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Review Article

Mitigating Risks via Efficient Procurement Strategies: A Comprehensive Review

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ABSTRACT: ***Risk is an integral component of any enterprise. Harmonizing the relationship among risks, growth, and returns helps optimize organizational benefits. Risk management entails the continuous monitoring, observation, and evaluation of alterations in the characteristics of existing hazards, as well as the ongoing management of changes in the risk profile of an event. The procurement function is a strategic and crucial component of an organization's sustainability and profitability. The possible risks arising from breach of contract, responsibility, delays in completion, force majeure events, natural disasters, warranty concerns, and intellectual property rights, if inadequately managed, can place the organization in exceedingly challenging circumstances. The primary sources of risk are intrinsically linked to the ground on which the project is being constructed, particularly in hydropower projects where geological conditions are paramount. Furthermore, the political and social environments, site accessibility and methodology, government macroeconomic policies-particularly concerning taxation and input material costs, foreign exchange, and, crucially, the anticipated conduct of contracting parties constitute the primary potential sources of risk. This article delineates potential models of organizational risk behavior and the related contract forms that may be implemented, including item rate contracts, lump sum contracts, cost-plus contracts, and EPC contracts. Prudence is distributing the risk and allocating it to the party most capable of managing it. Risk management approaches have been proposed for different types of contracts and the uncertainties typically encountered that jeopardize the performance of contracts.***

KEYWORDS: ***Procurement, Risk Allocation, Geological Baseline Report (GBR), Contracts, Engineering Procurement & Construction Contracts (EPC), Lump Sum Contracts, Item Contracts, Cost Plus Contracts.***

INTRODUCTION

Upon assuming the job of Chief Executive Officer (CEO) of British Petroleum in 2007, Tony Hayward proclaimed that safety was his paramount focus. He established regulations mandating that employees utilize lids on coffee cups while ambulating and abstain from texting while operating a vehicle. On April 20, 2010, three years later, the Deepwater Horizon oil rig exploded in the Gulf of Mexico, an event regarded as one of the most catastrophic man-made disasters in history. A U.S. investigative commission ascribed the catastrophe to managerial deficiencies that impaired individuals' capacity to recognize the dangers they encountered and to adequately assess, convey, and mitigate them.

Within an organization, risk is described as the impact of uncertainty on objectives; in other words, it is the likelihood that an event may transpire and negatively influence the attainment of goals. Stakeholders possess differing perceptions of risk. It is essential to identify and

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document their perceptions of risks and advantages, as well as to comprehend the underlying causes behind these perceptions. The risks can be categorized into three main types:

(a) Preventable: predominantly internal and can be circumvented or regulated

(b) Strategy risks: which the company accepts according to its risk appetite with an aim to generate superior returns

(c) External risks: these are beyond the control of the company e.g. natural and man-made disasters, major macro-economic shifts, geo-political, environmental changes, disruptive technologies etc. These external risks could be partly controllable or even uncontrollable.

Risks can be classified in various ways. Risk management should not be regarded merely as a compliance matter, as rule-based approaches will not reduce the probability or severity of a disaster. In many organizations, it is observed that it is very hard to talk about risk and there exists a strong tendency among executives to avoid or discourage even thinking about risks let alone discussing the same. We discount the uncertain failure while pursuing a "can do" attitude and do not spend time and money to avoid or mitigate risks. The fact remains that risk management is not a natural act of human behavior and we incubate the risks by tolerating minor failures and ignoring early warning signals. Another observed behavior is that we do not discuss the failures truthfully and toe the line which is supported by the leader or group and while doing so, the information is presented in such a manner that it supports the line and all that information which is expected to contradict is suppressed. In this endeavor what happens is that we put more resources on the failed courses of action and increase our commitment ultimately leading to disaster.

METHODOLOGY

Understanding the Risk

Risk is an omnipresent reality that affects individuals, organizations, and geographies at all times; we either consciously or unconsciously ignore, evade, or manage it. Risk must be defined within an organizational context, its forms identified, distinguished from strategy, and a risk management procedure established.

