



*Solutions for Rotating Machinery Control and Safety*

**Steam Turbines**

**Hydro Turbines**

**Combustion Turbines**

**Compressors**

**Generators**

**Turbine Safety Systems**

**Integrated Mechanical Systems**

**Installation and Commissioning**

**Field Service and Spare Parts**

**Training**

Combined Heat and Power

Energy Transmission

Industrial Utilities

Marine

Mining

Petrochemical

Power Generation

Pulp and Paper

Refining



## *Delivering Value Oriented Solutions and Services*

## *Comprehensive Rotating Equipment Control Services*

## *Purpose Built Turbine Protection and Controls*

## *Turnkey Delivery, Factory Tested From a Single Source*

CASE RMC, LLC delivers excellence in *Rotating Machine Control* with nearly 400 years of combined industry experience. Headquartered in northern Colorado, CASE RMC is centrally located to support *North American* and *global* clients.

Customers can expect attention to detail, follow through and prompt service *24 hours a day, 7 days a week.*

Wunderlich-Malec is an Engineering News-Record's TOP 500 engineering company headquartered in Minnesota and has a broad range of engineering, integration and manufacturing capabilities serving the power generation, transmission/distribution and industrial markets.

Wunderlich-Malec uniquely delivers value engineering services that lower costs, improve quality and accelerate project schedules from offices throughout the country. With nearly 500 experienced professionals in 35 locations, we are one of the largest and most experienced engineering, system integration and process automation providers in North America.

Together, CASE RMC with Wunderlich-Malec can provide complete process control, safety and rotating machinery controls solutions for the most demanding project requirements.

### *Rotating Machinery Control Upgrades*

### *Actuation System Upgrades*

### *Protection Systems Upgrades*

CASE RMC has extensive experience with *purpose built turbine controls* equipment and the capabilities required to implement your unique solution.

All the services needed to upgrade or update your existing systems are available from CASE RMC in-house.

- Application Engineering
  - Software development, testing, and documentation
  - Mechanical systems modifications
  - Consulting – enhance system operation
- Design Engineering
  - Enclosure/panel layout
  - Hardware models
- HMI and Infrastructure Engineering
  - Easy to use operator interfaces
  - Screens based on CASE RMC experience and customized for the end-user
- In-Factory Fabrication
  - Enclosures, back panels, auxiliary systems
  - Actuators, hydraulic skids, trip systems
- In-Factory Testing
  - Proprietary, hardwired, turbine-accurate simulator
  - In-house HPU to power mechanical components



*Installation inside a steam turbine front standard.*

## Rotating Machinery Control System Upgrades

CASE RMC is the expert in retrofitting all types of rotating machinery to achieve measurable results:

- Increased reliability reducing unplanned outages
- Reduced maintenance costs with supported products
- Significantly improved diagnostics
- Improved operation
  - Incorporate automatic starting and loading
  - Integration with unit controls
  - Improved speed/load regulation
  - Automatic throttle valve operation
- Better tools for NERC compliance
  - Improved response to frequency deviations/system upsets
  - Facilities to assist with MOD testing
- Position for unregulated market

CASE RMC provides control system upgrades for steam turbines, hydro turbines, combustion turbines, compressors and other rotating machinery using purpose-built as well as PLC and DCS based systems.

We utilize our *turbine testing simulator* to ensure the chosen control platform will perform in the intended application.

CASE RMC has extensive experience with actuator technology for steam, combustion and hydro turbines. Each actuator technology has appropriate pilot and direct drive applications:

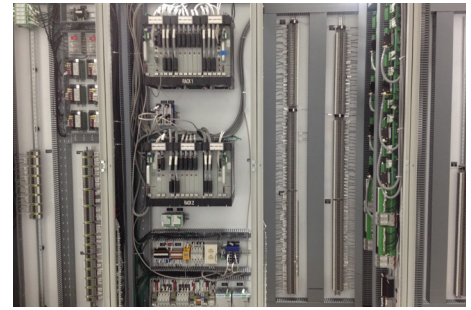
- Electric
- Low or high pressure hydraulic
- Pneumatic
- Self-contained hydraulic

Together, we help clients determine the right pilot or direct drive upgrade path, balancing system trade-offs such as cost, stability, reliability, and failure modes.

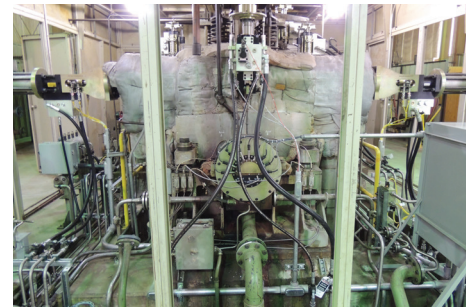
CASE RMC provides overspeed detection systems and custom-designed tripping systems to meet your machinery's safety needs.

We can assist in the design, equipment selection, fabrication, installation, commissioning, training and ongoing support of your protection systems.

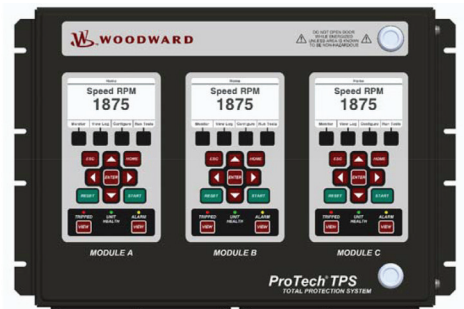
With TÜV certified engineers, we are trained and able to deliver SIL rated safety solutions.



