

## EVOLVING ENGINEERING OF INDUSTRIAL FACILITIES

Shawn McGaw, P. E.<sup>1</sup> and Silky Wong, S.E., P.E., LEED AP<sup>2</sup>

<sup>1</sup>Fluor Corp, One Fluor Daniel Drive, Sugar Land, TX 77478; PH (281) 263-3235;  
email: [shawn.mcgaw@fluor.com](mailto:shawn.mcgaw@fluor.com)

<sup>2</sup>Fluor Corp, One Fluor Daniel Drive, Sugar Land, TX 77478; PH (281) 295-6303;  
email: [silky.wong@fluor.com](mailto:silky.wong@fluor.com)

### Abstract

Engineering contracts for Industrial Oil & Gas facilities are typically different from those for residential and commercial facilities. Industrial Oil & Gas facilities involve large capital costs, large and complex equipment, jobsites in harsh environment, economic viability heavily subjected to government funding, permits and environmental regulations. As a result, engineering contracts for Industrial Oil & Gas facilities typically require multiple-staged estimating and planning periods to determine project viability throughout the engineering time period. In response to the changes to historical crude pricing which led to lower profitability, Industrial Oil & Gas Engineering must evolve to new execution, construction, and design techniques, in order to reduce costs for clients and thus making projects viable.

The purpose of the presentation is to arm engineers with an understanding of Engineering, Procurement and Construction (EPC) project execution for industrial facilities, so that they can better develop proposals and/or contracts for their clients.

Upon the completion of this presentation, the participants will understand various factors to determine project viability for industrial facilities. They will be able to identify different phases of a project; and how engineers' decisions at each phase affect the estimated project cost. The participants will understand the current challenges and trends in the Industrial Oil & Gas markets, which led to the increasing demand of modular construction. Lastly, they will gain insight into some context to engineering evolution related to execution, construction, and design techniques from project examples of the presenters' company<sup>1</sup>. Through those project examples, the participants will learn the key to a better, faster, safer, and more profitable project is: Proactively working with other functions outside their own functions.

### Keywords

Industrial facilities; Oil & Gas; On-Site built construction; Modular construction; Construction; Engineering

---

<sup>1</sup> Fluor Corporation, a global, publicly owned company, has served clients in the energy, chemicals, government, industrial, infrastructure, mining, power, and other capital-intensive industries since 1912. The company provides services and delivers solutions varies project phases. In 2016, Fluor Corporation has more than 60,000 employees, supporting more than 4,000 clients across six (6) continents, in more than 100 offices located in 36 countries.