

## N855: Managing Capital Projects in the Energy Industry

Format and Duration

Instructor(s): Laurent Spring

Classroom - 5 Days

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### Summary

The aim of this course is to offer practical and comprehensive guidance to participants, enabling them to effectively reduce project recycles that result in delivery delays, increased costs, negative impacts on overall economics and loss of credibility in delivering projects as per promises. This objective is achieved through the implementation of industry-leading practices in Front-End Loading, Integrated Project Management, and Governance decision-making. By adopting these practices, participants will gain the necessary tools to ensure efficient project execution and achieve optimal outcomes. By enrolling in this course, project practitioners will significantly enhance their ability to effectively manage and integrate multi-disciplinary and multi-functional teams throughout the entire front-end part of Capital Projects delivery, from the initial project kick-off to the Final Investment Decision. Although the course materials primarily draw from the Oil & Gas Industry (Upstream, Midstream, Downstream), the principles and strategies taught have direct applicability to any Capital Intensive projects within Extractive Industries, Energy generation and transmission, or Infrastructure sectors.

### Learning Outcomes

The course emphasizes the following key learning objectives:

1. Gain comprehensive knowledge of the development process for technical scope at each stage of the front-end, from idea generation to the Final Investment Decision.
2. Acquire proficiency in utilizing tools and techniques to optimize functional requirements and designs for economically viable project outcomes. Apply these tools and techniques in your own projects after completing the course.
3. Develop a deep understanding of the roles and responsibilities of other functions involved in project delivery. Address any knowledge gaps and gain exposure and experience in these functions following the course.
4. Cultivate familiarity with multi-functional workflows and 'swimlanes' as a best-in-class project management approach. Use this knowledge to map relevant 'swimlanes' applicable to your own project as a project management tool.
5. Comprehend the purpose, applicability, and usefulness of an Integrated Project Management System (IPMS), including standards, guidelines, tools, and templates. Apply this understanding to future projects by reading and internalizing your own company's IPMS, encompassing other functions.
6. Discuss the limitations of decisions that can be made by the Project Team and identify decisions that fall under the purview of Governance. After the course, read and internalize your own company's governance structure, roles and responsibilities, and RACI (Responsible, Accountable, Consulted, and Informed) framework.
7. Gain insight into the purpose, requirements, and timing of Project Assurance. Following the course, read and internalize your own company's Value Assurance Framework. Develop activity and decision-based work plans accordingly, separating technical scope, cost and schedule, and project execution readiness. This is applicable for both Project and Governance practitioners.

By focusing on these learning objectives, participants will enhance their project management skills and be better equipped to handle complex and multi-disciplinary projects effectively.

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### Training Method

This course is conducted over a five-day period, offering an immersive face-to-face learning experience. The training approach is highly practical, providing participants with ample opportunities for development and hands-on practice.

### Who Should Attend

Eligible participants are required to have a minimum of 15 years of professional experience, with at least 10 years specifically in a capital project environment. Furthermore, participants should hold a senior position with responsibilities for leading and integrating various aspects of capital projects. This includes senior professionals in project support functions and senior staff accountable for making governance decisions within projects.

Project governance professionals, whether they represent the operator, joint-venturers, or government regulatory and oversight bodies, will greatly deepen their understanding of the essential elements required to successfully deliver projects. By including participants with diverse backgrounds and expertise, the course facilitates a rich and collaborative learning environment where knowledge and experiences from various project functions can be shared and applied to real-world scenarios.

Participants are required to possess a minimum of one PMP and PMI certification in Project Management, Risk, Scheduling, Construction, or other relevant certifications in contracts and procurement management.

### Course Content

One of the persistent issues affecting project integration is the tendency for project practitioners and governance specialists to remain focused solely on their respective technical disciplines or functions. Rarely do they have the opportunity to develop skills in other crucial areas. To address this common problem, this course emphasizes the importance of concurrent multi-functional workstreams in capital project delivery.

Participants will gain insights into the necessary resources, time management, and integration strategies. Additionally, they will learn about the challenging trade-offs and decisions that must be made by them in a timely manner to ensure the project adheres to schedule and cost commitments.

