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THE EFFECTIVINESS OF PROJECT RISK MANAGEMENT: A STUDY WITHIN THE LIBYAN OIL AND GAS INDUSTRY

R. Elhoush and U. Kulatunga

School of the Built Environment, University of Salford, Salford, M5 4WT, UK

Email: r.elhoush@edu.salford.ac.uk

Abstract: Oil and gas projects are large, complex and risky, as they involve a considerable number of stakeholders, are technologically difficult and must adhere to tight budgets and schedules. Many of these projects are not delivered on time and within budget. The literature indicates that this failure is a result of improper project risk management practices. The literature also shows that although some scholars doubt the effectiveness of these practices, according to others, a positive relationship exists between applying these practices and project outcomes. This paper aims to explore the effectiveness of project risk management practices within the Libyan oil and gas industry. This paper follows a single case study approach. The data collection method adopted for this study was thirteen semi-structured interviews with experts. Results show that even though there is no written procedure for project risk management practices within the Libyan oil and gas industry, participants believe that applying these practices can increase overall project performance. This paper concludes that establishing an organisational culture to support the creation of a written risk management guideline, project manager leadership and familiarity of the individual with the project risk management concept supports the effectiveness of project risk management within the Libyan oil and gas industry, increasing project performance.

Keywords: Libya, Oil and gas, Project management, Project performance, Project risk management.

1. INTRODUCTION

Oil and gas projects are challenging, as they are complex, risky, involve a considerable number of stakeholders, are technologically difficult and must adhere to tight budgets and schedules (Briel, Luan, & Westney, 2013; Deloitte, 2015; EY, 2014, 2015). The continued need to ensure projects are managed properly and efficiently across the oil and gas sector has led both the industry and academia focusing on the development of reliable project management strategies to reduce project failures. Project risk management has been identified as a strong factor in need of careful assessment to ensure project failures are minimised (Al Subaih, 2015; Carvalho & Rabechini Junior, 2015; Rabechini Junior & Monteiro de Carvalho, 2013; Rogers & Ethridge, 2013; Salazar-Aramayo, Rodrigues-da-Silveira, Rodrigues-de-Almeida, & de Castro-Dantas, 2013). Briel et al. (2013) believe that, in these challenging environments, experienced project managers and the available project management best practices are not enough; instead, project managers should follow a coherent reference framework based on, but not limited to, official project phases and stage gates, the constant monitoring and reviewing of project risks and a strong integrated project team. To increase project performance, companies have committed to implementing effective project management and project risk management strategies. These strategies are meant to help companies remain competitive, while improving value creation among the company deliverables (Denney, 2006). The oil and gas industry has been subject to recent fluctuations in oil prices. In 2015, the price of oil fell to the lowest rate in almost four decades

(Baumeister & Kilian, 2016; Cagianelli, Michelez, & Nava, 2015a; Zhao, Hwang, & Gao, 2016), leading to project performance uncertainties, especially in regions affected by other additional risks, such as the uprisings and wars affecting the Middle East and North Africa (Khatib, 2014).

In Libya, the oil and gas sector is the economic backbone of the country, contributing significantly to the nation's income. According to the International Monetary Fund (IMF) (2013) and (2014), Libya's economy depends on oil and gas production. Hydrocarbon production contributes approximately 96% of the total government revenue. With the current risky and unsecured situation in Libya, the study of issues related to risk management in the oil and gas sector should be prioritised. Given the importance of project risk management as a factor in improving the performance of oil and gas projects, this paper aims to explore the practical effectiveness of project risk management in the Libyan oil and gas industry. The aims of this paper are as follows:

- Reviewing the relevant literature on reported project failures within the oil and gas industry and critically reviewing project risk management and the benefits and limitations of the tools and techniques used to support the process. This paper investigates the relationship between project risk management and project performance.
- Addressing the methodological choice followed.
- Presenting and discussing primary data collected for this study.
- Drawing conclusions, while also theorising about the way forward.

2. LITERATURE REVIEW

2.1 Oil and Gas Project Failure

Despite the importance of oil and gas projects, these projects still fail. In a recent universal study on the performance of 365 oil and gas projects conducted by one of the big four audit firms, Ernst & Young (EY) (EY, 2014), EY determined that a high percentage of projects failed to adhere to their approved time and budget. The study also revealed that project delivery success is declining when compared with the long-term industry outlook. The same study identified that improper project risk management practices are a primary reason for schedule delays and cost overruns. The study concluded with the recommendation that applying project management tools and techniques could improve project performance and reduce the risks of schedule delays and cost overruns. Aligned with these findings, according to Merrow (2012)—the founder of Independent Project Analysis (IPA) Inc. (IPA is a widely known for being a respected research organisation on project analysis including analysing projects within the oil and gas industry)—78% of oil and gas projects suffer from real problems with cost overruns and schedule delays.

