero regulator: William Murray of the Railroad Commission, a petroleum engineer who knew waste when he saw it. After WWII, vast amounts of casinghead gas were being flared in almost all of our big oil fields. Uncle Sam loomed in the background as a possible regulator: this gas could fuel a post-war industrial expansion. Commissioner Murray developed the "Doctrine of Co-equal Coercion." Both large and small operators were shut in under no-waste or no-flare orders issued by the RRC unless they agreed to prevent waste. Murray never issued a compulsory unitization order, but shutting in a field that was flaring or wasting gas concentrated the minds of all operators in the "show cause" hearing room. The only way that waste could be prevented was by reinjecting the gas or building cooperatively owned gas processing plants (and sharing pipeline space) to send the gas to markets. I tracked each no-flare and no-waste order and linked it to a RRC order approving a voluntary unitization agreement in that field shortly thereafter.

I discovered an even earlier hero in this search for an answer: An oil man named Henry Doherty, who was president of HL Doherty & Co, the fiscal agent for Cities Service Companies and a director of the American Petroleum Institute (API). He did much early scientific research on the nature of reservoir energy, such as gas drives. Based on this good science, he became an ardent proponent of compulsory unitization to prevent the massive waste occurring in the early U.S. oilfields. The API, driven by an ideology of private property rights and anti-regulation fervor, treated Doherty as a pariah, so he presented his views directly to President Coolidge in a letter in 1924:

If the public [some day] awakens to the fact that we have become a bankrupt nation as far as oil is concerned, and that it is too late to [practice conservation], I am sure they will blame both the men of the oil industry and the men in public office at the time conservation measures should have been adopted.³

Today, all states of the United States, and indeed all countries to my knowledge have legal provisions for compulsory unitization, except Texas. My book concluded with a statistical analysis showing that Texas nonetheless produced its oil relatively efficiently. Yes, compulsory unitization would be a better way of preventing waste. But, as with so many things in life, you can't let the best be the enemy of the good. Texas, with Commissioner Murray at the helm of the RRC (and Texas Supreme Court affirmance of his no-waste orders) did a good-enough job of preventing waste in our oil fields.

And I got tenured!

After 40 years of research and learning about energy, economics and the environment from this institutional perspective, I have concluded that a good regulator is industry's best

³ WEAVER, UNITIZATION OF OIL AND GAS FIELDS IN TEXAS, *supra* note 1, at note 4.

friend. A sub-theme for Texas regulators is that the federal government is a useful enemy, the title of another article that I wrote.⁴ This article included examples of the “inch by inch” regulation of oilfield pits by the RRC once the federal Clean Water Act was passed. A second example showed how a little blind salamander and a federal judge in far out West Texas saved the Edwards Aquifer from the tragedy of the commons of over-pumping, thereby preserving San Antonio’s sole source of drinking water.

The alternative to a good regulator is too often regulation by litigation, huge civil and criminal penalties and/or post-disaster statutory reform on a grand scale, such as OPA 90 (the Oil Pollution Act of 1990 that followed the Exxon Valdez oil spill) and Dodd Frank (following the global banking/financial crises in 2008-09). Industrial disasters and financial scandals seem always to be accompanied by government agency failures to protect the public, often driven by an anti-government ideology of the agency’s leaders and the executive branch and/or by legislatures that under-fund agencies because they view the regulation as unnecessary or overbearing. Ideology is the enemy of any sound policy, especially when it prevails over good science. Henry Doherty knew this.

Here are other examples of disasters and their aftermath:

The 1969 Santa Barbara (California) oil platform spill. The judge opened his opinion in a case involving the aftermath of this spill with the following description of the event:

The nation was confronted with an environmental disaster of unprecedented proportions that might have been avoided but for the failure of federal oversight.⁵

A federal regulator had approved Union Oil's request to waive safety requirements to line the well shaft with hardened casing to prevent just such an accident.

Within a year, Earth Day and the National Environmental Policy Act of 1970 ushered in a tsunami of other environmental laws for clean air, water, wildlife protection, coastal zone management and many more.

The 1989 Exxon Valdez tanker spill in Alaska. Congress unanimously passed the Oil Pollution Act of 1990 one year later. Why had the captain of one of the largest and most modern super-tankers allowed it to be driven onto Bligh Reef while under the watchful eye of the Coast Guard? Because the Coast Guard had no “watchful eye,” no radar to track tanker traffic in Prince William Sound. For twelve years, tankers had passed through without an accident, so its radar request was disapproved as not needed. Instead, monies were allocated to the Coast Guard’s efforts to halt the war on drugs.

