

OVERVIEW

Even the most efficient, reliable, best-maintained facilities in the world face mechanical integrity issues at some point. Some have just been improperly or poorly engineered from the start. New capital projects or unit revamps don't automatically get designed, engineered, constructed, and started up without potential issues that could lead to cost and schedule overruns or poor operating reliability.

As a leading global provider of asset protection solutions, MISTRAS Group has the resources, knowledge, network, and industry experience to be there when you're faced with those problems. As a one-source provider, we're involved in every part of your operations, so we can offer advice on how and when one part of your plant will impact another. We're there to assist you in developing, maintaining, and executing your plant vision.

MISTRAS' Engineering Center of Excellence (COE) combines resources and knowledge from three industry expert entities: MISTRAS AIMS and our member-company Carmagen Engineering, Inc., serving in collaboration with The Equity Engineering Group (E²G). Together, these industry heavyweights are uniquely equipped to raise the bar for plant optimization.

PROFIT
IMPROVEMENT

PLANT
EQUIPMENT
SUPPORT

PROJECT
PLANNING AND
EXECUTION



Visit us on the web at:
www.mistrasgroup.com

**YOUR SINGLE-SOURCE PROVIDER FOR
ENGINEERING EXCELLENCE**



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PROFIT IMPROVEMENT

Our engineering teams are dedicated not only to making sure your operations are safe, but to keeping them running full steam ahead at all times, through operations, reliability, and facility design support.

Operations Support

- Process monitoring and evaluation
- Troubleshooting
- Benchmarking
- Emission compliance

Energy Management

- Process heater equipment performance optimization
- Performance reviews and scope of work estimates
- RAGAGEP and KPI identification and recommendations
- Implementation Plan development and follow-up support

Reliability and Maintenance Management

- Maintenance philosophy and work procedures
- Work planning and scheduling
- Budget, cost, staffing, and contract control
- Technical support and training
- Organization design and process operations
- Proactive maintenance

Process Design, Operations, Safety, and HAZOP Reviews

- Process Hazard Analysis (PHA)
- Hazard and Operability (HAZOP) leadership and reviews
- Risk Management Programs



PLANT EQUIPMENT SUPPORT

As a one-source provider of asset protection solutions, MISTRAS has engineering capabilities for any process equipment or facility, including FCCUs, cokers, vessels, fired equipment, tanks, and piping.

Engineering Disciplines

- Mechanical
- Machinery/Rotating Equipment
- Fired Equipment
- Corrosion
- Welding
- Instrumentation/Controls
- Electric Power
- Materials Selection and Quality
- Heat Exchangers
- Civil
- Marine Terminal
- Offsites

Fixed Equipment Mechanical Engineering

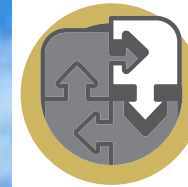
- Pressure equipment re-rates
- Piping system analyses
- Alterations and repairs
- Surface replication assessments
- Failure and fatigue analysis
- Heater tube remaining life assessments
- Non-coded vessel assessments

Fitness-for-Service (FFS) Assessments

- Conducted to API/ASME/National Board Codes and Standards
- Integrity operating windows
- Non-intrusive inspections (NII)- External inspections in lieu of internal inspection analysis
- Run-repair-replace decisions

Turnaround Optimization

Taking advantage of MISTRAS' industry-leading inspection capabilities, an integrated inspection and engineering approach helps keep turnaround costs, lost profits, and downtime to a minimum, and potentially extends plant run lengths without reducing safety or reliability.



PROJECT PLANNING & EXECUTION

MISTRAS' subject matter experts can help manage engineering and construction projects, from offering recommendations based on facility design and inspection data to full AIMS program development.

Capital Project Services

- Overall project execution planning
- Cost estimate and control tool validation
- Facility constructability assurance
- Contracting and procurement services
- Third-party engineering design and project reviews
- Construction planning and safety
- Plant completion and start-up assistance
- Project team staffing

Asset Integrity Management Services (AIMS) Program Development

- Systemization
- Damage and corrosion analysis
- Circuitization
- Inspection and Test Plan development
- Assignment of Condition Monitoring Locations (CMLs)
- Effective NDE method selection

Risk-Based Inspections

- Equipment condition assessments
- Semi-Quantitative, Quantitative, and Qualitative RBI approaches
- Inspection scheduling, planning, and tracking

- Pre-turnaround inspections
- Assessment of T/A process and maintenance effectiveness through KPIs and best-in-class performance comparisons
- T/A Planning Milestones
- Implementation Plan Development
- Best Practice recommendation