*Turbine upgrade using purpose built Woodward MicroNet™ Plus controls.*



*Actuation upgrade designed, fabricated, installed and commissioned by CASE RMC.*



*Electronic overspeed protection system provides precise trip speed and safe testing facilities for the equipment. Shown is a Woodward ProTech® TPS.*



*Low pressure example of an on-line testable and repairable hydraulic trip system designed and manufactured by CASE RMC.*

## Actuation Systems Upgrade

## Protection Systems Upgrade

# Experience you can build on since 1981

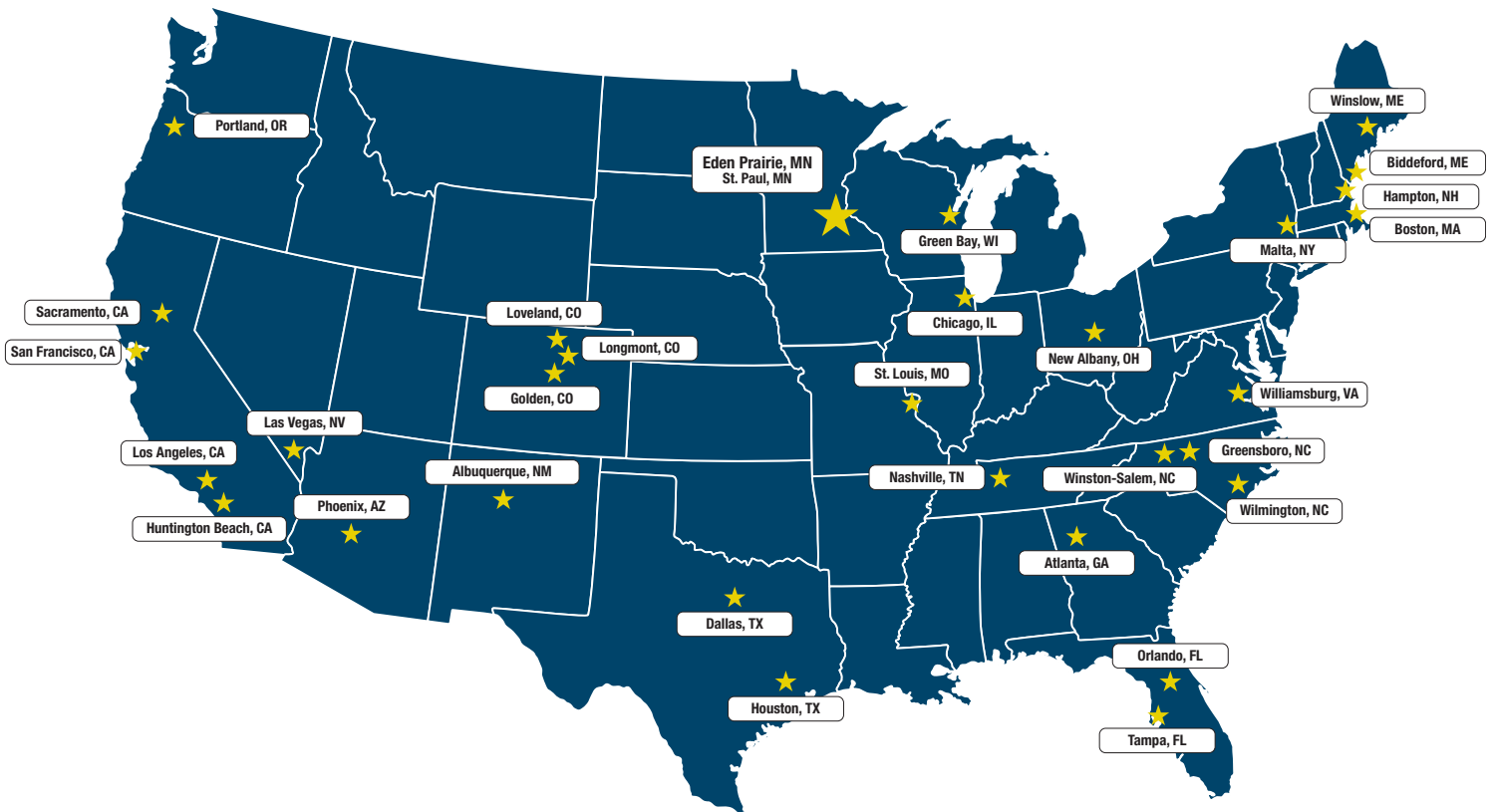
CASE RMC, together with Wunderlich-Malec, offers clients complete control solutions for most power generation and industrial plants with turbines and compressors. By managing a more comprehensive project scope, clients are freed from coordinating multiple vendors.

As an experienced engineering company with offices throughout the United States, we are uniquely qualified to *deliver value engineering services that lower costs, improve quality and accelerate project schedules.*

With nearly 500 experienced professionals, our team is one of the largest and most well-established engineering, system integration and process automation providers in North America providing:

- Architect Design
- Mechanical Design
- Power Electrical Design
- Controls and Automation
- Environmental Compliance
- Real-time Documentation
- System Integration
- Mechanical Fabrication
- Process Skids
- Power Distribution Control
- Modular Control Enclosures
- Plug and Play Construction

## Centers of Excellence



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