⁴ Jacqueline L. Weaver, *The Federal Government as a Useful Enemy: Perspectives on the Bush Energy/Environmental Agenda from the Texas Oilfields*, 19 PACE ENVTL L. REV. 1 (2001)(as part of Kerlin Distinguished Lecture series).

⁵ *California v. Norton*, 311 F. 3d 1162 (9th Cir. 2002).

2000-2001 Enron. “Can Energy Markets Be Trusted?”⁶ Enron’s bankruptcy and manipulation of both securities laws and natural gas markets set back the progress of electricity deregulation for years nationally. Both the SEC and FERC failed utterly in their duties to understand the new financial markets and deregulated gas and electricity markets that were being developed. The Enron failure foreshadowed the global financial recession of 2008 and the LIBOR and foreign exchange scandals that have plagued global markets in recent years. Regulators were no match for traders that lie and manipulate markets. Yet, markets cannot work without trust. Regulators must verify that those markets are worthy of citizens’ trust by understanding and monitoring them.

2010: Deepwater Horizon/Macondo/BP disaster in the Gulf of Mexico. This disaster involved bad decisions by several major industry players and the Minerals Management Service as regulator.⁷ Industry assured us that no such disaster could ever happen because blowout preventers were fail-proof, any oil spilled could be cleaned up easily with current technology, and existing rules and industry self-interest assured that no such disaster would or could occur. After all, none had occurred in the past two decades.

“Drilling Like There’s No Tomorrow”

On a smaller scale, let’s go back to the Texas love affair with the independent producer. In “Drilling Like There’s No Tomorrow,”⁸ Judson Boomhower (an energy economist) documents the interactions between energy, economics and the environment in a Texas context. Texas has several thousand very small producers (with less than \$1 million in revenues per year). Most environmental violations in Texas are committed by these very small firms. An obvious business model is incentivized under our bankruptcy laws: Produce what you can and, if a serious environmental incident occurs, declare bankruptcy.

Until 2001, a Texas statute allowed operators to pay a "good guy" fee of \$100 annually instead of filing a surety bond for plugging and abandoning wells. This low fee, and the RRC’s liberal granting of plugging extensions, resulted in a notable rise in the number of orphaned wells that the state (and its taxpayers) would have to fund to plug and abandon. One Commissioner finally admitted publicly that the agency’s well plugging extensions had become a "government-funded bailout" for some operators. Boomhower’s data show that almost 100% of the orphaned wells, 95% of field rules violations and 40% of blowouts were associated with the 20% of total

⁶ Jacqueline L. Weaver, *Can Energy Markets Be Trusted? The Effect of the Rise and Fall of Enron on Energy Markets*, 4 HOUSTON BUS. & TAX L. J. 1, 51 (2004) (research showed that if FERC had intervened knowledgeably in the California energy crisis in May 2000 with a must-offer rule to counter strategic withholding of bids and supplies, the energy crisis would have been avoided). *See also*, Jacqueline L. Weaver, *The Tragedy of the Commons from Spindletop to Enron*, 24 J. OF LAND, RESOURCES & ENVTL L. 187 (2004).

⁷ Jacqueline L. Weaver, *Offshore Safety in the Wake of the Macondo Disaster: The Role of the Regulator*, (Part II) 36 HOUSTON J. OF INT’L LAW 379 (2014); *Offshore Safety in the Wake of the Macondo Disaster: Business as Usual or Sea Change?* (Part I), 6 HOUSTON J. OF INT’L LAW 402 (2013).

⁸ Judson Boomhower, *Drilling Like There’s No Tomorrow: Bankruptcy, Insurance and Environmental Risk*, Energy Inst. at Haas (Univ. of Calif. at Berkeley), Working Paper 254 (Nov. 2014).

production that came from the smallest firms.⁹ Before universal bonding, Texas could not collect 68% of the penalties assessed for violations, most often because firms were in bankruptcy.¹⁰

When universal bonding came to Texas after 2001, the poorest performing companies exited the industry, unable to get an insurer to bond them. Total oil production was barely affected as most leases were sold to larger companies that were better able to produce by following the rules. The number of inactive wells out of compliance with RRC rules dropped 25% from 1999 to September 2005, and the number of RRC enforcement actions and default hearings also decreased significantly. More importantly, the Boomhower study tracks fewer blowouts, water pollution violations, and unplugged wells after universal bonding. The small operator could no longer sustain a business model of producing quickly and socializing the costs of inflicting serious environmental harms through bankruptcy.¹¹

This episode illustrates good, market-oriented, risk-based rulemaking that protects the environment efficiently and serves the public interest.

