

CONSTRUCTION INDUSTRY INSTITUTE

REFORMING OWNER,
CONTRACTOR, SUPPLIER
RELATIONSHIPS:

A PROJECT DELIVERY SYSTEM
TO OPTIMIZE SUPPLIER ROLES
IN EPC PROJECTS

Construction Industry Institute

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**Reforming Owner, Contractor, Supplier
Relationships:
A Project Delivery System
to Optimize Supplier Roles in EPC Projects**

**Prepared by
The Construction Industry Institute
Reforming Supplier Relationships Research Team**

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Executive Summary

By expanding its membership to include suppliers, CII recognizes that suppliers of key engineered systems and components can and should play a significant role in the pursuit of CII goals. CII, therefore, established the Reforming Supplier Relationships Research Team to explore the potential for reforming traditional owner/contractor/supplier relationships in engineer-procure-construct (EPC) projects to enhance the ability of suppliers to contribute more meaningfully to this process.

Believing that a *breakthrough* approach would be required to facilitate such a reformation, this research team concluded that if the role of suppliers of the most critical components and systems in a project is to be enhanced, then one must both enhance and prioritize the point of definitive contact with those suppliers: *the procurement process*. A new project delivery system was envisioned that divides the procurement process into “big P” — strategic procurement items, including complex engineered equipment and systems essential for project performance, and “little p” — the balance of items to be procured; and then reconfigures the traditional EPC model into Procurement, Engineering, procurement, and Construction, or PEpC.

In traditional EPC, procurement follows engineering, both sequentially and in the fact that engineering specifies and defines the items to be procured. In PEpC, the most strategic and project-critical procurement transactions occur *prior* to detail engineering, and those procured items then influence and define subsequent detailed engineering. Further, the core competencies of the supplier, which are often unique and beyond those possessed by either the owner or contractor, are provided directly into the project delivery system.

Utilizing a sophisticated simulation model of the classic EPC process, the research team compared the impact of a PEpC approach to project execution with traditional EPC. In both theoretical and field implementations, the results indicated that PEpC could produce savings in excess of 10 percent to 15 percent of the time and four to eight percent of the cost of the traditional EPC process.

Introduction

A Challenging Mission

Membership in CII traditionally has been limited to the principal consumers and principal providers of engineering and construction services, i.e., owners and contractors. Recently, CII expanded its membership categories to include the suppliers of major materials, equipment, and systems that are incorporated into construction projects. This membership expansion arose from the recognition that suppliers of key materials, equipment, and systems can and should play a significant role in pursuit of CII's mission to improve the cost, schedule, quality, and safety of the construction industry.

With this new recognition of the supplier community, CII created the Reforming Supplier Relationships Research Team and tasked it with examining the relationships and roles of suppliers in traditional EPC construction. More specifically, the research team was asked to explore the potential for reforming the traditional owner-contractor-supplier relationships in EPC projects in order to enhance the ability of suppliers to contribute more meaningfully to the process.

The research team recast this assignment into the following problem statement:

Strategic procurement items, including complex engineered equipment and systems essential for project performance, are frequently designed, manufactured, and delivered by suppliers who are outside the traditional "circle of cooperation" between owner and contractor. The expertise embedded in the design of this equipment, as well as the expertise needed for its successful integration, operation, and maintenance is frequently lost or under utilized. The resulting inefficiencies have an impact on the time, cost, and quality of engineering and construction as well as on the life cycle performance of constructed facilities.

After considerable discussion, and believing that a meaningful solution could be found, the research team posed the following hypothesis that would become the subject of its future efforts:

It is possible to systematically reform relationships between owner, contractor, and supplier so that suppliers of strategic procurement items and/or systems can be included in the full EPC process and thereby have a significant positive impact on the time, cost, and quality of the entire engineering and construction process, as well as on the life cycle performance of constructed facilities.

The hypothesis was based on the belief that substantial savings in time and cost could be realized if a step change in traditional owner/contractor/supplier relationships could be achieved in such a way as to make it possible for suppliers to contribute effectively in every phase of the total facility life cycle. It was clearly felt that owners, design contractors, and construction contractors would benefit from new and dramatically different relationships with suppliers, who should no longer be silent partners in the EPC process.

