



Turbomachinery & process optimization begins with FEED – engage CCC early

Ensure projects are optimally designed – avoid project risks and change management costs

CCC Engineering Design Services support End Users and Engineering Contractors to optimize the turbomachinery control design in the early phases (Pre-FEED and FEED). We ensure your projects are optimally designed in project documentation to avoid risks and change management costs in the subsequent phases (EPC, Commissioning, Operation). The CCC engineering approach focuses on a combination of different disciplines, process, machinery, instrumentation and control. Our project engineers work closely with our customers at their location, with guidance by global subject matter experts.

Benefits that transform the bottom line

- Reduced CAPEX and OPEX
- Reduced risks and change management costs on projects
- Improved safety, reliability, process yield and energy savings
- Increased project design control and compliance to global end user specifications
- Confidence that your interests are represented and protected

Resources that deliver a competitive advantage

- 50-year experience with multiple industries, processes and machinery
- Reference list including thousands of installations
- People with experience and certification
- Knowledge of industry standards and internal Engineering Design practices
- Global project engineering, working closely with customer



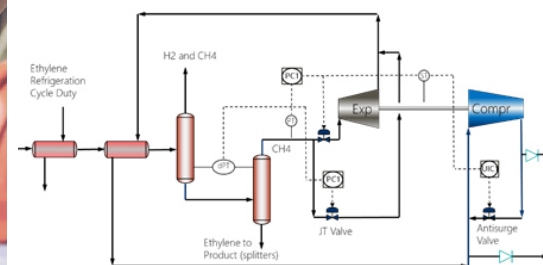
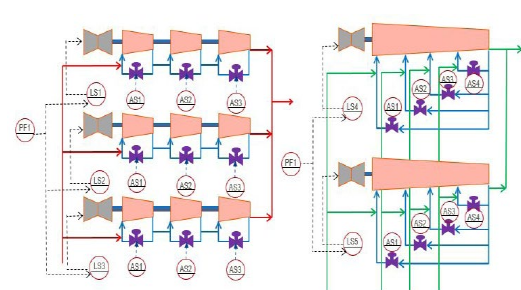
▲ Our Emulator coupled with high-fidelity process simulation software tests the turbomachinery control design in a dynamic environment.

CCC engineering design services – modular & adaptive

The CCC Engineering Design Services are modular and adaptive to the specific project needs and timeline. The areas and level of review and design methodologies can be adapted over time as the project definition evolves and expands.

CCC Engineering Design Services include:

1. Review project design: process, machinery and control to optimize the overall solution
2. Review and commenting FEED documentation (P&IDs, PFDs, machinery data, process control strategy, sequencing procedures, etc.)
3. Review and commenting dynamic simulation model and reports
4. Validate control solutions via CCC Emulator software (used in conjunction with 3rd party high-fidelity process dynamic simulation software) during FEED, including startup shutdown and upset scenarios. Review and comment on model and results
5. Develop Functional Design Specification for turbomachinery control, in line with end user specs
6. Participate in project review meetings
7. Deploy CCC resident engineer at Client's office, if required



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