

PROCUREMENT STRATEGIES FOR THE OIL AND GAS INDUSTRY: CONVENTIONAL VERSUS INNOVATIVE APPROACHES

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ABSTRACT

During the period of high oil and gas prices in the late 70's and early 80's, the operators (Petronas, BP, Esso, Shell etc.) was focused on ways and means of high volumes of oil and gas from the rich and easily accessible sources. In their rush for early oil production, there was a tendency to use construction techniques and equipment that were on the market at that particular time. Because of limited financial resources early operators were more concerned with the capital cost of construction and equipment than running and operation with little attention given to long-term procurement strategies. This resulted in concern by the operators that some contractors had adopted a 'sell and forget' approach that resulted in a poor image of after-sales service. The operators were also facing the risk of plant and equipment failure, which could lead to a major operational shutdown and loss of production. This experience, together with the oil and gas price crash in 1986, led the operators to look at other innovative options in procurement approaches, which not only based on cost, time and quality but also shared risks and profit. Lessons on procurement, including Design and Build/ Engineering, Procurement and Construction, Partnering/Alliancing/Joint Ventures and Performance-Based contracts from other industries were tested but with mixed outcomes. This paper presents a review of current literature on the subject within the industry which will form the basis of further work.

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1. INTRODUCTION

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The construction industry encompasses many sectors, which includes building, civil, mechanical, electrical and heavy engineering. The oil and gas industry, however, places greater reliance on other specialist disciplines or sectors such as geology, maritime and drilling. The oil and gas industry is different in nature to construction industry although the

typical stages of a project are design, construction, operation, maintenance and decommissioning. For example, in the oil and gas industry, during the operation stage, focus would be on the actual production of oil and gas for profit as the main income stream, whereas, in the construction industry, the focus would be on how the completed project is being used to provide a service or product. When compare to construction, most projects in the oil and gas industry have:

- higher capital/investment cost;
- higher levels of uncertainty/risk due to the exploratory nature;
- higher technology and more heavy engineering work;
- increase spasmodic delivery/supply schedule;
- larger scale/magnitude of projects; and
- larger number of engineering disciplines from exploration to first oil and production to decommissioning.

The oil and gas exploration and production in developing countries is a highly risky business in a very complicated industry. It links government, owners of the natural resources with the operators, investors of private capital, technology and equipment necessary for resource development, in a single sector where the stakes and risks, as well as the possible profit margins, can be very high. The oil and gas industry has for some time become one of the main contributors to the rising Malaysian economy and an excellent source of foreign exchange revenue. Sidhu (2003) reported that Petroleum Nasional, (Petronas) the government backed oil and gas operator, have secured a production sharing contract worth RM10.41 billion (GBP 1.7 billion) according to their financial year report which ended 31 March, 2003. They have also managed to earn a sum of RM31.91 billion (GBP 5.2 billion) through oil, gas and petroleum products export in the year 2002 and forecast an increase in revenue for this year.

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Although there are new technological breakthroughs in exploration and production especially after the oil and gas price crash in the late 80's, there has been little development from the traditional to the latest approaches in procurement where most of the methods used were a carbon copy from other industries' experiences. According to Wright (1996), the main instruments in restructuring the industry has been technological improvement, cost reducing initiatives such as CRINE (Cost Reduction In the New Era) and revised procurement strategies such as alliancing/partnering and leasing.

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2. CURRENT PRACTICES IN THE OIL AND GAS INDUSTRY

In comparison to the construction industry, the oil and gas industry involves relatively few major players, i.e. project initiators (clients/owners) and implementers (contractors). However, the existence of few owners and few engineering/contracting organizations, in Pedwell's *et al.* (1998) opinion, has still created an environment in which a considerable number of formal and informal relationships are formed between parties. The quality of these relationship and mutual dependencies directly affects total project costs and the risks associated with the outcomes of formal contracts.

Pedwell *et al.* (1998) again reiterated that procurement methods or techniques may differ from one country or from one region to another, consequently this the lack of standard procedures for procurement in the oil and gas industry results in too few guidelines (or constraints) on the owner's selection of the procurement method to be used or contractor selected.

