

CCC Optimization Services *For Total Train Performance*



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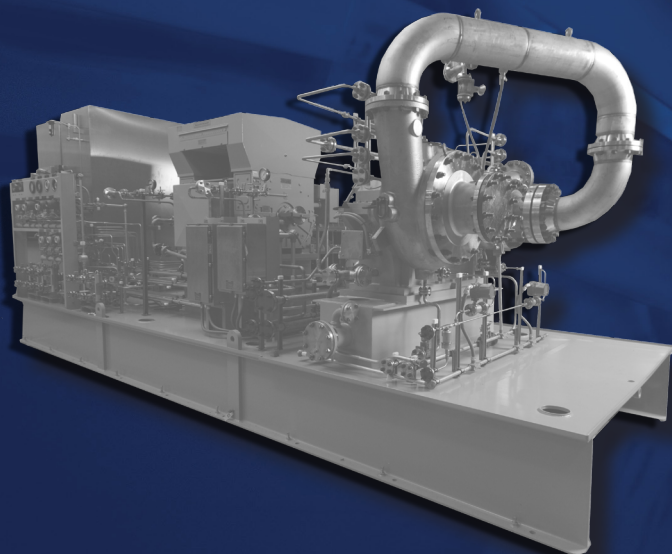
Hardware
Software
Services
Expertise
Experience



More Than 40 Years and 37,000 Turbomachinery Trains...*OPTIMIZED*

Compressor Controls Corporation (CCC) is the leader in Turbomachinery Optimization Services for the upstream, midstream and downstream Oil & Gas and petrochemicals industries. Process, controls, safety, & machinery engineers and plant executives optimize plant safety, capacity, efficiency and reliability every day utilizing CCC's expertise. Since 1974, more than 37,000 control installations have benefited from more than two billion hours of CCC's operational experience. This expertise is executed in a comprehensive platform of hardware, software and consulting services that optimize turbomachinery to improve process performance, increase yield, save energy, reduce downtime and enhance plant safety & security. **CCC's optimization services** are technology-agnostic. No other controls or automation vendor have the resources that can serve your needs better, with local support and a legacy of proven results.

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Expertise In Turbomachinery Optimization

Mission

CCC collaborates with customers to deliver reliable solutions for critical turbomachinery control applications that result in tangible economic benefits.

Vision

The CCC vision is to drive exciting growth as the customer's trusted advisor throughout the entire lifecycle. Service excellence, world-class execution, a growing global presence, outstanding products and expertise are the pillars of this vision.

Leadership

Executive Leadership Team

David Coslin, President

David Bizak, VP of Finance

Richard Hall, VP of Product Management & Marketing

Adam Oser, VP of Global Operations

Sarah Sabers, VP Human Resources

Serge Staroselsky, Chief Technology Officer

Regional Sales Directors

Brian Chan, Asia Pacific Sales Director

Islam Fahmi, Middle East Sales Director

Shawn Olson, North America Sales Director

Harald Stappers, Europe Sales Director

Fabio Zanetti, Latin America Sales Director

1.



Localized Experts in Turbomachinery Optimization

CCC is headquartered in Des Moines, Iowa – USA with offices located in major oil and gas production regions around the world. We have strategically positioned more than 150 turbomachinery engineers and experts near our customers' operational facilities in order to provide an unprecedented level of localized turbomachinery optimization expertise, capability, consultation, and customer support.

Quality Policy

It is the policy of CCC to provide reliable products that fulfill our customers' ongoing needs and expectations, and to foster a work place environment that facilitates quality in all aspects of products and services.

CCC utilizes an ISO 9001 Certified Quality Management System to ensure supplier and product quality every step of the design and manufacturing process.

2.

Employees utilize continuous improvement and industry standards to manage design, development, engineering, manufacturing and service programs.

