Front End Engineering and Development (FEED) is part of the planning and engineering phase of a plant upgrade / modification or new construction project. FEED activities follow conceptual project planning, and during the FEED phase, is where the best opportunities exist for cost and time savings for project. As this is the phase where most of the total costs are defined and where most changes have the smallest impact to the project.

Process plant owners/operators and EPC (Engineering, Procurement, and Construction) contractors are facing ever increasing pressure for enhancing plant efficiency, reliability, availability and safety to maximize their Return on Investment (ROI). A major part of the cost details in plants are defined in the early design phases making it critical that optimal technical solutions are defined in the front end. Thus, by investing in up-front FEED activities, the best opportunities to increase the ROI are generated.

Figures published by the Construction Industry Institute (CII) show a potential of 20% cost reduction and 39% time savings compared to a project without pre-project planning. The reason is that, at the early stage of a project, the design is very dynamic, decisions are highly interrelated, options can be evaluated and various scenarios are compared quickly with design options and costs continuously balanced.

All the benefits of a traditional FEED are also applicable to the area of process analytics that benefit both plant owners/operators and EPCs.

Siemens Analytical Products and Solutions brings a unique blend of expertise in analytical technologies and applications for complete analytical solutions to many industries. Based on this background, Siemens Analytical Products and Solutions offers a wide scope of FEED services focused on process analytical systems to support clients in maximizing performance and efficiency of their projects.

Read more on the following pages how Siemens Analytical Products and Solutions with its FEED for Process Analytics consulting services helps to reduce costs, save time, and improve plant efficiency.
FEED for Process Analytics – Increasing project execution efficiency

**FEED for Process Analytics**
Process analytics is an indispensable part of almost any process plant by providing key compositional data needed for process automation and environmental control. It is also known as a very specialized area of field instrumentation demanding hands-on experience and in-depth expertise. Therefore, FEED for Process Analytics (Fig. 1) can best be addressed by companies with practical experience in this area, such as Siemens Analytical Products and Solutions.

Figure 1 illustrates where FEED for Process Analytics fits and the three common stages involved.

- **Process analytics design** such as analyzing principles, analyzer technology, analyzing systems and shelters, sampling technologies, utilities and supply, application solutions, etc.

Studies and practical experience have shown that costs and timing of plant construction or modification projects are greatly affected by a careful FEED. The ability to minimize costs is high at the front end of a project and declines rapidly after project execution (Fig. 2).

- **Communication systems** as related to the analyzers, such as interfacing to networks or fieldbus systems, remote maintenance, diagnostics, etc.

- **Regulations and standards compliance** that apply to the process analytics used for the project.
**Modular services**

Based on extensive experience and expertise in all areas of process analytics, Siemens Analytical Products and Solutions offers a wide scope of FEED services to process industries such as Oil & Gas, Pharmaceutical, Cement, Power, and Chemistry for:

- new construction projects
- plant upgrades, revamps and
- plant standardizations.

Siemens Analytical Products and Solutions offers a variety of modules from Project Review to Design & Engineering (Fig. 1 and 4). The modules can also be customized for specific customer requirements.

Our FEED activities include close interactions with plant operators/EPC contractors (Fig. 3). We consult from assessment of the situation through studies and concepts up to detailed design for optimal analytical solutions. For plant upgrade projects, we visit the plant and evaluate the condition of existing analytical systems in close cooperation with the plant operators and recommend an optimal strategy for renovation or replacement.

**Siemens as a partner**

Siemens is the ideal partner for FEED for Process Analytics with a range of capabilities that include:

- **Analytical engineering expertise**
  As a manufacturer of a broad variety of analyzers, we are very experienced in the engineering and manufacturing of analytical systems and shelters. We are familiar with communication networks, well trained in service and maintenance, and familiar with many industrial processes and industries. This gives Siemens Analytical Products and Solutions a unique blend of overall analytical expertise and experience. Our multidisciplinary teams have the experience to provide successful complete measurement solutions even for demanding analytical applications.

- **Global project management presence**
  With our strategically located centers of competence in USA, Germany, Singapore, Dubai and Shanghai (Fig. 5), we are present globally and acquainted with all respective local and regional requirements, codes and standards. All centers are networked together for global project collaboration.

  - **Complete life cycle service and support**
    With our large service and support portfolio, we can assist throughout the complete life cycle (Fig. 6). Customized service contracts and experienced service on-site help to reduce downtimes and ensure optimum operation of the analytical equipment. We also offer a support hotline and a comprehensive selection of on-site training courses.

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### FEED for Process Analytics

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Fig. 4: Typical content of FEED service modules

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**FEED for Process Analytics – Global expertise at your disposal**

![Fig. 6: Service portfolio](image)

![Fig. 5: Global presence of Siemens Process Analytics](image)
Benefits
Whether you are a plant operator/owner or an EPC contractor, you can benefit in a variety of ways from FEED for Process Analytics by Siemens.

- Analytical application and industry know-how available right from the beginning of the project
- Established studies and concepts, that lead to realistic investment decisions
- Streamlined project management and coordination effort, due to one responsible contact person
- Additional expertise on demand, without having the costs, and the risks of building up the in-house capacities
- Detailed analyzer system specifications, drawings and documentation for clear and concise project execution.
- Lowest possible Total Costs of Ownership (TCO) along the entire life cycle including investment costs, consumptions, utilities supply and maintenance.

What customers say about the benefits of FEED for Process Analytics, based on their experiences

- “The additional process analytics experts we had available assigned our project with the necessary personnel. At this time we did not have the resources to do that by ourselves. The close interaction between Siemens’ project leader and our key persons made sure that the requirements were fulfilled quickly and completely. Siemens’ employees were able to perform many of the activities, without direct supervision or involvement of our technical personnel. We could focus on other core activities and saved a lot of time.”
- “The established studies, concepts and comparisons we received led to a clear reduction of investment in analyzers, network communication and shelters, because of the common standards we applied after FEED for Process Analytics was done. We got an optimal solution, considering investment and operational expenses along the system life cycle.”
- “We received comprehensive, unambiguous drawings and specifications in shortest time, before bidding. That avoided waiting until the analyzer system supplier reviewed engineering drawings after the purchase order, because installation could be prepared already. Therefore the whole bid process was quicker.”
- “The available specifications and drawings we received through FEED for Process Analytics, did not allow arbitrary interpretation and there were no cutting corners left. The spread of fixed price quotations was reduced significantly. Furthermore the available detail information, drawings and specifications reduced change orders not due to scope changes to a minimum.”

Fig. 7: Benefits users have experienced with FEED for Process Analytics

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