Long (2015) identified several problems related to the improper project risk management that causes oil and gas projects to exceed their budget and have major delays. The author summarised the main problems as follows:

- Inadequate project definition during early project stages.
- Insufficient documentation.
- Lack of experienced workforces.
- A large number of change orders.

- Inadequate camp size facilities, leading to additional cost and time in construction for additional facilities to fill the gap.
- Incorrect cost estimates.
- Not clear contract documents.
- Poor baseline schedules.
- Poor production design.
- Insufficient project management teams to manage change orders.

2.2 Project Risk Management

It is believed that the word 'risk' originated from the Italian word risicare; a literal translation for this word is 'to dare'. Therefore, risk is seen as an option rather than a destiny (Massingham, 2010). In recent years, the topics of risk and uncertainty have drawn the attention of many researchers and practitioners (Besner & Hobbs, 2012; Marle & Vidal, 2011; Rabechini Junior & Monteiro de Carvalho, 2013; Zwikael & Ahn, 2011). The topic of risk and risk management has been studied by different disciplines; the literature concludes there is no clear or standardised definition of these terms, and that different fields, such as economics, management, strategic management and project management view the concepts differently (Ehsan, 2013). Despite these differences, risk management is increasingly vital because the uncertainty surrounding many businesses continues to rise (Becker & Smidt, 2016).

According to the Project Management Institute (PMI) (PMI, 2013), project risk management is a significant area of project management. The PMI's Project Management Body of Knowledge (PMBOK) considers project risk management one of 10 knowledge areas. Their belief is that if a project manager complies with these 10 areas, the success of the project is guaranteed (PMI, 2013). However, the literature shows that there is no standardised definition of project risk management. Ghosh and Jintanapakanont (2004) define risk management as a *'tool for managing projects effectively through their life cycles'.* Variations in the definition of project risk management exist even among professional project management bodies such as the Association for Project Management (APM) and the PMI. APM defines project risk management as *'a process that allows individual risk events and overall risk to be understood and managed proactively, optimising success by minimising threats and maximising opportunities.'* (APM, 2004), while PMI says, *'Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. The objectives of project risk management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project'* (PMI, 2013).

Project risk management is a valuable component of project management, as it augments the worth of the other project management processes, offering support when employed with good practice values (Benta, Podean, & Mircean, 2011; Besner & Hobbs, 2012; PMI, 2013). The current practices of project risk management aim at recognising project challenges and multicultural environments, particularly those associated with increasingly global and complex environments (Thamhain, 2013). In the view of Besner and Hobbs (2012), project risk management is an organised practice to effectively manage project risks. Scholars and professional bodies, with slight differences in the level of detail, generally agree that the project risk management process consists of five steps: risk identification, risk assessment, risk classification, risk mitigation and risk controlling. Figure 1 (below) demonstrates these steps.