Procurement Process

The acquisition of works, products, or services for major power projects is conducted via competitive bidding. To facilitate this, the project developer issues tender documents that include the scope of work, supplies, services, and the terms and conditions for contract execution to potential bidders. The Standard Bidding Documents utilized by hydropower entities such as NHPC Ltd and the FIDIC conditions of the contract offer significant insight into the procurement methods employed for hydropower projects. An examination of diverse contract forms, risks arising during their execution, and legal rulings can facilitate the development of distinct risk models.

Risk Models and Management of Risk

Risk models can be developed based on different contract kinds, with their advantages and disadvantages analyzed. The management of risk in a contract is not a singular event. The process begins with establishing the contract terms for procurement and persists throughout the contract administration phase, during which the contracts are implemented on-site following the award. Many huge projects have been reported to fail mostly due to contractual problems

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rather than technical issues. Based on these experiences, effective measures can be delineated to manage risks, which would aid in preventing contractual failures.

DISCUSSION

Risk Management – An Overview

Risk being an inseparable part of any business must be managed either by accepting it or eliminating it or avoiding it or reducing its impact or sharing it. It is imperative to comprehend that risk management differs from strategy management in that the former emphasizes threats and failings, while the latter emphasizes opportunities and success. However, sometimes the risks can be used as an opportunity to maximize the upside while minimizing the downside. Business risk management should calibrate and align the relationship between risks, growth and return, although growth and return may appear to be opposite attributes to risks. Effective risk management is characterized by the ability to harmonize conflicting features, while a robust organizational framework endeavors to capitalize on the opportunities concealed inside risk events.

The risk management process comprises the following:

(a) Identification of risk

(b) Identification of causes/ sources of risk

(c) Identification of consequences of risks

(d) Identification of likelihood and probability of risk

(e) Identification of severity of risks

(f) Ranking of risks

Followed by identifying responses to the risks and the actions to be taken to manage such responses by delineating the responsibility of a business unit. Risk management entails the continuous monitoring, observation, and evaluation of alterations in the characteristics of existing hazards, as well as the ongoing management of changes in the risk profile of a transaction.

Procurement Function

The organizations of the modern era are interdependent and depending upon the nature of the business or purpose of incorporating an organization, the objectives are decided. However, most business organizations aim to maximize their bottom line while observing their corporate social responsibility, ethics and corporate governance. The bottom line is directly influenced by the expenses incurred by the company in procuring the resources may be works, goods or services.

The procurement function is a strategic and essential component of an organization's sustainability and profitability. The potential risks arising from breaches of contract, product liability, public liability, limitations of liability, errors and omissions, delays in completion, force majeure events, natural disasters, warranty issues, and intellectual property rights etc., if inadequately managed, can place the company in exceedingly challenging circumstances.

The aim of procurement is to minimize expenditure while maximizing quality. The procurement function must provide the necessary works, goods, and services in the appropriate quality and quantity, at the correct time and price. Simultaneously, the public procurement

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process should prioritize transparency, equity, and fairness. Risk management should begin at the start of the bidding process when the decision is taken on the type of tenders to be invited and important terms and conditions to be incorporated in the bidding document. While formulating and embedding risk management tools in procurement, one must never lose sight of the fact that entire contractual processes should be in accordance with the applicable law.

Sources of Risk in Power Projects

The primary sources of risk are intrinsically linked to the ground upon which the project is established, particularly in hydropower projects where geological set-up and topographical conditions become critical as it is neither feasible nor cost-effective to fully investigate the entire subsurface. Furthermore, the political and social environments, natural disasters such as floods and earthquakes, site accessibility, government macroeconomic policies particularly concerning taxation and input material prices, foreign exchange, and the anticipated conduct of contracting parties represent significant potential sources of risk. The projects involve the procurement of works, goods and services. The basic law of contracting for all this remains the same but they differ in terms of treatment given to payment, acceptance criteria, quality assurance plans, transfer of ownership, insurance, performance guarantee/warrantee, IPR and variations or change proposals. In the succeeding paragraph, various risk models and suggested risk management methodologies that should be built into the procurement process are discussed.

