

# Partnering in offshore drilling projects

## **Abstract:**

**Purpose** – This paper analyses the current state of partnering practices in offshore development drilling projects using the RBP taxonomy framework.

**Design/methodology/approach** – The paper comprises a literature review on project partnering and the RBP taxonomy framework. The case study presents an incentive-based drilling project in Norway.

**Findings** – The RBP taxonomy framework can characterize partnering practices in offshore development drilling projects. Furthermore, we observed that partnering elements in the offshore industry context rated consistently lower than partnering elements observed in the construction industry.

**Practical implications** – This paper functions as a source of information and advice for project managers aiming to implement partnering in offshore drilling projects by introducing the elements of the RBP taxonomy into a different context. The paper is relevant to other petroleum extraction regions because elements of drilling work procedures follow a common pattern. The research opens the door for further research on partnering in offshore drilling projects and the use of RBP taxonomy in other industries.

**Originality/value** – The paper introduces the RBP taxonomy framework in offshore drilling projects.

**Keywords** - Project partnering, relation-based procurement taxonomy, offshore drilling

**Paper type** - Case study

## **1 Introduction**

Nearly two decades ago, a Norwegian industry coalition strongly recommended partnering in offshore projects (NORSOK, 1996) following the UK-based CRINE initiative (Cost Reduction in the New Era) in 1992. The underlying rationale for this recommendation was the assumption that close collaboration between project partners, for example through information sharing and joint planning, improves both project quality and productivity. A successful BP alliance project (Knott, 1996) demonstrated the benefits of partnering in the offshore oil and gas industries (Pryke, 2009). Halman and Braks (1999) highlighted conditions for realizing a win-win situation for all parties in a project alliance.

“Alliancing is distinguished as a specific form of partnering within one of these categories (project-specific partnering) and the key features of an alliance are: Early involvement of key participants, Equitable relationship, Managerial commitment, Integrated team, Trust, Innovation and Open communication”(Scott, 2001)

"The 'partnering' model was developed and promoted as a way of preventing disputes (rather than resolving disputes), improving communication, increasing quality and efficiency, achieving on-time performance, improving long-term relationships, and obtaining a fair profit and prompt payment for the designer/contractor. Partnering was not a contractual agreement, and therefore was not legally enforceable.

As the formal extension to the 'partnering' model, alliancing was first used in the oil and gas fields of the North Sea by British Petroleum (BP) in the early 1990s. (Commonwealth of Australia, 2015)

Despite initial successes with partnering projects, cost efficiency in the North Sea has declined over the last 15 years, according to McKinsey (2014). Analysis revealed that the increase in total expenditure concealed cost inefficiencies in both operational and capital expenditures (Cole, 2014). "The overall cost increase in the North Sea between 2003 and 2012 can be explained by three main factors: increased activity levels, increased input costs per unit of material, service or labour, and inefficiency. Specifically, for drilling and wells, lower efficiency accounts for 31% of the 2003-2012 annual growth in total cost of 16%. Inefficiency resulting from lower productivity, increasingly over-specified activities and poor purchasing practices are major causes of increasing costs (Cole, 2014: 3)". The figures are consistent with a comprehensive analysis of drilling project performance on the Norwegian Continental Shelf (NCS) by Petoro (2014). While some of this inefficiency may be due to regulatory changes and increased activity, the large majority results from operator practices and approaches (Cole, 2014).

Because production is falling (Norwegian Petroleum Directorate, 2015b), improving drilling project efficiency in terms of investment per unit produced is required and partnering is again highlighted. However, earlier studies show that only limited first order collaboration, as defined by Walker and Lloyd-Walker (2015), has taken place on the Norwegian Continental Shelf (NCS) with integrated teams, supply chain integrations, rig management consortiums (Ribesen et al., 2011) and incentive contracts (Osmundsen, 2013). Despite these valuable insights, we currently lack a thorough understanding of the extent to which different elements of project partnering are implemented in the offshore industry. A deeper understanding of the current state of partnering in the industry could help us to identify problem areas in partnering and function as a roadmap for further developing project practices. The RBP taxonomy might address this problem because there seems to be no earlier documented application of a partnering taxonomy model in any offshore drilling project.

The research question for this paper is:

RQ: What is the current state of partnering practices in offshore development drilling projects?

In this paper, we explore this research question by reviewing the published literature and applying the RBP taxonomy to a case project to investigate whether the taxonomy can be applied to offshore drilling projects and to analyse the use of partnering elements in such projects.

## 2 Literature review

Literature review process included selection of keywords and search strings, identifying relevant search databases, applying the search, and extracting relevant findings from the literature. Keywords and search strings were project partnering, project collaboration, offshore, drilling, oil, and gas. Databases used included Scopus, Google Scholar and Web of Science. This paper consistently uses

the term “partnering” which sometimes overlaps with other closely related terms such as project partnering, relationship-based procurement, collaborative networks, project partnering, strategic partnering and project alliances.

## 2.1 Defining partnering

Definitions of partnering have evolved over time and vary by industry and geography (Latham, 1994, Crowley and Karim, 1995, Construction Industry Institute (CII), 1996, Construction Excellence, 2009, Rowlinson et al., 2002). Still, there is no unified view of the concept of partnering relationships in the construction industry (Bygballe et al., 2010). The European Construction Institute (ECI) (1997: 13) definition of partnering reads: *“Partnering is a managerial approach used by two or more organisations to achieve specific business objectives by maximising the effectiveness of each participant’s resources. The approach is based on mutual objectives, an agreed method of problem resolution and an active search for continuous measurable improvements”*

In other widely used definitions, phrases on what partnering is just indicate “a long-term commitment ... for the purposes of achieving specific business objectives” (Construction Industry Institute (CII), 1996) or “a managerial approach to facilitate team working across contractual boundaries” (Construction task force, 1998). The RBP framework is a viable attempt at providing an improved understanding of what partnering is, as explained in the next section.

## 2.2 Development of partnering taxonomy

A taxonomy is a system for naming and organizing elements, especially plants and animals, into groups that share similar qualities (Cambridge Dictionary). The use of taxonomies has expanded over the years to the science or practice of classification of things (Collins Dictionary), in this context the classification of partnering projects by their characteristics or properties.

Larson (1997), Morwood et al. (2008) and Chen et al. (2012) are among those who have measured achieved goals of partnering, all indicating a need for better classification and quantification of the extent of partnering applied in a project. According to Hong (2012), research published in several leading construction-related journals between 1989 and 2009 tended to focus on partnering conceptual models, reviews of partnering development and application, potential benefits of and barriers to implementation, critical success factors, and partnering performance measurement and evaluation together with use of partnering across the construction supply chain (Hong et al., 2012).

Yeung et al. (2007) provided an early quantification of partnering. The Partnering Performance Index (PPI) introduced relationship-oriented objective and subjective quantifiable measurements. Wu and Udejaja (2008) contributed with measurement design of collaborative working, and Lau and Rowlinson (2010) measured trust and intentions.

Based on the philosopher Ludvig Wittgenstein’s family-resemblance concept, Nyström (2005) determined a commonly attributed set of characteristics of partnerships. Walker and Lloyd-Walker (2015) developed the RBP framework while referring to Nyström. The RBP Taxonomy model uses a 5-point Likert scale to provide a measured and quantified snapshot of scores of elements in this partnering typology. The snapshot can visualize the planned, implemented or completed partnering project.

The RBP Taxonomy is a way to analyse and visualize partnering case study data. The RBP Taxonomy provides guidance on measuring the elements between low and high intensity. It covers three main components: platform foundational facilities, behavioural factors, and processes, routines and means, which were further broken down into the 16 elements listed below (Walker and Lloyd-Walker, 2015).

Platform foundational facilities supply the basic elements for any form of collaboration including:

1. Motivation and context to collaborate define and affect the potential degree of collaboration. The sub-elements are the value creation, emergency response capability, resource availability, relational rationale and risk-handling capability expected through entering the partnering project;
2. A joint governance structure defines how common-platform governance characteristics will be incorporated into the project procurement form. This includes governance processes, structure and best-value strategy through key results and key performance indicators;
3. Integrated risk mitigation strategy defines how common assumptions are incorporated into the project procurement form and how parties will deal with risk. This includes risk sharing conversations, risk mitigation actions and system integration for handling of risk, uncertainty and ambiguity;
4. A joint communication strategy defines how project participants interact and communicate with each other and how the project procurement form affects that. This includes common processes and systems and an integrated communication platform; and
5. Substantial co-location including hierarchical integration mechanisms and physical co-location.