“Don’t blame us: the federal government made us do it.”

Federal laws create a level playing field among states, counteracting the race to the bottom (a policy to attract industry and jobs by lowering environmental and safety standards compared to other states). The federal Clean Water Act forced Texas to tighten its regulation of oilfield pits resulting in the “no-pit” rule. And I have already noted that little blind salamander

⁹ *Id.* at 17, 38.

¹⁰ State Review of Oil and Natural Gas Environmental Regulations (STRONGER): Texas State Review (2003) a (peer-assist organization of state regulators). This Texas review had input from the federal EPA and the Interstate Oil and Gas Compact Commission (as cited in Boomhower, *supra* note 8, at note 30).

¹¹ The 2016 Sunset Advisory Commission Staff Report on the Railroad Commission of Texas offers a recommendation for another reform to the bonding system that would help eliminate the growing and large backlog of abandoned wells still existing in Texas. The Staff Report’s analysis concluded that insufficient and inequitable statutory bonding requirements contribute to a large backlog of abandoned wells. Revenues from bonds covered only 16% of the cost to plug wells in Texas in fiscal year 2015. The cost to plug has doubled since bond amounts were set in 1991. The blanket bond structure was found to inadequately account for the risk of well abandonment. Bonds should be calibrated to account for risk factors, such as well depth. This opportunity to adopt a market-oriented, risk-based bonding system appears to hold no appeal to either legislators or commissioners whose focus on keeping firms alive today is echoed in so many past episodes. SUNSET ADVISORY COMM’N STAFF REPORT ON THE RAILROAD COMM’N OF TEXAS (2016) (recommending “Improvements to Effectively Ensure Public Safety and Environmental Protection,” Exec. Summary, Issue 3, at 3-4)(2016). The Staff Report also found that the RRC cannot show the effectiveness of its efforts to regulate because it lacks reliable data collection. The RRC does not know how many severe violations of rules occurred, what percentage of violations were due to repeat offenders, and how many operators with severe violations did not face enforcement action last year. There is little incentive for operators to comply the rules unless they are told to do so by RRC staff because penalties are so low. Thus, RRC regulatory enforcement has little deterrent effect. The “nuclear option” of severing a lease is weak because the RRC staff cannot assure severance compliance. The Staff Report recommended that the RRC adopt more performance-based risk assessment as regulatory measures that better ensure strategic use of its resources.

whose endangered status saved the Edwards Aquifer, the only source of drinking water for San Antonio.

Today's challenge on the federal/state regulatory front is methane's social license to operate. Unless the methane leakage rate is below about 3% in a life-cycle analysis from wells to end use, natural gas can be worse than coal in terms of its impact on global warming. The coal to gas comparison depends critically on the time frame and degree of leakage. Methane traps heat 120 times more effectively than carbon dioxide (CO₂) when first released. Methane gradually breaks down into CO₂ and is 84 times as heat-trapping over 20 years and 28 times as heat-trapping over 100 years. Good climate science tells us that the most important time frame is the near-term of ten and twenty years.

Enter the federal EPA's Quad 0000 regs to the rescue. These regulations were made effective over a period of two years to allow the demand for Reduced Emission Completion (REC) equipment to be met. Operators now have mobile trailers to bring the equipment on site.¹² Green completions give industry its social license to operate, at a reasonable cost that brings enduring environmental benefits. Colorado was the first state to enact rules to reduce methane emissions in oil and gas field facilities. Its Reg 7 was drafted with EDF (Environmental Defense Fund) and industry leaders from Anadarko, Noble Energy and Encana. Reg 7 requires leak detection and repair (LDAR) and devices to capture 95% of methane emissions. The rule has not crimped economic growth in Colorado. It creates good jobs in the LDAR industry and has spurred a budding methane mitigation industry.¹³ A winning combination in the EEE matrix!