Roper Technologies

CCC is a wholly owned subsidiary of Roper Technologies, Inc. – a constituent of the S&P 500, Fortune 1000, and the Russell 1000 indices. Roper Technologies designs and develops software (both software-as-a-service and licensed), and engineered products and solutions for healthcare, transportation, food, energy, water, education and other niche markets worldwide.



Clear Focus

*Keeping your turbomachinery process optimized,
reliable and safe starts with well-trained knowledgeable
people, world-wide. We are where you need us.*



On-line Training

Our instructors have over 20 years of field engineering expertise providing insightful, practical training that can be put to use right away. All CCC courses are for Operation & Process Engineers, Instrument Technicians, Reliability and Maintenance Engineers.



Classroom Training

A diverse set of courses have been developed to meet a wide range of client needs from fundamental skill development to refresher and even specialized classes for experienced employees.

Visit CCC Learning Center.



On-site Simulations

Training is customized for your attendees with a dedicated instructor so you don't have to travel and it is specific to your applications. Tracks include:

- Control Theory
- Controller Maintenance and Operation
- Best Practices

CCC Solutions – We Deliver What They Promised™

No matter the stage or age of your plant, CCC consultants will assist in the design, operation, or upgrade of your facility. We are the preferred provider of turbomachinery controls, with 40 years of experience on all brands of turbomachines and processes. CCC global Consultants have experience optimizing turbomachinery across a wide range of industries including:

Markets & Applications:

Upstream Oil & Gas

Offshore
Onshore



Midstream Oil & Gas

Pipeline
LNG
Gas Processing



Downstream

Refining
Petrochemical



Chemicals

Ammonium Nitrate
Air Separation
Specialty Chemicals

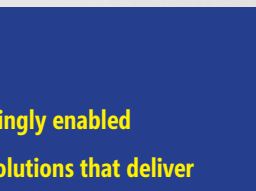


Metals & Mining

Steel
Mining
Metals Refining

Power Generation

Water Treatment



4.



Operators are increasingly enabled with CCC total train solutions that deliver robust integrated engineering, operation, maintenance and diagnostics.

