

# Chapter 1

## Engineering and Construction Projects Characteristics

### **ABSTRACT**

*Companies try to use better techniques to deal with complex projects. The maturity of companies to apply these better techniques can guarantee project success or not. The environment, where the engineering and construction project is developed, also has influence over the success. The maturity of a company's project management processes is also a factor of success. This chapter aims to talk about concepts related to engineering and construction initiatives.*

### **CONCEPT OF ENGINEERING AND CONSTRUCTION PROJECTS**

Different kinds of project (as the development of new housing units, new industrial plants, highways or railways) comprises engineering and construction phases (Coutinho, 2009). They require multidisciplinary knowledge and high level of planning.

These kinds of projects usually will have following characteristics or demands: application of accurate engineering techniques, high amounts of financial resources, large teams, time (of conclusion) pressure, several kinds of risks, including project environmental risks, and different expectations about quality.

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Engineering and Construction projects may be unpublished, or reforms, or repowering and or maintenance of large recoveries, aimed at understanding the application of a Capital Expenditure (CAPEX) from investors or the State itself.

The engineering of a project comprises a coordinated series of activities or tasks performed by engineers and designers from one or more engineering disciplines or departments. Its tasks consist of such things as performing calculations, writing specifications, preparing bids, reviewing equipment proposals and evaluating or selecting equipment and preparing various lists, such as equipment and materials lists, and drawings such as electrical, piping and instrumentation diagrams, physical layouts and other drawings used in design and construction.

Some companies have in house staff to handle small projects, while other larger companies have a department that does internal project engineering. Large projects are typically outsourced to engineering companies. Staffing at engineering companies varies according to the work load. In these companies the employment may only last until an individual's tasks are completed.

Based on the level of uncertainty surrounding the project, we can assume that risks will be closer to the project from the initiation until its closure.

Now we begin to understand the importance, for a company, to have project management processes in place to guarantee or to decrease the level of uncertainty of a project (Kerzner, 2003). We have to understand that it's not enough only applying concepts of project management but ensuring that they are properly implemented and being followed by the respective team of the project.

At this point we can realize the importance of an instrument to evaluate if a company has maturity in its project management processes. The unique way to check the reliability of a project management process is measuring its maturity using a defined model. For this company's board, this maturity simplifies the process to invest financial resources and become them more confident about the project approval and development process.

The objective of this book is to talk about the models used to check the maturity of project management process of a company as well as to discuss the use of this model in complex projects.

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