Managing operational and legal risks in oil and gas projects: An insight into the contractual approach.

Wan Mohd Zulhafiz Wan Zahari, Ph.D.
Assistant Professor, Ahmad Ibrahim Kulliyyah of Laws;
Deputy Legal Adviser, Office of the Legal Adviser,
International Islamic University Malaysia (IIUM).
Email: wzulhafiz@iium.edu.my

Candidate of Master of Business Administration (MBA) in Energy Management,
College of Graduate Studies,
Universiti Teknologi PETRONAS (UTP).
Email: wan_20000846@utp.edu.my

ABSTRACT

Oil and gas projects are inherently complex and volatile in nature. These projects expose to risks in all phases and milestones commencing from the feasibility phase to the operational stage, where there is a tendency that the operations will not run efficiently and does not turn out exactly as planned. In this regard, the project risk relates to the prospect of uncertainties of the technical, schedule, and cost outcomes of the project where these risks have a direct impact on the project schedule, cost and performance. On the other hand, since the oil and gas projects involve with volatile hydrocarbon, they are exposed to extremely high legal risks and repercussions. Hence, risk management is a significant part of project management in the oil and gas industry. The process would be carried out by identifying, assessing, mitigating and allocating the prospects of risk associated with each activity of the project. While most of the previous studies have given emphasise on quantitative risk management, this paper aims and rather focusing on the qualitative risk management. In this regard, it is proposed that the operational and legal risks in the oil and gas projects could be managed and allocated using contractual terms to overcome exposures and uncertainties in their operations. The methodology employed in this paper will be a qualitative study - a combination of both doctrinal and case studies which will be carried out in a descriptive, analytic and prescriptive manner.

Keywords: operation management, qualitative risk management, operational risk, legal risk, contractual approach.

1.0 INTRODUCTION

Practitioners and scholars often debate the exact meaning, definition, and repercussions of risk. Krajewski, Ritzman, and Malhotra, in their book, "*Operations Management: Processes and Supply Chains*", define risk as 'a measure of the probability and consequence of not reaching a defined project goal' which 'involves the notion of uncertainty as it relates to project timing and costs'(Krajewski, Ritzman, and Malhotra 2009, 67). Badiru and Osisanya (2013) describe risk as a measure of the probability, level of severity, and exposure to all hazards for project activity. It can also be associated with the possibility or likelihood attaining the desired result, o the extent to which the unfavourable outcomes of an event which may negatively affect the projected outcome (Sorge 2004, 91).

Meanwhile, Jaafari (2001) explains that risk relates to 'exposure to loss/gain, or the probability of occurrence of loss/gain multiplied by its respective magnitude'. In this regard, occasions are considered as inevitable, and the likelihood of their incidence is 100% or utterly uncertain if the possibility of incidence is 0%, where the uncertainties are considerably broad between these two extremes (Jaafari 2001, 89). Therefore, it is essential to specify the objective functions under each project in order to measure such likelihood of fulfilling each of the target values such as capital expenditure, completion time and so on.

The process of measuring such probability and the likelihood of exposures is a part of risk management. Risk management is an affair to ensure that 'contingency ready to respond to the impact (good or bad) of occurrence of the risk, such that risk mitigation or risk exploitation becomes an intrinsic part of the project plan' (Badiru and Osisanya 2013, 443). The risk management process in the oil and gas projects will be discussed in further details in the next section. Traditionally an emphasis has been given on quantitative risk management (Tah and Carr 2001). However, this paper aims to focus on the qualitative risk management where operational and legal risks in the oil and gas projects would be managed and allocated using a contractual approach to overcome exposures and uncertainties in their operations.

2.0 RISK MANAGEMENT IN OIL AND GAS PROJECTS

Risk management is a significant part of project management in the oil and gas industry. It can be carried out successfully by investigating and identifying the prospects of risk associated with each activity of the project. The risk can be measured or assessed in terms of probability, likelihood and repercussion. The risk will have a direct impact on the profitability and efficiency of the projects.