Enhanced Reliability – Total Train Performance

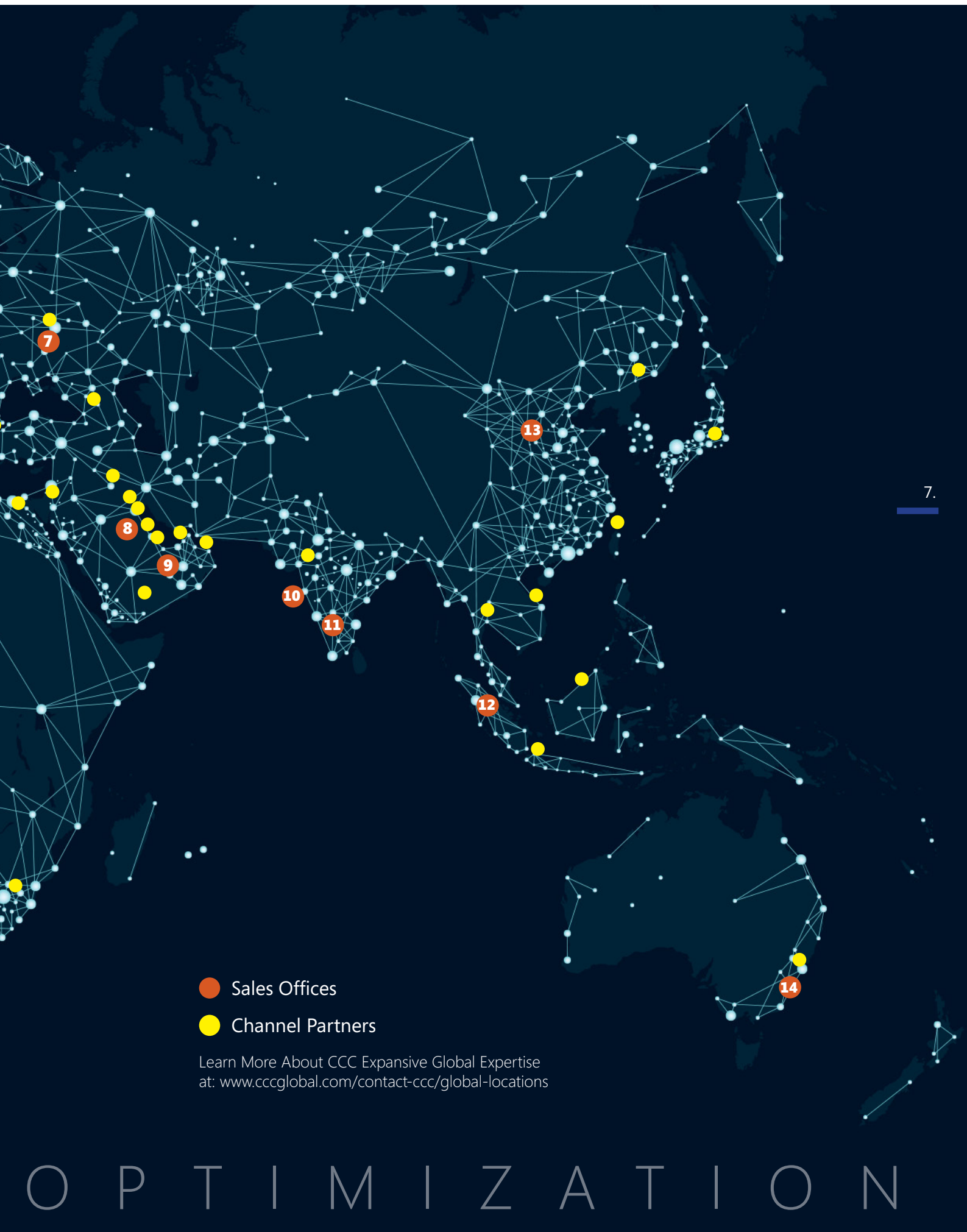
*CCC solves instances where operators are reluctant
to operate turbomachinery in automatic mode.*



CCC has strategically positioned more than 150 turbomachinery engineers and experts near our customers' operational facilities in order to provide an unprecedented level of localized expertise, capability, consultation, customer support and turbomachinery optimization.

6.

G L O B A L





Our Competitive Advantage

CCC Consultants will identify and realize value across the lifecycle of your facilities. Our expertise and experience are coupled with financial modeling to ensure the economic viability and success of your project. In some cases, CCC will guarantee the results, and offer pay-for-performance or bonus-type contracts. CCC Consulting will yield benefits during all phases of a facility's lifecycle:

Feed

Capital Cost Avoidance

CCC optimization services will analyze a preliminary engineering design, identify and reduce capital costs by properly sizing equipment and control components. These cost savings are balanced with operational performance requirements and reliability by utilizing CCC's extensive field experience.

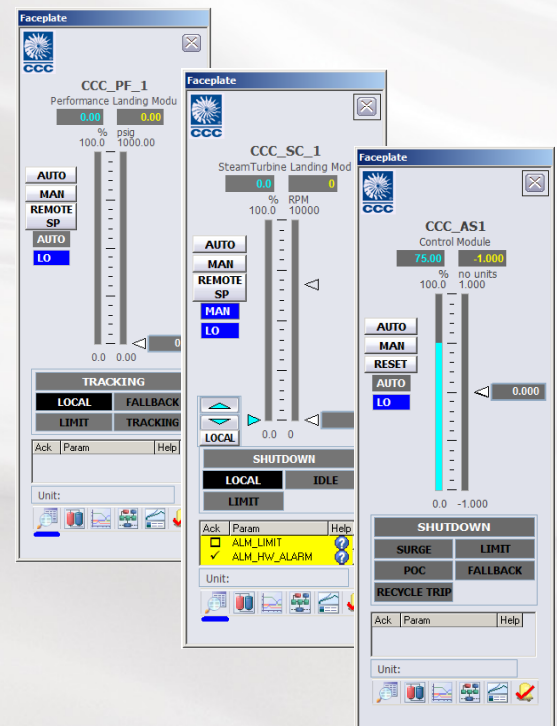
CCC optimization services will review your Process Flow Diagrams, Piping & Instrumentation Diagrams, Piping Isometrics, Machine specifications, Mass and Heat Balance to enhance your processes. CCC can also optimize machine selection and modifications under a variety of operational use cases.

