

The Offshore Oil and Gas Industry
Report on Insurance – Part Three

October 29, 2010

Booz | Allen | Hamilton

Disclaimer

This project was funded by the Department of Energy, National Energy Technology Laboratory an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

INTRODUCTION

Booz Allen was tasked to research the following questions pertaining to how operators and drillers (i.e., those engaged in exploration and production (“E&P”) activities) insure their assets, equipment, workers, and potential business losses in the event of a disaster, such as an oil spill. In this third report, we respond to the following questions:

- a) How does insuring firms engaged in exploration and production (E&P) activities compare to insuring firms engaged in other forms of energy production?
- b) Will companies make changes on their own to reduce risk and secure lower premiums?
- c) Will companies absorb the costs associated with implementing new safety regulations or simply pass costs on through the supply chain?
- d) How does the cost of regulation differ for companies that self-insure versus companies that purchase insurance from a third-party?
- e) Do insurance companies penalize firms engaged in “state-of-the-art” exploratory drilling with higher premiums?

Booz Allen previously answered the following two questions in Part One of our report:

- a) How do insurance companies insure firms engaged in E&P operations?
- b) What are the different kinds of insurance policies available to operators and drillers?

Part Two of our report addressed the questions identified below:

- c) Is there an actuarial component to insuring E&P operations?
- d) Where and how do insurers get their data?
- e) What role does Lloyd's Register play?
- f) Are audits performed on firms engaged in E&P activity? If so, are they conducted by an independent third-party?
- g) Does the operator or the drilling company have final say over safety procedures on the drilling rig?
- h) What do insurers consider to be the largest risks associated with firms engaged in E&P operations?

KEY FINDINGS

- The U.S. Congress passed sweeping energy legislation in the form of the Price-Anderson Act (1957) and the Oil Pollution Act (1990). These two pieces of legislation set a precedent of government intervention by imposing limitations on the liabilities an energy company could face in the event of an accident.
- The “secondary insurance” feature of the Price-Anderson Act unifies all U.S. nuclear reactors, creating a financial incentive to avoid nuclear accidents across the industry. Nuclear reactor licensees endeavor to create and then implement industry best-practices.
- Due to greater demand by the oil and gas industry for increased insurance coverage since April, private insurers are currently looking for new alternatives for increasing insurance capacity. To do so, insurance companies are attempting to raise capital within the private investment markets; for example, insurance companies are attempting to create an oil

and gas insurance pool. This approach is in contrast to the Price-Anderson Act, whereby the government mandated an industry-wide insurance pool across the nuclear energy industry.

- Firms engaged in offshore exploration and production in the Gulf of Mexico have already implemented changes aimed at reducing accident risk and lowering insurance premiums in response to the Gulf oil spill, although the motivation behind these efforts remains unclear.
- Although firms may implement new safety practices, they may not see their insurance premiums decline. This is due to increased demand for insurance coverage, which has and will continue to increase insurance premiums in the near term.
- A firm's ability to bear increased production costs as a result of new insurance regulation depends upon: (a) the market conditions constraining a firm's ability to pass costs through the supply chain to consumers, and (b) the firm's ability to absorb increased production costs in the short term – whether or not they are related to safety.
- Energy consultants believe that proposals in Congress to raise U.S. liability costs to \$10 billion to drill for oil in the Gulf could leave just three companies remaining in the industry -- BP, Exxon Mobil Corp. and Royal Dutch Shell Plc – firms with the sufficient resources to self-insure. This could lead to the exit of smaller firms from this market, leading to greater industry concentration and less competition among producers in the Gulf of Mexico.

Q: HOW DOES INSURING FIRMS ENGAGED IN EXPLORATION AND PRODUCTION (E&P) ACTIVITIES COMPARE TO INSURING FIRMS ENGAGED IN OTHER FORMS OF ENERGY PRODUCTION?

Energy is produced in a variety of ways. Renewable forms of energy production include those produced from naturally-replenishing sources such as hydroelectric, solar, and wind. Other sources of energy include nuclear, coal, and oil and natural gas. Energy-market insurers offer a wide range of policies that enable firms engaged in energy production to protect against property-casualty, workers' compensation, and business loss. However, the insurance markets providing coverage for the nuclear and oil and gas industries are particularly unique. Unlike other forms of energy production, accidents in the nuclear and fossil fuel industries may result in devastating outcomes to surrounding communities. Due to the considerable environmental and financial implications of such accidents, the U.S. Congress intervened in both the nuclear and oil and gas industries by passing the Price-Anderson Act of 1957 and the Oil Pollution Act of 1990. Each piece of legislation influenced investment and the market for liability insurance in both industries. The following discussion addresses three unique features of this legislation – the establishment of a liability cap, the creation of a unique insurance structure, and the establishment of an insurance “pool” – and the implications it had on energy producers' behavior and the market for liability insurance.