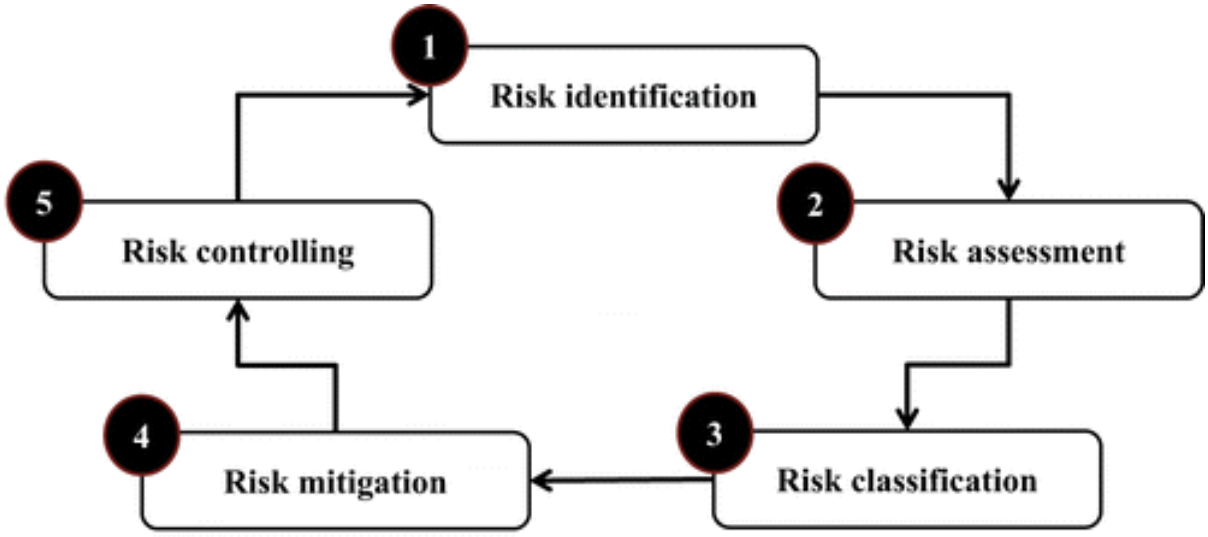

Figure 23: Project risk management process (Firmenich & Firmenich, 2017)

2.3 Different tools and techniques that support project risk management process

There are currently over 30 risk management techniques in the literature supporting project risk management activity, with varied applications and suitability depending on the nature, size and complexity of the projects (Cagliano, Grimaldi, & Rafele, 2015; Salazar-Aramayo et al., 2013). Such risk techniques require the utilisation of specific tools, so some projects may combine more than one set of techniques (Suslick & Schiozer, 2004). The following list shows the different practices in risk management as summarised by the extensive literature review done by Cagliano et al. (2015).

Checklist
Brainstorming
Risk Ranking/Risk Probability and Impact
Change Analysis
Decision Tree Analysis
Fuzzy Logic
Cause and Effect Diagram
Expert Judgement
Fault Tree Analysis
Event Tree Analysis
Delphi
Expected Monetary Value
Hazard and Operability
Human Reliability Assessment
Hazard Review
Interview
Incident Reporting
Pareto Analysis
Monte Carlo
Preliminary Hazard Analysis
Sensitivity Analysis
Swift Analysis
Strengths, Weaknesses, Opportunities and Threats
‘5’ Whys Technique
What-if Analysis
Risk Breakdown Matrix
Risk Breakdown Structure
Event and Causal Factor Charting
Failure Mode and Effect Criticality Analysis (FMECA

2.4 Limitations of project risk management tools and techniques

The current tools utilised to assess and manage project risk have certain limitations, as outlined in this section. The literature underlines that there is a problem with the current risk management tools within the project management environment (Benta et al., 2011; Besner & Hobbs, 2012; Thamhain, 2013; Zwikael & Sadeh, 2007). The tools and techniques do not provide strong answers and have limitations based on a number of presumptions and assumptions (Aven, Vinnem, & Wiencke, 2007). According to Zwikael and Ahn (2011), although risk planning tools are popular within the project management discipline, the literature identifies many disadvantages regarding risk planning practices. These include: a limited variety of tools used, the poor quality of tool use and the high complexity and the perceived low effectiveness of existing tools.

Although many tools for assessing risks in projects are available, the majority of project risk assessments are limited to using risk-ranking tools only (Cagliano et al., 2015; Mojtahedi, Mousavi, & Makui, 2010; Osabutey, Obro-Adibo, Agbodohu, & Kumi, 2013; Whitfield, 2015). Evidence shows that effective risk assessment has gone beyond ranking the risk of projects and into developing an integrated and sustainable approach to risk management (Brandt, Sarif, & Mohd, 2013; Cagianelli, Michelez, & Nava, 2015b). Such models of risk assessment have two obvious shortcomings: the subjective nature of judgment and interpretation of data inputs, as human actors are likely to either underestimate or overestimate the frequency and chance of possible risks occurring; and the incompleteness of the analysis related to an assessor's failure to identify all relevant sources of risk. The main issue here is that while the calculation of risk through probability analysis may appear scientific in nature, it may be misleading and inaccurate in evaluating the true nature of risks (Carter & Hancock, 1994, p. 116; Harris, 2009).

2.5 Selecting an effective project risk management tool/technique

Choosing an effective risk management technique/tool is one of the key steps in ensuring guaranteed project performance. Considering how projects differ in nature, location, size or even complexity (Cagliano et al., 2015; EY, 2015; Salazar-Aramayo et al., 2013), projects may require different risk assessment tools to ensure project performance in different cultures (Liu, Meng, & Fellows, 2015). The selection of an appropriate risk assessment tool is a function of three important dimensions: the risk management phase, the project phase and the corporate maturity of the project team towards the risk (Cagliano et al., 2015). The following subsections discuss these three dimensions in detail.

