

Firms engaged in energy exploration and production business essay

[Business](#)



Insurers have raised their premiums to firms engaged in E&P activities by as much as 50 % since the oil spill. Insurers currently offer a variety of policies to firms engaged in offshore drilling. These policies include: offshore physical damage cover, coverage for hull and machinery, Operator's Extra Expense coverage, and Environmental/pollution liability. The terms, conditions, and types of policies offered are likely to change in the coming months. Insurers are currently re-evaluating how they assess and take on risk of projects and firms engaged in E&P activity. Insurance and reinsurance companies see rising premiums as a financial opportunity. This will likely draw capital into the E&P insurance market, increasing the amount of insurance available to meet E&P firms rising demand for coverage. E&P firms manage and mitigate their risks in a variety of ways, one of which is obtaining third-party insurance. To assess the cost and likelihood of an event occurring, underwriters assess risk at the project level, at the company level, as well as consider current and future market conditions. Current global insurance capacity available to meet the Oil Spill Financial Responsibility requirements of the 1990 Oil Pollution Act is approximately \$1.5 billion. Direct insurance firms purchase reinsurance policies in order to diversify financial risk. This also reduces the barrier to entry for smaller insurance firms who may not have the capital available to pay out should a catastrophic event occur. The availability, price, terms and conditions of insurance policies purchased by firms engaged in offshore drilling are likely to change in the coming months as a result of the oil spill. Firms involved in drilling operations are already demanding greater levels of insurance coverage in reaction to the spill. In addition to insurance companies, the energy firms themselves are employing

actuarial analyses to evaluate their risks. This information allows firms to hold stronger bargaining positions when negotiating policies with insurers. Insurers obtain their data from a wide variety of sources, including company data, publically available data, internally held data, and industry experts. Energy companies hire Lloyd's Register, one of eleven members of the International Association of Classification Societies, to appraise their assets and operations, ensuring compliance with regulations, industry standards, and underwriting requirements. Drilling companies initiate safety audits, hiring third-party inspectors to assess safety practices on drilling rigs. According to an industry expert, the operator trumps the driller with regard to safety practices and procedures followed during drilling operations. However, accountability appears somewhat ambiguous. Insurers, and other stakeholders, are concerned that, although firms engaged in exploration and production (E&P) activities extensively document safety processes and procedures, the incentives to effectuate safe operations may not be in place. It is critical that investors perceive that companies engaged in low-occurrence but high-risk, high-consequence deepwater exploration have risk mitigation policies in place that truly reduce risk. Otherwise, investors will be unwilling to participate in the capital markets that generate the funds necessary to insure these operations. 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 endeavour 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.

HOW DO INSURANCE COMPANIES INSURE FIRMS ENGAGED IN ENERGY EXPLORATION AND PRODUCTION?

Energy companies engaged in exploration and production (" E&P") activities face an extraordinary amount of risk on multiple levels that are unique to the industry. Offshore operations include a wide variety of assets such as fixed or floating platforms, mobile offshore drilling units (MODUs), sub-sea facilities, offshore pipelines, storage facilities, offshore construction and installation projects, vessels, and even some onshore property engaged in E&P operations.[1]In addition to the significant capital investment associated with these assets, offshore operations entail operational, environmental, and personnel risk. E&P firms manage and mitigate these risks in a variety of ways, which may include obtaining insurance coverage from a third-party insurer.[2]The energy insurance market is comprised of a number of stakeholders, including the insured, the broker, the direct insurer, the reinsurer, and capital investors. After conducting a series of internal analyses to determine the maximum loss level the firm is able to sustain, the firm will approach an insurance broker, who is charged with matching the firm's desired coverage level with the insurer offering the most favourable terms and conditions. The insurance broker enters negotiations with underwriters, who evaluate the risk and exposure associated with the potential client. The underwriters are tasked with determining the coverage the insured should receive and the premium the insured should pay. To make this

determination, underwriters' assess risk on multiple levels: The Project.