Detailed Design

Our analysis will avoid capital expenses through the appropriate sizing of equipment. In one example, our consultants negated a compressor replacement project by analyzing and implementing a piping change and controls upgrade.

Our Extensive Experience Includes:

- Process, Piping & Machinery Design
- Optimization Equipment Selection
- Valve Sizing
- Control Strategies
- Economic analysis
- Specification & design documentation
- Turbomachinery automation systems
- Instrumentation specifications
- Integration with DCS and historians
- Mechanical retrofit for turbomachinery control
- Emulation and dynamic simulation
- Machinery Performance Monitoring Services



CCC is currently working closely with DCS manufacturers to enable seamless vertical optimization of the TOTAL TRAIN SOLUTION package for minimizing project risks even further while making the operator interface more functional, intuitive and effective.

Monitor, Operate, Diagnose

CCC ensures optimized plant operations where REAL tangible benefits are realized, delivering increased yield, throughput, lower energy costs and reduced risk.





Startup

CCC expertise will assist with startup and troubleshooting. Our extensive experience can quickly get to the root of turbomachinery issues.

Startup Capabilities Includes:

- Instrumentation
- Calibration
- Loop tuning
- Control algorithm configuration
- Surge testing
- Functional testing
- As built documentation

Operational and Maintenance

CCC is frequently called upon to evaluate and assess problematic or challenging turbo machinery operational issues like cycling, hunting, poor efficiency and surging. We improve efficiency and optimize production by insuring that the control system is functioning efficiently and reliably.

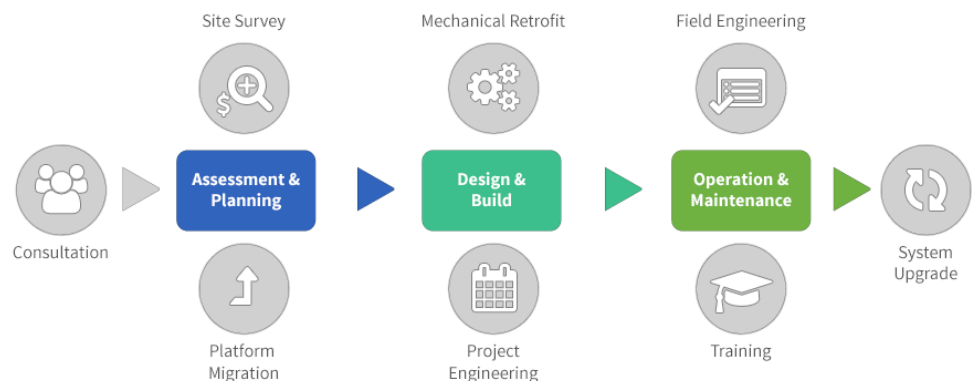
Areas Where We Solve Operational Problems Includes:

- Production throughput and yield optimization
- Reliability
- Safety and Security
- Mistake-proofing and procedure automation
- Cybersecurity
- Safety Integrity Level assessments
- Change Management
- Energy efficiency
- Process and Machinery Troubleshooting
- Economic Analysis

Upgrade, De-bottleneck, Revamp Phase:

When it is time to make improvements, CCC will assess and recommend the most cost-effective designs for meeting upgrade objectives.

Many turbomachinery operational problems are a result of piping design, fluid conditioning, control strategy, and hardware selection. CCC Consulting can identify and suggest proven designs and best practices to avoid turbomachinery operational issues early in the process design phase, resulting in significant savings and production throughput.



