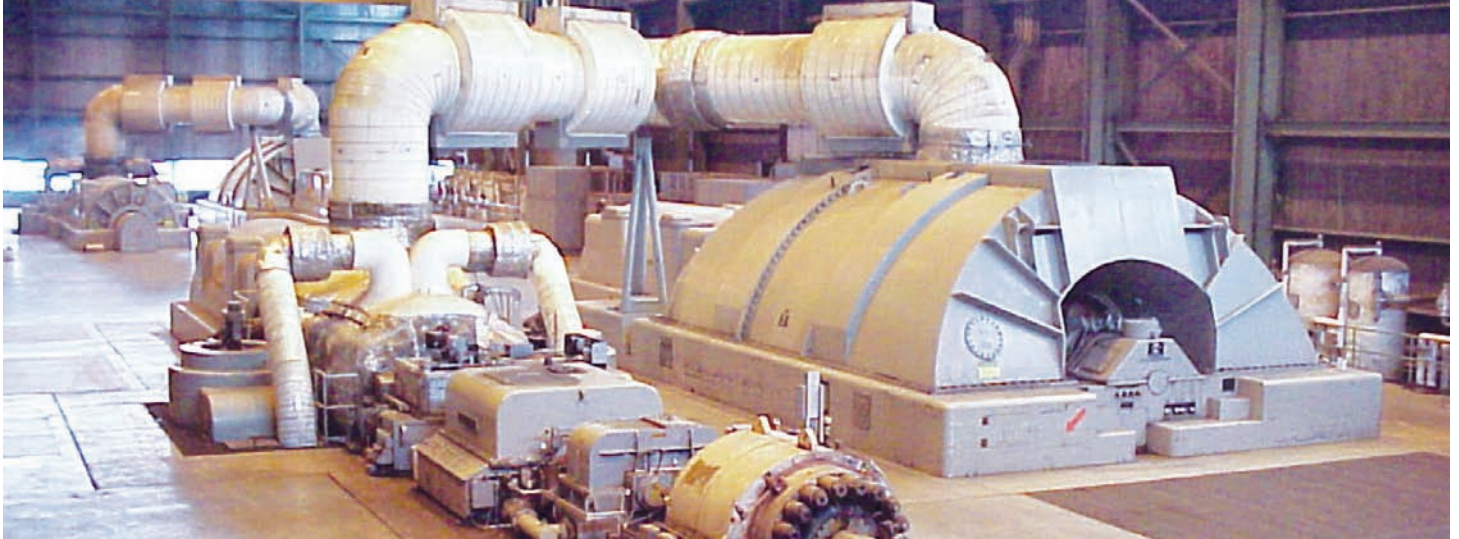


Hydraulic System Support and Services Improve hydraulic system reliability



When was the last time you serviced your ABB turbine hydraulic components?

The typical maximum service life of most Electro-Hydraulic (EHC) Components is five years before a refurbishment is required.

ABB's hydraulic repair and reconditioning service specializes in bringing equipment back to its original specification, helping to prevent costly failures, and improve plant safety. Skilled mechanical and hydraulic engineers assist in outage planning, efficiently manage repairs and return equipment to service on time – every time.

Benefits

- Increased availability
- Enhanced performance
- Safer, cleaner working environment

ABB hydraulic preventive maintenance services can be provided entirely by ABB and our contractors or with support from your in-house plant maintenance personnel

Comprehensive maintenance program

ABB Hydraulic System Services help eliminate Electro-Hydraulic (EHC) system problems due to worn and damaged components. Equipment evaluation and planning enables fast and comprehensive maintenance during scheduled outages.

Services include:

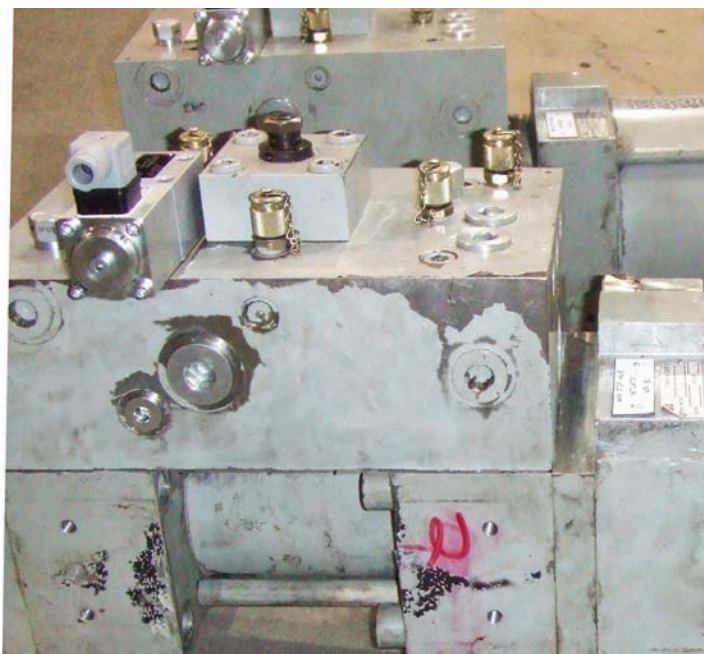
- Onsite component wear inspection
- Assessment
- Parts rebuild/replacement
- Complete annual maintenance programs

ABB understands the critical tolerances required for actuator assemblies, servo valves, pumping systems, and the repair and reconditioning services required to keep plants safe and on-line.

