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## CAPEX VAR: KEY TO IMPROVING PREDICTABILITY

by Richard Westney, PE, PMP  
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# Westney Consulting Group

**World Energy interviews Richard Westney, founder and CEO of Westney Consulting Group, and Keith Dodson, senior partner of Risk Resolution LLC, a Westney Company.**



Richard Westney



Keith Dodson

**World Energy:** The oil and gas industry appears to have had limited success in predicting the cost of its major projects. Today, due to increased competition for hydrocarbons, the magnitude and consequences of capital cost excursions are increasing. Furthermore, due to energy projects and emerging market demand for commodities, we seem to be experiencing what might be termed "hyper-inflation" in the components of capital projects. Does this mean we should expect even greater loss in capital cost predictability?

**Richard Westney:** The risk of further loss in predictability is certainly increasing. This is due in part to market pressures. Moreover, history shows that, when there is a shortage of the critical human resources for projects, predictability diminishes exponentially. Today such resources are very scarce. Although the current scenarios are not encouraging, I believe there is a chance to mitigate the damage. We usually expect the answer to such challenges to be found in improved project management, but I have become convinced that better project management alone will not markedly improve the outcome of projects – especially very large projects.

**World Energy:** What, then, can help companies improve the predictability of their major capital projects?

**Richard Westney:** The risk-management work Keith Dodson and I have been doing has convinced us that, if there is to be any real improvement in predictability, we must engage the executive level to take a leadership role in managing risks. We must acknowledge the gap that has existed between executive awareness and project-management authority for risk management. Improving predictability requires a change from the traditional project governance model, which placed virtually all accountability on the project manager, to one in which accountability is consistent with the level of authority and risk to be managed.

A good example can be found in safety. Back in the 1970s, safety management was not an executive-level issue. Since then, with executive acceptance of accountability and visible metrics, we have made incredible strides in improving safety performance. So, I am excited that the same sort of potential exists in capital cost risk management.

**World Energy:** It is unlikely that any executive would ever knowingly fail to address a billion-dollar risk to his or her company. What has prevented executive engagement on this sort of risk?

**Keith Dodson:** The key word in your question is "knowingly," and the simple answer is that executives do not "know." In our experience, due to several barriers, the information on project risks that reaches executives is usually incomplete and biased. If the risk assessment does not identify or clearly portray the magnitude of the risks, of

course the executives making the investment decision cannot fully understand or account for them in the decision process.

For example, the executive usually receives his or her initial view of the project cost and schedule from developers who are apt to be optimistic since they, and the people on whom they depend for information, have a strong motivation for the project to proceed. As the project proceeds, the next source of executive risk information is based on current risk assessment and analysis processes, which we believe are flawed.

**World Energy:** What flaws have you identified in current risk analysis processes?

**Keith Dodson:** First of all, the most common processes and software assume the deterministic base-estimate values represent the most likely outcome. However, history has shown that the base estimate is often well below the most likely value. Estimate values are only as accurate as the "risk vision" of the estimators or the project team who guides them. Where the team has concerns that they cannot control the risks, an assumption is made based on the estimator's limited risk vision. Next, these estimated values are used as the basis for assessing cost ranges. Finally, these ranges are used for Monte Carlo simulation, which may not adequately reflect the discontinuous nature of some project risks. All of these combine to produce an optimistic result that often does not portray the true magnitude of the risks.

**World Energy:** How do you propose to correct the flow of information to executive management concerning risks that only they have the authority to address?

**Keith Dodson:** The risk assessment process must identify risks above the control of the project team that need executive visibility. It is very important that the risk assessment processes are not anchored to the estimate or schedule values. We believe the risk assessment must contain some degree of true independence to assure "company bias" is eliminated from information provided to executives.

**Richard Westney:** For example, our risk assessments have found major strategic risks are associated with a lack of alignment among the project stakeholders, which may include conflicting priorities of national and international oil companies. These risks are typically not well addressed by current project processes or governance. New executive-level processes and tools are required to assure integration and correct governance, and we have developed and are implementing such tools.

