Front End Engineering Design for Major Projects Training Course

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4100 € (Per Person)

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Course Introduction / Overview:

Front-End Engineering Design (FEED) is the most critical phase in the lifecycle of major industrial projects, setting the foundation for success or failure. A well-executed FEED phase significantly reduces technical uncertainties, clarifies project scope, and provides a robust basis for cost and schedule estimates, thereby minimizing risks during the execution phase. This comprehensive program is designed to equip participants with the essential knowledge and skills to effectively manage and execute the FEED process. Drawing on industry best practices and principles outlined in seminal works like "Project Management for Engineering and Construction" by Garold D. Oberlender, the course delves into the intricate details of developing a robust project definition package. Participants will explore the entire FEED workflow, from initial concept selection and feasibility studies to the development of detailed engineering deliverables ready for the Engineering, Procurement, and Construction (EPC) phase. BIG BEN Training Center has structured this course to bridge the gap between theoretical knowledge and practical application, ensuring that attendees can confidently navigate the complexities of front-end planning and contribute to the successful sanctioning and execution of capital-intensive projects.

Target Audience / This training course is suitable for:

- Project Managers and Directors.
- Lead Engineers and Discipline Engineers (Process, Mechanical, Electrical, Civil).
- Project Controls Managers and Specialists.
- Cost Estimators and Schedulers.
- Procurement and Contract Managers.
- Construction and Commissioning Managers.
- Business Development and Investment Analysts.
- Operations and Maintenance Supervisors.

Target Sectors and Industries:

- Oil and Gas (Upstream, Midstream, and Downstream).
- Petrochemicals and Chemicals Manufacturing.
- Power Generation (Conventional and Renewable).
- Mining, Minerals, and Metals Processing.
- Pharmaceuticals and Biotechnology.
- Heavy Infrastructure and Transportation Projects.
- Water and Wastewater Treatment Facilities.
- Governmental bodies and public sector infrastructure agencies.

Target Organizations Departments:

- Engineering and Design.
- Project Management Office (PMO).
- Capital Projects and Execution.
- Contracts and Procurement.
- Planning and Project Controls.
- Finance and Investment Analysis.
- Operations and Plant Management.
- Health, Safety, and Environment (HSE).

Course Offerings:

By the end of this course, the participants will have able to:

- Develop a comprehensive project scope and design basis.
- Master the key deliverables of the FEED package.
- Perform Class 3/4 cost estimates and preliminary project scheduling.
- Lead and participate in critical design and safety reviews like HAZOP.
- Evaluate technical and commercial risks effectively during the front-end phase.
- Create a robust Project Execution Plan (PEP).
- Prepare a detailed FEED package for tendering to EPC contractors.
- Align project stakeholders on objectives, scope, and execution strategy.
- Apply value engineering principles to optimize project design and cost.
- Understand the criteria for a successful Final Investment Decision (FID).

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, practical, and engaging, ensuring maximum knowledge retention and skill development. This course moves beyond traditional lectures to create a dynamic learning environment where participants actively apply concepts to real-world scenarios. The program is built upon a foundation of expert-led presentations that cover the theoretical aspects of Front-End Engineering Design. These sessions are complemented by a series of in-depth case studies drawn from major industrial projects across various sectors, allowing participants to analyze both successes and failures. A significant portion of the course is dedicated to hands-on workshops and group exercises where attendees will collaborate to develop key FEED deliverables, conduct risk assessments, and simulate decision-making processes. Open discussions, Q&A sessions, and peer-to-peer knowledge sharing are actively encouraged to foster a collaborative atmosphere. This blended approach ensures that participants not only understand the principles of FEED but also gain the confidence to apply them effectively in their professional roles upon returning to the workplace.

Course Agenda (Course Units):

Unit One: Fundamentals of Front-End Engineering Design (FEED)

- Introduction to the project lifecycle and the role of FEED.
- Understanding Front-End Loading (FEL) and its phases.
- Key objectives and success factors for the FEED stage.
- Defining the relationship between FEED, feasibility studies, and detailed design.
- Roles and responsibilities of the project team during FEED.
- Introduction to key industry standards and practices.
- The impact of poor FEED on project outcomes.

Unit Two: Scope Definition and Basis of Design

- Developing the project objectives and business case.
- Establishing the Basis of Design (BOD) document.
- Conducting site selection and technology evaluation.
- Creating Block Flow Diagrams (BFDs) and Process Flow Diagrams (PFDs).
- Defining battery limits and interfaces with existing facilities.
- Stakeholder management and alignment workshops.
- Finalizing the project scope statement.

Unit Three: Core Engineering Deliverables and Safety in Design

- Developing Piping and Instrumentation Diagrams (P&IDs).
- Creating preliminary plot plans and equipment layouts.
- Sizing and specification of major equipment.
- Introduction to preliminary civil, structural, electrical, and instrumentation design.
- Integrating Health, Safety, and Environment (HSE) in design.
- Conducting Hazard and Operability (HAZOP) studies.
- Preparing the FEED design book and key drawings.

Unit Four: Cost Estimation, Scheduling, and Risk Management

- Introduction to AACE cost estimate classifications (Class 3 & 4).
- Techniques for developing the FEED capital cost estimate (CAPEX).
- Estimating operating and maintenance costs (OPEX).
- Developing the Level 2/3 project master schedule.
- Identifying, analyzing, and responding to project risks.
- Creating the project risk register for the execution phase.
- Applying value engineering concepts to optimize the project.

Unit Five: Execution Planning and the Final Investment Decision

- Developing the Project Execution Plan (PEP).
- Formulating the procurement and contracting strategy.
- Defining the construction and commissioning strategy.
- Compiling the final FEED package for EPC tender.
- Understanding the process for project sanctioning.
- Preparing the documentation for the Final Investment Decision (FID).
- Managing the transition from FEED to the EPC phase.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How can the principles of Front-End Loading (FEL) be adapted to manage uncertainty in fast-tracked projects with evolving technologies?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing on the strategic integration of engineering, project management, and business acumen, which is essential for the successful delivery of major industrial projects. While many programs concentrate solely on the technical deliverables of the FEED phase, this training provides a holistic perspective, teaching participants how to connect engineering decisions directly to financial outcomes, risk profiles, and long-term asset performance. It emphasizes the "why" behind the "what," enabling attendees to make more informed, value-driven decisions. The curriculum is heavily rooted in practical application, utilizing a case-study methodology that explores complex, real-world project challenges rather than simplified textbook examples. This approach forces participants to grapple with the same ambiguities and trade-offs faced by senior project leaders. Furthermore, the course content is designed to foster critical thinking about the entire project lifecycle, ensuring that the FEED package is not just technically sound but also strategically aligned with the organization's business objectives, making it a robust and bankable plan for execution.