THE LIABILITY CAP

In 1957, Congress passed the Price-Anderson Act for the nuclear industry, which capped a firm's financial liability as a result of a catastrophic accident. This Act served two primary purposes: to compensate the public in the event of a nuclear incident and to limit the potential liability of companies involved in certain nuclear

activities.¹ Price-Anderson capped a nuclear reactor licensee's liability at \$375 million.² In 1990, Congress passed the Oil Pollution Act, which capped liability at \$75 million. By thus limiting the liability of investors resulting from a catastrophic accident, the federal government encouraged private investment in nuclear, oil, and gas industries.³

The potential magnitude of losses from an accident makes investors wary of providing the capital necessary to insure the nuclear and fossil fuels forms of energy production. Estimates of a nuclear plant accidents range into the hundreds of billions of dollars.⁴ The economic impact of an oil spill can also be considerable. For example, as of September 29, 2010, BP reported that the cost of the Deepwater Horizon oil spill was at \$11.2 billion.⁵ The likelihood (probability) and magnitude of an accident and its ensuing costs, however, need to be weighed against the benefits of nuclear and fossil fuel energy supplies.

One benefit of nuclear energy is that although production requires significant up-front investment, the variable costs associated with producing nuclear energy are

¹ "Need for Nuclear Liability Insurance." American Nuclear Insurers. August 2010.

<http://www.amnucins.com/library/Nuclear%20Liability%20in%20the%20US.pdf>. This is the liability under the "primary insurance" clause. Each licensee may also need to contribute \$117.5 million in secondary insurance. Both types of insurance are discussed in this paper.

² The Nuclear Regulatory Commission (NRC) periodically reviews its regulations to require licensees of nuclear reactors to increase their coverage level as the private insurance market increases the maximum level of primary insurance that it is willing to offer.

³ The Price-Anderson Act is third-party, liability coverage and does not cover property damage sustained at the nuclear site or workers compensation. See Statement Submitted by the United States Nuclear Regulatory Commission to the Subcommittee on Capital Markets, Insurance and Government Sponsored Enterprises of the Committee on Financial Services United States House of Representatives Concerning the Price-Anderson Act. 24 October 2001. <<http://www.nrc.gov/reading-rm/doc-collections/congress-docs/congress-testimony/2001/10-24-01PA-Testimony2.pdf>>

⁴ Heyes, Anthony. Determining the Price of Price-Anderson. Regulation. Winter 2002-2003. <<http://www.cato.org/pubs/regulation/regv25n4/v25n4-8.pdf>>

⁵ Walker, Ian. "BP Pledges Assets as Gulf Spill Collateral." The Wall Street Journal. 1 October 2010. <<http://online.wsj.com/article/SB10001424052748703859204575525482920628758.html?KEYWORDS=Ddeepwater+Horizon+cost+estimate>>

relatively low as compared to other energy sources.⁶ Nuclear energy production is a “cleaner” form of production, emitting fewer carbon emissions than other types of fuels. A benefit of fossil fuel extraction in the Gulf of Mexico is that it is an abundant domestic source, which offsets in part any supply quotas imposed by the Organization of Petroleum Exporting Countries (OPEC).

Limiting the liability of a firm can be an effective method of encouraging investment if the investor community views the benefits associated with these forms of energy as outweighing the costs. However, the cost-benefit decision for investors will not be the same as that of local communities surrounding nuclear and fossil fuel facilities. Neighborhoods surrounding these facilities will want nuclear and fossil fuel producers to take every precaution to ensure the safe operation of these facilities. A liability cap, however, effectively reduces the cost of a catastrophic accident for those directly responsible. This may result in a lower incentive by the firm to invest in safety, *ceteris paribus*.⁷ There is renewed interest in energy liability caps since the Deepwater Horizon oil spill. However, the U.S. Senate has recently blocked an initiative to increase the liability cap established in the Oil Pollution Act because the full implications of increasing the liability cap remain unknown. Regulators need to be aware if other means exist to effect the desired outcome while minimizing market distortions.