Since the exploration is a basis of the oil and gas industry, a distinct and various set of risk is involved where it will be measured for its managerial processes, technical as well as exploration risks. The central portion of project risk analysis in the oil and gas industry comprise risk and estimation of reserves. Besides, 'the major activities in oil and gas risk analysis consist of feasibility studies, design, transportation, utility, survey works,

construction, permanent structure works, mechanical and electrical installations, maintenance, and so on' (Badiru and Osisanya 2013, 443).

Mandaraka-Sheppard (2013) defines risk management as a 'systematic approach of taking safety precautions at all levels of business, perhaps intuitively, including the management of financial and commercial risks and the obtaining of insurance cover' (Mandaraka-Sheppard 2013). While, Groton, Smith, and Wilson opine that it is vital to reduce the total cost of risk to a project as a whole, not the costs to each contracting party individually (Groton and Smith 2010, 6; Wilson 1993).

Badiru and Osisanya (2013) claim that there is no risk-free activity in the oil and gas business (Badiru and Osisanya 2013, 27). On this point, Zulhafiz (2017) suggests that the industry players undertake several measures and practices to manage the risks and reduce the exposure by taking a lesson learnt and experience from the previous events such as Piper Alpha in the United Kingdom and Deepwater Horizon in the Gulf of Mexico pertaining to the offshore disasters and accidents in the oil and gas industry which caused by the negligence and human errors. It is said that injuries to personnel and severe damage to property may result in substantial losses for the project participants; rectifying the financial consequences of such risks can be very costly and may cause substantial financial setbacks to a business (W. M. Zulhafiz 2017a, 1). According to the Guardian, 2012, the Deepwater Horizon incident has led to the dip of BP profits by 35% See Dan Milmo, 'BP's Deepwater Horizon costs rise $847m' (The Guardian, 2012).

Lyons and Skitmore (2004) state that risk management practice usually involves risk identification, risk analysis, risk response, and risk monitoring. Risk identification is usually the logical starting point in risk due diligence process because it may uncover and record any potential threat that might affect the project (Walewski and Gibson 2003). Risk analysis (also known as risk assessment) is the process of evaluating risks by assessing their probability of occurrence and their impacts on the project (AlSalman and Sillars 2013). Risk response is the process of formulating a management strategy, including establishing risk allocation and developing a management plan for resolving the risk in any situation where more than one party is involved in a project (Lam et al. 2007; Zaghloul and Hartman 2003).

Hooker (2010) discovers that a contract can be used as a tool to distribute risk and clearly identify who bears that risk; a contract also provides mechanisms for the general administration of the project, dispute resolution and management of claims. As for the risk mitigation strategies, the project manager can adopt several formulations as part of the risk response planning, such as (i) risk transfer; (ii) risk-sharing; (iii) risk reduction; (iv) risk contingency planning; and (v) risk mitigation through insurance (Badiru and Osisanya 2013, 462). Both quantitative and qualitative risks which have been identified in smaller or larger amounts will be allocated, distributed and shared to the parties by entering into a contract (Triantis 2000; W. Zulhafiz 2015). Where the risk is quantifiable, it would be computed and calculated by special software to analyse the potential risk and to be included in the price (Akintoye and MacLeod 1997). However, for the qualitative risk, including

some operational risks, legal uncertainties and liabilities, such risks can be allocated between the parties through contractual provisions (W. M. Zulhafiz 2017b).

2.1 Risks in oil and gas projects

Badiru and Osisanya (2013) state that project risks arise from the uncertainty that is existed in entire projects to one extent or another. Zulhafiz points out that the most common risks to the oil and gas projects, which lead to severe repercussions, *inter alia*, (i) market risks such as changes to the oil price, interest rates and exchange rates; (ii) credit risks such as default; (iii) operational risks such as equipment failure, workforce and CAPEX/ OPEX overrun; (iv) geological risks such as dry wells; (v) environmental risks such as pollution; (vi) political risks such as change of government; (vii) war/terrorism, expropriation and change of regulatory regime; and lastly, (viii) legal risk such as, breach of contract, tort and statutory duties, consequential loss, exclusion of negligence, liability and indemnities (W. M. Zulhafiz 2017a, 169). This paper, however, will only focus on operational and legal risks.