An Innovative Methodology

Addressing the problem statement and confirming the hypothesis required a research effort that extended beyond the classic steps of identifying a problem, gathering data, examining results, and recommending change. A suitable methodology was, therefore, developed that included the following four key steps:

1. Initiating an extensive search for innovation within and beyond the boundaries of the industrial construction industry.
2. Defining a breakthrough project delivery system, which would make it possible to utilize supplier expertise in all phases of the project life cycle.
3. Measuring and quantifying the effect of implementing the breakthrough in both theoretical and field implementations.

4. Developing the required tools to facilitate the routine implementation of the breakthrough throughout the industry.

The results of Steps 1 and 2 are covered in the following chapter. The measurement process is discussed in Chapter 3; and implementation procedures are in discussed in Chapter 4.

Development of the Breakthrough Model

A Search for Innovation

The research team set out to identify instances or trends of enhanced supplier involvement, both within and beyond the construction industry. A literature survey, a mail questionnaire of CII member companies, and a number of structured interviews by research team members were used to identify and study instances where owners, contractors, or suppliers had successfully developed or employed innovative or atypical relationships within the EPC process.

Four principal conclusions flow from this effort:

1. There is both need and precedent for the development of a step change to the EPC process that brings suppliers of strategic components and/or systems for a project into the circle of cooperation between owner and contractor.
2. The analysis of the questionnaire results showed that suppliers were, in numerous cases, being used in an expanded role with regard to status, time of involvement, and expected role, but that business and commercial relationships remained narrowly and traditionally defined.
3. The interviews conducted by research team members confirmed pockets of innovation within the industry and presented strong anecdotal evidence of reductions in time and cost due to the early involvement of strategic suppliers.
4. The survey of associated industries showed that at least two industries, the automotive manufacturing industry and the micro-electronics construction industry, had improved performance by expanding the role played by suppliers and that many of their lessons could be transferred to the mainstream industrial construction sector.

Defining a Breakthrough Delivery System Model

The research team was convinced that a step change to the EPC process that would bring suppliers of strategic items and/or systems into the circle of cooperation between owners and contractors was both necessary and possible.

Discussion among the varied interests represented by the research team membership led to a discussion during which the members came to the following conclusion:

If one really desires to enhance the role of suppliers of the most critical components and systems in a project, then one must both enhance and prioritize the point of definitive contact with those suppliers: *the procurement process*.

This led the research team to envision a project delivery system that takes the “big P” for procurement in the EPC process and places it before the E for engineering so that the technical knowledge and expertise of major suppliers can be integrated into all phases of the project from the beginning, thus PEC.

In recognition of this change and the fact that a number of non-strategic procurement items would continue to be procured in the traditional way (little p), the research team designated the process PEpC.

This, together with the need to accommodate a variety of interests and applications, led to the following broad definition:

PEpC (Procurement, Engineering, procurement, and Construction) is an innovative project delivery system which makes it possible to utilize key supplier expertise in all phases of the project life cycle by developing an advance procurement strategy and by actually reaching full commercial and contractual agreement with suppliers of strategic procurement items and/or systems *prior* to the principal project engineering activities.

Refining the Breakthrough

The fundamental and essential characteristic of PEpC compared with classic EPC is that procurement of the most project-critical components is accomplished prior to all but the most preliminary engineering efforts. (In this context, *procurement* means concluding a full, complete, and binding contractual agreement between the buyer and seller for one or more specified products and or services.)

In traditional EPC, procurement follows engineering, both sequentially and in the fact that engineering specifies and defines the items to be procured. In PEpC, the most strategic and project-critical procurement transactions occur prior to detail engineering, and those procured items then influence and define subsequent detail engineering. More importantly, the suppliers of such project-critical components are no longer passive compliers with specifications generated by engineering, but can now play an active role in defining their own contribution to the engineering and design process, as well as those of other related and downstream suppliers.

The “big P” procurement in PEpC should not be confused with early or advanced purchasing strategies frequently utilized in EPC projects to deal with long-lead items. In traditional EPC, early purchase of long-lead items occurs principally, and often solely, to preserve the scheduling interests of the project. In PEpC, however, early procurements are concluded with the principal intent of bringing selected suppliers of project-critical components into the owner and contractor “circle of cooperation” so that suppliers can more effectively contribute to and influence downstream engineering and other front-end activities and decisions, i.e., to deliver supplier core competencies directly into the project delivery system and not indirectly via the owner or contractor.

The idea of utilizing supplier knowledge and expertise in developing project designs and specifications is certainly not new. Any experienced engineering designer or specifier knows the value of supplier input, just as any supplier representative knows the importance of maintaining contact with engineering.