The green completion equipment is just one example of technology-forcing innovation spurred by environmental regulations. Our environmental laws are designed to encourage new and cleaner technology over time. New plants should be cleaner and more efficient than old ones. Lower oil and gas prices have led to major productivity gains and efficiencies in the shale industry. Similarly, environmental and safety laws also drive innovation, a cleaner environment and productivity gains.

Sometimes these laws work through Draconian measures, such as Commissioner Murray's no-waste and shut-down orders in the Texas oil fields. Even before this, the Texas Attorney General, in 1942, sued 155 operators in the East Texas field to enjoin their oil production as a public nuisance.¹⁴ The operators discharged hundreds of thousands of barrels of salt water and chlorides into the Neches River, and more was to come as the Big Inch pipeline construction moved forward to help fuel U.S. armed forces in WWII. All nearby fish and aquatic life in the Neches river were extinct and the discharges rendered the river water unfit for

¹² New Source Performance Standards for Subpart 0000 (the "quad zero" regulations) and new Subpart 0000a to curb greenhouse gas emissions, especially methane, VOCs (Volatile Organic Compounds) and air toxics from new wells and other sources like compressors and leaks. These regulations were issued under the Clean Air Act's Section 111(b), adopted by EPA in May 2016. The rules require green completions (RECs, or Reduced Emission Completions) for oil wells; gas wells were already required to use RECs in 2012. The rules also require Leak Detection and Repair (LDAR) for fugitive emissions.

¹³ Brittany Patterson, *As House Moves to Kill Methane Regs, Colo. Asks Why*, Climate Wire (Jan. 30, 2017).

¹⁴ *Goldsmith & Powell v. State*, 159 S.W.2d 534 (Tex. Civ. App. 1942).

agricultural, domestic or industrial use. The court perpetually enjoined the operators from allowing injurious substances to flow into the river. This decision forced the Railroad Commission into action. Small operators needed help. They could not afford to drill their own injection wells and install costly treatment equipment. The RRC adopted a bonus allowable rule for reinjecting the produced salt water back into the East Texas field. The bonus oil granted per barrel of reinjected brine was set to equal the cost of a fieldwide injection program (and also worked to maintain reservoir pressure in the field). Lawyers helped to create the East Texas Saltwater Disposal Company to run the fieldwide reinjection program. The company sought to distribute its stock widely among all operators, roughly in proportion to the number of wells owned. The company served all operators in the field without discrimination, whether they were shareholders or not.

To those of us who remember this early example of the East Texas Saltwater Disposal Company, the formation by industry of the Marine Well Containment Company after the Macondo disaster came as no surprise.¹⁵

Can the link between sound environmental regulation and enhanced industry productivity be generalized? Michael Porter, a well-known professor at the Harvard Business School, hypothesized that the link was often a positive one. A recent study undertook a meta-analysis of 108 studies that had tested the Porter hypothesis. Did regulation-driven innovation result in net productivity gains? The answer was “yes” when the environmental regulations set strict standards with flexible mechanisms for compliance.¹⁶ In sum, in the longer term (using a lagged regulatory variable), the results of these 108 empirical studies were consistent with the “Strong Porter” hypothesis that strict but flexible environmental regulations induce innovation and increase country-level competitiveness over time.

So, what will be the next invention? Scientists are heroes.

The oil industry is a technology leader. Will the next invention be an inexpensive continuous emission monitor for methane? A technology to reduce water usage in fracking by using CO₂ as the pressurized fluid (in its supercritical phase when it is neither a liquid or a solid?) (Lab work has shown CO₂ can perform this way; pilot field demonstrations are now needed.) Halliburton already has a frack fluid that is 99% water and sand; the other 1% of the chemicals are derived from food and are safe for human consumption.

¹⁵ The Marine Well Containment Company (MWCC) was jump-started with a \$1 billion fund, jointly contributed by four major oil companies. It now has ten member companies. It provides capping stacks and related services on a 24/7 basis to operators in the Gulf that pay fees for these services. Visit <http://www.marinewellcontainment.com/about-us/> for photos and information about its services and equipment.

¹⁶ Mark Cohen & Adeline Tubb, *The Impact of Environmental Regulation on Firm and Country Competitiveness: A Meta-Analysis of the Porter Hypothesis* (2016), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2692919. See also, Michael Porter and Claus van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. OF ECON. PERSPECTIVE 97-118; Michael Porter, *America's Green Strategy*, 264 SCIENTIFIC AMERICAN 168 (1991); and Margaret Taylor, Edward Rubin & David Hounshell, *Regulation as the Mother of Innovation: The Case of SO₂ Control*, 27 LAW & POLICY 348 (April 2005).