Risk phases

Risk assessment is established by first understanding the nature and sequence of events around the risk. Risk is characterised by the sequence of three events: the cause, occurrence and consequences (Hillson & Murray-Webster, 2007). These three events have been converted into the phases of the risk management process, involving planning, identification, analysis, monitoring, response and control of the risk (Cagliano et al., 2015). The way they derive the risk assessment and management is provided in Table 1.

Table 1 Risk management phases and actions

Risk management phase	Action towards risk management
Planning	Identify objectives, resources and approaches to risk
Identification	Causes of risk
Analysis	Probability of occurrence and impact of the risk
Response	Actions to develop opportunities and reduce threat

Despite the clarity of the risk phases and their corresponding action plan, identifying the objectives, causes and even the probability of risk occurrence due to the individual knowledge and understanding of a particular risk is complex (Cagianelli et al., 2015b; Cagliano et al., 2015; Rabechini Junior & Monteiro de Carvalho, 2013). Many project failures, are due to the risk assessment team's inability to understand and identify possible sources of project risk (Zwikael & Ahn, 2011), and their inability to accurately score the risk for a variety of projects, especially in the Middle East and North Africa (MENA) region (Aven et al., 2007; Liu et al., 2015; Srivastava & Gupta, 2010). Although the sequence risk phases are conducted in differs, the early part of the risk assessment, i.e. planning, is a crucial step in ensuring a project's success during its implementation (Salas, 2015; Ward & Chapman, 1995).

Project life cycle phases

A project's life cycle is demarcated by four distinct phases—conceptual, planning, execution and termination (Cagliano et al., 2015; Ward & Chapman, 1995)—which enables the management of a project's schedule with distinct deliverables at each phase. The possible sources and causes of uncertainties are identified in the conceptual and planning phases (Cagliano et al., 2015).

Risk corporate maturity

Tackling and mitigating risk is different for every project and company. Risk corporate maturity requires an understanding and awareness of risk by considering that risk scope data are required to ensure the systematic implementation of the measures to mitigate risk (Pitsis, Kornberger, & Clegg, 2004). Perhaps some projects' risks are managed based on an informal risk management approach, which tends to manage risks as they occur (Cagliano et al., 2015; Lyon & Hollcroft, 2012; Suslick & Schiozer, 2004; Ward & Chapman, 1995).

2.6 Project Risk Management and Project Performance

Several scholars have debated about the relationship between performing project risk management process and project success. Some believe applying these these practices has a strong positive relation with desirable project outcomes, while others believe the complete opposite. Elkington and Smallman (2002) stress the importance of earlier (e.g. project brief stage) project risk management in the project and consider the amount of project risk management used increases the level of project success. A recent comprehensive study conducted by Zwikael and Ahn (2011) examines the effectiveness of current risk management practices to reduce project risk. In their study, they used a multi-industry, multinational survey during the 2002–2007 period covering 701 project managers in seven

industries in three countries, including Japan, New Zealand and Israel. They found that the country and industry of the executed project has an important impact on the level of the perceived project risk and the risk management process adopted. The authors conclude that even a reasonable or moderate quantity of risk management helps minimise project risks, increasing the project's level of success. De Bakker, Boonstra and Wortmann (2012) agree that project risk management has a significant positive influence on project success, emphasising the risk identification stage as the most important factor contributing to project success. Baloi and Price (2003) and Zou, Zhang and Wang (2007) also found a strong relationship between performing project risk management and project success.

While numbers of authors support the idea that project risk management has a positive impact on project performance, other scholars do not seem as optimistic. For example, Raz, Shenhar and Dvir (2002) did not find a relationship between project success and risk management, stressing the need for more training, better tools and techniques, promoting the effectiveness of project risk management and the development of more tools specific to types of projects. Bannerman (2008) claims that, in practice, risk management methods lag behind the understanding and recommendations of the research literature. The author insists that, even if a project is successful, it can be challenging to relate that successful result to project management practices, believing instead that success is often credited to good luck or the efforts and exclusive skills of the individuals involved in the project.

Therefore, it is evident that many oil and gas projects still fail because of poor project risk management. As the relationship between project risk management and project performance is still ambiguous, this paper aims to investigate this phenomenon within the Libyan oil and gas industry.

3. METHODOLOGY

This paper aims to explore the practical effectiveness of project risk management in the Libyan oil and gas industry. Therefore, the National Oil Corporation (NOC) of Libya was chosen as a case study for this research. The NOC is fully responsible for all oil and gas activities (upstream, midstream and downstream) in Libya. The context of this research is limited to the oil and gas upstream projects within the Libyan oil and gas industry.