**World Energy:** You have indicated that you believe a degree of independence is required in a risk assessment to avoid a "company bias." What do you mean by this?

## Improving CAPEX Predictability & Performance

**Richard Westney:** I have spent a great deal of time over the years facilitating traditional risk assessments, including peer reviews and "cold eyes" independent reviews. Experience suggests that, if developers and project managers see the project is being strongly promoted from above, and if management is anchored to optimistic cost expectations, the risk assessment results will inevitably be optimistic unless an independent, outside perspective is involved.

We began our expanded approach to risk management in 2003, when Keith observed that the traditional practice of "laying off" project risks to contractors was over. The project "wraps" provided to the power industry had proven disastrous, and several contractors and insurers had even gone out of business. With a few other disasters, such as Halliburton's misadventure in Brazil, it was clear that contractors were no longer going to be willing or able to take on risks as they had in the past. With the risk now transferred to the owners and lenders, there was going to be a requirement for more independence and realism in risk assessment. Moreover, Sarbanes-Oxley legislation, with its new requirements for management knowledge and disclosure, would also increase the need to have the best possible information on project cost risks. The past few years have certainly proven this forecast to be correct.

We also found there is a significant opportunity to better manage and reduce risk exposure by optimizing the allocation of risks among owners, contractors and lenders. Our experience in this area confirms that such a process also requires neutrality in the risk assessment that can only be accomplished by an independent party.

**World Energy:** You have proposed a concept of CAPEX VaR. What is the value proposition for that idea?

**Keith Dodson:** Management requires data and metrics that provide information on both current status and trends. VaR, or "value at risk," is a well-understood concept for representing the risk in a portfolio of securities or commodities, and it is commonly used by energy companies to measure and manage the volatility of their commodities portfolios.

A CAPEX VaR, relating specifically to capital expenditures, can be used in a similar way to manage project risks. By raising the level of the information on project risks to a constantly calculated CAPEX VaR, executives will have the tool to keep them keenly aware of the financial exposure they have to project cost excursions. Decisions can be made on a much more informed basis and the full resources of the corporation applied to mitigations. The CAPEX VaR also provides the basis for communication to the organization, boards, auditors, partners, lenders and shareholders about the risks the organization might be facing and, more importantly, how they might be mitigated.

Engineering and construction contractors can also benefit from the use of CAPEX VaR to assess the risk liability across their project portfolio, giving a better indication of the company's true financial condition.

**World Energy:** Could you describe the Westney Risk Resolution risk assessment process?

**Keith Dodson:** We have developed a very detailed checklist on project risks, with several degrees of granularity, depending on the stage of the project. It works as an internal control process to assure no risk is overlooked, and it also provides complete documentation and an audit trail.

While the checklist is important, we make sure our assessment teams include consultants with significant hands-on experience with project risks. Prior to a risk assessment, we perform a "risk due diligence" to make sure all the risks are identified. We accomplish this by a combination of independent analysis and interview of key knowledge-holders.

**World Energy:** What do you do with the risk information you obtain this way?

**Keith Dodson:** We segregate the project risks as either "tactical" or "strategic." Tactical risks are assessed in the traditional way, by ranging the estimate and schedule and by using commercially available risk-analysis software.

Strategic risks require a different approach, for which we have our own process and software applications. We use a modified scenario analysis to identify risks that may not have been considered or were undervalued. A key element of our process is that each strategic risk is individually identified and an impact value assessed. This process provides a "financial risk register" that can be used as a form of P&L for risk management. Our assessment is not anchored to the deterministic estimate or schedule, and it is designed to work with risks that are discontinuous or dramatically skewed. A CAPEX portfolio VaR can be calculated using techniques similar to those proven in the securities and commodities industry.

*For further information about CAPEX VaR, please see the article "CAPEX VaR: Key to Improving Predictability," by Richard Westney and Keith Dodson, on page 134.*

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