ECONOMIC ANALYSIS APPROACH

Economic analysis may be broadly defined as a systematic investigation of the full implications of achieving an objective. PT&C developed an approach which applies a structured methodology to project analysis. Using a combination of our broad technical staff background with our unprecedented experience in cost engineering, we provide comprehensive economic analyses in a wide area of interests. While each project is somewhat unique, PT&C applies a similar methodology as a basis for project evaluation and analysis. The PT&C approach centers around four key steps as outlined below.

Data Gathering

This phase attempts to determine specific facts and their relation to all stakeholders in the project. Collectively these facts form the basic objective of the project. Activities in this phase include documentation review, establishment of a chronology of historical events, identification of work scope and review of other existing analyses. The work scope may be identified in a variety of ways ranging from preliminary studies to completed engineering documents. Regardless of where the project is in its life cycle, ascertaining the data which exists is critical to developing the analysis. Site configuration and potential engineering solutions or alternatives can be derived from the review of the identified project scope which fulfill the project objective.

Estimate Development

This phase consists of review of the selected alternatives, performing a conceptual or parametric appraisal, development of a detailed estimate and estimate validation. Given that analyses are performed early in a project life cycle and complete data does not exist, certain assumptions must be made and documented for each alternative. Often assumptions are made in order to generate alternatives, therefore assumption development and documentation may occur several times during the analysis.

A life cycle cost estimate for each alternative is prepared either at a conceptual level or, if possible, with more detailed information. The conceptual or parametric appraisal is performed using both in-house and industry cost models. PT&C has developed multiple cost models for MCACES for environmental and civil applications. PT&C has also developed thousands of detailed cost line items for hazardous, toxic and radiological work which are used in the development of the detailed cost estimates. The resulting estimates for the alternatives are compared to other projects which are similar in nature.

PT&C has an extensive collection of project data which represents hundreds of actual projects. The challenge in this phase of the project analysis is to make the most use of limited available data while applying sound cost engineering judgment.

Risk and Uncertainty Assessment

This phase addresses the inherent potential of each alternative to change during the life cycle. The risk and uncertainty assessment assists in quantifying the impact of certain events on the project. When multiple alternatives are simultaneously evaluated, the results of the risk and uncertainty assessment differentiates alternatives that appeared very similar. The identification of project risks and or uncertainties is accomplished through review of the project assumptions and determining the known and unknowns of the project. The impact of the various uncertainties may be explained through the development of a range and distribution of possible cost values for each of the input assumptions. Response trials or “what-if” type scenarios are also performed to measure their influence on key cost drivers. The next step is to quantify these results to the overall project.

The actual quantification of the risk and uncertainty is derived though modeling or simulating the combined variability of each project element. The simulation process essentially generates multiple guesses, called trials, about the potential costs. The results of the simulation are a distribution from which the following can be observed. The range of probable costs, the level of confidence that costs will not exceed or their likelihood of occurrence and the sensitivity of the estimate to certain assumptions, specifically the identification of high risk high impact events and low risk low impact events.

Report of Evaluation Results

The analysis concludes with an evaluation of the results from the above phases. Findings are stated and conclusions are drawn. In cases where other analyses have been performed, a variance analysis is prepared for comparison. The areas of noteworthy uncertainty are discussed for each alternative. For each alternative a range of probable costs and schedule duration are presented and discussed. Where appropriate, recommendations are made that would increase the level of confidence in the analysis. The overall objective of the evaluation phase is to collect and present enough information so that an informed decision can be made.