

The Engineer Inside the System

*Accurate economic evaluation across
the capital project lifecycle*

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The engineering industry has witnessed great change and turbulence over recent years. Today's generation of estimators and engineers are under pressure to do more with fewer resources and adapt quickly to change. It is vital that engineering and construction companies (E&Cs) embrace methodologies to meet customer requirements and cope with new economic conditions. Being at the forefront of technology enables contractors to be more flexible and meet owner-operator needs in a highly competitive market.

Integrated economic evaluation software with built-in engineering and cost content produces comprehensive, accurate conceptual estimates. Empowering estimators with cutting-edge technology enables them to rapidly and confidently evaluate capital investment projects early in the design process, understand all the economic implications of engineering decisions, and manage projects more effectively.

Sometimes companies have their own estimating systems. However, the great advantage with integrated, robust and specialized economic evaluation software is that it provides a common platform to accurately estimate a project throughout its lifecycle—from early concept through construction. Project specifications can quickly be set up and also allow estimators to focus on communicating information between the engineers and the estimating software. This clear communication on scope is the vital ingredient that determines the cost.

Engineers inside the system

The adoption of scalable, intelligent “engineering-in-a-box” estimating and FEED software captures knowledge during each phase of the project lifecycle.

AspenTech's Aspen Capital Cost Estimator (ACCE) software is a complete, knowledge-based engineering design tool that produces cost based on first principles. It provides an opportunity to design a plant using the application, which can be benchmarked against the process engineer's design to ensure accuracy and consistency.



The tool itself is comparable to having an engineer inside the computer that is as functional as a team of disciplined engineers within the company. For example, the tool can instruct how to develop single line diagrams, and teach how to organize and put together an electrical system. Alternatively, it is similar to a structural engineer that demonstrates best practices for the design of structures and similarly in piping. Therefore, all the engineering knowledge is embedded within the software tool and helps the estimator to engineer design and cost and validate information provided by engineering disciplines. The years of embedded knowledge within the tool help E&Cs to accurately and quickly reduce estimating uncertainty in bidding costs for the design/build of a chemical plant.

Communication is paramount throughout a project. The alignment between the E&C and the owner-operator is vital to ensure estimates are accurate and meet project specifications. ACCE is a powerful tool that allows both parties to use the same common database and language. Accuracy doesn't come from the slide rule, but from the communication of what is entered into the economic evaluation software (i.e. ACCE). This is what defines the accuracy of an estimate and not, for example, whether there are 2.3 or 2.4 man hours per

linear foot of piping. It is not the units counts per se, but rather the scope definition and whether the associated information is clearly included within the estimate (i.e. too much or too few cubic yards of concrete).

With complete transparency, the E&C can demonstrate to customers detailed estimates of a project. With a high level of accuracy, estimators give owner-operators confidence that the estimate meets their needs and that they are working with a partner that can fulfill the engineering project on time and within budget. When changes occur, ACCE can cope with adjustments to the estimate at a click of a button and within minutes, deliver a new estimate (versus days or weeks when using traditional spreadsheets).

When compared to traditional tools, economic evaluation tools from AspenTech allow E&Cs to increase their incomes by up to 50%, because the functionalities can perform the work of five people and be considerably more accurate throughout the project estimating lifecycle. Whether the project is for greenfield or brownfield projects (on-shore or off-shore), ACCE is ideal for revamps and patching to gain more out of existing plants. The tool is able to easily break down capital expenses and generates reports very quickly.

Once the estimate is set up properly inside the model-based software, the estimator can make changes very effectively. For example, when designing tank farms for a client, where the tank's size, location, geometric layout and any other aspects of the configuration may be altered. Using ACCE, the estimator can make changes within minutes for every option instructed by the client. This would not be possible using traditional spreadsheets.

Using **AspenTech's economic evaluation tools**

allows E&Cs to increase their incomes by up to more than using traditional tools

50%

Empowering the next generation

Attracting qualified employees is a major challenge in the industry today. There is a large population of employees close to retirement, and there are not enough qualified engineers to fill the gap. Companies hiring and training their own estimators need to get less experienced staff further along the estimating learning curve. This is achieved much faster by empowering users with ACCE, as opposed to adopting a more traditional system. For new users, ACCE is like a self-learning process that helps staff to be exposed not just to estimating, but also to the total project concept. Therefore, less effort is required to remove business bottlenecks from the lack of skilled estimators, which supports knowledge building and enables staff to be better employees.



Built-in knowledge delivers enormous benefits. The economic evaluation system from AspenTech empowers estimators to do more and achieve more timely and accurate estimates in collaboration with process engineering design. The templates and databases that are generated from using ACCE give the next generation of estimators a tremendous platform to add immediate value, due to the inherent capability within the software product. For many E&Cs today, ACCE is an excellent tool for passing on knowledge and skills from one generation to the next.

AspenTech is a leading supplier of software that optimizes process manufacturing—for energy, chemicals, engineering and construction, and other industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world's leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit www.aspentech.com.

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