Real Results

In a recent case study, the customer engaged CCC early and was able to shelve a compressor re-wheel project and implement a much less costly project.



Optimization Services

CCC consultants work with our clients to assess economic, safety, and reliability benefits of our projects. We work with your operating and maintenance teams to ensure that key value assumptions are realistic and conservative, and to develop pragmatic and effective solutions.

CCC Optimization Process Includes:

- Compressor re-rate, re-wheel
- Piping and valve assessments
- Controls and instrumentation upgrade
- Capital Cost avoidance
- Economic Analysis
- Specification and design documentation
- Front-end Engineering
- Design of Turbomachinery automation systems
- Site walkdown
- Data analysis
- Mapping compressor operation, – Verification of surge limit line location,
- Definition of process throughput of yield increase opportunities
- Quantification of potential improvements in term of energy consumption/production/reliability and corresponding economic benefit
- Definition of work scope including installation and integration with DCS
- General contractor capabilities for TMC retrofits (instrumentation, actuation, valves, field installation, mechanical retrofit)

12.

Credentials

CCC optimization consultants are credentialed with advanced engineering degrees, professional certifications, and have decades of real-world pragmatic experience. Our technical and theoretical depth are bolstered by decades of actual application and solutions on a wide variety of machine types, processes, and automation platforms. CCC consultants present at technical conferences and participate on industry boards including the American Petroleum Institute, Texas A&M Turbomachinery Symposium, India Instrumentation Experts Club.

Certifications Held By CCC Consultants Includes:

- Masters of Science in Engineering
- Doctorates in Engineering
- Professional Engineering License
- Masters in Business Administration
- Six Sigma Greenbelt / Blackbelt
- Certified Functional Safety Engineer (CFE)

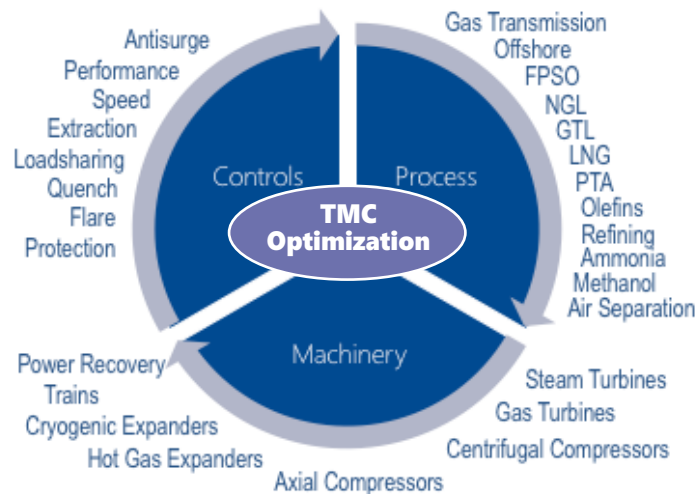
Case Studies:

Contact your CCC sales representative for examples that may reflect your situation.

**For a FREE evaluation or
demo of our TRAIN TOOLS®
call us today! 1.800.387.4652**



Turbomachinery Control (TMC)



Turbomachinery control (TMC) applications such as antisurge and load-sharing, as well as hardware platforms on which they are deployed, have been evolving through faster system response, higher availability, and standardization. Packaged turbomachinery control solutions (often referred to as Unit Control Systems) horizontally integrate critical control and safety functions. This solution development and support requires a strong expertise spanning across instrumentation and controls, process, and machinery.

At the same time, as end users continue to streamline plant operations through consolidation of resources, it is becoming increasingly important to have a consistent and well-integrated plant monitoring and control environment. This improves operators' situational awareness – helping respond to abnormal situations quicker with less errors and more safety.

CCC architecture for TMC solutions allows for easy integration with the DCS and historian through pre-developed integration packages. TMC becomes seamlessly integrated with the primary operator screens and historian environment to further enhance the end user experience and add value through the lifecycle.



Learn more about CCC Optimization Services at: www.cccglobal.com/contact-us

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