3.0 MANAGING OPERATIONAL RISKS IN OIL AND GAS PROJECTS – A CONTRACTUAL APPROACH

Oil and gas projects are inherently complex and volatile, with many variables. According to Badiru and Osisanya (2013), these projects involve risks in all phases and milestones commencing from the feasibility phase to the operational stage, where there is a tendency that the operations will not run efficiently and does not turn out exactly as planned. In this regard, the project risk relates to the prospect of uncertainties of the technical, schedule, and cost outcomes of the project where these risks have a direct impact on the project schedule, cost, and performance (Badiru and Osisanya 2013, 444).

Operational risks in the oil and gas industry include (i) cost risk (the risk of costs to procure services, rigs, and other equipment being higher than anticipated or budgeted), (ii) delay risk (the risk that rigs, services, and other equipment may not be available at all), and (iii) cycle time risk (the chance that a more extended than expected period will elapse between capital expenditure on any particular well and first production from that well) (Sweeny et al. 2013, 303).

Badiru and Osisanya (2013) state that a common area of uncertainty is the size of project parameters, such as time, cost, and quality concerning the expectations of the project where the project manager was unable to estimate precisely how much time and strength that was needed to complete a particular work. These include problems that (i) cause higher than expected well costs, typically due to operational inefficiencies, unplanned non-productive time, and difficulty procuring the rigs, equipment, and services necessary for development at an acceptable price, or at all (cost risk); (ii) cause a lower than anticipated rate of completing new producing wells due to supply chain limitations, permitting, operational inefficiencies, and intentionally slowing down project plans to avoid extended cycle times between capital expenditure on a well and its initial production (delay risk); and (iii) extend

the period between capital expenditure on a well and its initial production, typically due to logistical issues, backlogs of well completions, or insufficient infrastructure capacity (cycle-time risk) (Sweeny et al. 2013, 300).

It is suggested that a proper risk mitigation plan be conducted to identify risk in order to ensure better and smoother successful of project completion within the stipulated period, cost, and technical specifications (Badiru and Osisanya 2013, 459). Nevertheless, it is essential to note that it would be feasible to estimate the risks and variances of the objective functions if such project variables could be identified in advance provided that they remained unchanged during the project period. While it is not always the case, this is because some of the project's variables or their likelihood of incidence may shift over time. For example, on complex projects within a changing environment, uncertainty will not necessarily diminish over time. This scenario will then make the task to manage the risk is extremely difficult.

In the following, Triantis (2000) explains the concept of uncertainties in a sales contract:

- *Seller agrees to manufacture and deliver a specific good to Buyer one year later. Buyer maximises the value of the good to him at delivery (V) by making a reliance investment of R.*
- *The cost to Seller of making and delivering the good is C.*
- *To keep the discussion simple, assume that Seller has no other use for the good, no third party would bid for the good and the exchange has no external effect on third parties.*
- *Therefore, the social gain (or loss) from the completed exchange is the difference: V - R - C.*
- *The parties' contract under uncertainty and with imperfect information about the state of the world that will materialise at the time of delivery.*
- *V and C are stochastic, and their respective distributions are neither perfectly positively nor perfectly negatively correlated.*
- *The latter assumption allows the parties to have conflicting interests with respect to the decision to terminate their contract.*
- *At the time of contracting, Seller and Buyer observe the same joint distribution of V and C, although the actual values at the time of contracting is private information.*
- *The terms of the contract divide the gain (or loss) from the exchange (V - R - C) between Buyer and Seller and the parties may decide to condition the division on the state of the world existing at delivery.*

Triantis (2000) suggests that a comprehensive contingent contract should stipulate the parties' obligations in each possible state of the potential scenarios and the division of the gain (or loss) from the contract in each state. He also suggests that a comprehensive, complete contingent contract should set an investment incentive and agreed sharing of risks over each state of the potential scenarios. He further explains that each state can be defined in both quantitative and qualitative terms which reflect the values of V and C and the factors that produced V and C (Triantis 2000, 103). Additionally, the risk allocation can also be achieved by setting out contractual provisions which declare which party will be liable for

(or exempted from) a given risk and to what extent, and enables the risk to be allocated between the parties in advance (Anson et al. 2010, 3).