The nuclear industry is considered one of the safest forms of energy production.⁸ This, in part, is attributable to the importance the industry places on industry best-

⁶ Power Plants: Characteristics and Costs. CRS Report for Congress. 13 November 2008. <<http://online.wsj.com/article/SB10001424052748703859204575525482920628758.html?KEYWORDS=Deepwater+Horizon+cost+estimate>>

⁷ Price-Anderson Act: The Billion Dollar Bailout for Nuclear Power Mishaps. Public Citizen. September 2004. <<http://www.citizen.org/documents/Price%20Anderson%20Factsheet.pdf>>. See also Greenstone, Michael. “A Built-In Incentive for Oil Spills.” Politico. 5 June 2010. <<http://www.politico.com/news/stories/0610/38068.html>>

⁸ Nuclear Energy Industry Continued To Set Safety Standard in 2009, WANO Indicators Confirm. The Nuclear Energy Institute. 15 June 2010. <<http://www.nei.org/newsandevents/newsreleases/nuclear-energy-industry-continued-to-set-safety-standard-in-2009-wano-indicators-confirm/>>

practices. A unique feature of the Price-Anderson Act unites all U.S. nuclear reactors, creating a financial incentive to avoid nuclear accidents across the industry. This is explained further below.

THE INCENTIVE STRUCTURE OF THE PRICE-ANDERSON ACT

The Price-Anderson Act imposes a unique incentive structure on the nuclear power generation industry. The Act states that each nuclear reactor licensee must pay a premium to receive \$375 million in “primary” insurance.⁹ In addition, licensees are required to obtain “secondary” insurance. The secondary insurance coverage is unique in that it takes the form of *retroactive* payments to be *contributed by all nuclear power licensees* to cover potential claims exceeding the primary insurance coverage.¹⁰ Currently, the maximum prorated secondary insurance share a licensee is required to pay is approximately \$117.5 million.¹¹ With 104 nuclear reactors, industry-wide total secondary insurance coverage for any single reactor equals approximately \$12.2 billion (104 reactors multiplied by \$117.5 million). Therefore, the maximum insurance coverage paid by the nuclear industry for any single accident equals approximately \$12.6 billion (\$0.375 billion in primary insurance plus \$12.2 billion in secondary insurance).¹²

⁹ The Nuclear Regulatory Commission (NRC) periodically reviews its regulations to require licensees of nuclear reactors to increase their coverage level as the private insurance market increases the maximum level of primary insurance that it is willing to offer.

¹⁰ The Nuclear Regulatory Commission (NRC) allows licensees to price their secondary insurance in of six ways: (1) surety bond, (2) letter of credit, (3) revolving credit/term loan arrangement, (4) maintenance of escrow deposits of government securities, (5) annual certified financial statement showing either that a cash flow can be generated and would be available for payment of retrospective premiums within 3 months after submission of the statement or cash reserve or combination of these; (6) such other type of guarantee as may be approved by the Commission.

¹¹ American Nuclear Insurers. < <http://www.amnucins.com/Media%20Center.html#Limit>>. The Nuclear Regulatory Commission (NRC) reviews the amount of retrospective premiums every 5 years using the aggregate change in the CPI for urban consumers.

¹² To the extent claims exceed the primary and secondary insurance available, then the NRC surveys the causes and extent of damage and submits a report to Congress and courts. After the courts decide on liability, then the President would submit to Congress as estimate of the financial extent of damages, recommendations for additional sources of funds, and one or more compensation plans for full and prompt compensation.

The secondary insurance mandated by Congress in the Price-Anderson Act has a unique incentive structure. To the extent an accident is costly and exceeds the primary insurance cap, secondary insurance retroactively punishes all licensees equally. This is significant in that each licensee has a vested interest in the safe operations of every other licensee across the industry. The importance the industry places on establishing industry-wide best-practices is apparent. For example, in response to the Three-Mile Island accident, the nuclear industry created the Institute of Nuclear Power Operations (INPO). INPO conducts regular site inspections of all reactors in the U.S. The inspections are conducted independently of those performed by American Nuclear Insurers (ANI) and the Nuclear Regulatory Commission (NRC). INPO evaluates nuclear facilities, identifies best practices, and then shares that information with the rest of the industry. The names of the facilities are kept confidential so that those facilities needing improvement maintain anonymity while other facilities can benefit from learning of their mistakes.