Underwriters will investigate the specific project for which the E&P firm is seeking coverage. This investigation typically includes a review of the unit design, construction materials, operating model, liquids and materials being handled, safety practices and procedures, equipment, the complexity of the drilling and construction activities, the location and environment in which the project is taking place, and the number of personnel working and residing on the unit.[3] Underwriters may contact outside consultants to conduct an independent report to determine, for example, that the drill was installed properly.[4] The Company. Underwriters will also investigate the company or companies wishing to secure coverage.[5] Underwriters will evaluate the firm's historical accident records and past losses. Underwriters also factor in the firm's aversion to risk, the company's culture of mitigating risk, and its current and future risk exposure. The Market. Other driving factors of insurance premiums include the "capacity," or supply, of insurance available on the global market, the price of oil, and the demand for insurance coverage. Industry experts have stated that the current global commercial insurance capacity for third-party liability insurance that is available to meet the Oil Spill Financial Responsibility ("OSFR") requirements under the 1990 Oil Pollution Act is approximately \$1.5 billion.[6] This short-term constraint on capacity could prove problematic should Congress increase the limits of the oil liability cap originally established in the 1990 Oil Pollution Act. Another driving factor is the price of oil. In recent years, complex and costly drilling operations became financially feasible as the price of oil rose. [7] Insurance industry experts expect energy firms to demand a greater

amount of coverage as a result of the Deepwater Horizon incident.[8]Each underwriting company has its own strategies for determining which risks it can acquire and which ones it should leave behind; however, there are common practices that underwriters use to assess risk. Underwriters use both qualitative and quantitative approaches to evaluate risk, combining sophisticated analytical tools with knowledge and experience. Examples include actuarial analyses[9], sophisticated computer-based modelling such as catastrophe ("CAT" modelling)[10], surveying, and simulating disaster scenarios.[11]Once the underwriters have evaluated the risks, the policy is matched with investors, who can provide the capital necessary to guarantee the risk. Investors may include institutions, insurance companies, as well as individuals. The direct insurer may also purchase reinsurance. Reinsurance between a direct insurer and the reinsurer acts in much the same way as between the policy holder and direct insurer. The direct insurer purchases a policy from a reinsurer which it can make a claim on under certain terms and conditions as specified in the policy. Reinsurance is beneficial to direct insurers for a number of reasons. First, it allows direct insurers to diversify their risks. For example, one environmental disaster will not adversely impact a single insurer, but rather a number of insurers who are able to endure smaller financial losses. Second, it allows insurance institutions that may not have access to a significant amount of capital to enter the insurance market. By taking out a policy for a certain, fixed amount, it can afford to insure operations of greater risk. In the event that a disastrous event does occur, the direct insurer will obtain funds from the reinsurers such that it can pay out its claim to the original policy holder. This allows a greater number of

insurers to participate in the marketplace, making it more competitive than it otherwise would be. The offshore energy exploration and production market is different from most markets because it's marked by complex capital undertakings, with possible, but infrequent, large-scale losses. Historically, insurers have viewed offshore operations as more complex and riskier than onshore operations because of the remote locations, complexity of drilling and construction activities, use of large marine vessels, falling and drowning hazards, and higher initial capital investment. Deep and ultra-deep (> 1, 500 meters) water developments are traditionally perceived by underwriters as "considerable risk" since they push the technological boundaries and the capabilities of the industry.[12]Asset values tend to be much greater than on-shore developments, which result in significantly higher premium for underwriters.[13]Generally, financial risks associated with E&P activities are assumed by the individual companies involved. Due to the significant up-front investment and risk associated with offshore drilling operations, underwriters currently are using more sophisticated analyses more than in prior years to evaluate the probability of potential losses. Generally, financial risks associated with E&P activities are assumed by the individual companies involved.[14]Currently, each drilling operation is placed on a co-insurance basis at current market conditions.[15]Limits are chosen based upon the estimated worst case cost of controlling a wild well, the cost of drilling the well, and the cost of residual pollution liability. Policies are generally renewed annually, typically around June and July for assets located in the Gulf of Mexico.[16]Deductibles tend to be based on minimums for the type of operation and type of well -- exploratory and development wells attract

higher deductibles than producing wells.[17]In reaction to the Deepwater Horizon accident, major insurance and reinsurance firms such as W. R. Berkley and Lancashire have increased premiums charged to firms engaged in E&P activities by as much as 50 %.[18]Moody's estimates that property insurance coverage is " 15-25 % higher for rigs operating in shallow water and up to 50 % higher for deepwater rigs." [19]This is a result of a number of factors, including increased demand for coverage by E&P firms[20]in conjunction with insurance companies re-evaluating the financial risks associated with offshore drilling. Insurance and reinsurance firms, including Munich Reinsurance, see the rising premiums as a business opportunity, since rates in other industries remain relatively flat.[21]This will likely draw capital into the E&P insurance market, increasing the amount of insurance funds available to meet E&P firms' rising demand for coverage.