It is worth noting that the use of this approach to final decision-making profoundly depends on the qualitative judgment and experiential knowledge of contract specialists. The problem of this kind of decision-making process is its obliqueness because frequently such approach is barely be applied, analysed and retrieved by others (Lam et al. 2007, 486).

4.0 MANAGING LEGAL RISKS IN OIL AND GAS PROJECTS – A CONTRACTUAL APPROACH

As discussed above, since most of the oil and gas activities engage with volatile hydrocarbon, the efficiency of the projects are exposed to considerable risks and liabilities (Martin 2005). For example, in the Scottish case of *Caledonia North Sea Ltd v London Bridge Engineering Ltd* [2002] UKHL 4, [2002] 1 Lloyd's Rep 553, numbers of litigations relating to personnel, property and environment (pollution) have been brought by multiple-parties for numerous causes of action. In this case, a leakage in a faulty condensate pump caught fire at the North Sea oil platform known as Piper Alpha, exploded and killed one hundred and sixty-five people and injured sixty-one. Investigations revealed that the initial explosion was caused by the negligence of two people, i.e. an employee of a specialist valve contractor and an employee of the operator.

Gordon (2011) claims that most of the oil and gas projects depart from the common law tradition on risk allocation by shifting the risk to another party in order to protect commercial interests where contractual provisions would be used to allocate the risk. The common law specifies the essential obligations of the parties in terms of risk and liability. In general, risk allocation under contract law and tort law in a common-law jurisdiction is subject to several elements. Those elements are, *inter alia*, breach of care, negligence, the remoteness of damages, mitigation of losses, compensatory damages, and whether the party that has breached the contract or duty is under the obligation to bear the losses suffered by the non-breaching party (Alramahi 2013).

Contractual risk allocation is one element of risk management between or among the parties involved in an undertaking (Badiru and Osisanya 2013). This is particularly challenging in the oil and gas industry where several parties are involved in one project (Halman and Braks 1999). Hewitt (2010) states that most oil and gas contracts are based on one standard model form or another. They are mostly similar in primary content with a few significant modifications depending on the particular commercial activities involved. This practice appears to save the parties time and transaction costs and is more convenient since the parties are working on the model form of contracts with which they are already familiar (Hewitt 2010, 333).

However, Cameron (2012) argues that subsequent to the Macondo disaster (which is also known as Deepwater Horizon case) in the Gulf of Mexico in 2010, operators have attempted to depart from the established standard model forms of contracts and to shift

greater risk to the contractor in the event of the catastrophe which has caused imbalanced risk allocation between the parties. Zulhafiz (2017b) explains that even though model or standard forms of general conditions of the contract are available, he says that the underlying principle of reciprocal indemnity behind risk allocation in these contracts has not been fully adhered to by the parties. In this regard, Motiar Rahman and Kumaraswamy (2002) suggest that the nature and extent of risks tend to be project-specific in today's high-risk scenarios and multiparty complex projects that adoption of tailor-made contract approaches is more suitable.

A contract can be considered as a trade-off between the contractor's price for undertaking the work and his willingness to accept both the controllable and uncontrollable risks (Flanagan and Norman 1993). Whether the party is willing and aware to bear the risk will affect its response to risk. (C Ward, B Chapman, and Curtis 1991) The cost of improper risk allocation could be seen from the response from contractors such as adding a high contingency (premium) to the bid price or delivering low quality work (Fisk and Reynolds 2000).

Nigel and Anthony (1988) that some question should be resolved before the parties allocate risks, such as, which party has the greater degree of control over the eventuality?; which party has the greater capacity to absorb the risk?; which party can best assess, evaluate and make allowance for the risk?; and which party typically undertakes such risks in the course of his business?.

Gordon (2011) explains that risk can be allocated in a contract if the contractual terms specify which party will be liable for or exempted from certain risks; the contract could use exculpatory provisions such as limitation of liability, exemption clause and indemnity clause. It could also require one or more parties to take out a set level or certain types of insurance (Downie and McBratney 2012, 17). In theory, the rationale behind this technique of risk allocation is that the party with the most control over the risk is responsible for any financial loss (O'Neil 1996, 360). Nevertheless, Boykett (2012) argues that the strength of the bargaining position plays a dominant role in the scope of such risk allocations.