Behavioural factors drive normative practice elements including:

6. The degree of an authentic leadership style defines how the project leadership team and individuals, as participant team leaders, interact and communicate with each other in terms of deploying their various sources of power and influence in a way that is perceived as authentic. Subthemes include reflectiveness, pragmatism, resilience, wisdom, spirit and authenticity;
7. A balance between trust and control defines how the project leadership team balances representing and protecting the interests of the project owner with those of other genuinely relevant stakeholders, while relying on the integrity, benevolence and ability of all project team parties to “do the right thing” in terms of project performance. Subthemes include autonomy, forms of trust, safe workplace cultures and trust relationship building;
8. A commitment to be innovative represents the duality of project participants being willing, and able, to be innovative, including commitment to continuous improvement, testing, prototyping and experimenting;
9. A common best-for-project mindset relates to the focus being placed on value generated in delivering the project compared with objectives of delivering what was explicitly requested or demanded. Subthemes include alignment of common goals, performance levels, drive for excellence, value reporting and recruiting support; and
10. A no-blame culture relates to the focus being placed on creating and maintaining a culture with its supporting mechanisms to eliminate the attribution of blame. Subthemes include firstly the rationale for a no-blame culture and secondly the mechanisms that support the creation and maintenance of a no-blame culture.

Processes, routines and means reinforce behaviours. They are supported by the platform facilities elements including:

11. Consensus decision making between teams relates to the extent of total agreement on a decision made at the strategic and project executive level. Subthemes include participants' cultural drivers of the decision-making process in addition to enablers and inhibitors of consensus decision making;

12. Incentive arrangements relate to the processes, routines, and behavioural and normative practices that facilitate and enable incentives to encourage excellence in performance. This includes the incentive mechanism itself and the way any tension between innovation and incentivization is managed;

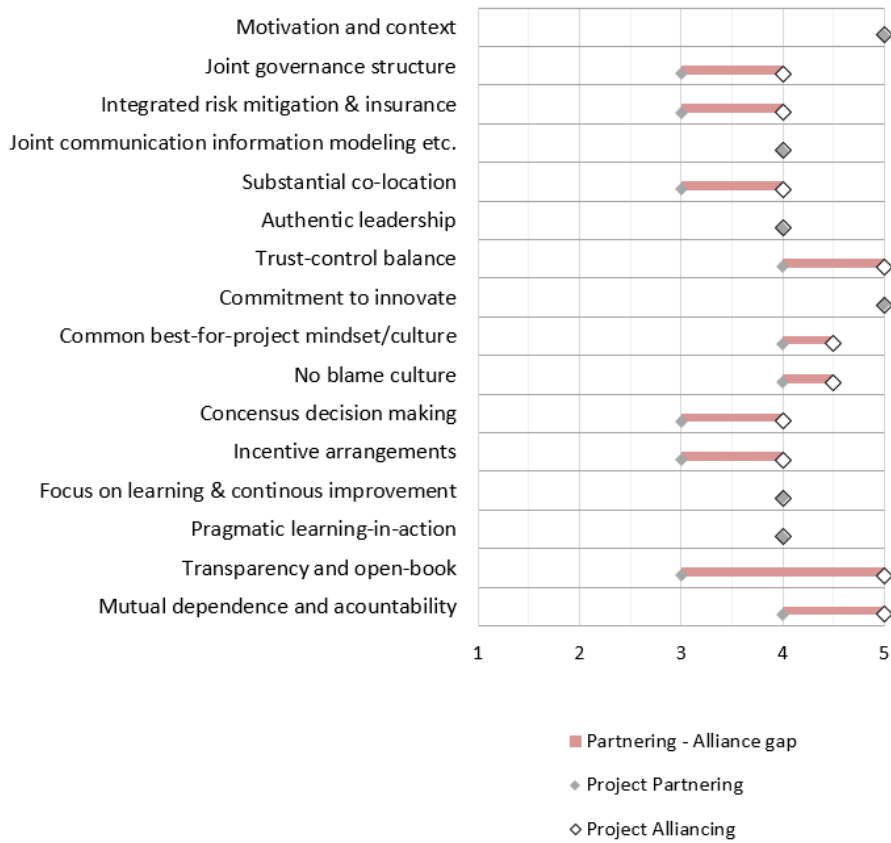
13. A focus on learning and continuous improvement relates to the processes, routines, and means that facilitate and enable learning and continuous improvement. Subthemes include participants' capability for adapting to new ideas, being open and enthusiastic about learning new things, and new approaches to their work. The second subtheme relates to the process of lessons-learned absorption and transfer within and between teams. The third relates to the culture of skills and learning development. The fourth relates to inherent tensions between innovation and incentivization procedures;

14. Pragmatic learning in action is the active gathering of value from collaboration with the strategic aim of learning and gaining competitive advantage through opportunities to learn and adapt. Subthemes include action learning, coaching and mentoring;

15. Transparency and open-book processes refer to project participants allowing themselves to be audited and fully open to scrutiny; and

16. Mutual dependence and accountability refer to collaboration in projects requiring participants not only to recognize their interdependency but also to respond honestly when communicating. Subthemes include characteristics of mutual dependency in addition to initiatives enhancing and inhibiting mutual dependency.

With the five-point Likert scale, each element of the RBP taxonomy has a neutral mid-point. All elements also have equal weight, although platform elements are more fundamental than the behaviour and process elements. Walker and Lloyd-Walker present a benchmark of Project Partnering with ratings adds up to 60. In a presentation given at Chalmers and NTNU in March 2015, Walker also presents Project Alliancing in the RBP framework with ratings adding up to 70, an increase of 10. What distinguishes Partnering from Alliancing in the platform elements, are higher ratings on joint governance structure, integrated risk mitigation and insurance and co-location. In the behaviour elements, trust-control balance, common best-for-project mindset and a no blame culture. In the process elements, there are higher ratings on consensus decision making, incentive arrangements, transparency and open-book, and mutual dependence and accountability. This fit well with the findings of McKenna (2006)



As the most advanced and recently developed tool available (Ibrahim et al., 2015, Memon and Rowlinson, 2015), the RBP framework has earlier been applied once in a construction industry case study (Walker and Rahmani, 2015). The case study presented in this paper is the first to make use of the RBP framework in the oil and gas sector.

### 2.3 Partnering in drilling projects

Partnering was adapted by oil and gas operators and service companies in the late 1980s as a means of increasing efficiency and quality, reducing costs, accessing resources, aligning interests or facing untried challenges (Bresnen and Marshall, 2000, Scott, 2001, Robson, 2004, Lahdenperä, 2012, Garcia et al., 2014, Barlow et al., 1997). "One obstacle to the more rapid spread of project alliancing is probably the upstream community's lack of familiarity with the commercial models and

contractual basis for partnering” (Robson, 2004: 5). Based on 39 out of 56 papers published by SPE (Society of Petroleum Engineers) between 1990 and 2004, Robson (2004) concluded on the other hand that the operator might typically achieve a performance improvement of 20% or more using project partnering compared to the traditional approach. This might take the form of extra production, less cost, less time, or increased efficiency. Nearly all operators reported benefits from aligning their key contractors with the operators’ project goals, and these cited quality of communication as a particular benefit.

The motivation for partnering in oil and gas has evolved over time and with market conditions. During 2000-2004, “The operator would be motivated by the need for expertise and/or reduced costs. The project scope would comprise engineering, programming, and executing well construction and include project management of some third-party companies. The commercial terms for this alliance would include bonus and malus with the major service company liable for all contractors’ performance as well as project technical risks” (Robson, 2004: 4). In nearly a quarter of the alliances observed in 2000-2004, reservoir engineering services, the core competence of the oil companies, formed part of the work scope. Robson saw a clear trend where partnering participants increasingly involved elements of both risk and reward, also for project technical risks (see also Reiley, 1994) within their control or influence. As Crabtree et al. (1997) identified lack of inter-firm trust as a hindrance to collaboration, Green (2003) addressed the importance of measuring goodwill trust in an alliance to promote operational effectiveness.

In Norway, the Ministry of Petroleum and Energy (2003) promoted incentive contracts between oil companies and contractors. However, only a few semi-partnering projects have been implemented on the NCS during the last twelve years (Osmundsen et al., 2010, Ribesen et al., 2011). On the contractual side, partnering has not been implemented on the NCS, according to Kaasen (2013). With this backdrop in mind, in the next section, we proceed to explaining the research methodology applied in this paper.

### 3 Methodology

The research strategy of this study is a single, qualitative, descriptive (Yin, 1989) and intrinsic case study with inductive research design based on Yin (1994). This research philosophy is pragmatism in both ontology and epistemology (Saunders et al., 2009). The case study research strategy was selected to provide an analysis of the processes of partnering in an offshore drilling project and hence contribute to building the RBP taxonomy theory (Cassell and Symon, 2004). The case was selected as an outstanding NCS drilling project with good access to information suitable for demonstrating theory and for answering the initially tentative research question formulated in the introduction.

The research question was altered as the research matured, in accordance with Eisenhardt (1989). [Sentence on how RQ matured. ]The paper is based on literature research on partnering in construction and offshore drilling projects. Multiple data collection methods were used and qualitative data was retrieved from plans, reports and interviews, including reports and verifications by independent regulatory authorities. There has been an overlap between collection and analysis of data using flexible and opportunistic data collection methods.