To gain full understanding of the phenomena, semi-structured interviews with 13 experts were conducted. All participants were chosen carefully to add value to the research and avoid any bias in the results. This research's participants include six department heads, three senior project managers, three project engineers and one board advisor. This research includes interactions between different people and technological influences in real-life situations. Different perspectives regarding risk management within the Libyan oil and gas industry were investigated during the research. This research largely follows the social constructionism (interpretivism) philosophy, the ontological position of subjectivists and the axiological view of being value-laden.

First, participants were asked about the availability of a written project risk management framework or procedure within the company. Then, they were asked to identify the tools and techniques most currently used to support the management of project risks within the Libyan oil and gas industry. Finally, they were asked about their views on the effectiveness of these tools and techniques related to project success.

4. FINDINGS AND DISCUSSION

Project risk management is a significant area of the project management discipline. The PMI's PMBOK considers project risk management one of its ten knowledge areas; their belief is that the project manager complying with these ten areas guarantees the success of the project (PMI, 2013). Yet, according to Cervone (2006), not all project managers appreciate the true value of risk management, and in many cases it is not given the attention it deserves. This may be because some authors doubt the effectiveness of project risk management practices related to the project's performance (Zwikael & Ahn, 2011). As mentioned in section 2.3, many tools and techniques support the project risk management process. Participants were asked to identify the most currently used tools and techniques within the Libyan oil and gas industry. When interviewees were asked about the availability of a written framework or procedure to perform project risk management, all answers revealed the lack of a structured framework or policy to follow. Instead, they mainly focus on identifying and assessing risks related to health, safety and environment. Therefore, all the tools and techniques used are solely based on the prior knowledge and experience of the project manager or engineer and his or her team. All interviewees were shown various tools and techniques used to evaluate project risks including brainstorming, risk matrix, Hazard Identification (HAZID) and Hazard and Operability (HAZOP), lessons learned, expert judgment, workplace risk assessment, Quantitative Risk Assessment (QRA) and Monte Carlo simulations. According to participants, the most frequently used techniques are brainstorming sessions and risk matrix. The other techniques are less commonly used, especially Monte Carlo simulations. This finding echoes the findings of the academic literature, as many scholars believe that, despite the many tools available project risk assessment, the majority of project risk management practices are limited to using risk-ranking tools (e.g. risk matrix) (Cagliano et al., 2015; Mojtahedi et al., 2010; Osabutey et al., 2013; Whitfield, 2015). Only simple techniques are used to evaluate risks within the Libyan oil and gas industry. This could be because the industry does not appreciate the value of having proper project risk management practices in place. One reason for this, according to Ahlemann, El Arbi, Kaiser, and Heck (2013), is that risk management applications are considered to have several issues, such as non-acceptance in practice, limited effectiveness and vague application situations. In addition, Ibbs and Kwak (2000) and Zwikael and Globerson (2006) identify a gap in the area, confirming that risk management practices are infrequently applied in many projects. Surprisingly, even in large and complex projects, their application rates are still very low.

When participants asked about the effectiveness of the current tools and techniques they used to identify and evaluate project risks, most of the participants believed that applying these techniques could enhance project performance. One participant mentioned, '*Of course it [applying the tools and techniques to evaluate project risks] does improve the success rate of the project because you will have a plan in advance'*. De Carvalho and Rabechini (2015) argue that applying project risk management practices can have a positive influence on project success, emphasising the importance of having a risk manager available for the project, as this could have a positive impact on the project outcome. Only two interviewees did not seem very optimistic about these tools and techniques. They did not think they are very effective. One respondent stated, *'...I do not think they are very effective'*. One reason for this was mentioned by one of the interviewees: *'All of the available techniques rely on the input data, so if people involved with the data input process have accurate readings, then the results will be accurate, as this is strongly related to the truth level of the input data'*. Another reason could be that the accuracy of the data depends on the person's own experience and knowledge. To this end, de Carvalho and Rabechini (2015) emphasise the

importance of soft skills in performing the project risk management process, stressing the significance of combining both soft and hard skills as a crucial factor in increasing project success. According to Grabher (2004) and Söderlund and Maylor (2012), soft skills are defined as the management of interpersonal relationships allowing the different people involved in the project to work together, while hard skills are mainly centred on administrative activities and the available toolsets to facilitate them.