Contract Types for Procurement

Normally for procurement of works, goods and services, the following types of arrangements are adopted:

a. Item rate contract: These contain Bill of Quantities which are also called Schedule of Quantities or Schedule of Rates; Technical specification for each item of Works/Goods/Services and the bidder is asked to quote the price for each item. A variation clause is provided to share the risk. In case of item rate contracts like items of goods to be procured or items of work to be executed, sometimes the owner himself provides estimated rates for each item and asks the bidder to quote a percentage above or below the total price thus arrived.

b. Lump sum contracts: For entire Works/Goods/Services a lump sum price is quoted which is valid for a given scope of work, However, to take care of identified variations in a major parameter of a structure, a suitable amount for payment or recovery is provided.

c. Cost plus contract: The bidder is allowed a certain percentage to cover his overhead and profits over and above the actual expenses incurred on the performance of works/manufacture and delivery of goods.

d. Engineering Procurement & Construction (EPC) contracts or Turnkey Contracts – as the name implies the contractor is responsible right from the Planning and Design of structure and associated equipment to the Completion of the project and Delivery of the desired output.

Except in the cost-plus model, the rates could be fixed i.e., no price variation or escalation is payable, or they could be subject to price variation according to a certain agreed methodology.

Risk Models

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The risk models can be designed on either of the following philosophies, as the risk must be appropriately managed.

(a) Entire Risk to the Owner

This is basically a Cost-plus type contract. If the Contractor treats the project as his own and makes efforts to reduce the cost, this may ideally become the least-cost option and both parties may be in a win-win situation. However, in practice, it does not happen. In such a case, the Contractor may not try to increase efficiency or productivity by employing innovative methods as the Contractor is assured of reimbursement of all the expenses, and also, he may not be responsible for timelines too, and as such this type of model is rarely followed. This can however be adopted for Research & Development Projects or for the Development of new Products.

(b) No Risk to Owner

This is typically a case for a Lump-sum Contract or Turnkey or EPC type of contract where Design, Engineering, Procurement and Construction is the exclusive responsibility of the Contractor and the Contractor is paid the stated sum in the contract. However, in some of the Lump-sum contracts, the Contractor is paid extra, or the cost is reduced for variation beyond a defined limit for specific structural components, such as changes in foundation depth for bridges resulting from alterations in foundation rock elevation. In these contracts, the Owner supplies certain inputs and requests the Contractor to produce the specified final product. In the case of a Hydroelectric project, the Owner may guarantee the discharge, and levels at the inlet and outlet and ask the Contractor to deliver him a Project of specific generating capacity. The main feature of a Turnkey contract is that the total amount payable to the Contractor has a ceiling i.e., contract value plus a contingency, where contingency is expressed as a percentage of contract value. Contingency is meant to cover variations in quantities and new items arising out of detailed design or changes in design, geological variations and site conditions. The bidder prepares BOQ, containing items of work, technical specifications, quantities as estimated by the bidder and unit rates quoted by a bidder for delivering the desired product.

As such, no rates are to be determined for substituted and new items. These contracts may also provide a Schedule where the items to be executed under abnormal conditions are identified with their unit rates but without quantities. In such cases, the disputes are normally limited to the issue of extension of time and prolongation costs but in case the contractor encounters highly adverse geology or adverse site conditions and the cost increase is beyond the affordable capacity of the Contractor, the project will suffer in addition to litigation. On the other hand, if certain unforeseen events, which the Contractor has accounted for in his bid do not take place, it would mean a windfall to the Contractor. To take care of this aspect, the payment for items identified therein should be made at the quoted rates therein for actual quantities executed subject to the ceiling provided in the Contract. In real life, these models are modified, and they do not really remain as no risk to the Owner. It is normally the costliest model as far as the Owner is concerned and it may be preferred in cases where the Owner does not possess the capacity and capability to design and engineer. This model would succeed where reliable and adequate investigation results are available so that the Contractor is able to frame his bids based on dependable data.

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(c) Limited Risk to Owner

These are typically item-rate contracts. The Owner is responsible for the investigations, design and engineering of the project. This is theoretically considered as most economical option. However, it may turn out to be the least economical in cases where the Owner has not properly assessed the work requirement, underlying risks and proposed construction techniques. In item rate contracts, the contractor quotes rates for various items for the given quantity and the rates hold good for some stipulated variation limit say ±25%, beyond which different methods are applied for fixation of rates of the deviated quantities. The contractor's liability is confined to the amount provided in the Bill of Quantities, in addition to the variation limit indicated therein.