There is no similar “secondary” insurance imposed upon firms engaged in exploration and production activities in the oil and gas industries. Congress authorized funding for the Oil Spill Liability Trust Fund (OSLTF or “Fund”) in its 1990 Oil Pollution Act. However, the OSLTF is primarily funded by a five cent per-barrel fee levied on companies engaged in E&P activities.¹³ This payment is not retroactive – it’s paid on an as-you-go basis, which does not “punish” firms, per se, should an incident occur. Since firms are not directly penalized for industry accidents, they may be less encouraged to participate in efforts that foster safety and promote best-practices across the industry.¹⁴

¹³ The Oil Spill Liability Trust Fund. The United States Coast Guard.
<http://www.uscg.mil/npfc/About_NPFC/osltf.asp>

¹⁴ Firms engaged in exploratory and production (E&P) activities are punished in financial markets should a catastrophic event occur. This is discussed in Part One of the report entitled “The Offshore Oil and Gas Industry Market Response.”

THE INSURANCE POOL

Due to greater demand by the oil and gas industry for increased insurance coverage since April, private insurers are currently looking for new alternatives for increasing insurance capacity. To do so, insurance companies are attempting to raise capital within the private investment markets; for example, insurance companies are attempting to create an oil and gas insurance pool. This approach is in contrast to the Price-Anderson Act, wherein the government mandated the formation of an industry-wide insurance pool across the nuclear energy field.¹⁵

American Nuclear Insurers (ANI) is an association that serves as the direct underwriter of nuclear liability insurance for nuclear facilities in the U.S.¹⁶ All nuclear licensees must purchase their primary insurance from ANI to maintain their operating licenses, which are administered by the Nuclear Regulatory Commission (NRC). As with the liability cap, the private insurance pool was seen as a method for encouraging investment in the nuclear energy. The pooling of capital meant that no one insurer would suffer the full loss of a catastrophic event. In addition to diversifying risk, the pool increased the amount of capital available to insure large-risk endeavors.

¹⁵ The United States Nuclear Regulatory Commission. "A Short History of Nuclear Regulation, 1946-1999." <<http://www.nrc.gov/about-nrc/short-history.html#price-anderson>>

¹⁶ ANI operates both a domestic syndicate and a foreign syndicate. The domestic syndicate offers third-party nuclear liability insurance to domestic operators of nuclear power reactors, nuclear fuel fabrication facilities, waste disposal and other nuclear facilities. It also writes nuclear liability insurance for suppliers of products or services (including transportation services), to these facilities. The foreign syndicate provides reinsurance to foreign nuclear pools. ANI contrasts with Nuclear Electric Insurance Limited (NEIL), which insures electric utilities for damages to insured sites, decontamination expenses, or other risks of direct physical loss and costs associated with long-term interruptions of electricity supply.

The oil and gas industry does not have a government-mandated insurance pool. Rather, it has relied on the financial markets - mainly the insurance and reinsurance markets -- to create the insurance capacity required to facilitate investment. Although underwriters believe that their methods for assessing risk in this industry need to be revisited, they still view this industry as a profitable one. Firms engaged in E&P activities are demanding greater insurance coverage and are willing to pay more for it as a result of the Deepwater Horizon oil spill. Insurance and reinsurance firms see rising premiums as a business opportunity, especially since rates in other industries remain relatively flat.¹⁷ As a result, insurers are devising ways of pooling capital to increase insurance capacity and diversify risk to a greater extent than previously possible.¹⁸ Although the validity of these proposals should be confirmed, it illustrates the point that private markets may be able to raise insurance capacity without government intervention.

CONCLUSION

The insurance markets providing coverage for the nuclear, oil, and gas industries are particularly unique. Unlike other forms of energy production, accidents in the nuclear and fossil fuel industries may result in devastating outcomes to surrounding communities. To encourage private investment in these industries, the U.S. Congress intervened by passing the Price-Anderson Act of 1957 and the Oil Pollution Act of 1990. Both pieces of legislation are similar in some ways but different in others. Both Acts limit a firm's liability should an accident occur. This

¹⁷ Chapman, Peter and Phillip Sanders. "Munich Re to Boost Oil-Rig Insurance Sales After Gulf Spill." *The Chronicle with Bloomberg*. 11 September 2010. < <http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2010/09/11/bloomberg1376-L8MV4507SXX01-40ISK00FVFJNEEM256QUCEHJJG.DTL>>