Therefore, it is evident from the opinions of the participants that project risk management could improve project performance; however, within the Libyan context, it is also evident that no clear written framework guiding the project manager or his or her team to follow or facilitate the process currently exists. One possible reason for not implementing an efficient project risk management process could be as a result of the organisational culture. Different scholars (see Crawford, Morris, Thomas and Winter (2006); Sharma and Gupta (2012)) point to the influence of organisational context on risk management. These contexts include organisational culture, climate and demographics. Other factors that can influence the project risk management process, according to Gladwell (2012) and Söderlund and Maylor (2012), include the beliefs, power conflicts, judgement and trust of individuals. One would argue that to achieve an effective project risk management strategy, strong leadership is required to enforce these practices. According to Thamhain (2013), in order to establish a strong and effective project risk management process within an organisation there must be comprehensive participation and collaboration throughout all divisions of the project team and its setting. Thus, to ensure the effective implementation of project risk management within the Libyan oil and gas industry, making use of the value of its supportive tools and techniques, there should be a strong relationship between all team members including the decision-makers and top managers.

5. CONCLUSION AND WAY FORWARD

The aim of this paper was to explore the effectiveness of project risk management practices within the Libyan oil and gas industry. Ensuring that risks are identified, assessed, controlled and mitigated are the key steps of the project risk management process because unmanaged risks can cause significant issues throughout a project's life cycle, potentially affecting overall project performance. This paper identified a positive relationship between performing risk management and project performance, although some scholars noted in the academic literature do no support this argument. Different tools and techniques are available to support the process of conducing project risk management practices. Although there is no structured written risk management framework or procedure within the Libyan oil industry, most participants strongly believe that applying project risk management practices with the help of available tools and techniques could increase the project performance in the Libyan oil and gas industry. However, findings also showed that, even though there are different tools and techniques, only the simple ones are used (namely brainstorming and risk matrix). This paper concluded that establishing an organisational culture that supports the founding of a written risk management guideline or procedure, supports project manager leadership and ensures the familiarity of individuals with the project risk management tools, techniques and concepts, will increase the effectiveness of project risk management and project performance within the Libyan oil and gas industry.

6. REFERENCES

Ahlemann, F., El Arbi, F., Kaiser, M. G., & Heck, A. (2013). A process framework for theoretically grounded prescriptive research in the project management field. International Journal of Project Management, 31(1), 43–56.

Al Subaih, A. (2015). Integrated Project Delivery: A Paradigm Shift for Oil and Gas Projects in the UAE and the Middle East Region. Oil and Gas Facilities, 4(04), 64–77. doi:10.2118/171722-PA

APM. (2004). PRAM - Project Risk Analysis and Management guide. Buckinghamshire: APM Publishing.

Aven, Vinnem, J. E., & Wiencke, H. S. (2007). A decision framework for risk management, with application to the offshore oil and gas industry. Reliability Engineering & System Safety, 92(4), 433–448. doi:http://dx.doi.org/10.1016/j.ress.2005.12.009

Baloi, D., & Price, A. D. (2003). Modelling global risk factors affecting construction cost performance. International Journal of Project Management, 21(4), 261–269.

Bannerman, P. L. (2008). Risk and risk management in software projects: A reassessment. Journal of Systems and Software, 81(12), 2118–2133.

Baumeister, C., & Kilian, L. (2016). Forty Years of Oil Price Fluctuations: Why the Price of Oil May Still Surprise Us.

Becker, K., & Smidt, M. (2016). A risk perspective on human resource management: A review and directions for future research. Human Resource Management Review, 26(2), 149–165. doi:http://dx.doi.org/10.1016/j.hrmr.2015.12.001

Benta, D., Podean, M., & Mircean, C. (2011). On Best Practices for Risk Management in Complex Projects. Informatica Economica Journal, 15(2), 142–152.

Besner, C., & Hobbs, B. (2012). The paradox of risk management; a project management practice perspective. International Journal of Managing Projects in Business, 5(2), 230–247. doi:10.1108/17538371211214923

Brandt, H., Sarif, M., & Mohd, S. (2013). Life extension of offshore assets-Balancing safety & project economics. Paper presented at the SPE Asia Pacific Oil and Gas Conference and Exhibition.

Briel, E., Luan, P., & Westney, R. (2013). Built-In Bias Jeopardizes Project Success. Oil and Gas Facilities. doi:10.2118/0413-0019-OGF

Cagianelli, M., Michelez, J., & Nava, F. (2015a). Integrated Risk Management to Meet the Challenges of Today's Oil&Gas Industry. Paper presented at the Offshore Mediterranean Conference., Ravenna, Italy.

Cagianelli, M., Michelez, J., & Nava, F. (2015b). Integrated Risk Management to Meet the Challenges of Today's Oil&Gas Industry. Paper presented at the Offshore Mediterranean Conference., Ravenna, Italy.