Informants representing each of the involved parties have provided evaluations and verifications – seven through semi-structured interviews, three in e-mail correspondence and four in an

opportunistic dialogue. The interviews had an introduction on the aim to produce a paper on the case and without reference to the RBP framework. The opening question was: “What was your evaluation of the project?” Follow up questions sought to have the informants elaborate on the case project compared to ordinary NCS drilling projects, also without directly referring to any RBP element. Additionally, informants were asked for comments on how future drilling projects could learn from this case project. In the dialogues, the informants were informed of the purpose and asked to elaborate on their experience of the case, with follow-up questions.

After information gathering, the relevant notes and report quotes for each element of the RBP framework were extracted, followed by identification of RBP elements missing in the data. The analysis was interpretative, non-statistical and qualitative with the aim of illustrating the case by applying informants’ reflections to the RBP taxonomy. The RBP taxonomy rating for each element is an evaluation by the first author based on the information provided. Draft case context and results were sent to key informants for commenting and validation.

The case study approach builds strongly on the NCS context and the organizational structure; hence the findings have limited wider significance (Cassell and Symon, 2004).

The first author of this paper participated as Chief Financial Officer (CFO) in Pertra, project owner of the case study presented, in 2002-2005. The position as CFO provided first-hand access to inside information and a relation to stakeholders. With more than ten years since project execution, a distance to the project and stakeholders has evolved, allowing for critical assessment of the case. The first author acknowledges the probability of bias; however, the insights provided by membership of the management team from formation to sale of the company are vital for the rich case study provided. Trust that had been developed as a team member might have facilitated information which would not be given to an unfamiliar researcher in a one-off interview (Cassell and Symon, 2004).

During data collection from the case project, in addition to the first author, the following informants contributed:

**Table 1: Sources of information**

No .	Stakeholder	Informant’s Position / citation	Source	Contribution of empirical data
1	Pertra	VP – Drilling	Semi-structured interview and comments on draft results	Detailed project evaluation
2	Pertra	HSE Director	Semi-structured interview and comments on draft results	Ditto
3	Petoro	Technical Director	Semi-structured interview, by phone	Retrospective perception of the Varg Vest project from licence partner and industry
4	Talisman Energy	Drilling Engineer	Opportunistic dialogue by phone and e-mail correspondence	Licence and well documents. Industry’s retrospective perception of the Varg Vest project.
5	Insurance broker	Pertra insurance policy accountable	Semi-structured interview	Detailed facts on Pertra’s Varg Vest drilling insurance scheme and mutual risk sharing’s



				effect on NCS drilling insurance.
6	Halliburton	Contract Manager	Semi-structured interview, by phone, and comments on draft results	Detailed project evaluation
7	Halliburton	Vice President – Business development	E-mail correspondence	Halliburton’s evaluation of the project in general
8	Maersk Drilling	Vice President – Drilling operations	E-mail correspondence	Maersk’s evaluation of the project in general
9	Maersk Drilling	Former VP – Operations	Semi-structured interview and comments on draft results	Detailed project evaluation
10	Drilling efficiency consultancy	Managing Director	E-mail correspondence, Excel sheet comparing Pertra wells	Detailed technical evaluation of Varg Vest wells as compared to other Pertra wells.
11	DPT	Project Manager	Opportunistic dialogue, no comments after review of draft results	Detailed project evaluation
12	Det norske oljeselskap	Drilling Manager	Semi-structured interview	Detailed project evaluation (indirect experience) and comparison with other more recent drilling projects.
13	Det norske oljeselskap	Managing Director	Opportunistic dialogue	Headline evaluation of the project and comparison with partnering elements in other more recent drilling projects.
14	Statoil	Project Director	Opportunistic dialogue	General comments on partnering experiences at the NCS
15	Oil consultant	Project director	Comments on procurement strategy	Ditto
16	Norwegian Petroleum Directorate (NPD)	(Norwegian Petroleum Directorate, 2003)	Rig intake audit report	Authorities’ evaluation of rig intake process, hereunder participants’ roles, responsibilities, safety and consequences of incentive schemes, including catastrophe scenarios.
17	Production Licence 038		Well programme 15/12-A-6 A	Project organization, offshore organization, responsibilities, handling of conflicts in plans, procedures and regulations in non-conformance situations, operational instructions, list of contractors, risk matrix,

				contingency plan and technical details. 71 pages
18	Production Licence 038		Well programme 15/12-A-12 A	Ditto. 65 pages
19	Production Licence 038		Final Well Report 15/12-A-6 A	Section A: Geophysics, geology and reservoir evaluation, wellsite samples and log data. Section B: Drilling and well operations; list of contractors, operations organization chart, operation summary, HSE summary, drilling problems and recommendations (including communication and collaboration issues). 204 pages
20	Production Licence 038		Final Well Report 15/12-A-12 A	Ditto. 145 pages
21	Production Licence 038		Drilling Contract	Complete contract on deliveries, daily rate compensation, incentive terms, insurance, and conditions precedent.
22	Pertra	Available from brreg.no	Annual reports 2002 - 2004	Profit and loss statements, balance sheets, Board of Directors annual report
23	Production Licence 038 (PL038)	(Ministry of Petroleum and Energy, 1974)	Joint Operating Agreement	Governance (voting rules), liabilities, authorizations, operator's duties, partner's duties, economy, insurance within licence, and other joint venture regulations

Information was gathered from all stakeholders directly involved, in addition to independent third parties such as the drilling efficiency consultancy and NPD. Notes including date, place and duration of the focused dialogues and semi-structured interviews were taken. However, interviews were not recorded, to ensure that sensitive and business-critical issues related to the focal project could be openly discussed. The case project itself is described in the next section, where we start by outlining the context of the project.

## 4 Case study

### 4.1 The context of NCS drilling projects and offshore drilling project characteristics

Petroleum activities are subject to Norway's Petroleum Act and specified in regulations and guidelines. The petroleum regulations are risk-based, and emphasize principles for reducing health, safety and environmental (HSE) risk, hence also how risks may be shared. The responsible party pursuant to these regulations is the operator and others participating in operations. The responsible

party must ensure compliance with the requirements, largely formulated as performance-based (functional) requirements through characteristics or qualities that an activity must possess. The guidelines to the regulations provide recommended solutions for fulfilling the specific requirements. These usually take the form of recognized norms or industry standards. When a recommended solution is applied, the requirement can be regarded as met. Should an alternative solution be chosen, it must be possible to document that the requirement has been fulfilled as well as or better than with the recommended option. This influences the ability for innovation in a partnering project. All action should be thoroughly planned and evaluated, and any pragmatic change of plans due to learning in action is a limited option with respect to regulations (Petroleum Safety Authority Norway).

NCS development drilling projects averaged NOK 44 billion per year in 2010-2014, peaking in 2013 at NOK 55 billion (Statistics Norway, 2015). During 2010-2014, 712 development wells were completed at an average cost of NOK 309m per wellbore. These include initial drillings, side-tracks and multi-lateral wells (Norwegian Petroleum Directorate, 2015a).

NCS production well costs for fixed installations have quadrupled in ten years and well costs for mobile installations have tripled in ten years. In the past 20 years, the duration of routine operations has doubled and drilling efficiency is key to future value creation (Petoro, 2014).

Norwegian average daily production as at January 2016 is about 2m barrels of liquids (oil, natural gas liquids and condensate). This is about 2.1% of total world production. Total daily NCS production of gas for sale as at July 2015 is 0.36 billion Sm<sup>3</sup> or 10% more than the liquids when measured in oil equivalents. The 2015 NCS production of 117 billion Sm<sup>3</sup> gas for sale was about 27% of European 2015e gas consumption of 441 billion Sm<sup>3</sup> gas according to Eurogas.org. Statoil accounts for 30% of NCS petroleum production. (Sources: NPD.no, DNB.no, Eurogas.org and Statoil.com)

Offshore development projects are capital-intensive, using advanced technologies with great technological complexity and many interdependencies. There is managerial complexity with 25-50 participants, including the drilling rig owner, drilling service companies, supply vessel operators, helicopter services and others on the supply side. Normally two to six concessionaires (oil companies with an awarded or acquired concession to produce petroleum) are represented by one operator on the client side in addition to authorities and other external stakeholders. There may be multiple locations and a number of time zones. Thus, offshore drilling projects are global and complex (Yusuf et al., 2012, Badiru and Osisanya, 2013).

NCS concessions are organized as joint ventures of at least two oil companies. This practice is supported by Beshears (2013), who measured that a corporate alliance combining its information and expertise was relatively more profitable than solo firm leases in the Gulf of Mexico drilling operations. The concessions follow EU regulations on procurement including invitation to tender or competitive dialogue procedures (Arrowsmith and Treumer, 2012).

The concessionaires submit a drilling plan to the authorities as a basis for approval. An impact assessment report is sent to all those who may be affected by the project to provide them an opportunity to put forward their views. Hence, the authorities have a coordinating role towards stakeholders external to the drilling project (NPD).

Operators are compensated by the partners for their work in the licence. Partners, however, normally cover their own expenses for fulfilling their obligation to verify operator's compliance.