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2.1 Conventional Type

According to Pedwell *et al.* (1998) and Huse (2002), the most common types of procurement methods used by the oil and gas industry are:

- Lump Sum;
- Cost Plus;
- Engineering, Procurement and Construct (EPC)/Turnkey; and
- Service Type.

Conventional cost or priced-based methods of procurement, such as Lump Sum, stress capital cost and price competition between contractor's proposals that meet the minimum requirements stated in the tender. This approach, cited Gransberg and Ellicot (1997), has several obvious advantages:

- a simplified, though time consuming, tender preparation and report;
- a simplified selection process in which the lowest responsive, responsible offer wins; and
- it is difficult to protest as the aggrieved must show how the process is flawed since the lowest tender is readily apparent.

Conversely, Gransberg and Ellicot (1997) stressed that the disadvantages of this approach include the following:

- it makes a selection based only on initial price or capital cost which could be too risky for a complex and exploratory oil and gas industry;
- it assumes perfect (unambiguous) plans and specifications which, in the oil and gas industry, is frequently not the case;
- it assumes that the minimum requirements meet the client's needs and that exceeding minimum standards does not enhance the project; and
- the process may have the tendency to select a contractor with the lowest bid but at the end of the day may not be able to deliver.

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Under the **cost plus approach**, the client pays the contractor for costs incurred plus a predetermined margin of profit. The margin or fee can be fixed, fluctuating or determined as a percentage of actual costs. This type of approach may create no incentive to work economically or rapidly, since, for example, the greater the cost, the greater the profit, irrespective of progress. However, in order to compensate for this lack of incentive, the client may include an incentive mechanism as part of the pricing provisions of the contract (Gao, 1994).

In the case of **EPC or turnkey approach**, Huse (2002) stated that the contractor is entirely responsible for both the design and construction of the work. The client, at the end of the day, receives a completed project in accordance with his performance specifications. As far as the performance and quality of the works are concerned, he needs to look no further than the contractor. Yeo and Ning (2002) outlined the number of challenges faced by EPC projects such as:

- interdependence of activities;
- phase overlaps;
- work fragmentation;
- complex organizational structure; and
- uncertainty in accurate prediction of desired outcomes.

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Similarly, as in the case of Lump Sum, the contractor will only be paid according to the agreed price at the beginning of the project. This type of contract may prove to be too risky in

an oil and gas environment as experienced by Halliburton (2002). In their press release statement, Halliburton (2002) announced that they, *“will no longer pursue EPC contracts for their offshore oil and gas industry where it is required to make a Lump Sum, fixed price commitments”*. They also added that: *“Our decision to exit this sector of the business stems from the growing imbalance in the risk and reward available on these offshore EPC projects”*.

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The **service type** approach acts as a support element to the major procurement method and is widely used as and when necessary during the construction, operation and maintenance stages of an oil and gas fields. The services provided by contractors can vary based on location, type and purpose. This can be from the provision of food supplies and spare parts, to the supply of equipments and plants to the oil and gas fields. This service type approach usually involves competitive tendering based on the lowest bidder. It can be effective in driving down the price of services to be provided but drives up clients' internal costs in the tendering process and may also prevent suppliers from achieving sufficient profit.

2.2 Innovative Approaches

Like many mature industries, costs, prices and investment are reducing and driving the industry towards greater efficiency. In the oil and gas industry, in particular, exploration and production activities are no longer in the position where it is good enough to “get it done at any price”, as financial realities prevail. Fortunately, a fair deal of commercial and technological development has taken place, giving the industry opportunities to continue to provide cost effective solutions to their rising operational costs based on other industries experiences. Among the innovative approaches used were:

- Partnering/Alliancing/Joint venture (Wright, 1996);
- Performance-based (Kashiwagi and Al-Sharmani, 1997; Kumaraswamy and Dulaimi, 2001);
- Supply chain management (Yeo and Ning, 2002);
- Risk management (IQPC Oil and Gas, 2003);
- Incentive schemes (ECI Report 2003);
- Leasing (Wright, 1996); and
- Contract to produce. (Wright, 1996).