WHAT ARE THE DIFFERENT KINDS OF INSURANCE?

Insurers have been offering insurance coverage to companies engaged in offshore drilling as early as the 1940s.[22]Throughout the 1970s and to the present, insurance companies have supplied more specialized, tailored, and more comprehensive policies as the industry grew more technologically advanced, pushed farther into the ocean, and drilled deeper than in prior years. Though disastrous events such as oil spills are considered to be infrequent, the economic, financial, and environmental implications are significant and far-reaching when they do occur, as experienced recently. It was not until Congress passed the Oil Pollution Act of 1990 that firms engaged in offshore energy exploration and production were required by law to prove that they had the financial wherewithal to deal with the effects of oil

spills, including clean-up, property damage, and restoration of the environment. One way an exploration and production (" E&P") firm may prove financial responsibility is to purchase insurance coverage from a third-party insurer.[23]

THE OIL POLLUTION ACT OF 1990 AND PROVING " FINANCIAL RESPONSIBILITY" – A BRIEF OVERVIEW

In response to the Exxon Valdez spill in 1989, Congress passed the Oil Pollution Act (" OPA") of 1990.[24]The OPA addressed a wide range of problems associated with preventing, responding to, and paying for oil pollution incidents in navigable U. S. waters. The OPA greatly increased federal oversight of maritime oil transportation, while providing greater environmental safeguards by, for example, mandating contingency planning, enhancing federal response capability, broadening enforcement authority, increasing penalties, and significantly broadening financial responsibility requirements.[25]Passage of the OPA led to more clearly defined guidelines for assigning liability in the offshore energy industry. Specifically, it stated that "...each responsible party for a vessel or a facility from which oil is discharged, or which poses the substantial threat of discharge of oil, into or upon the navigable waters or adjoining shorelines or the exclusive economic zone is liable for the removal costs and damages..."[26]The OPA clearly articulated that the responsible party would be charged with incurring costs associated with oil removal, damages for injury to or destruction of natural resources, property, subsistence use, lost revenue to state and/or federal government, lost profits, and the provision of public services.[27]Title 1 of the OPA also authorized the Oil Spill Liability Trust Fund (OSLTF of Fund).

[28]The purpose of the Fund was " to reimburse or pay costs incurred by the [Federal, State, Indian, or foreign] trustee... with respect to the damaged natural resources." Specifically, the Fund would cover costs associated with assessing natural resource damages, costs associated with developing and implementing plans for restoration, rehabilitation, replacement, or acquisition of the equivalent of damaged resources, and the payment of claims for uncompensated removal costs. In addition, the Fund could cover costs associated with the payment of Federal administrative, operational, and personnel costs and expenses reasonably necessary for and incidental to the implementation of the Act. In addition to establishing a scheme for assigning liability, Section 1016 of the OPA set forth requirements for firms engaged in offshore energy exploration and production to demonstrate they were financially sound enough to take on this newly assigned potential liability. Section 1016 states that the responsible party " must establish and maintain... evidence of financial responsibility sufficient to meet the maximum amount of liability to which the responsible party could be subjected under section 1004(a) or (d) of this Act, in a case where the responsible party would be entitled to limit liability under that section." As a result, offshore drilling facilities were required to produce evidence that they could cover their liability under a worst-case oil spill discharge with the potential of more than 1, 000 barrels of oil. To demonstrate financial responsibility, the party can show evidence of insurance, surety bond, guarantee, letter of credit, or qualification as a self-insurer. Consequently, firms, contractors, and subcontractors engaged in offshore energy production are required to show proof of financial responsibility. In an effort

to reduce the cost of insurance operators, drillers, and other contractors engage in contract negotiations to assign liability to a party prior to the beginning of drilling operations.[29]Typically, the drilling contractor bears the risks associated with personal injury or death of its own personnel and generally assumes liability for the rig and associated contractor equipment loss or damage. The operator normally accepts liability for its own personnel and property and, generally assumes responsibility for well-related risks (including pollution, well control, and well damage or loss).[30]With respect to employees of subcontractor or service companies, the operator and contractor generally indemnify each other from injury or death of employees of their respective subcontractors and other contractors.[31]