¹⁸ For example, Munich Reinsurance believes its proposed solutions would increase available capacity from approximately \$1.5 billion to potentially \$20 billion. See "Munich Reinsurance Develops New Insurance Solution for Oil Catastrophes." 12 September 2010. http://www.munichre.com/en/media_relations/press_releases/2010/2010_09_12_press_release.aspx. For more information regarding Munich Reinsurance's proposed solutions, visit: http://www.munichre.com/app_pages/www/@res/pdf/media_relations/press_releases/2010/2010_09_12_montecarlo_en.pdf.

may lead to an under-production of safety practices and procedures in both industries. In establishing a unique incentive structure, the Price-Anderson Act provides incentives to the nuclear industry to create industry best-practices and safe operating procedures. Although the government mandated the establishment of an insurance pool for the nuclear industry in the Price-Anderson Act, the government may not need to do so in the oil and gas industry. Private insurers are devising ways to raise the capital necessary to continue exploratory drilling. These three points of comparison highlight the intersection of government intervention and competitive markets when it comes to insurance, demonstrating the impact on both industries.

Q: WILL COMPANIES MAKE CHANGES ON THEIR OWN TO REDUCE RISK AND SECURE LOWER PREMIUMS?

Firms engaged in offshore exploration and production in the Gulf of Mexico have already implemented changes aimed at reducing accident risk and lowering insurance premiums in response to the Gulf oil spill. The motivation behind these efforts, however, remains unclear. Our research finds that the implementation of new safety programs may be motivated by politics rather than an incentive to lower premiums. In addition, the full extent of changes in firms' behavior will not be realized until uncertainty surrounding future regulation is abated.

Insurance coverage for drilling contractors and control-of-well expenses are the areas most likely to be targeted by underwriters for premium rate increases.¹⁹ Consequently, E&P firms in the Gulf are investigating methods to increase safety for those activities, which will reduce insurance premiums related to those specific risks. Royal Dutch Shell is urging U.S. regulators to adopt the stricter drilling regulations of the North Sea and impose them on offshore drilling companies operating in the Gulf.²⁰ Shell believes these tougher standards may have prevented the mistakes that led to the BP oil spill. One of the key requirements would force every company drilling an offshore well to prepare a "safety case," which will consist of plans that examine all potential risks and define who is responsible for each risk-management task.²¹ Companies are also reevaluating their own operational safety procedures, since changes in the

¹⁹ King, Rawle O., Deepwater Horizon Oil Spill Disaster: Risk, Recovery, and Insurance Implications. Congressional Research Service, July 12, 2010. URL: <http://www.fas.org/sgp/crs/misc/R41320.pdf>

²⁰ National Post's Financial Post & FP Investing (Canada). Shell wants U.S. To adopt tougher drilling standards used in North Sea. October 15, 2010

²¹ National Post's Financial Post & FP Investing (Canada). Shell wants U.S. To adopt tougher drilling standards used in North Sea. October 15, 2010

insurance market are expected to be driven by reassessments of operational risks.

Although firms may implement new safety practices, their insurance premiums may not necessarily decline. The BP spill is fueling demand for more insurance, but the types of insurance vary. BP was self-insured, but not all companies have the resources necessary to bear the associated costs. However, since demand for insurance coverage is expected to increase dramatically, the supply of insurance will be limited in the short run until insurance companies find new ways to obtain the necessary capital.²² In this type of insurance environment, self-insuring will become a cost-effective option as more companies face higher insurance premiums.

Prior to the spill, energy underwriting rates in the offshore oil and gas industry were down 10-15%. However, in recognition of the increased risks, premiums for insuring deepwater operations have recently increased by 25-30% and deepwater drilling by 100% or more.²³ Despite the large increases, insurers warn the full impact of increased insurance premiums will not be felt until January, when the bulk of reinsurance is bought.²⁴ According to Alex Maloney, chief underwriting officer of the global insurance provider Lancashire, “The question that board members of oil and gas companies are asking management is... have they got enough insurance?” Maloney added that his company is seeing companies purchasing double the amount of insurance they had previously.²⁵ In order to retain a competitive advantage, offshore oil and gas companies must find ways to maintain profitability in the face of these significantly higher insurance costs.