Innovation happens in laws, regulations and policies also. The Macondo disaster brought three changes to business as usual, even though Congress enacted no new statutes. The changes took place at the agency level and in industry joint task forces, often working with government regulators to devise a new system to regulate offshore safety in the Gulf of Mexico.

The Center for Offshore Safety, an arm of the American Petroleum Institute, is a key driver of safety in the Gulf of Mexico. Newly formed after the Macondo disaster, the Center created the protocols for third-party audits of operators' newly-required safety and management systems (SEMS). The post-2010 regulatory framework for offshore safety quickly incorporated key industry Recommended Practices as regulatory requirements in the Code of Federal Regulations, notably the requirement of having a SEMS plan in place as detailed in API Recommended Practice 75. COS-certified third-party auditors work to assure the plans are actually being implemented by operators. As James Watson, the first director of BSEE (the new Bureau of Safety and Environmental Enforcement in the Department of Interior) stated; "We are moving to an operator-driven safety program with BSEE oversight."¹⁷

The post-Macondo SEMS regime is a form of the "new environmental governance," sometimes called "privatized governance," under which public ends are pursued through private standards, monitoring, and enforcement.¹⁸ The SEMS system now used in Gulf is similar to Mexico's adoption of third-party environmental audits of its domestic manufacturers for NAFTA purposes. Under-resourced regulators use expert "agents" to audit industry. The Center for Offshore Safety also promotes extensive sharing of best safety practices within the offshore industry. Its collection of statistical data and analysis of workplace incidents, as reported by its members, is superior to that of the federal government.

It takes an average of eight years for OSHA, the U.S. workplace safety regulator, to finalize a new safety standard.¹⁹ It took twenty years for a new scaffolding standard to be enacted. The speed at which the new offshore regulatory framework was adopted seems astounding. For years, the offshore industry and its trade associations had strongly opposed proposals by the federal government to require SEMS as a regulation. Virtually overnight, API 65 (the Drilling Safety Rule) and API 75 (SEMS) became regulatory requirements. Why was a disaster required to move the industry forward on the safety and environmental front? An anti-regulatory ideology appears to be a root cause, according to our National Academy of Sciences report on the Safety Culture of the offshore industry.²⁰

¹⁷ Statement of James Watson, April 29, 2013, as quoted in Weaver, HJIL II, *supra* note 7, at 402.

¹⁸ See the author's two HJIL articles, *supra* note 7 that document the new offshore regulatory system now in force in the Gulf of Mexico and the actions of the major players that created it.

¹⁹ Senate Committee on Health, Education, Labor and Pensions Hearing, Time Takes its Toll: Delays in OSHA's Standard-Setting Process and the Impact on Worker Safety, S. Hrg. 112-725, 112th Congress, 2d. Sess. Apr. 19, 2012, available at <http://www.gpo.gov/fdsys/>.

²⁰ COMM. ON OFFSHORE OIL & GAS INDUSTRY SAFETY CULTURE, MARINE BD., TRANSP. RESEARCH BD., NAT'L ACADEMY OF SCIENCES, STRENGTHENING THE SAFETY CULTURE OF THE OFFSHORE OIL AND GAS INDUSTRY, Report 321 (2016).

The interrelationship between regulation and industry behavior is aptly told with an example from the tragic sinking of the Titanic. The Titanic carried 2,224 people and had lifeboats for 1,178 people. The ship owner designed the Titanic to hold 48 lifeboats so if the UK regulator required a seat for all passengers, this would be easy to do.²¹ However, the regulator required only 16 lifeboats for ships this size. The Titanic was travelling along a well-used sea lane where shuttling passengers to other nearby ships (assuming the Titanic sank slowly) was possible. Besides, no passenger ship this size had ever sunk on this route.