INSURANCE POLICIES AVAILABLE TO E&P FIRMS

Booz Allen identified and researched policies offered by major insurance and reinsurance companies to firms engaged in offshore energy exploration and production. These insurers include but are not limited to Munich Reinsurance Co., Swiss Reinsurance Co. Ltd., Hannover Rueckversicherung AG, Chartis (a subsidiary of American International Group Inc), and W. R. Berkley Corporation. Based on our research, we have found the following policies to be currently available to operators, drillers, and other contractors: Offshore Physical Damage Coverage: indemnifies the insured for all risks associated with physical loss or damage to fixed offshore drilling, production and accommodation facilities, including: fixed offshore drilling, production and accommodation facilities, pipelines, subsea equipment, and offshore loading. Hull, Machinery, etc.: Covers damage to Mobile Offshore Drilling Units ("MODUs") such as jack-ups, semi-submersibles, and drill ships. Operators'

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Extra Expense: A policy offered to oil and gas companies that provides coverage for expenses associated to regaining control of a well. This policy typically covers the cost to control operations (both materials used and cost of hiring firms to help control), redrill the well to a depth it was previously, and the cost associated with removing or cleaning seepage/pollution. The policy can also be extended to cover expenses associated with the property of others in the insured's care, underground blowout, evacuation expenses, removal of wreck, and legal expenses emanating from the incident.

Land Rigs and Miscellaneous Property: Coverage encompasses land rigs and miscellaneous property used in the exploration and development of hydrocarbons. Examples include contractor's equipment, scientific and sampling instruments, diving equipment and remotely operated vehicles.

Oil Spill Financial Responsibility: Coverage to party as a designated applicant of covered offshore facilities for liability under the various sections of the Oil Pollution Act of 1990. Includes protection for removal costs and damages caused by oil and gas discharges from exploration and production facilities.

Environmental/Pollution Liability: Provides coverage for bodily injury, property damage, and clean-up costs as a result of a pollution incident.

Business Interruption/Loss of Production Income: Provides coverage for energy businesses against loss due to temporary interruption in oil/gas supply from an offshore facility.[32]

Comprehensive General Liability: Provides coverage for claims an energy business is legally obligated to pay as a result of bodily injury or property damage to a third party.[33]

Workers Compensation/Employers Liability: Provides coverage for claims arising out of employee injuries or deaths incurred while the employee is in the line of

duty. The availability, price, terms and conditions of these aforementioned policies have changed and are likely to continue changing in the coming months. Firms involved in drilling operations are already demanding greater levels of insurance coverage.[34]The increased demand for coverage has led to increased premiums but will also likely lead a greater number of available policy offerings, especially where the insureds perceive a potential gap in coverage.

WHAT DO INSURERS BELIEVE TO BE THE LARGEST RISKS?

Many if not most insurers are concerned that their methods and processes for understanding and assessing risk associated with deepwater drilling operations have lagged the energy industry's technological advances. Furthermore, rating assumptions have not been as dynamic as they should have been.[35]Prior to policy renewals in the June-July time frame, insurers indicated that they anticipated adding broadly worded, event specific exclusions to prospectively eliminate coverage for a deepwater event, such as the Deepwater Horizon spill.[36]Insurance brokers, who work on behalf of companies seeking coverage, were working with insurance companies/underwriters to better understand the risks associated with these assets, particularly in an attempt to avoid overly narrow wording of renewal policies.[37]As a related concern, underwriters appear to believe that although safety measures, procedures and manuals may be well documented, execution of these procedures may be more lax than stakeholders would prefer.[38]Similar to insurance underwriters, investors want to ensure that the appropriate incentives are in place so as to mitigate