²² King, Rawle O., Deepwater Horizon Oil Spill Disaster: Risk, Recovery, and Insurance Implications. Congressional Research Service, July 12, 2010. URL: <http://www.fas.org/sgp/crs/misc/R41320.pdf>

²³ Oil industry set for surge in insurance premiums after Deepwater disaster. URL: <http://www.guardian.co.uk/business/2010/sep/20/deepwater-oil-rigs-insurance-costs>

²⁴ Same as above

²⁵ Oil industry set for surge in insurance premiums after Deepwater disaster URL: <http://www.guardian.co.uk/business/2010/sep/20/deepwater-oil-rigs-insurance-costs>

Another finding is that an incentive structure encouraging management to avoid risky behavior may be helpful. Insurers are reporting that they may look at management incentives, such as whether rig supervisors have monetary incentives to promote rig safety.²⁶ BP announced that it is reviewing its incentive structure to “ensure that employees never feel pressured or tempted to sacrifice safety for other goals.”²⁷

For firms to reduce their insurance premiums, they will have to reduce the risks they take in the pursuit of oil. This will likely be effectuated by a combination of better safety practices as well as an incentive structure that complements the execution of those practices. Moreover, insurance premiums may not decline despite attempts to improve safety. As the demand for coverage rises, the price for that coverage will also rise. Significantly higher insurance premiums may lead to more firms opting to self-insure, likely an option only for the largest firms, or exiting the market altogether, likely to be the smaller market participants unable to meet the higher cost requirements.

²⁶ Malone, Scott. “Investors Seek Oil Firms’ Safety Plans, Insurers’ Underwriting Plans.” Insurance Journal. 5 August 2010. <<http://www.insurancejournal.com/news/national/2010/08/05/112229.htm>>

²⁷ Bergin, Tom. BP Links Bonus Pay to Safety, Risk Management.” Reuters. 19 October 2010. <<http://192.165.222.5/thenews/newsdesk/LDE69I0EW.htm>>

Q: WILL COMPANIES ABSORB THE COSTS ASSOCIATED WITH IMPLEMENTING NEW SAFETY REGULATIONS OR SIMPLY PASS COSTS ON THROUGH THE SUPPLY CHAIN?

Two distinct questions are raised here with two distinct answers. The first question is what are the market conditions constraining a firm's ability to pass costs through the supply chain? The second question focuses on each firm's ability to absorb increased production costs – whether they are related to safety or not – within the market in which the firm is operating.

A firm's ability to pass costs through to customers will differ at each step along the supply chain. At the exploration and production level, offshore oil and gas producers in the Gulf of Mexico can be considered "price-takers." Although the market is not perfectly competitive, no single firm operating in the Gulf will affect the world market price for oil if it changes its quantity produced.²⁸ Consequently, a firm's ability to negotiate higher prices for the crude oil and gas that they extract from the ground is limited. Since purchasers of crude oil and gas have many different sources from which to buy, E&P firms will have to absorb much of the added cost of producing in the Gulf. As a result, higher production costs resulting from increased regulation and insurance costs will have to be absorbed by the E&P companies for the most part and not passed along the supply chain to end users. This will not hold true if firms' production costs are increased at, for example, the "transportation to end-users" phase of the supply chain. Pipelines transporting crude oil, refined petroleum products, and liquefied natural gases in interstate commerce are primarily subject to cost-based rate regulation.²⁹ Pipeline companies facing increased operating costs may file rate increases if they are deemed as "just and reasonable." These will generally translate into an increase

²⁸ The world price of crude oil is driven by factors outside of the Gulf of Mexico, primarily OPEC.

²⁹ Pipelines are allowed to charge "market-based" rates in markets with a sufficiently low level of market concentration.

in price paid by consumers since the demand for refined petroleum products, particularly in the short run, is relatively inelastic.³⁰

Each firm's ability to absorb increased production costs depends on many factors. Firms with economies of scale and scope will have a competitive advantage over the marginal supplier. For example, large, vertically integrated firms may receive volume discounts on the purchase of inputs or employ a production technology yielding significantly larger amounts of output compared to smaller competitors. These firms will have lower variable costs relative to smaller producers. Consequently, the larger firms will be better positioned to absorb increased production costs while smaller firms may have no choice but to exit the market.

The ability of firms to absorb additional operating costs is a concern due to the number of smaller, "independent" firms operating in the Gulf of Mexico. According to oil and gas banker Michael O'Dwyer of Morgan Stanley, "Once legislation is passed, pressure on smaller players in the Gulf will inevitably increase. We expect to see a change in the ownership structure in the Gulf with smaller players looking to consolidate and potentially exit."³¹ Consequently, the "cost" of new regulation will have to be carefully studied. A comprehensive study will take account of the composition of the market, the cost structures of the different types of firms, and the economic impacts at each point down the supply chain.