## 4.2 Case context

The Varg Field is located in Production Licence 038 (PL038) in the Norwegian North Sea. Pertra, as one of the newcomers on the NCS, acquired a 70% operated working interest in the field at a cash consideration of USD 1 with state-owned Petoro as partner in the production licence. The Varg field was doomed for shutdown already approved by the authorities. The field had low priority from the sellers, receiving little attention and resources as production declined.

Plug and abandonment liabilities of approx. USD 30m followed the acquisition. Hence, Pertra was highly motivated to prolong the field life by postponing production shutdown. New high-end seismic data was acquired (Reksnes et al., 2002) providing a significantly improved illumination of the reservoir. A new interpretation of data was performed and matured into a new understanding of field properties. Pertra, PGS Production and PGS Reservoir, all core participants, were all 100% subsidiaries of PGS ASA, which had filed for Chapter 11 (US procedure for protection of creditors) in mid-2003.

During 2003 and 2004, Pertra managed six development well operations, all with drilling rigs provided by Maersk, a drilling rig owner and operator. Two wells in the Varg Vest compartment were drilled in an incentive-based partnering project proving 40m barrels of oil reserves and extending the field life to July 2016. By early 2005, Pertra had been sold to Talisman Energy. The collaborative advantage developed was not utilized in new projects. The Varg Vest production accounted for the majority of the company value of USD 175m.

The objective of the case project was to extend production at Varg. The goals were to:

- Prove hydrocarbons in the Varg Vest segment (well 1)
- Complete well 1 as an oil producer
- Drill and complete well 2 as an oil producer
- Maximize the Varg oil production

The goals included both exploration risk and a goal to maximize total production. This was the first occurrence of a production tariff incentive between an oil company and drilling service contactors.

## 4.3 Participants of the Varg Vest project

The PL038 was operated by Pertra and state-owned Petoro as the licence partner. All licence decisions required a unanimous vote. Pertra invoiced the licence for all services provided. Petoro covered their expenses for monitoring the licence activity unless specifically approved by the licence management committee.

Pertra was a new operator on the NCS with only five employees by year-end 2003. PGS Production provided a floating production, storage and off-loading vessel (FPSO) on the Varg Field on contract with PL038. The compensation was as a tariff per barrel produced. Pertra's effort to postpone field shutdown helped PGS Production to avoid stacking of the FPSO. PGS Production also provided procurement and accounting services in addition to emergency response facilities and other operational services. PGS Reservoir provided geology and geophysical services, including reservoir and production analysis. Drilling Production Technology (DPT) had the function of Pertra's drilling department. In operational mode Pertra employed 25 full-time employees in total, directly and indirectly, none of them working offshore.

Maersk Drilling provided the operated drilling rig including rig positioning, anchoring and casing running services. Services provided by Halliburton included the full range of drilling services including services provided by sub-contractors.

Halliburton, Maersk and PGS Production shared pain and gain with the Production Licence. NPD granted a drilling permit after application from the production licence and coordinated information to and comments from external stakeholders. NPD also performed an audit of the rig intake process with semi-structured interviews of Petra, Halliburton and Maersk management.

The project lasted approximately nine months and the tariff period another nine months. Both wells were completed on time. The project had no lost-time, reported or acute emission incidents (final well reports). Based on insights from this case project, the next chapter will discuss it in light of the RBP taxonomy.

## 5 Results

### 5.1 Evaluations based on the RBP taxonomy framework

In this section, we analyse the case project using the RBP taxonomy. For each taxonomy element, we first list a brief explanation of each element and the suggested translation into a five-point Likert scale (both in italics) directly cited from Walker and Lloyd-Walker (2015). These are followed by insights from the case project and a quantitative rating of the extent to which the element was implemented in the case project.

#### **Platform Foundational Facilities, RBP Taxonomy Element 1 - Motivation and Context of the Circumstances**

*This element defines circumstances that affect the potential degree of possible collaboration.*

*Low levels - relate to a hostile collaboration environment.*

*High levels - relate to project participants accepting the logic of a clear advantage of adopting a focus on a supportive and collaborative approach to delivering benefits that align with participants' values.*

Petra had an ambition to work more efficiently than the well-established major oil companies did. Based on an outsourcing strategy, Petra had five employees and only one director as the drilling department. Drilling planning was outsourced to newly established Drilling Performance Technology (DPT), and there were frame contracts for resources from sister companies PGS Production and PGS Reservoir.

Petra was making sufficient money to fund two new wells at budget cost. However, the Board of Directors approved cash commitment for one well only as a reasonable precaution against possible cost overruns. Petra management wanted to drill two wells also to mitigate risks of failure due to technical or reservoir malfunction. The partnering approach was key to ordering two wells rather than one.

The other participants had varying motivation for the partnering approach. A top management member of Halliburton, the drilling and well services provider, had earlier promoted partnering (Gazi et al., 1995). The Petra wells provided an opportunity to demonstrate their capabilities and the benefits of partnering. Maersk was more reluctant about the partnering approach. "As I recall, we

saw the contracting approach to be a deal enabler. If we were to conclude this contract and secure the work for the Mærsk Giant then it would have to be on the described terms” (informant 9). During the project, the rig company only partly adapted the traditional relationship to a shared collaborative culture without regard to organizational boundaries. The drilling management consultant DPT was motivated to demonstrate their ability to be an outsourced drilling department for smaller oil companies.

A project where service companies to a limited degree shared reservoir risks with the oil company was an entirely new arrangement on the NCS (Osmundsen et al., 2009). Participants were unfamiliar with the arrangement and considerable effort was made to evaluate contractual scenarios.

Element 1 rating = 3.5

#### **Platform Foundational Facilities, RBP Taxonomy Element 2 - Joint Governance Structure.**

*The unified way that each project delivery team party legitimizes its actions through rules, standards and norms, values and coordination mechanisms such as organizational routines, and how committees, liaison and hierarchy represent a unified or complementary way of interacting.*

*Low - relates to a laissez-faire approach where each participating project team has established its own individual stand-alone project governance standards. Little coherence in alignment of the whole project delivery organizational processes and structure with few explicit expectations about what success looks like and how to define and measure it.*

*High - relates to an effectively structured, uniform, integrated and consistent set of performance standards that apply across and within the project delivery teams. All participant organizations share a common understanding of how to organize for success and what constitutes valuable project output and outcome success.*

Under the authorities’ regulations, Pertra as the licence operator was fully responsible for the project. Together with partner Petoro, Pertra had the power and authority to make final decisions. The Pertra management system manual and drilling procedure was the basis for the project.

Halliburton, Maersk and DPT were encouraged to influence decisions, but had no formal influence in the project. NPD observed that DPT functioned as a drilling department for Pertra as the contracts between Pertra and Maersk and between Pertra and Halliburton were managed by DPT. Distribution of responsibility was perceived somewhat differently by the parties, with Pertra on one side and DPT, Maersk and Halliburton on the other side (Norwegian Petroleum Directorate, 2003). Maersk and Halliburton were somewhat more uncertain about what authority they had and sought to have decisions approved by Pertra, although DPT had in principle been granted unlimited authority to make decisions on behalf of Pertra. In any emergency situation, however, there was no doubt by Maersk and DPT of their unlimited authority (Norwegian Petroleum Directorate, 2003).

“Responsibility and authority shall be unambiguously defined and coordinated at all times” (Petroleum Safety Authority Norway, 2014). This is the reasoning behind the hierarchical project and offshore organizations (Well Programmes).

The central participant organizations shared the understanding of how to organize for success and what constitutes valuable project output and outcome success. Several team-building sessions established this understanding and joint governance structures were not formalized.

Element 2 Rating = 3

### **Platform Foundational Facilities, RBP Taxonomy Element 3 - Integrated Risk Mitigation Strategy.**

*The way strategy is organized for all parties to be part of the client's risk management system. This impacts explicit understanding of how to collaboratively manage risk and uncertainty and gain advantage from a project-wide insurance policy.*

*Low - an immature and confused individual firm-specific risk management approach and poorly defined systemic approaches to deal with uncertainty and ambiguity.*

*High - consistent and integrated risk assessment processes being identified, assessed and mitigated against a project-wide, systems-wide impact for the project or network.*

In the drilling plans, one risk matrix for the whole project was delivered for HSE authorities' consent. The risk matrix was a result of a collaborative process and covered technical risks only. Each participant organization also had a matrix of economic risks. Each participant organization had its own insurance policy, and a project-wide insurance policy was never discussed as an option.

Element 3 Rating = 2

### **Platform Foundational Facilities, RBP Taxonomy Element 4 - Joint Communication Strategy.**

*System integrated processes and extent of common information communication technology (ICT) groupware use including building information modelling (BIM). (Here translated to Drilling Information Modelling as a process involving the generation and management of digital representations of physical and functional characteristics of a well).*

*Low - poor quality staff interaction, use of firm-specific rather than project-wide processes and ICT systems and weak cross-team mechanisms for gaining mutual understanding.*

*High - well integrated processes that are well understood by all participants and advanced communication technologies being used that seamlessly connect all project parties.*

Standard communication technologies were used. Because the project only lasted some nine months, specific project e-mail addresses were not required. Project personnel initially preferred communication by phone or e-mail. Video meeting facilities were available and occasionally used. Projectplace.com, which in its early days offered basic project management tools for sharing of documents, was introduced during the project (Informant 1).