Partnering/alliancing/joint ventures have as many definitions as there are partnering agreements. According to Henry (1992), partnering can be defined as a contractual arrangement in which a client and a contractor/supplier agree to work closely together to the increased benefit of both. According to the CIOB (2003), *“In broad terms, partnering teams agree mutual objectives that take account of the interests of all the parties; establish co-operative methods of decision making including procedures for resolving problems quickly; and identify actions to achieve specific improvements to normal performance”*. To be more precise as in Percival, *et al.* (1992) and Wright, (1996) partnering is seen as a relationship where:

- both parties see Win-Win solutions;
- value is placed on long-term relationships;
- trust and openness are norms;
- an environment for profit exists;
- both parties are encouraged to openly address any problems;
- both understand that neither benefits from exploitation of the other;
- innovation is encouraged; and
- each partner is aware of the other's needs, concerns and objectives, and is interested in helping their partner to achieve such.

However, as in any new approach, partnering does have some drawbacks and there have been failures. According to Percival, *et al.* (1992), this is probably due to:

- a lack of understanding of each other's core values and its importance;
- a lack of vision of a long-term relationship coupled with lack of commitment to espouse them;
- unclear roles and responsibilities and alignment to common goals; and
- failure of creating trust between parties.

The performance-based approach includes the following characteristics: (Kashiwagi and Al-Sharmani, 1997; and Kumaraswamy and Dulaimi, 2001)

- it does not require pre-qualification;
- it awards a project on the best available price and performance in a one-step, competitive bid procurement;
- it motivates a contractor to continuously improve;
- it selects the best available contractor for the best price for each unique requirement as defined by the client whereby the selection is based on documented and verified performance;
- it allows all innovative solutions to be compared and the comparison is based on proven and documented performance;
- it identifies the best price for different levels of construction performance; and
- it allows the client to procure a "level of performance" defined by the client.

Supply Chain Management (SCM) according to Yeo and Ning, (2002), is a process of strategically managing the movement and storage (if necessary) of materials, parts and finished product from supplies, through the manufacturing process and on to customers or end user. The SCM approach advocates that a company should extend its internal focus to suppliers and supplier's suppliers, thus creating the chain. The essences of SCM are (Yeo and Ning, 2002 and Burton and Lanciault, 1999):

- enhancing trust among supply chain members;
- re-engineering the business process to build a networked enterprise model;
- co-ordinated procurement process in the whole chain; and
- collaborative attitude among all of the chain members.

In a high-risk, high-return industry, such as the oil and gas, an innovative approach in Risk Management is essential. Failure to mitigate risk exposure with an effective approach could be costly. In a high competitive and changing world, an effective Risk Management strategy is the considered a tool to increase financial success and improve operational security. In the IQPC Oil and Gas review (2003), the elements covered by the Risk Management approach, included:

- avoiding contractual pitfalls;
- implementation of effective indemnities for major capital projects in order to fully understand risk position;
- assess the benefits of standard and non-standard contracts; and
- shaping insurance contracts to safeguard against financial damage.

According to ECI (2003), incentive schemes for contractors and suppliers were not intended as a panacea but rather to provide an alternative procurement route when methods that are more conventional were likely to create potential conflicts, with subsequent detrimental

effects on the overall success of the project. The success of incentive schemes depends on several key factors (Richmond-Coggan, 2001):

- trust, a key factor to success;
- potential benefits must be justified commercially;
- a higher level of administrative effort;
- only to be undertaken by those with the appropriate knowledge and skills due to high risk;
- good documentation and communication with all parties to the contract;
- acquisition of new skills, especially in the area of communication; and
- be seen as aiming to drive down inefficiency and costs rather than contractors and suppliers profit margins.

Wright (1996) acknowledges that some contractors have started to lease facilities to operators through variable, fixed or negotiated financial arrangements. This is another strategy for the contractor to ensure work for its design offices, fabrication yards, installation fleets, operational staff and even its tankers. Although to date, leasing for example, in the North Sea has concerned only the Floating Production and System Offloading (FPSO), other process modules and permanent production jack-ups have been mooted as suitable candidates. Leasing is most cost-effective for small fields with short lives, as in marginal fields, where capital expenditure cannot be fully recovered. However, for larger fields with longer lives, it is more advantageous for the operator to own the facilities.