Risk allocation provisions deal with hypothetical events – this means that the identity of the person bearing the liability which will accrue if certain circumstances take place is determined in advance (Uff and Odams 1995). Such clauses are intended to ensure that, where harm arises, oil companies accept responsibility for such harm and can meet the costs of mitigating that harm, including requirements for insurance and allocation of liability (Tim Boykett 2012).

Zulhafiz (2017a) describes that the allocation of risk is one of the critical decision-making processes leading to project success. He further suggests that the most challenging aspect of drawing up oil and gas contract is deciding how to fairly allocate risk between the parties, while at the same time achieving the commercial goals of the contracts (W. M. Zulhafiz 2017a).

5. CONCLUSION

In a nutshell, the operational and legal risks in the oil and gas projects can be managed and allocated through contractual practices in the following manners: -

(1) Allocating operational risk through contract terms - One response is to include specific provisions in a contract. A typical example is that the contract should stipulate the parties' obligations in each possible state of the potential scenarios and the division of the gain (or loss) from the contract in each state. The contract should set an investment incentive and agreed to share risks over each state of the potential scenarios. That each state of the possible scenarios should be clearly defined in both quantitative and qualitative terms in the contractual provisions so as to avoid vagueness and ambiguity.

(2) Allocating legal risk through contract terms - A transfer of legal risk arising can be allocated in a contract by specifying which party will be liable for or exempted from certain risks; the contract could use exculpatory provisions such as limitation of liability, exemption clause and indemnity clause. Where applicable, some risk should be insured by the contracting parties. In the event that it is an uninsurable risk, it should be transferred to the best party who is able to control the risk.

There is significant area for future research in relation to the management of both operational and legal risks in oil and gas projects. Taking into account that the current research has employed qualitative risk management to allocate contractual terms to overcome exposures and uncertainties in the operational and legal risks in oil and gas projects, it is highly recommended that future research would consider quantitative methods to quantify the relevant risks and integrate the same in the contractual provisions.

REFERENCES

Akintoye, Akintola S, and Malcolm J MacLeod. 1997. "Risk Analysis and Management in Construction." *Int. J. Project. Mgmt.* 15(1): 31–38.

Alramahi, Moe. 2013. *Oil and Gas Law in the UK*. Bloomsbury Professional.

AlSalman, A, and D Sillars. 2013. "Modeling the Effects Of Sub-Optimal Risk Allocation In The Construction Industry." In *Engineering Project Organization Conference*, EPOS.

Anson, Sir William Reynell, J. Beatson, Andrew S. Burrows, and John Cartwright. 2010. *Anson's Law of Contract*. OU Press.

Badiru, Adedeji B, and Samuel O Osisanya. 2013. *Project Management for the Oil and Gas Industry: A World System Approach*. CRC Press.

C Ward, S, C B Chapman, and Bernard Curtis. 1991. "On the Allocation of Risk in Construction Projects." *Int. J. Project. Mgmt.* 9(3): 140–47.

Downie, David, and Malcolm McBratney. 2012. *Contractual Risk Allocation: Using Warranties, Exclusions, Indemnities and Insurance Provisions to Mitigate and Manage Risk*. Inter Alia Publishing, Australia.

Fisk, Edward R, and Wayne D Reynolds. 2000. *Construction Project Administration*. Prentice Hall.

Flanagan, Roger, and George Norman. 1993. *Risk Management and Construction*. Blackwell Scientific Oxford.

Gordon, Greg. 2011. "Risk Allocation in Oil and Gas Contracts." In *Oil and Gas Law: Current Practice & Emerging Trends*, eds. Greg Gordon, John Paterson, and Emre Usenmez. Dundee University Press.

Groton, James, and Robert J. Smith. 2010. *Realistic Risk Allocation*. New York: CPR.

Halman, J I M, and BF M Braks. 1999. "Project Alliancing in the Offshore Industry." *Int. J. Project. Mgmt.* 17(2): 71–76.