During drilling, live data were transmitted to Pertra, PGS Reservoir and DPT. In case a situation occurred, in principle all participant organizations had access to the same information. Systems integration was aligned to allow transfer of information and interoperability including drilling information modelling. Team integration relied on team-building kick-offs, personal relationships and standards of professionalism (Informant 1).

An effort was made to make electronic communication work as "it took a hardworking and experienced IT person (from PGS Production) with many useful contacts in many places about 8 days to make the phone and data communication networks functional" (final well report).

"The organisation of Pertra, the rig contractor and the drilling services contractor are very coordinated and the interviews revealed few divergences" (Norwegian Petroleum Directorate, 2003).

Element 4 Rating = 3

### **Platform Foundational Facilities, RBP Taxonomy Element 5 - Substantial Co-location.**

*The extent that project teams are within easy physical reach of each other. This facilitates ad hoc encounters to improve building relationships and facilitating common understanding.*

*Low - firm-specific policy determining that disparate teams are physically located in dispersed locations. A large visibility gap exists between project leaders and those at the 'coal face'.*

*High - project-wide policy that attempts to maximize participant co-location on-site where feasible including the Project Owner Representative with high interaction between project leadership groups and the project management and physical delivery team members.*

The project was managed from six-seven locations over five time zones. There was no substantial co-location other than during team-building and project meetings. The lack of co-location was not perceived as a hindrance for communication in the project (informant 11). The low power distance and flat organization of Pertra did not compensate for the lack of substantial co-location.

Element 5 Rating = 2

**Behavioural factors; RBP Taxonomy Element 6 - Authentic Leadership.**

*Possessing ethically principled values and consistency of action with espoused rhetoric. This applies across the project delivery team at every level not only for the project lead person(s) but also for the supporting design and supply chain team leaders. Typically, authentic leadership comprises reflectiveness, pragmatism, appreciativeness, resilience, wisdom, spirit and authenticity.*

*Low - espoused principled values are not demonstrated in action, manifested through a gap between the rhetoric and the reality of leading teams.*

*High - demonstrate consistency in espoused and enacted values that are genuinely principled.*

Pertra's top management was directly involved in the project with full consistency between rhetoric and reality of leading teams.

The project attracted a high level of top management attention in all involved organizations. Top management attention made the client believe in receiving the best team and equipment from incentivized contractors. However, service personnel with limited experience were reported in a final well report: "All service hands should have a minimum of 5 years of experience. A trainee should go together with a senior hand to gain experience". Service personnel from companies not included in the incentive scheme were involved in these minor incidents.

"The interviews revealed positive feedback from all involved parties that this was efficient, good management focus and clear ownerships to elements in the rig intake process on both sides" (Norwegian Petroleum Directorate, 2003).

Although this project was a partnering project during the planning phase, all doubt of authority was set aside during the operational phase: "All activities shall be conducted according to Pertra's requirements and guidelines. Non-conformance with Pertra and NPD's requirements shall be handled according to Pertra's non-conformance procedure. Non-conformance with Customer's requirements shall be agreed upon and approved by the Customer in writing. In case of conflicts between this program and the Pertra's Requirements, this program shall prevail when requirements are listed as approved non-conformances" (Well programme)

Element 6 Rating = 3



#### **Behavioural factors; RBP Taxonomy Element 7 – Trust Control Balance.**

*Representing and protecting the interests of project leaders with that of other genuinely relevant stakeholders while relying on the integrity, benevolence and ability of all project team parties to 'do the right thing'.*

*Low - extreme naivety by participants about trusting others implicitly or alternatively by exhibiting high levels of suspicion and/or unreasonable demands for formal and informal control and monitoring that implies a cynical attitude towards trust of others.*

*High - innate sensibility to juggle transparency and accountability demands with the need for trust with necessary due diligence. It also demonstrates a professional understanding of the nature of project participant accountability constraints and opportunities for resolving and possible helping resolve institutional paradoxes so that accountability is consistent with accepted responsibility.*

Trust on a personal level was established prior to the project (informants 1 and 6). In addition, as top management was directly involved, there was an understanding that any unforeseen problems could be resolved (Informant 6). However, standard litigation clauses applied (Drilling contract and Informant 6).

Element 7 Rating = 3

#### **Behavioural factors; RBP Taxonomy Element 8 – Commitment to be innovative**

*Being within a structured mechanism that enables and empowers people to be innovative. Facilitating a project team participants' capacity for learning, reflection, creativity being ambidextrous and the organization's core values of supporting and rewarding questioning the status quo.*

*Low – inadequate or incomplete linkage of motivation, ability and facilitation for innovation within the context of the procurement form.*

*High – vision, objectives and desire to be innovative with well-considered instruments to measure and demonstrate innovation, motivation through rewards and incentives and demonstrated high levels of existing absorptive capacity for innovation.*

The project allowed Halliburton to test and demonstrate new technology although no new inventions were patented (Bybee, 2004).

As Halliburton had a significant tariff payment at risk, Petra allowed use of a new directional drilling tool. There were only three available tools of this kind world-wide. Big oil companies with huge projects found it extraordinary that Petra as a minor newcomer had access to such a tool (Informant 14).

New well completion technology with oriented perforations as a sand-control method (Tronvoll et al., 2004) was also perceived as an advantage made available due to the incentive payment (Informant 1).

Element 8 Rating = 5

#### **Behavioural factors; RBP Taxonomy Element 9 – Common Best-for-Project Mindset and Culture**

*Focus on value generated in delivering the project compared with objectives of delivering what was explicitly requested or demanded being directed at a positive and successful project outcome rather than individual teams being winners or losers.*

*Low – higher level of priority for individual benefit realization at the potential expense of other project team members and the project owner.*

*High – a genuine attitude that ‘we all sink-or-swim together’ and a focus on maximizing value to the project or network. Contractual arrangements will reinforce pooled gain or pain based on performance measured by Key Result Areas and Key Performance Indicators.*

This procurement strategy, new on the NCS, provided a long-awaited opportunity for the oil service companies to demonstrate their full competence and capability. This was the main driver for a best-for-project focus that was stronger than in traditional projects (Informant 6).

Additional resources and new technology were made available (informant 2). Participant organizations accepted the incentive payment structure and paved the way for two rather than one well.

Element 9 Rating = 3.5

#### **Behavioural factors; RBP Taxonomy Element 10 – No-Blame Culture**

*Teams welcome being accountable for problems as they arise rather than shirking or shifting responsibility to others who may be vulnerable to being blamed for potential failure. Discussing problems in an unprejudiced way and being open to alternative perspectives to see issues from multiple perspectives.*

*Low – a project participant’s high propensity to shift blame from themselves to others. These problems may be attributable to them for unforeseen, unanticipated or unwanted events that impact adversely upon project delivery. A low no-blame culture is also palpable by a tendency to avoid acknowledging potential problem situations in the hope that blame can be attributed to others.*

*High – a culture of open discussion of problems, unforeseen, unanticipated or unwanted events that may impact adversely upon project delivery. It is may also be manifested by the project owner taking ownership of risk elements that other participants are unable to bear rather than force them to accept accountability for such risks.*

There was a mindset that every participant contributed with their best efforts. However, contractually standard litigation and responsibility clauses applied. Project risks were allocated adequately, where each participant was capable of taking on their proportion of the risk. In a catastrophe scenario, PL038 had the full responsibility and insurance coverage for 3rd party liabilities, re-drilling and clean-up.

In practice, no-blame initiatives were not formally implemented. Informant 1 however expressed an attitude that one should not find the culprit, but rather find the solution and how to prevent a recurrence. “This is an attitude one cannot write down in a procedure, but will gradually be perceived as real by the participants in the project through it being demonstrated every time you have trouble” (informant 1).

RBP Element 10 Rating = 4

#### **Processes; RBP Taxonomy Element 11 – Consensus Decision Making**

*The extent to which there is total agreement on a decision made at the project strategic and project operational executive level. This requires extensive time for discussion, exploration and testing mental models and this may be contrasted with the interests of speedy decisions and action to counter crises.*

*Low – highly hierarchical project team leaders' leadership style where power and influence determine how decisions are made and where the expected response is that decisions are implemented without question or complaint with a tendency for a domination of top-down directives being issued as edicts.*

*High – highly egalitarian and collaborative project team leadership style. Issues and problems requiring a decision develop out of inclusive knowledge sharing and discussion of perspectives, expected intended and unintended consequences and implications of decisions. High levels of feedback, good or bad, are sought.*

The service companies had an influence over the location and completion of the wells. "This was a very important element to facilitate good results and gave participants confidence to say what they thought and it was fun to work for Pertra" (Informant 1) See also element 2 on governance structure above.