Once this limit is exceeded, the entire risk gets transferred to the owner. One option could be to make the quoted rates applicable for all deviations in the quantities. In this approach, if the rate quoted by the Contractor for such an item is abnormally high and the deviation is on the positive side, the owner ends up paying a very large amount. In case the contractor rates are on the lower side, the contractor may not ultimately complete the work on some pretext or other and the work will linger or shall be abandoned and finally the entire project will be subjected to contractual dispute. For fresh and substituted products, the Contractor will be compensated at newly established prices. Many disputes emerge on the issue of settlement of rates as both parties are not able to agree to mutually acceptable rates. Certain contracts stipulate that the rates determined by the Engineer-in-Charge are final and beyond the scope of the Arbitration clause; however, it has been noted that for various reasons, including technicalities, the resolution of these rates often devolves to Arbitrators. Non-settlement of rates ultimately causes both time and cost overruns in contracts in addition to disputes, and litigation which prolongs for a long time which results in a heavy cost of adjudication to both parties.

Management of Risks

Risk is typically assessed in the context of Financial Risks; however, other types of risks, particularly for publicly traded companies, such as Reputational Risk, can be critically significant for a company's survival. A compromised reputation may hinder the company's ability to secure funding for future projects, and governmental entities may withhold new project opportunities. Furthermore, if the company fails to complete existing infrastructure projects, creditors may pursue liquidation in the event of default on interest or principal payments on borrowed debt. Therefore, effective risk management is crucial. This management applies to both the Owner and the Contractor. The optimal scenario is one in which neither party is permitted to gain an advantage to the detriment of another. One perspective posits that the Owner should assume all risk, as it is the Owner who chose the Site. Nevertheless, the Owner may endeavour to transfer the risk to the contractor via fixed-price contracts. Imposing all risk on one party is imprudent; thus, the core premise of risk management is to assign risk to the party most equipped to manage it. The contractor can mitigate his risk by assessing the financial ramifications of all potential risks and incorporating their costs into his proposed proposal. The tenderer's bid amount estimation will rely on the information provided by the Owner and the data obtained from his own sources, including site examination and secondary data. The risk might potentially be null if the contractor has all the information and its interpretation when submitting the proposal; nonetheless, this remains a hypothetical scenario requiring extraordinary foresight.

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The Contract typically states that the Contractor must have visited and thoroughly assessed the site and its surroundings, ensuring an understanding of the transportation system in all its facets, the availability of various materials, sub-soil water and its fluctuations, climatic conditions, and other relevant factors influencing the works; and as a result, the Contractor shall bear all associated risks and liabilities. The Contracts also include disclaimer terms regarding the geological inputs and conditions provided by the Owner. However, these do not benefit the Owner because it is the Service Receiver, Purchaser, or Owner of an asset who must pay for the entire cost; the Contractor, Supplier, or Service Provider will include the cost of all inputs in his quoted rates, and thus transparency will only help the Owner achieve the lowest cost.

To understand the implication of such disclaimer clauses, it would be worthwhile to refer to the following extract from the book titled "Tunnelling Contracts and Site Investigations" by P.B. Attewell (pp. 200):

"The contractor was provided by the employer at the pre-tender stage with a document called 'Engineering Site Information', which provided basic information on the soil conditions, and which also contained a disclaimer of liability. The contractor claimed that the information so provided 'was false, inaccurate and misleading [and] the clays at the site, contrary to that information, contained large quantities of cobbles.

The High Court of Australia held that the documents did not disclose that the contractor had no cause of action, the words of the Chief Justice being as follows:

'The basic information in the site investigation document appears to have been the result of much highly technical investigation on the part of [the employer]. It was information that the [contractors] had neither the time nor the opportunity to obtain by themselves. It might even be doubted whether they could be expected to obtain it by their own efforts as a potential or actual tenderer. But it was indispensable information if a judgment were to be formed as to the extent of the work to be done …'

In another case relating to change in sub-surface conditions, the same book referred to above authored by P.B. Attwell states (pp. 200) that "The employer's tender documents stated that the ground conditions at the site comprised a mixture of Northampton shire sand and Upper Lias clay. Tufa was found in areas of the site as work progressed, and as a result, the foundations had to be re-designed and additional work carried out. The Court of Appeal held that the contractors were entitled to recover some compensation for breach of an implied warranty by the employer that the ground conditions would accord with the hypothesis upon which they had been instructed to design."