So the Titanic set off with 20 lifeboats. The ship owner trusted the regulator to know the right standard. Private risk management became rigid regulatory compliance, a fatal consequence. This episode explains the title of the National Academy of Sciences 2016 report on the offshore industry. It must move “Beyond Compliance” and strengthen the safety culture of the entire industry, from small operator to super-major.²²

Closer to home, it was not industry practice, pre-2010, to have a pre-built stack ready to cap a well in the event of a blowout and oil spill. In Phase II of the litigation over the 2010 oil spill, Judge Barbier noted the role of industry practice:

It is possible for an entire industry to unduly delay in adopting new and available devices [so compliance with a regulation or industry practice does not necessarily preclude a finding of gross negligence]. But, [such compliance with a regulation] is a relevant consideration that tends to weigh against culpability.

Punitive damages for gross negligence in source control planning are not warranted because of compliance with regulations and industry practice.

If ready access to a capping stack had existed, the Macondo well could have been sealed in 24 days. The technology to build the stack was readily available, but federal regulators had approved BP’s oil spill response plan without requiring access to such a stack. BP’s 500-page oil spill response plan was approved under a regulation that required showing that the operator could “respond quickly and effectively” to an oil spill. The plan focused on collecting oil at the surface, and the use of ROVs to shut-in the “fail-safe” blowout preventer as the last line of defense (before drilling a relief well). A worst-case incident like Macondo was not on the radar screen.

Key Roles for an Effective Regulator

What do these episodes and examples tell us about the role of the regulator today? In my view, two roles are essential.

²¹ Chris Berg, *The Real Reason for the Tragedy of the Titanic*, WALL ST. J. (April 12, 2012)(available online at www.wsj.com).

²² COMM. ON OFFSHORE OIL & GAS INDUSTRY SAFETY CULTURE, MARINE BD., TRANSP. RESEARCH BD., NAT’L ACADEMY OF SCIENCES, *BEYOND COMPLIANCE* (2016) (a booklet prepared for industry use as a briefer version of the full NAS Report cited *supra* note 20).

First, standard setting. Should the regulator adopt industry standards as regulations? Are industry standards really the best, or at least good? Or do standard-setting organizations, like the API, adopt “consensus” standards that do not reflect best practice? Were the industry standards created in an open, transparent process, allowing diverse viewpoints? Did workers participate in the standard setting? Did other expert groups, academics, and knowledgeable NGOs (like EDF)? The regulator must be able to assess an industry standard or recommended practice before adopting it in regulations. It is clear that our government agencies need the help of expert scientists in other institutions to help them make these decisions in a complex, technology-driven and dynamic industry like the U.S. oil industry. Judge Barbier’s words and the Titanic example show how important the standard-setting process is.

Second, data collection and analysis. Information has the power to drive good regulation and enforcement. One example from offshore makes the point. All operators can be required to submit incidents of “near misses” to a data base that can serve as a leading indicator of rising risk levels offshore. U.S. regulators have long collected lagging indicators, such as data about actual well explosions, spills, worker injuries and deaths that have already occurred. But leading indicators are precursors to an incident and can be used to enhance vigilance and discover problems before workers are killed or a well explodes. Precursors are already used by many in the industry, and by the experienced UK and Norwegian offshore regulators. Some good precursors include records of delayed maintenance, the number of well “kicks” encountered in drilling, and the time it takes a crew member to recognize that a sensor is indicating an abnormal pressure reading. Norwegian and UK regulators have focused on precursor data for years. Both regulators report much data and analysis to the public about risk levels, sometimes naming companies. The Center for Offshore Safety has no jurisdiction to require non-members to submit the kind of data and information about best practices that its members submit. Thus, its data does not cover all operators in the Gulf. Only a regulator can require all operators to submit the types of data that underpin good regulatory frameworks by warning of rising risks before a disaster brings danger into full view 24/7.

Into the Boardroom: In the UK and in Norway, company managers must describe how they monitor for major hazard indicators, especially for accident precursors, such as maintenance backlogs. Boards of directors are expected to review this data; the regulator has assisted in training programs on corporate use of this data. The UK HSE (the safety regulator) uses this data to benchmark companies and challenge low performers with intervention visits.

Some industry groups have been willing to recognize that regulators must fill the gap that the industry alone cannot fill. For example, the International Association of Drilling Contractors (IADC) has urged government regulators to be more active. Industry can develop codes of best practice and urge members to use them, but, some companies do not and will not voluntarily commit to such practices. So, the IADC urged offshore regulators to “work aggressively to investigate incidents and place their learning from incidents in the public domain.” The regulator needs data, analysis, expertise and funding to do this job effectively.