Element 11 Rating = 3

#### **Processes; RBP Taxonomy Element 12 – Incentive Arrangements**

*The structure of a pain sharing-gain sharing agreement, how the process was instigated and how it operated to create an incentive to excel.*

*Low – little emphasis placed upon encouraging parties to place potential profit and gain-pain in a risk-reward arrangement subject to a whole-of-project outcome performance. KRAs and KPIs are absent or rudimentary.*

*High – much emphasis placed upon encouraging parties to agree to place potential profit and gain-pain in a risk- reward arrangement that is subject to a whole-of-project outcome performance. Key Result Areas and Key Performance Areas are well developed, provide stretch and challenge and are sophisticated in their understanding of the project context.*

"The rig contract includes strong incentives to deliver good quality wells, and at the same time good safety and progress. The payment structure was very different from other drilling contracts on the NCS" (Norwegian Petroleum Directorate, 2003).

The main compensation elements were a lump-sum at start-up of operations, a very low daily rate and a tariff per produced barrel of the whole field from completion of the first well until year-end 2004 (Norwegian Petroleum Directorate, 2003). An audit revealed that this incentive did not have negative effects on safety and quality (Norwegian Petroleum Directorate, 2003).

Maersk and Halliburton got approximately 50% of total compensation as a tariff per barrel produced. The payment structure was strongly linked to Pertra's objectives and shared with the contractors. "We also introduced incentives for DPT and Halliburton sharing pain and gain based on drilling downtime. This gave the participants a strong incentive to plan thoroughly, supplying quality equipment and carry out the operation flawlessly" (informant 1).

None of the involved parties foresaw any problems with the incentive structure (Norwegian Petroleum Directorate, 2003). NPD advised the parties to systematically analyse consequences of the

incentive mechanism in unexpected scenarios like accidents, bankruptcy, mergers, or if the Petroleum Safety Authority issued notification of order to one party.

DPT and PGS Reservoir were not included in the tariff incentive structure and compensated by lump-sum and hourly rate respectively. They would have like to be included in the tariff incentive as they represented a core competence for the project (Informant 11). DPT had the drilling competence and PGS Reservoir had the required reservoir competence. By including these in the incentive scheme, the partnering taxonomy rating would be increased to the full score.

Element 13 Rating = 4

#### **Processes; RBP Taxonomy Element 13 – Focus on Learning and Continuous Improvement**

*Providing a compelling projects-as-learning value proposition and the practice of transforming learning opportunities into continuous improvement.*

*Low – actors within collaborative arrangements and a network delivering a project being blind to and failing to grasp the potential competitive advantage of applying presented learning opportunities.*

*High – actors within collaborative arrangements and a network delivering a project being alert and aware of opportunities for improvement and being successful in grasping competitive advantage through effectively harvesting lessons learned.*

Continuous improvement is a core principle for NCS operations and regulated in management system procedures. “The responsible party shall ensure that the management of health, safety and the environment comprises the activities, resources, processes and organisation necessary to ensure prudent activities and continuous improvement” (Petroleum Safety Authority Norway, 2014).

Although there is little learning within the project timeline, the following project may benefit from lessons learned from the previous project. The final well reports of the two wells list 74 problems that occurred, the cause, the solution and recommendations for following projects. Drilling data were also shared with other operators worldwide via the IHS Rushmore database.

These initiatives predominantly follow regulatory requirements rather than the partnering approach.

Element 12 Rating = 3

#### **Processes; RBP Taxonomy Element 14 – Pragmatic Learning-in-Action**

*Value through teams collaborating with the strategic aim to gain competitive advantage through collective opportunities to learn and adapt. Team leaders and members seeing the project as a learning experience with acceptance that both experimental success and failure require discussion and analysis. Often unexpected opportunities arise out of failed experiments through assumptions being re-framed that lead to promising benefits in other contexts.*

*Low – actors within a network delivering a project to fail to translate learning opportunities into actual benefits and competitive action. Failed experiments are punished.*

*High – actors within a network delivering a project capitalizing on learning opportunities to achieve competitive action. This can be also assessed by the weight that these actors place on the value of experimentation as a way to see issues and solutions in a new light. Failed*

*experiments are valued for their intellectual stimulation in discovering for example, a better understanding of cause-effect loops.*

Offshore drilling projects do not allow for experiments and follow plans, or contingency plans, during operations. Experiments are allowed only when properly evaluated, planned and approved in accordance with procedures (Informant 1).

The planning process however, experimented with a drilling application with a significantly reduced amount of documentation attached. NPD responded positively on the to-the-point application without any excess documentation (Informant 1). The drilling plan was later sent to another operator as an example to be followed on NPD's recommendation.

Element 14 Rating = 4

**Processes; RBP Taxonomy Element 15 – Transparency and Open Book Processes, Routines and Practices**

*Project participants agree to be audited and fully open to scrutiny. Actors within the project network would have confidence that they can trust those inspecting their books not to take advantage of that access and information.*

*People doing the audits, due diligence and inspections must be capable and effective enough to understand the implication of what they inspect. Total transparency and accountability is necessary where the project is undertaken on a cost-plus basis where the project owner is funding all direct, administrative and management costs. The extent of transparency and accountability is a trade-off between the PO playing a 'hands-on' or 'hands-off' role.*

*Low – intensely protects the security of organizations and individuals to gain access to information about cost structures or the basis of project plans. It seeks to hide both good and bad news but this often results in mistrust that undermines collaboration and opportunities for constructive change.*

*High – presents opportunities for generating trust by clients and other parties that may access that information. It is a confronting notion that many organizations cannot face. It requires the project owner's authorized probity auditors to have free access to their financial books. Thus, confidence in ethical and legal business conduct is necessary to accept this challenge.*

A joint and several liability in the licence agreement reduced financial risks with state-owned and solid Petoro as partner. This right for suppliers to get payment from Petoro in case of an insolvency situation in Pertra practically eliminated the need for suppliers to review Pertra's financial capacity.

Halliburton and Maersk had access to inspect Pertra's financial capacity. Pertra trusted that the information provided was not abused. The economics of the field was uncomplicated with leased production facilities. Although the oil price to be achieved was not hedged at the time, the financial capacity was dependent on production volume and hence a technical evaluation of reservoir properties.

For Pertra, however, there was no open-book for evaluation of Maersk and Halliburton's profit on this project as compared to other similar projects. Pertra evaluated the suppliers' prices only on experience from other similar wells and perception of market situation.

Element 15 Rating = 2

### **Processes; RBP Taxonomy Element 16 – Mutual dependence and accountability**

*Collaboration in projects requires participants to not only recognize their inter-dependency but to also honestly respond to a sink-or-swim-together workplace culture. Governance systems support and enhance or alternatively they may inhibit individual team responsibility and accountability approaches to cross-team collaboration*

*Low – an inability or lack of desire to acknowledge the potential value of team inter-dependence and accountability. Participants follow individualistic paths, possibly at the expense of others, and/or do not support a sink-or-swim-together workplace culture or they actively undermine that culture.*

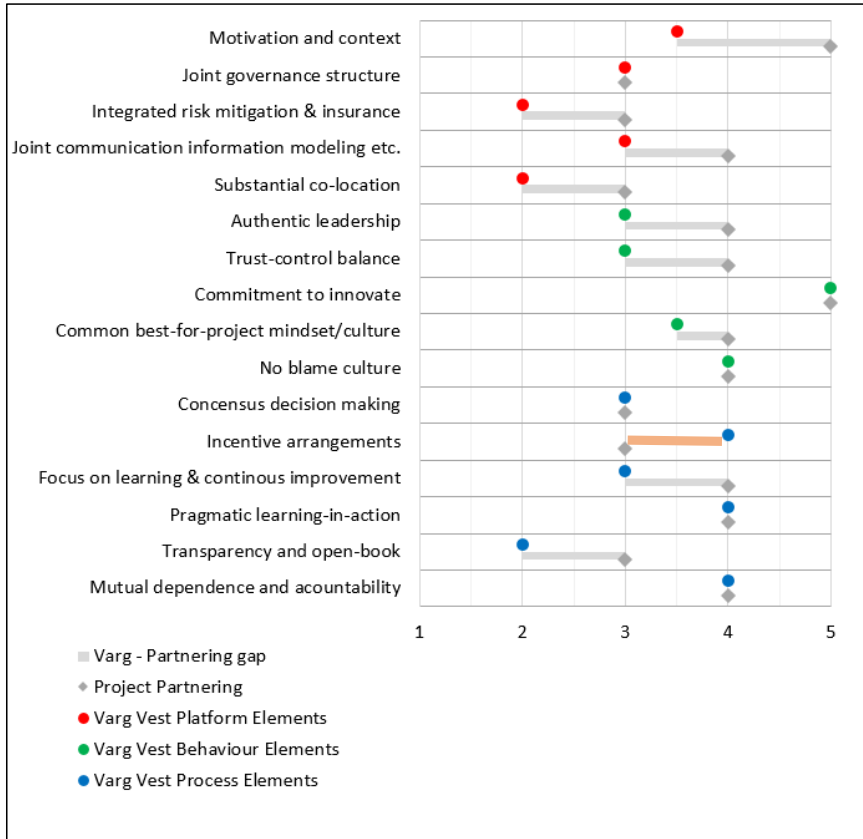
*High – an ability and keen desire to acknowledge team inter-dependence and accountability in ways that build inter-team trust and commitment through actively enhancing a sink-or-swim-together workplace culture and to actively counter any actions that may inhibit this culture.*

All the project participants had compatible competence and were not able to deliver the project without participation of the others. Information and collaboration were required to and from all parties in order to make both project and each participant succeed. Hence, high team interdependence derived from the specialized participants. Additionally, the project was perceived as a reference project, causing all to be in a swim-together condition.