Hewitt, Toby. 2010. "An Asian Perspective on Model Oil and Gas Services Contracts." *Journal of Energy & Natural Resources Law* 28(3): 331.

Hooker, Vincent. 2010. "Major Oil and Gas Projects - the Real Risks to EPC Contractors and Owners." *Const. L. J.* 26(2): 98.

Jaafari, Ali. 2001. "Management of Risks, Uncertainties and Opportunities on Projects: Time for a Fundamental Shift." *International journal of project management* 19(2): 89–101.

Krajewski, L, L Ritzman, and M K Malhotra. 2009. *Operations Management 9th Ed*. Pearson Education, Harlow.

Lam, K. C. Ka Chi, Dan Wang, Patricia T K Lee, and Yick Tat Tsang. 2007. "Modelling Risk Allocation Decision in Construction Contracts." *Int. J. Project. Mgmt.* 25(5): 485–93.

Lyons, Terry, and Martin Skitmore. 2004. "Project Risk Management in the Queensland Engineering Construction Industry: A Survey." *Int. J. Project. Mgmt.* 22(1): 51–61.

Mandaraka-Sheppard, Aleka. 2013. *Modern Maritime Law Volume 2: Managing Risks and Liabilities*. 3rd ed. Oxon: Informa Law.

Martin, Timothy. 2005. "Model Contracts: A Survey of the Global Petroleum Industry." *Fuel and Energy Abstracts*.

Motor Rahman, M, and M M Kumaraswamy. 2002. “Risk Management Trends in the Construction Industry: Moving towards Joint Risk Management.” *Engin. Const. & Architec. Mgmt.* 9(2): 131–51.

Nigel, Robinson M, and Lavers P Anthony. 1988. *Construction Law in Singapore and Malaysia*. Butterworths & Co (Asia) Pte Ltd.

O’Neil, William E. 1996. “Insuring Contractual Indemnity Agreements under CGL, MGL, and P& (and) I Policies.” *Tul.Mar.LJ* 21: 359.

Sorge, Marco. 2004. “The Nature of Credit Risk in Project Finance.” *BIS quarterly review* 6: 91–101.

Sweeny, David H., Preston Cody, Susan Lindberg, and Michael P. Darden. 2013. “Fracturing Relationships: The Impact of Risk and Risk Allocation on Unconventional Oil and Gas Projects.” *Texas Journal of Oil, Gas and Energy Law* 9.

Tah, J. H. M., and V. Carr. 2001. “Knowledge-Based Approach to Construction Project Risk Management.” *Journal of Computing in Civil Engineering* 15(3): 170–77.

Tim Boykett, Marta Peirano and Simone Boria. 2012. version 1 *Oil Contracts - How to Read and Understand a Petroleum Contract*. Times Up Press, Austria.

Triantis, George G. 2000. “Unforeseen Contingencies. Risk Allocation in Contracts.” *Encyclo. L. Econs.* 3: 100–116.

Uff, John, and A Martin Odams. 1995. *Risk, Management and Procurement in Construction*. Construction Law Press, London.

Walewski, John, and G Gibson. 2003. 31 *International Project Risk Assessment: Methods, Procedures, and Critical Factors*. Center for Construction Industry Studies, University of Texas at Austin, Report.

Wilson, Dennis J. 1993. *Allocation of Insurance-Related Risks and Costs on Construction Projects*. Ed. Rusty Haggard. Publication.

Zaghloul, Ramy, and Francis Hartman. 2003. “Construction Contracts: The Cost of Mistrust.” *Int. J. Project. Mgmt.* 21(6): 419–24.

Zulhafiz, Wan. 2015. “Unfair Contract Terms Act 1977: Does It Provide a Good Model in Regulating Risk Allocation Provisions in Oilfield Contracts in Malaysia?” *International Journal of Trade and Global Markets* 8(1): 3–16.

Zulhafiz, Wan M. 2017a. “On the Contractual Risk Allocation in Oil and Gas Projects.” *The Law Review* (2): 8.

———. 2017b. “Recent Trends in Allocation of Risk Post-Macondo: The Growing Tension Between Oil and Gas Standard Forms of Contract, and Contractual Practice.” *International Energy Law Review* (5): 174.