or -- even better - eliminate most risk. One proposed solution is to make compensation and incentive packages for senior management include specific links to environmental health and safety targets.[39]Stakeholders are also looking for increased transparency, such as evidence that companies have robust spill contingency plans and clear guideline for contractor selection oversight.[40]For example, this summer investors sent letters to major energy companies asking them to disclose information about their oil spill prevention and response plans.[41]It is critical that investors perceive that companies engaged in low-occurrence but high-risk, high-consequence deepwater exploration have risk mitigation policies in place that truly reduce risk. Otherwise, investors will be unwilling to participate in the capital markets that generate the funds necessary to insure these operations.[42]It is important to note that the Deepwater Horizon event is serving as a learning opportunity. This event tested the industry's ability to prevent and then respond to a disastrous event. Energy firms, insurers, and investors are gaining a better understanding of the technology available and processes to prevent similar incidents.[43]This is expected to result in the industry's enhanced ability to reduce risk and respond to events more quickly, while also allowing underwriters to more accurately assess similar risk and then price accordingly. In summary, insurers who underwrite policies in the E&P market believe they are facing two major risks. First, insurers question whether their methods for understanding and assessing risk associated with deepwater drilling operations reflect the energy industry's technological advances. Second, insurers and investors are concerned that the execution of safety procedures may be more lax than

stakeholders would prefer. However, the insurance industry views the Deepwater Horizon event as a learning opportunity to better understand drilling operations and appraise the market accordingly.

ARE AUDITS PERFORMED? ARE THEY PERFORMED ON DRILLING OPERATIONS? IF SO, ARE THEY RESOURCED INTERNALLY OR BY A THIRD-PARTY?

Within the drilling and operating industry, audits are performed by multiple types of agents. Firms will perform their own internal audits to conform to both the American Petroleum Institute (API) and local, state, and national standards, although such audits are not necessarily required. External audits are also performed by the regulatory bodies or agencies that govern the industry. The governing body for offshore drill operators is the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE); formerly the Mineral Management Service (MMS)[44]. These audits often focus on operational and safety risks, and are performed to determine whether a firm abides by the current regulatory standards. This agency states that rig inspections should be conducted every month.

[45]Additionally, third parties are sometimes hired by firms to perform audits. As noted above, Transocean Limited hired Lloyd's Register to evaluate its rig operations prior to the accident. Lloyd's Register found that Transocean's practices were rather ineffective, particularly its safety culture.

[46]Lloyd's also found that rig maintenance was not on par with what is typically expected of a similar vessel. In light of the April incident, this suggest that firms may fail to plan and act despite input received from independent parties.

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' behaviour 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.[47] Price-Anderson capped a nuclear reactor licensee's liability at \$375 million.[48] 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.[49] 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.[50] 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.[51] 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 relatively low as compared to other energy sources.[52] 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. Neighbourhoods 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*.^[53] 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.^[54] This, in part, is attributable to the importance the industry places on industry best-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.[55]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.

[56]Currently, the maximum prorated secondary insurance share a licensee is required to pay is approximately \$117. 5 million.[57]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).

[58]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. [59]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.[60]

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.[61]American Nuclear Insurers (ANI) is an association that serves as the direct underwriter of nuclear liability insurance for nuclear facilities in the U. S.[62]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 endeavours. 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. [63]As a result, insurers are devising ways of pooling capital to increase insurance capacity and diversify risk to a greater extent than previously possible.[64]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.

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' behaviour will not be realized until uncertainty surrounding future regulation is abated. Insurance coverage for drilling contractors and control-of-well expenses are the area's most likely to be targeted by underwriters for premium rate increases.[65]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. [66]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.[67]Companies are also re-evaluating their own operational safety procedures, since changes in the 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 fuelling 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.[68]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. In this type of insurance environment, self-insuring will become a cost-effective option as more companies face higher insurance premiums.[69]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. 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.[70]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. 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.[71]BP announced that it is reviewing its incentive structure to " ensure that employees never feel pressured or tempted to sacrifice safety for other goals." [72]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.

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. [73]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.[74] 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 in price paid by consumers since the demand for refined petroleum products, particularly in the short run, is relatively inelastic.[75] 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." [76] 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.

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 billion. 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. . 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. 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. 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." [77] 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." [78] 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. [79] 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. 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.

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.[80]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: 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." 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 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." 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." 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. 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. [81]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.