The Geological Baseline Report (GBR) serves as a mechanism to adjudicate disputes and ascertain the entitlement of the Contractor's claims. This technique absolves Contractors of liability for unlimited hazards stemming from unforeseeable ground conditions.

It is however difficult to develop an accurate and quantitative baseline as variability in geological formations and inaccessibility to site are the hard facts of life. One should also recognize that each baseline presented in the Geological Baseline report may give rise to a claim in case of variation from the data supplied in GBR.

It protects the owner from contractor claims over differing site conditions, as contractors cannot assert ignorance of the existing conditions if they are documented in the GBR. If the owner attempts to present the GBR in a way that transfers unreasonable risks to the contractor, the

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purpose of the GBR will be lost. Such instances have also been reported in which the contractor attempts to fabricate a rationale regarding how a specific variable has impacted his costs. and therefore, only those properties of soil/ rock must be provided that are relevant to the contractor to execute his work e.g. excavation, temporary and permanent support system.

In the light of above discussions, some of the steps, that can be taken to manage risks in the procurement process and administration of Contracts are listed hereunder:

(i) Disclaimer clauses should be avoided. It is a good idea to share the risks. A contract must allocate the Risks and provide for Risk Registers. In the Bill of quantities of item rate contracts keep even those contingency items, whose occurrence has very little probability. When a claim is to be decided, a comparison will have to be done between the actual ground conditions vis a vis the ground conditions mentioned in GBR. So, those baselines selected and quantified for inclusion must be the GBR which is measurable or verifiable. However, it should be kept in mind that GBR is not a panacea.

(ii) Owner to provide Realistic completion time with Construction Sequences. The bidder should be asked to provide his construction Program in the form of a Bar Chart as well as a Critical Path thereon with linked resources of man, machinery and material. A Construction Program without linked resources is meaningless.

(iii) Sufficiently detailed Tender drawing should be included as it becomes a potential source of dispute and often affects cost and time substantially during execution.

(iv) While evaluating delay claims, an "as-planned CPM schedule" should be compared with an "as-built CPM schedule". CPM analysis allows both parties and the Dispute Board/Arbitral Tribunal to discern between critical and non-critical delays or concurrent delays while analyzing delays.

(v) At the beginning of the project, introduce the mechanism of the Dispute Avoidance Board (DAB).

(vi) A few disputes have arisen on account of abrupt and abnormal increases in minimum wages and the price variation clause normally provides for compensation of price variation on account of labour based on the Consumer Price Index (CPI) whose rate of variation is not always in sync with minimum wages. To mitigate this risk by both parties, 50% of labour component should be compensated based on the increase in minimum wages and 50% based on CPI. In Case the Contractor wants only CPI, write clearly in the Contract that no payment or recovery for an increase or decrease in minimum wages by any authority shall be done by the Owner.

(vii) While framing the Insurance clause, provide a reasonable amount of deductible to be incorporated in the Insurance policy and those losses up to this level in each case shall be borne by the Contractor. The amount for which insurance is to be obtained should also be clearly specified in the contract. It shall enable the contractor to decide on premium and include the cost thereof in his prices properly.

(viii) The contract document must explicitly state the increased costs payable to the Contractor due to delays caused by the Owner.

(ix) A risk allocation register should be part of the contract which should identify various risks, the party to whom these are allocated and the extent of sharing between parties.

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(x) The major taxes and duties included in the rates quoted by the Contractor should be disclosed by the tenderer so that any increase or decrease therein can be properly compensated or recovered by the Owner.

(xi) Various disputes or claims of the Contractor/ Supplier/ Service Provider should be documented and every organization should have a procurement development group responsible for being the repository of all such claims/ disputes, and their resolution whether amicably or through adjudication by Arbitral Tribunal or Court and such lessons learned should be incorporated in the future bids to be invited by the Owner.

CONCLUSION

Risk management can be achieved through efficient procurement processes by incorporating GBR, comprehensive tender drawings, risk allocation registries, and price variations associated with minimum wages in the bidding documentation. Organizations are urged to form a development group within the procurement department to manage a repository of claims and disputes and to perpetually improve the terms and conditions of the contract. These measures will ultimately facilitate cost reduction, efficient task execution, timely project completion, and enhance the company's profitability.

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