#### Day 1: ASSESS Stage 1

Stage Gated Process and Project Assurance

- Provide an overview of the Capital Project Investment Framework that governs all projects
- Detail the required actions for each Project Stage
- Explain the purpose and significance of different types of Project Assurance

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### Integrated Project Management System

- Showcase the positive impact of IPMS documentation on Project Delivery
- Introduce the use of multi-functional integrated swimlanes as a project management tool

### Front-End Loading

- Define the FEL concept, emphasize its importance, and highlight the consequences of not applying it
- Explore industry best-practice FEL principles for project maturation

### Project Framing

- Utilize Early Benchmarking to gain insights and establish realistic expectations
- Establish effective Project Framing strategies and assemble a successful Project and Governance Team

### Technical Scope Development in ASSESS

- Present a step-by-step approach to be followed during the ASSESS stage and identify responsible parties

### Value Improvement Practices

- Introduce fundamental concepts and design optimization practices in the Front-End phase

### Day 2: ASSESS Stage 2

- Concept Families Identification Process
- Explore workflows for developing concept families
- Discuss possible and desirable development strategies
- Highlight the use of Block Flow Diagrams
- Identify specific functionalities and options for Concept Families
- Guide the creation of the Concept Families Long List
- Engage in exercises focused on developing Concept Decision Tables

### Value Improvement Practices applicable to ASSESS Stage

- Understand different Classes of Facilities quality and determine the optimal requirements
- Evaluate technology selection for downstream O&G projects: Licensor or Open Art
- Assess constructability feasibility and the key considerations for early verification

### Shortlisting the conceptual long list

- Examine the decision-making process for shortlisting concepts
- Discuss the involvement of Governance and key Stakeholders in selecting focused concepts

### Day 3: SELECT Stage 1

#### Technical Scope Development in SELECT

- Provide a detailed, step-by-step approach for the activities to be carried out during the SELECT stage and specify the responsible parties
- Focus on developing the minimum functionalities concept line-up

#### Cost & Schedule Estimations

- Explain the process of developing Cost Blocks for each concept using the S&P QUE\$TOR tool
- Demonstrate the generation of Level 1 schedules and Class 4 cost estimates

### Day 4: SELECT Stage 2

#### Concept Selection Assurance Review

- Explore best practices that underpin quality concept selection
- Identify key technical and documentation requirements for undertaking Concept Selection
- Discuss the outcome of Concept Selection and its readiness for the Conceptual Design phase

#### Conceptual Design Phase

- Optimize the selected minimum functionalities concept through relevant VIPs:
  - Process simplification
  - Waste minimization
  - Energy optimization
  - Design to capacity, including standardization and replication

#### Freezing the Conceptual Design and Functionalities

- Conduct an Integrated Technical Review on Basis For Design
- Finalize the scope of cost blocks for quantities and specifications

#### Work-up Level 2 Schedule and Class 3 Cost Estimations

- Facilitate a Project Execution and Contracting strategy workshop based on the frozen scope
- Define the Front-End Engineering Design (FEED) execution strategy, identify Long Lead Items and Licensor requirements
- Develop probabilistic Level 2 and Class 3 cost estimates anchored in market conditions and identified risks

#### End of SELECT Assurance Reviews

- Conduct a Cost Estimation and Schedule Assurance Review, evaluating promises to Shareholders
- Perform a Project Readiness Review to ensure everything is in place for successful delivery of the

Project in the DEFINE phase and readiness to take Final Investment Decision (FID)

### External Benchmarking

- Compare the Project's Cost & Schedule against industry standards
- Evaluate team readiness and identify any gaps that need to be addressed

### Day 5: Define Stage

#### Technical Scope Development in DEFINE

- Provide a detailed, step-by-step approach for the activities to be carried out during the DEFINE stage and specify the responsible parties.
- Explain how the Front-End Engineering Design is constructed based on the Basis for Design and Statement of Requirements.
- Discuss the optimization of the FEED scope through relevant VIP:
  - Constructability
  - Process Reliability
  - Predictive Maintenance
  - Customized Standards

#### Freezing the Front-End Engineering Design and Scope

- Conduct a Hazard and Operability Review (HAZOP)
- Perform an Integrated Technical Review on FEED dossier before team demobilization
- Finalize essential documentation (e.g., P&ID, G&A, equipment list,...)

#### Work-up Level 3 Schedule and Class 2 Cost Estimations

- Conduct a Project Execution and Contracting strategy tactics workshop based on frozen scope
- Define the Project execution strategy, agree on Long Lead Items tendering
- Develop probabilistic Level 3 and Class 2 cost estimates based on direct market queries and identified risks as the basis for Final Investment Decision (FID)

#### End of DEFINE Assurance Reviews

- Conduct a Cost Estimation and Schedule Assurance Review, assessing the FID promises to Shareholders
- Perform a Project Readiness Review to ensure everything is in place for engineering, procurement, construction, and commissioning

#### Tendering Stage

- Prepare Invitation to Tender packages based on the frozen FEED and Project Execution and Contracting strategy, sectionalizing for Long Lead Items and Project requirements
- Execute the tendering cycle and evaluate technical and commercial aspects to enable contract award

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decisions for FID

Taking FID

- Discuss the decision-making process, including differences between the Operator, Joint Venture (JV) partners, and Regulator