³⁰ "Inelastic" demand means that the quantity demanded is relatively unresponsive to changes in price.

³¹ Turner, David and Farge, Emma. BP Gulf Oil Disaster Legacy Includes Higher Risk, Insurance Costs. October 12, 2010. URL:<http://www.insurancejournal.com/news/national/2010/10/12/113979.htm>

Q: HOW DOES THE COST OF REGULATION DIFFER FOR COMPANIES THAT SELF-INSURE VERSUS PURCHASING INSURANCE FROM A THIRD-PARTY?

Given the fallout from the Deepwater Horizon oil spill, most insurance market experts expect insurance to be available only at a very high premium¹. Currently, the liability insurance capacity of the offshore energy insurance market is fixed in the short run, including coverage for offshore oil pollution spills in U.S. waters. The total available liability funds are estimated to be somewhere in the range of \$1.25 billion to \$1.5 billion³². New legislative measures (S. 3305, H.R. 5214, H.R. 5629) to remove the liability limit on oil companies has raised concerns that higher limits of liability and financial responsibility will discourage smaller companies from exploratory drilling, potentially forcing market exit, and making the option of self-insurance more attractive to larger firms. According to the Congressional Research Service, the “imposition of higher strict liability limits for large-scale oil pollution could have the effect of greatly increasing the demand for liability insurance protection.”¹ Further, insurers may experience greater difficulty evaluating risk exposures, defining reasonable limits for coverage and calculating insurance prices.

Self insurance in the offshore drilling market is approached as a “catastrophic” risk management technique. Money is set aside using actuarial and insurance information, so that the amount set aside (similar to an insurance premium) is sufficient to cover future, uncertain losses.

Energy consultants believe that proposals in Congress to raise U.S. liability costs to \$10 billion to drill for oil in the Gulf could leave just three companies -- BP, Exxon Mobil Corp. and Royal Dutch Shell Plc -- with the finances to self-insure.

³² King, Rawle O., “Deepwater Horizon Oil Spill Disaster: Risk, Recovery, and Insurance Implications, Congressional Research Service, 2010

Prohibitive premiums and the impracticality of insuring one-time, catastrophic events could mean that going forward all deepwater operators will need to be wholly self-insured.

BP, Exxon Mobil and Shell, the world's three largest non-state oil companies, are at least partially self-insured through wholly owned units, according to company filings. BP, which owns Guernsey-based Jupiter Insurance, said in a March 2010 regulatory filing "that it was more economic for it to bear losses as they arose rather than to buy external policies."³³ More companies may have to insure themselves if the U.S. decides to raise the cap on liability for economic damages from deepwater drilling to \$10 billion from \$75 million. "The real impact on energy insurance prices hasn't emerged yet because this year's contract terms were set before the BP- leased rig exploded."³⁴

Consolidation is another way companies in the Gulf of Mexico are likely to cope with the increased cost of insurance. The cost of obtaining insurance coverage will be prohibitively expensive for smaller independents unable to self-insure against an oil spill. Large integrated oil and gas companies could acquire such independents or their deepwater properties.³⁵ But the final result of all of this is unclear. If many smaller independents exit the market, or are bought out by larger companies, larger companies' may be less willing to operate in the deep waters of the Gulf, since these larger companies frequently find partners among the smaller firms for deepwater projects to share the costs and risks.³⁶

³³ King, Rawle O., "Deepwater Horizon Oil Spill Disaster: Risk, Recovery, and Insurance Implications, Congressional Research Service, 2010

³⁴ Person, Natalie Obiko, "Offshore Insurance to Shrink as Providers Flee BP-Like Risk," Bloomberg, 2010, <http://www.bloomberg.com/news/2010-06-24/offshore-oil-drilling-insurance-to-shrink-as-providers-flee-bp-like-risk.html>

³⁵ Dittrick, Paula. Higher costs, consolidation expected in Gulf of Mexico.

URL: http://www.pennenergy.com/index/petroleum/display/9010473793/articles/oil-gas-journal/general-interest-2/2010/08/higher-costs_consolidation.html

³⁶ Dittrick, Paula. Higher costs, consolidation expected in Gulf of Mexico.

URL: http://www.pennenergy.com/index/petroleum/display/9010473793/articles/oil-gas-journal/general-interest-2/2010/08/higher-costs_consolidation.html

In conclusion, the extent to which insurance premiums will increase is yet to be fully realized following the Deepwater Horizon accident. Depending upon new regulation and the modified liability limits, premiums may become prohibitively costly, driving smaller firms from the market, leaving only highly capitalized firms with the ability to self insure and a far more concentrated oil and gas industry in the end.