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The next step from partnering/alliancing and leasing, according to Wright (1996), is for contractors become directly involved in what is termed as 'contract to produce'. This entails a life-of-field approach and requires a capability on the part of the contractors to develop and operate oil and gas fields rather than just servicing them. This is considered by many to be the future direction for procurement strategy in the oil and gas industry. Large broad discipline contractors such as Brown and Root and Halliburton, for example, are actively recruiting oil companies' expertise to assist them in achieving their 'contract to produce' procurement strategy. By adopting such strategy, the major contractors will become quasi oil companies, with oil companies or operators, only maintaining responsibility for finding and selling oil and gas.

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3. CURRENT ISSUES ON PROCUREMENT IN THE OIL AND GAS INDUSTRY

3.1 Conventional Type

Most conventional approaches to procurement deal with capital cost/fixed price only. With the currently high operational and maintenance costs that the oil and gas industry has to cope with, there is a desperate need to look at costing on a Whole Life Cycle basis as stated by ECI (2003). Most clients argued that by using the conventional approach, most of the risks are to be borne by them. This could be too risky especially when the client has to venture into marginal fields once the production of oil and gas is starting to decline. High capital investment for small field reservoirs may be too risky for clients to handle alone.

3.2 Innovative Approach Type

In order to overcome the problems or offer potential solutions to help the industry's future survival, a few innovative approaches to procurement strategy have been put forward by the players in the industry, these include:

- cooperation rather than competition among contractors and suppliers (Wright, 1996; Stabell and Sheehan, 2001; McHaffie, *et al.* 1993; and Adam, 1992);

- effective supply chain management to increase efficiency and improvements in clients/supplier relationship (Yeo and Ning, 2002; Stabell and Sheehan, 2001);
- partnering/alliancing/joint value enhancement to be looked at in accordance to today's market environment (Chan, *et al.* 2003; Brunsman, *et al.* 1998; Bruce and Shermer, 1993);
- cost effectiveness with regards to operational management (Wright, 1996); and
- effective incentive schemes for contractors and supplier (Richmond-Coggan, 2001).

4. THE INNOVATIVE APPROACH TO PROCUREMENT STRATEGIES IN THE OIL AND GAS INDUSTRY

There is a need for innovative procurement strategies in the oil and gas industry, as cited by Dittrick (1999) in a survey of integrated oil and gas companies in the US, which stated the following.

- The project procurement process in the oil and gas industry is a capital-intensive industry. As 90-95 per cent of project costs are paid to contractors and suppliers to ensure project success, it is critical that procurement strategies should incorporate and integrate with the capital project procurement process from start to finish.
- Must submit to total system of cost and evaluation throughout the procurement process such as Whole Life Cycle costing.
- Must have some form of standardization programme and specification reviews
- A strategic outsourcing must be in place such as in supply chain management
- A contractor and supplier management and incentive programme must exist in order to secure the commitment of contractors and suppliers to the overall success of the project.

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Wright (1996) stated that the adoption of these new procurement strategies by the key players in the UK North Sea has been instrumental in rejuvenating the industry by allowing cost-effective development of smaller and more marginal oil and gas fields. The CRINE initiatives have also helped to create the appropriate environment for more open contractual arrangements.

5. CONCLUSION

There is a need to look in-depth at new approaches to procurement strategies for the oil and gas industry. However, as Luu, *et al.* (2003) mentioned in their findings, selection of the most appropriate procurement strategy should be based on:

- external parameters which include political, financial, economical, sociological and competitiveness;
- project risks with reference to industrial, political and technological constraints;
- client's long and short-term objectives, such as Whole Life Costing and on-time completion;
- Client's involvement in risk allocation, such as their willingness to be involved, trust towards other parties and willingness to take risks;
- Client's characteristics which include strategy, experience and capabilities;
- project physical characteristics to meet demanding technological, administrative and legislative requirements; and
- project complexity, which is an important issue to be addressed in the selection of procurement system.

Merely copying other industries' experiences may not be sufficient with the underlying principle differences that lies/exist between them. There are already calls made within the industry that not enough effort has been made on the development of procurement strategies. (by the number of written and documented literature on the subject and research conducted) As Torrance, (2002) said in his final conclusion,: "When both sides of the industry, the demand side and the supply side, can meet directly more often to understand and agree upon mutually beneficial, satisfying and profitable ways of doing business, then further changes in procurement will develop".

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