

# Emerson Mechanical Solutions



## Comprehensive Portfolio of Engineered Mechanical Solutions for the Power Industry

Turbines and other mechanical equipment often utilize older components that have deteriorating control accuracy and increasing service costs. Emerson Automation Solutions' Power & Water organization offers mechanical retrofits that improve the operation and performance of nuclear, fossil, combined cycle, captive industrial, renewable or hydro power generating plants.



**Reliable**

Experienced at delivering a full range of reliable, field-proven solutions customized for single system conversions, turnkey (EPC) retrofits and expanded scope services.



**Integrated**

Mechanical solutions designed to integrate directly with Ovation™ system logic for tighter, more accurate control and increased availability.



**Safe**

Dependable advanced protection solutions for turbine shutdown during an overspeed event can improve safety and reduce costly equipment damage while meeting insurance requirements.



**Custom**

All solutions are tailored to meet customer-specific scope requirements, schedule restrictions and budget constraints.



**Experienced**

A focused, dedicated team that provides comprehensive project management and implementation with full-scope mechanical and electrical installation and commissioning services.



**Trusted**

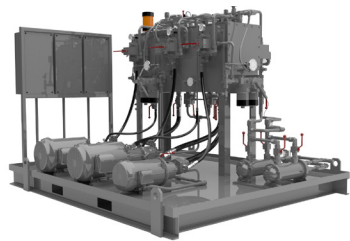
Global industry expertise and comprehensive lifecycle services from a single, trusted vendor with a history of long-term and dependable customer support.

# Engineered Mechanical Retrofits

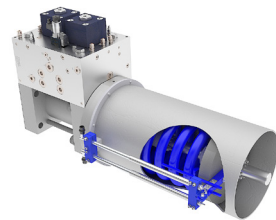
Designed to enhance long-term reliability and performance, Emerson's mechanical solutions help prevent nuisance trips, limit fluid contamination issues and reduce unplanned outages. Our equipment is engineered using industry-leading technologies that meet API standards as well as field-proven Ovation control strategies to maintain peak performance. Each fully documented solution is customized to accommodate project scope, schedule and budget requirements.

## Individual Mechanical Component Upgrades

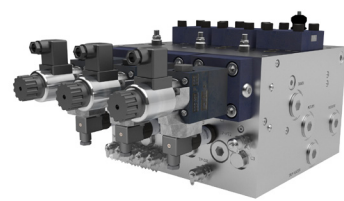
**Hydraulic Power Unit**  
provides constant source of pressurized hydraulic fluid



**Hydraulic & Electronic Actuator Assembly**  
accurately and quickly positions turbine valves



**Testable Dump Manifold**  
rapidly and reliably depressurizes hydraulic trip header while online



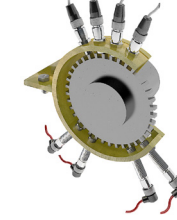
**Pressure Status Manifold**  
continuously monitors critical header pressure



**Turbine Manual Trip Handle**  
manually depressurizes hydraulic trip header



**Speed Sensing Assembly**  
precisely measures rotational speed



**Accumulator Assembly**  
rapidly responds to pressure fluctuations



**Duplex Filter Assembly**  
decreases fluid contamination



### MHC to EHC Conversions

- Modernizing low-pressure mechanical-hydraulic control equipment to a high-pressure electro-hydraulic system increases reliability
- Exact valve positioning and faster response times to megawatt load, speed setpoint, or open/close/trip commands improves performance
- Integrating mechanical diagnostic data into the Ovation control system enhances troubleshooting
- PCMM 3D laser scans enable seamless integration of new and existing equipment, minimize field modifications and reduce installation time
- Simplified design decreases maintenance frequency and costs

### Electronic Overspeed Protection

- Precise speed, zero-speed and creep control helps protect the turbine from potentially catastrophic overspeed events
- Redundant and failsafe design reduces nuisance trips and improves reliability
- Options to retaining existing sensors or integrate custom sensor brackets with OEM equipment helps meet budget and schedule constraints

### Trip Upgrades

- Reliable and rapid trip header depressurizing prohibits turbine overspeed conditions
- Fault-tolerant design using 2-out-of-3 voting decreases nuisance trips
- Online testing with pressure feedback to the control system eliminates the need for an actual turbine trip
- Optional manual trip handle provides emergency hydraulic trip capability to enhance turbine protection
- Hydraulic or lube oil filters remove particulate contamination to reduce the risk of equipment damage

### Digital Hydro Governor Retrofits

- Replacing outdated mechanical control, feedback links and devices with modern hydraulics and instrumentation improves operation
- Redundant hydraulic control and tripping functions increase reliability
- Accurate, repeatable and responsive reaction to setpoint and frequency changes improves wicket gate control
- Simplified design using fewer signal converters between the control system and field instrumentation reduces communication risks and maintenance costs

### Vintage OEM Part Replacements

- Cost-effective 'drop-in' replacements for obsolete parts preserves existing investment
- New equipment reduces risk of failure and enables continued plant operation
- Comprehensive support programs eliminate expensive service calls and long wait times
- PCMM 3D laser scanning generates high-quality measurements for site verification, reverse engineering and installation design

### Position Feedback Upgrades

- Accurate and repeatable valve stroke position feedback with high-speed response times improves turbine control and safety
- Single, duplex or triplex redundancy reduces the risk of unplanned downtime
- Modern design easily integrates into OEM assemblies, eliminates obsolescence issues, protects equipment and reduces maintenance costs

# Comprehensive Mechanical Services

Emerson's mechanical experts provide comprehensive long-term support for maintaining existing equipment, refurbishing parts, benchmarking performance or testing. As the OEM designer, fabricator and installer of the mechanical equipment, Emerson is uniquely qualified to provide timely expert service and technical assistance.

## SERVICE

## BENEFIT

	SERVICE	BENEFIT
 <b>RELIABILITY</b>	Mechanical component services	Rebuild, replacement, maintenance, inspection, cleaning or upgrade services for installed mechanical components including accumulators, actuators, filtration systems, hydraulic power units and servo valves.
	Field support - emergency or schedule site services	Expert on-site support for various activities including upgrades, inspections, flush setup and valve trip time recording.
	Reverse engineering	Custom 'drop-in-place' solutions created with cutting-edge 3D scanning technology that models OEM-supplied mechanical components.
 <b>MAINTENANCE</b>	On-site spare parts	Immediate access to an on-site inventory of critical mechanical hardware components.
	Maintenance agreements	Select services bundled into a customized maintenance agreement to meet plant, staff and budget needs.
 <b>PERFORMANCE</b>	Training	Onsite training conducted by qualified Emerson experts on actual installed equipment.
	Turnkey (EPC) services	Full installation scope services including site management, electrical & mechanical construction services that assist with meeting applicable local and federal standards, system commissioning and field engineering support.
	Expanded scope services	Accurate project scope definition obtained through pre-bid site walkdowns, specification assistance, pre-project engineering design, and demolition/ installation engineering studies. If required, an Emerson foreman can be assigned to manage craft labor.

For more information:  
[www.Emerson.com/Ovation](http://www.Emerson.com/Ovation)

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