The IOGP (the International Oil & Gas Producers association that describes itself as the “voice of the global upstream industry”²³) issued the following warning to the petroleum industry after Macondo:

OGP members should be aware that if a regulator is not providing robust oversight, then an important part of the technical assurance process may be missing. This is a ‘weak signal’ and should be recognized as a reason to carry out a more extensive programme of self-audit to compensate for the lack of competent regulatory oversight.²⁴

If regulators do not act, litigation will fill the void. Under the UK Manslaughter Act of 2007, the jury may consider, in determining liability of a corporation for worker deaths, “the extent to which the evidence shows that there were attitudes, policies, systems or accepted practices within the organization that were likely to have encouraged any [failure to comply with HSE legislation] or to have produced tolerance of it.”²⁵

In short, a complacent attitude at the top signifying a lack of a “safety culture” will go before a jury. Senior management’s attitudes and practices in balancing safety risks against profits will be scrutinized. The penalty is an unlimited fine, intended to be punitive.

Conclusion

At a recent Center for Offshore Safety Forum, a Shell employee described a pilot project on its Brutus offshore platform in the Gulf. At the start of the work day, the supervisor asked the crew members four open-ended questions:

1. What can go wrong today? (and what is the “worst case” wrong)
2. What can cause it to go wrong?
3. What can prevent it from going wrong?
4. If it does happen, what is the mitigation plan?

The result of this active engagement with the crew was a 40% to 50% decrease in environmental noncompliance events, such as oil spills. Shell now uses these four questions globally.

Calling all Regulators: Can the companies you regulate answer these questions regarding their overall operations? You can make the companies better and stronger by pushing hard for these answers.

²³ Visit <http://www.iogp.org/>.

²⁴ See INT’L ASS’N OF OIL & GAS PRODUCERS, DEEPWATER WELLS GLOBAL INDUSTRY RESPONSE GROUP RECOMMENDATIONS, REPORT NO. 463,, at 21 (2011).

²⁵ Corporate Manslaughter and Corporate Homicide Act 2007, 2007 c. 19 (U.K.), accessed at <http://www.legislation.gov.uk/ukpga/2007/19/contents>. See John Paterson, *Health and Safety at Work Offshore*, Ch. 8, in GREG GORDON ET AL. (eds.), *OIL AND GAS LAW: CURRENT PRACTICE AND EMERGING TRENDS* (2d ed. 2011) at 188, 225-26.

Calling all CEOs: Can you answer these questions for your operations?

The mother of all common resource problems faces us today: Global climate change. Ask these same four questions and use good science and good business judgment to answer them:

1. What can go wrong (and what is the “worst case” wrong)?
2. What can cause it to go wrong?
3. What can prevent it from going wrong?
4. If it does happen, what is the mitigation plan?

If the oil and gas industry is not part of the solution to global warming, who will be blamed when citizens all over the world suffer the consequences of climate change and try to adapt to it? Henry Doherty has told us the answer. More than 190 countries of the world have pledged to reduce greenhouse gas emissions in a framework that enables countries to develop flexible, efficient policies to implement their commitments.

So, let’s take that mega-analysis of the Porter hypothesis to heart and describe the attributes of sound market-based climate change policy. An effective system for mitigating climate change would have the following attributes:

- Promote global participation;
- Apply to all greenhouse gas (GHG) emissions;
- Provide a uniform price for all GHG emissions;
- Apply the costs of GHG emissions to the parties most able and likely to alter behavior in response to a price signal;
- Prevent shifting of GHG emissions to unregulated jurisdictions;
- Link with other market-based systems outside the regulated jurisdiction;
- Return revenue generated back to the economy in an equitable fashion that encourages economic growth and limits regressive income effects; and
- Provide for accurate and cost-effective GHG emissions measurement, verification and reporting.

The bulleted text above is taken, almost verbatim, from the ExxonMobil Corporate Citizenship 2015 Report, on page 30. There is a way forward that brings out the best America has offered over the decades as an example to many other nations: innovative thinking, scientific and managerial innovations, efficient markets and practices, and international linkages that can give all citizens of this world a better environment. The petroleum industry can play a starring role here.

To repeat: “A good regulation is industry’s best friend.”

Thank you all for helping me on a lifetime journey of learning about energy, economics and the environment. While I have cleaned out my UHLC office, I am not retiring from dialogue on the issues that we all face in this industry in our roles as business leaders, wise counselors and thoughtful citizens.