Q: DO INSURANCE COMPANIES PENALIZE FIRMS ENGAGED IN “STATE-OF-THE-ART” EXPLORATORY DRILLING WITH HIGHER PREMIUMS?

The Gulf of Mexico has been a major source of oil and gas to the United States for nearly half a century. More recently, energy companies have focused their attention on oil and gas resources in water depths of 1,000 feet or greater because of declining production in shallower waters. Due to the complexity of deep water drilling, equipment has been redesigned to withstand the added pressure and extreme conditions found in the greater depths of offshore waters. For example, drilling platforms with rigid frames attached to the seafloor were deemed cost prohibitive for use in deeper waters.³⁷ As a result, new drill ships and technologies were developed. Deep water exploration also involves many additional operational challenges. For example, risers, the pipes which connect the drilling platform to the well, are exposed over considerable length (now exceeding 10,000 feet, or 2 miles) to the straining pressures of multiple ocean currents.¹ This is one example of why insurance premiums for exploration companies engaged in deepwater drilling are significantly higher than for those companies involved in shallow water exploration.

To minimize the need to drill costly and unnecessary wells, “state-of-the-art” technologies to more accurately identify targets are being designed to address the challenges associated with deep water exploratory drilling. Examples include 3D and 4D seismic information and advanced computer interpretations. The Bureau of Ocean Energy Management Regulation and Enforcement (BOEMRE) explains the advancements:

“Massive blowout preventers, some 45 feet high and weighing 320 tons, are installed on the ocean floor to protect the environment from the threat of an

³⁷ Cutler, Cleveland, "Energy in the Deepwater Gulf of Mexico," The Bureau of Ocean Energy Management, Regulation and Enforcement, 2010.

accidental deep water oil release. Remotely controlled robots operate effectively in the high pressure, cold and dark environment of the ocean bottom to construct, maintain and repair costly drilling equipment. New drill ships capable of carrying the tons of necessary pipe and other drilling equipment have been constructed to support deep water operations. These ships are specially equipped with thrusters controlled by computers and geospatial positioning systems to maintain their position and reduce tension on their riser systems.”³⁸

As noted above, there are higher operational costs associated with deep water drilling; therefore insurance companies charge higher premiums to firms engaged in “state-of-the-art” exploratory drilling. According to the BOEMRE, “the cost of developing a single deep water field can exceed \$1 billion, with costs likely to increase as operations are conducted in even deeper waters. Compare this to the cost of a typical shallow Gulf development (100 feet of water, 10,000 foot wells) at \$100 million, and you can appreciate the cost of addressing the challenges of deep water.”²

In addition to these added costs, companies involved in “state-of-the-art” exploratory drilling also face significantly greater risks. This translates into higher premiums for multiple categories of insurance:

- Offshore physical damage insurance: Deepwater exploratory drilling has greater risks associated with physical damage of equipment. Subsea equipment costs are higher due to greater depths and pressure. Oil wells are deeper and require more advanced technology to counter a blowout. The strength of ocean currents have an adverse effect on under-water equipment, therefore companies involved in these activities face higher premiums in this category.

³⁸ Cutler, Cleveland, "Energy in the Deepwater Gulf of Mexico," The Bureau of Ocean Energy Management, Regulation and Enforcement, 2010.

- Operator's Extra Expense (OEE)/Energy Exploration and Development (EED): This category of coverage includes costs associated with well blowout. As the Horizon Oil Spill has demonstrated, countering the effects of a blowout in deep water wells is many times more difficult and requires advanced technology, which is not required in shallower waters. Evacuation expenses are also greater. The farther offshore an oil rig is located, the higher are the costs associated with removal of wreckage. This results in increased insurance costs for firms engaged in deep exploration activities.

As a result of the Deepwater Horizon incident, higher, perceived operational risks are causing offshore energy insurance underwriters to reassess their insurance policies. Rather than adjusting rates based on the operator's exposure to the elements, such as hurricanes, insurance adjusters are more closely examining operational risks.³⁹ For the above reasons, companies involved in state-of-the-art exploratory drilling will likely see greater increases in insurance premiums as their operational activities expose them to greater overall risk.

³⁹ King, Rawle O. "Deepwater Horizon Oil Spill Disaster: Risk, Recovery, and Insurance Implications." July 12, 2010.