Cagliano, A. C., Grimaldi, S., & Rafele, C. (2015). Choosing project risk management techniques. A theoretical framework. Journal of Risk Research, 18(2), 232–248.

Carter, B., & Hancock, T. (1994). J. Morin, and N. Robins. Introducing RISKMAN methodology: Blackwell Ltd.

Carvalho, M. M. d., & Rabechini Junior, R. (2015). Impact of risk management on project performance: the importance of soft skills. International Journal of Production Research, 53(2), 321–340.

Cervone, H. F. (2006). Project risk management. OCLC Systems & Services: International digital library perspectives, 22(4), 256–262. doi:10.1108/10650750610706970

Crawford, L., Morris, P., Thomas, J., & Winter, M. (2006). Practitioner development: From trained technicians to reflective practitioners. International Journal of Project Management, 24(8), 722–733.

de Bakker, K., Boonstra, A., & Wortmann, H. (2012). Risk managements' communicative effects influencing IT project success. International Journal of Project Management, 30(4), 444–457.

de Carvalho, M. M., & Rabechini, R. (2015). Impact of risk management on project performance: the importance of soft skills. International Journal of Production Research, 53(2), 321–340. doi:10.1080/00207543.2014.919423

Deloitte. (2015). Oil and Gas Reality Check 2015: A look at the top issues facing the oil and gas sector. Retrieved from London: http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Energy-and-Resources/gx-er-oil-and-gas-reality-check-2015.pdf

Denney, D. (2006). Stage-Gate Project-Management Process in the Oil and Gas Industry. Society of Petroleum Engineers. doi:10.2118/1206-0068-JPT

Ehsan, E. (2013). Risk management: the next source of competitive advantage. Foresight, 15(2), 117–131. doi:10.1108/14636681311321121

Elkington, P., & Smallman, C. (2002). Managing project risks: a case study from the utilities sector. International Journal of Project Management, 20(1), 49–57.

EY. (2014). Spotlight on oil and gas megaprojects. Retrieved from London: http://www.ey.com/Publication/vwLUAssets/EY-spotlight-on-oil-and-gas-megaprojects/$FILE/EY-spotlight-on-oil-and-gas-megaprojects.pdf