Element 16 Rating = 4

#### **Visualization**

To visualize the partnering approach applied, the RBP taxonomy was slightly modified. Walker and Lloyd-Walker used a spider diagram with one colour legend for each case. We utilized a spider diagram visualizing the score of each element in the three categories; platform, behaviour and process. In Figure 1, colours are used to highlight the platform, behaviour and process elements for comparison with the project partnering taxonomy as indicated by Walker and Lloyd-Walker (2015). In the case studied in this paper, no individual ratings exceed the earlier findings of Walker and Lloyd-Walker (2015), indicating that partnering practice may be less mature in the observed context than in the Australian construction sector studied by Walker and Lloyd-Walker.



**Figure 1: RBP Taxonomy for visualization of the offshore drilling case project.**

The Platform Foundational Facilities marked in red show lower ratings as compared to Walker and Lloyd-Walker (2015), on the motivation, integrated risk mitigation, joint communication and co-location elements. As compared to Walker and Lloyd-Walker (2015), the observed project goals were somewhat less aligned. In addition, a lack of project-wide insurance arrangements was observed. Forcing the actors to co-locate may have facilitated internal project communication, although this was not emphasized by our informants.

Behavioural factors (green) are also consistently lower than Walker and Lloyd-Walker’s findings (2015). In particular, we observed fairly low values in the authentic leadership, trust-control balance and no-blame culture. The commitment-to-innovate element is on level with a partnering project as indicated by Walker and Lloyd-Walker (2015).

The processes (blue) visualize a rating on alliancing level on incentive arrangements, although a very low rating for the transparency and open-book element. All other elements follow the indications of a partnering project as indicated by Walker and Lloyd-Walker (2015).

As a whole, and even though our empirical investigation is limited to a single case, our observations imply that the maturity level for project partnering is lower, and clearly lower than Project Alliancing,

in NCS drilling projects that Australian construction projects. In particular, it appears that NCS drilling projects have ample room for development in platform and behavioural elements.

## 6 Discussion and Conclusions

While earlier studies, (e.g. Barlow (2000), Robson (2004) and Green (2003)) have discussed partnering practices in the offshore industry, the present study, relying on the RBP framework, provides a multi-dimensional and systematic description of partnering practices in offshore drilling. As such, the findings of this study provide a holistic overview of the maturity of partnering practices in the observed context. In addition to elements where partnering practices were quite developed such as use of incentive arrangements and high commitment to innovate (Reiley, 1994, Garcia et al., 2014), the present study also revealed elements where approaches were observed to be less partnering-oriented. Examples of such elements include lack of transparency and open-book auditing, lack of integrated risk mitigation and risk insurance practices, and lack of authentic leadership. Identification of the elements may be particularly valuable for further development of partnering practices in the industry studied.

While the development of RBP framework is predominantly based on research carried out in the construction industry (Walker and Lloyd-Walker, 2015), we observed that the taxonomy can also be applied to improve understanding, implementation and measurement of partnering in oil and gas. The framework adds more detail to partnering as previously recognized in oil and gas (Kemp and Stephen, 1998, Halman and Braks, 1999, Scott, 2001, Bresnen and Marshall, 2000, Robson, 2004). The RBP framework provides an improved classification of each particular partnering case. Through rating of the partnering elements, a more meaningful measurement of the outcome of each level of partnering evolves. This may in turn open the door for implementation of RBP taxonomy in other industries.

While the application of the RBP taxonomy to an offshore drilling project was mostly a straightforward process, we also encountered difficulties in collecting rich information for some of the 16 elements. Furthermore, some elements in the framework such as pragmatic learning in action, focus on learning and continuous improvement and commitment to innovate and joint governance structure, authentic leadership and consensus decision-making were found to be slightly overlapping although spread over platform, behaviour and process elements. Research literature on partnering in drilling projects has previously not quantified the level of partnering applied in a project, even when measuring the outcome of a partnering project (Gazi et al., 1995, Robson, 2004, Kalsaas, 2013). Further research and refining in this field may contribute further to the understanding of planning, implementation and evaluation of partnering. This case study alone does not provide sufficient documentation to modify the RBP framework for special use in offshore drilling projects. However, one potential avenue for further development of the framework would be the systematic identification and removal of overlap between the 16 elements.

The possibilities for partnering were found to be partially context-dependent as well, since the NCS regulations (Petroleum Safety Authority Norway, 2015) influence how and to which extent risks may be shared and who is the responsible party obliged to ensure compliance with regulations. All action should be thoroughly planned and evaluated, and any pragmatic change of plans due to learning in action is not an option with regard to regulations. The regulations also demand focus on learning and continuous improvement. However, joint governance structure or consensus decision-making leading to any doubt of ultimate responsibility is not in accordance with regulations. Finally, the



structure between concessionaires within the production licence (Ministry of Petroleum and Energy, 1974) and service companies limits the possibility for a project-wide insurance and the accompanying high ambition for integrated risk mitigation. A systematic study and understanding of these kinds of contextual factors could help academics and practitioners understand to which extent partnering practices that are applicable in a specific legislation and industry context are transferable to another context.

The case study documents lower ratings for partnering elements in drilling projects, visualized in Figure 1 as the difference between the case ratings and the project partnering ratings as provided by Walker and Lloyd-Walker (2015).

Partnering is an active search for continuous measurable improvements (Yeung et al., 2012). RBP taxonomy operationalizes the qualitative description of partnering and makes it more tangible. Hence, the RBP taxonomy is an important contribution to evaluating prerequisites, components and goals of partnering in accordance with Nyström (2005).

The RBP framework can characterize partnering practices in offshore development drilling projects. Furthermore, we observed that partnering elements in the offshore industry context were rated consistently lower than partnering elements in the construction industry observed by Walker and Lloyd-Walker (2015). RBP framework. The RBP taxonomy elements provide a tool for planning and evaluating drilling projects where the project manager can evaluate the effect of adjusting each element and compare with other projects in a similar context.

## 7 References

- ARROWSMITH, S. & TREUMER, S. 2012. *Competitive dialogue in EU procurement*, Cambridge University Press.
- BADIRU, A. B. & OSISANYA, S. O. 2013. Characteristics of Oil and Gas Projects. *Project Management for the Oil and Gas Industry*. CRC Press.
- BARLOW, J., COHEN, M., JASHAPARA, A. & SIMPSON, Y. 1997. Towards positive partnering. Revealing the realities in the construction industry. Policy Press.
- BESHEARS, J. 2013. The performance of corporate alliances: Evidence from oil and gas drilling in the Gulf of Mexico. *Journal of Financial Economics*, 110, 324-346.
- BRESNEN, M. & MARSHALL, N. 2000. Partnering in construction: a critical review of issues, problems and dilemmas. *Construction Management and Economics*, 18, 229-237.
- BYBEE, K. 2004. Oriented Perforations as a Sand-Control Method. *Journal of Petroleum Technology*.
- BYGBALLE, L. E., JAHRE, M. & SWARD, A. 2010. Partnering relationships in construction: A literature review. *Journal of Purchasing and Supply Management*, 16, 239-253.
- CASSELL, C. & SYMON, G. 2004. *Essential guide to qualitative methods in organizational research*, London, Sage Publications.
- CHEN, G., ZHANG, G., XIE, Y.-M. & JIN, X.-H. 2012. Overview of alliancing research and practice in the construction industry. *Architectural Engineering and Design Management*, 8, 103-119.