EY. (2015). Joint ventures for oil and gas megaprojects. Retrieved from London: http://www.ey.com/Publication/vwLUAssets/ey-joint-ventures-for-oil-and-gas-megaprojects/$FILE/ey-joint-ventures-for-oil-and-gas-megaprojects.pdf
Firmenich, J., & Firmenich, J. (2017). Customisable framework for project risk management. Construction Innovation, 17(1), 68–89.
Ghosh, S., & Jintanapakanont, J. (2004). Identifying and assessing the critical risk factors in an underground rail project in Thailand: a factor analysis approach. International Journal of Project Management, 22(8), 633–643. doi:http://dx.doi.org/10.1016/j.ijproman.2004.05.004
Gladwell, M. (2012). Blink: The Power of Thinking Without [thinking]: CNIB.
Grabher, G. (2004). Learning in projects, remembering in networks? Communality, sociality, and connectivity in project ecologies. European urban and regional studies, 11(2), 103–123.
Harris, E. (2009). Strategic project risk appraisal and management: Gower.
Hillson, D., & Murray-Webster, R. (2007). Understanding and managing risk attitude. Aldershot: Aldershot : Gower.
Ibbs, C. W., & Kwak, Y.-H. (2000). Assessing project management maturity.
Khatib, H. (2014). Oil and natural gas prospects: Middle East and North Africa. Energy Policy, 64, 71–77.
Liu, J., Meng, F., & Fellows, R. (2015). An exploratory study of understanding project risk management from the perspective of national culture. International Journal of Project Management, 33(3), 564–575. doi:http://dx.doi.org/10.1016/j.ijproman.2014.08.004
Long, R. J. (2015). Typical Problems Leading to Delays, Cost Overruns, and Claims on Process Plant and Offshore Oil and Gas Projects. Retrieved from Littleton, Colorado: http://www.long-intl.com/articles/Long_Intl_Typ_Prob_Lead_to_Delay-Cost_Overruns-Claims_on_Proj_Pl-OffShore_OG_Proj.pdf
Lyon, B. K., & Hollcroft, B. (2012). Risk Assessments: Top 10 Pitfalls & Tips for Improvement. American Society of Safety Engineers.
Marle, F., & Vidal, L.-A. (2011). Project risk management processes: improving coordination using a clustering approach. Research in Engineering Design, 22(3), 189–206. doi:10.1007/s00163-011-0106-9
Massingham, P. (2010). Knowledge risk management: a framework. Journal of Knowledge Management, 14(3), 464–485. doi:10.1108/13673271011050166
Merrow, E. (2012). Oil and gas Industry Megaprojects: Our Recent Track Record. Oil and Gas Facilities, 38–42. doi:10.2118/153695-PA
Mojtahedi, S. M. H., Mousavi, S. M., & Makui, A. (2010). Project risk identification and assessment simultaneously using multi-attribute group decision making technique. Safety science, 48(4), 499–507.
Osabutey, D., Obro-Adibo, G., Agbodohu, W., & Kumi, P. (2013). Analysis of risk management practices in the oil and gas industry in Ghana. Case study of Tema Oil Refinery (TOR). European journal of business and management, 5(29).
Pitsis, T. S., Kornberger, M., & Clegg, S. (2004). The art of managing relationships in interorganizational collaboration. M@ n@ gement, 7(3), 47–67.
PMI. (2013). A Guide to the Project Management Body of Knowledge (PMBOK Guide). Newtown Square, Pennsylvania: Project Management Institute.
Rabechini Junior, R., & Monteiro de Carvalho, M. (2013). Understanding the Impact of Project Risk Management on Project Performance: an Empirical Study. Journal of technology management & innovation, 8(suppl 1), 6–6. doi:10.4067/s0718-27242013000300006
Raz, T., Shenhar, A. J., & Dvir, D. (2002). Risk management, project success, and technological uncertainty. R&D Management, 32, 101–109.
Rogers, V. C., & Ethridge, J. R. (2013). Enterprise Risk Management In The Oil And Gas Industry: An Analysis Of Selected Fortune 500 Oil And Gas Companies' Reaction In 2009 And 2010. American Journal of Business Education (Online), 6(6), 577.
Salas, R. (2015). Managing Risks at the Early Phases of Oil and Gas Major Capital Projects. Paper presented at the Health, Safety, Security and Environmental Conference-Americas, Denver, Colorado, USA.
Salazar-Aramayo, J. L., Rodrigues-da-Silveira, R., Rodrigues-de-Almeida, M., & de Castro-Dantas, T. N. (2013). A conceptual model for project management of exploration and production in the oil and gas industry: The case of a Brazilian company. International Journal of Project Management, 31(4), 589–601. doi:http://dx.doi.org/10.1016/j.ijproman.2012.09.016
Sharma, A., & Gupta, A. (2012). Impact of organisational climate and demographics on project specific risks in context to Indian software industry. International Journal of Project Management, 30(2), 176–187.
Söderlund, J., & Maylor, H. (2012). Project management scholarship: Relevance, impact and five integrative challenges for business and management schools. International Journal of Project Management, 30(6), 686–696.

Srivastava, A., & Gupta, J. P. (2010). New methodologies for security risk assessment of oil and gas industry. Process Safety and Environmental Protection, 88(6), 407–412. doi:http://dx.doi.org/10.1016/j.psep.2010.06.004
Suslick, S. B., & Schiozer, D. J. (2004). Risk analysis applied to petroleum exploration and production: an overview. Journal of Petroleum Science and Engineering, 44(1–2), 1–9. doi:http://dx.doi.org/10.1016/j.petrol.2004.02.001
Thamhain, H. (2013). Managing risks in complex projects. Project Management Journal, 44(2), 20–35.
Ward, S. C., & Chapman, C. B. (1995). Risk-management perspective on the project lifecycle. International Journal of Project Management, 13(3), 145–149. doi:http://dx.doi.org/10.1016/0263-7863(95)00008-E
Whitfield, S. (2015). Managing Nontechnical Risk in Offshore Projects. SPE-1015-0016-OGF.
Zhao, X., Hwang, B.-G., & Gao, Y. (2016). A fuzzy synthetic evaluation approach for risk assessment: a case of Singapore's green projects. Journal of Cleaner Production, 115, 203–213. doi:http://dx.doi.org/10.1016/j.jclepro.2015.11.042
Zou, P. X., Zhang, G., & Wang, J. (2007). Understanding the key risks in construction projects in China. International Journal of Project Management, 25(6), 601–614.
Zwikael, & Ahn, M. (2011). The effectiveness of risk management: an analysis of project risk planning across industries and countries. Risk analysis, 31(1), 25–37.
Zwikael, & Globerson, S. (2006). From critical success factors to critical success processes. International Journal of Production Research, 44(17), 3433–3449.
Zwikael, & Sadeh, A. (2007). Planning effort as an effective risk management tool. Journal of Operations Management, 25(4), 755–767.