- COLE, D. 2014. Meeting the challenge of increasing North Sea costs. *McKinsey Company, Oil & Gas Practice*.
- COMMONWEALTH OF AUSTRALIA 2015. National Alliance Contracting Guidelines - Guide to Alliance Contracting. *In: DEVELOPMENT, D. O. I. A. R. (ed.)*.
- CONSTRUCTION EXCELLENCE 2009. Collaborative Procurement Guide.
- CONSTRUCTION INDUSTRY INSTITUTE (CII) 1996. Model for Partnering Excellence, Research Summary 102-1.
- CONSTRUCTION TASK FORCE 1998. Rethinking Construction - The Egan report. London: Department of trade and industry.
- CRABTREE, E., JANE BOWER, D. & KEOGH, W. 1997. Conflict or collaboration: The changing nature of inter-firm relationships in the UK oil and gas industry. *Technology Analysis & Strategic Management*, 9, 179-192.
- CROWLEY, L. G. & KARIM, M. A. 1995. Conceptual model of partnering. *Journal of management in engineering*, 11, 33-39.
- EISENHARDT, K. 1989. Building theories from case-study research. *Acad. Manage. Rev.*, 14, 532-550.
- EUROPEAN CONSTRUCTION INSTITUTE (ECI) 1997. Partnering in the public sector. Loughborough.
- GARCIA, R., LESSARD, D. & SINGH, A. 2014. Strategic partnering in oil and gas: A capabilities perspective. *Energy Strategy Reviews*, 3, 21-29.
- GAZI, N. H., HOTTMAN, W. E., LOGAN, J. L. & VERRETT, R. C. Alliances and partnering. Proceedings of the 9th Middle East Oil Show & Conference. Part 2, March 11-14, 1995 Richardson, TX, United States. SPE, 199-207.
- GREEN, R. 2003. Measuring goodwill trust between groups of people: three years of an oil industry alliance. *Strategic Change*, 12, 367-379.
- HALMAN, J. I. M. & BRAKS, B. F. M. 1999. Project alliancing in the offshore industry. *International Journal of Project Management*, 17, 71-76.
- HONG, Y., CHAN, D. W. M., CHAN, A. P. C. & YEUNG, F. Y. 2012. Critical analysis of partnering research trend in construction journals. 28, 82-95.
- IBRAHIM, C. K. I., COSTELLO, S. B. & WILKINSON, S. 2015. Key indicators influencing the management of team integration in construction projects. *International Journal of Managing Projects in Business*, 8, 300.
- KAASEN, K. 2013. *Petroleum contracts*, Oslo, Universitetsforlaget.
- KALSAAS, B. T. 2013. Collaborative innovation: the decade that radically changed drilling performance. *Production Planning & Control*, 24, 265-275.
- KEMP, A. G. & STEPHEN, L. 1998. Risk:reward sharing contracts in the oil industry: the effects of bonus:penalty schemes. *Canadian Journal of Zoology*, 76, 111-120.
- KNOTT, T. 1996. *No Business as Usual: An Extraordinary North Sea Result*, London, The British Petroleum Company.
- LAHDENPERÄ, P. 2012. Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery. *Construction Management and Economics*, 30, 57-79.
- LARSON, E. 1997. Partnering on construction projects: A study of the relationship between partnering activities and project success. *Ieee Transactions on Engineering Management*, 44, 188-195.
- LATHAM, S. M. 1994. Constructing the team. HMSO.
- LAU, E. & ROWLINSON, S. 2010. Trust relations in the construction industry. *International Journal of Managing Projects in Business*, 3, 693-704.
- MCKENNA, N. 2006. *The micro-foundations of alignment among sponsors and contractors on large engineering projects*. phd, University of Western Australia.

- MCKINSEY 2014. The Future of the North Sea: Tackling the Challenges Facing our Industry. DEVEX.
- MEMON, S. A. & ROWLINSON, S. 2015. An Investigation into the Attitude and Relational Behaviour in Relationship Based Procurement (RBP): A conceptual Framework.
- MINISTRY OF PETROLEUM AND ENERGY 1974. Joint Operating Agreement PL038.
- MINISTRY OF PETROLEUM AND ENERGY 2003. Report no 38 to the Storting 2003-2004, White Paper on the Petroleum Activity. Oslo: Stortinget.
- MORWOOD, R., SCOTT, D., PITCHER, I. & AECOM, M. 2008. *Alliancing: A Participant's Guide: Real Life Experiences for Constructors, Designers, Facilitators and Clients*, Maunsell AECOM.
- NORSOK 1996. Integrated collaboration and incentive contracts. Oslo: NORSOK.
- NORWEGIAN PETROLEUM DIRECTORATE 2003. Audit of the rig hiring process for drilling of sidetrack well on Varg (in Norwegian: Tilsyn med intaksprosessen av rigg på Varg).
- NORWEGIAN PETROLEUM DIRECTORATE. 2015a. *Exploration and Development wellbores - ordered by the year drilling was completed* [Online]. Available: <http://factpages.npd.no/factpages/Default.aspx?culture=en> [Accessed 2015].
- NORWEGIAN PETROLEUM DIRECTORATE 2015b. The petroleum resources on the Norwegian continental shelf 2014. Stavanger.
- NYSTRÖM, J. 2005. The definition of partnering as a Wittgenstein family-resemblance concept. *Construction Management and Economics*, 23, 473-481.
- OSMUNDSEN, P. 2013. Contracts and Incentives Innovation in Norway's Offshore Sector. *International Journal of Economics and Management Engineering*, 3, 254-261.
- OSMUNDSEN, P., SORENES, T. & TOFT, A. 2009. Oil Service Contracts: New Incentive Schemes to Promote Drilling Efficiency. *SSRN Working Paper Series*.
- OSMUNDSEN, P., SØRENES, T. & TOFT, A. 2010. Offshore oil service contracts new incentive schemes to promote drilling efficiency. *Journal of Petroleum Science and Engineering*, 72, 220-228.
- PETORO. 2014. *Cost developments threaten the Norwegian shelf, SOL HSE Conference (in Norwegian)* [Online]. Stavanger. Available: <https://www.petoro.no/Kostnadsutviklingen%20truer%20norsk%20sokkel.pdf> [Accessed].
- PETROLEUM SAFETY AUTHORITY NORWAY 2014. The management regulations. In: PETROLEUM SAFETY AUTHORITY NORWAY (ed.).
- PETROLEUM SAFETY AUTHORITY NORWAY 2015. Regulations relating to health, safety and the environment in the petroleum activities. In: NORWEGIAN PETROLEUM DIRECTORATE (ed.).
- PRYKE, S. 2009. Introduction. *Construction Supply Chain Management*. Wiley-Blackwell.
- REILEY, R. H. 1994. Faster Technology Transfer Through Partnering. World Petroleum Congress.
- REKSNES, P. A., HAUGANE, E. & HEGNA, S. 2002. How PGS created a new image for the Varg Field. *First Break*, 20, 773-777.
- RIBESEN, B. T., SAASEN, A., HORVEI, K. A., MAGNUSSEN, T. & VEIBERG, T. 2011. Rig management structure optimizes drilling off Norway. *Oil and Gas Journal*, 109, 72-79.
- ROBSON, S. 2004. Alliancing and Partnerships: What We Have Learned and Where We Are Going. Society of Petroleum Engineers.
- ROWLINSON, S., JEFFERIES, M., MOHAMED, S., MOSCHNER, K., SIDWELL, T., CARPENTER, C., SARGENT, R., TESSIER, G., SPATHONIS, J., WALKER, D. &

- CHEUNG, F. 2002. A review of the Concepts and Definitions of the Various Forms of Relational Contracting.
- SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2009. *Research methods*.
- SCOTT, B. 2001. *Partnering in Europe: Incentive based alliancing for projects*, Thomas Telford.
- STATISTICS NORWAY. 2015. *Oil and gas activities, investments* [Online]. Available: <https://www.ssb.no/228497/accrued-investment-costs.extraction-of-crude-petroleum-and-natural-gas-and-transport-via-pipelines-by-cost-category.nok-million> [Accessed].
- TRONVOLL, J., EEK, A., LARSEN, I. & SANFILIPPO, F. 2004. The Effect of Oriented Perforations as a Sand Control Method: A Field Case Study from the Varg Field, North Sea. Society of Petroleum Engineers.
- WALKER, D. H. T. & LLOYD-WALKER, B. M. 2015. *Collaborative Project Procurement Arrangements*, PMI.
- WALKER, D. H. T. & RAHMANI, F. Collaborative Approaches to Deliver a Water Treatment Plant Project. IRNOP, 2015 London.
- WU, S. & UDEAJA, C. Developing a framework for measuring collaborative working and project performance. Proceedings of the Association of Researchers in Construction Management (ARCOM) International Conference, 2008.
- YEUNG, F. Y., CHAN, A. P. C. & CHAN, D. W. M. 2012. Defining relational contracting from the Wittgenstein family-resemblance philosophy. 30, 225-239.
- YEUNG, J. F. Y., CHAN, A. P. C., CHAN, D. W. M. & LI, L. K. 2007. Development of a partnering performance index (PPI) for construction projects in Hong Kong: a Delphi study. *Construction Management and Economics*, 25, 1219-1237.
- YIN, R. 1994. Discovering the future of the case-study method in evaluation research. *Eval. Pract.*, 15, 283-290.
- YUSUF, Y. Y., GUNASEKARAN, A., MUSA, A., DAUDA, M., EL-BERISHY, N. M. & CANG, S. 2012. A relational study of supply chain agility, competitiveness and business performance in the oil and gas industry. *International Journal of Production Economics*, 147, 531-543.