A regular maintenance schedule for hydraulic cylinder seal replacement and bearing clearance verifications can prevent downtime. Maintenance activities eliminate hazards such as:

- Seal failures that can leave hazardous EHC fluid on floors and walkways
- Leaks around steam lines that could result in fires, erratic operation of valve actuators
- Potential injury to personnel

Operating history has shown that hydraulic cylinders should be removed and reconditioned or replaced every three to five years depending on their type and application. ABB provides a comprehensive outage maintenance plan to efficiently manage the entire repair and reconditioning process.



Before

On-site services

ABB Hydraulic System Services also include a complete range of repair and reconditioning services, these include:

- EHC System inspection and assessment
- Hydraulic system recommissioning/calibration
- System flush
- Hydraulic Power Unit (HPU) service

Repair/replacement services

Proir to a scheduled outage, ABB performs a detailed inspection on all ABB hydraulic equipment and generates a proposal for the customer's review. Upon customer acceptance, during the scheduled outage, all equipment is disassembled, cleaned, rebuilt and tested as needed. Worn parts are replaced using plant or ABB inventory. When an actuator assembly requires repair, it's sent to ABB's hydraulic repair facility. Upon arrival at our hydraulic repair facility we will repair and recondition the assemblies.

Actuator assembly reconditioning

New components will be installed while the servo valves are inspected and repaired. The cylinders are inspected and all "wear" parts are replaced, including piston, piston rod, piston rings, bearings, cylinder tube and all soft seals. If additional work is required due to unforeseen damage ABB will contact the customer with the required additional work scope and pricing. After reassembly, a service report is generated and forwarded to the customer. The reconditioned cylinders will be assembled to their reconditioned manifold(s) and tested as an assembly. Once proven to be in 100% working order, the assemblies are shipped directly to the site for installation under the supervision of ABB's Hydraulic Expert.



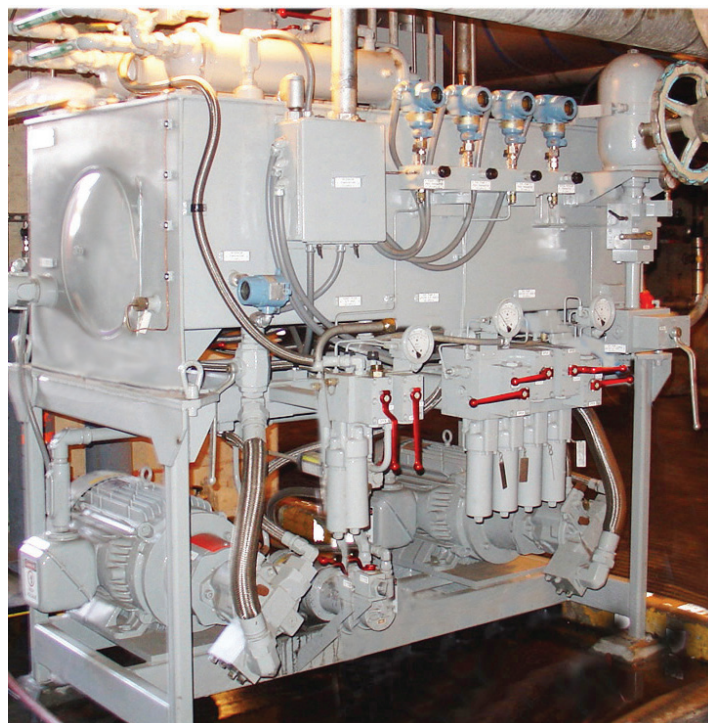
After

Additional equipment that can be serviced on-site

- Hydraulic trip manifolds
- Accumulator assemblies
- Hydraulic Power Unit (HPU)

ABB will work with plant personnel or ABB's own contractors to replace all hydraulic system solenoid valves. This includes all valves on trip manifolds, testing valves on open/closed actuators and any auxiliary manifold valves.

Accumulator bladders and seals will be replaced both on accumulator stands and at the hydraulic power unit.



HPU services will include:

- Reservoir inspection
- Clean reservoir and magnets
- Grease motors
- Inspect all HPU valves and fittings for leaks
- Replace desiccant breather element
- Adjust pressure setting for all relief valves and pump compensators
- Work with plant technicians to calibrate all switches and transmitters
- Change all HPU filter elements
- Replace HPU hydraulic fluid with new fluid (supply and disposal of old fluid handled by customer)

After completion of all specialty services, a full system flush will be performed. The system will then be re-commissioned. All affected hydraulic equipment will be operationally verified and actuators calibrated.

Installation services

ABB has partnered with industry recognized contractors and has working relationships with most major AE firms to provide a full complement of start-up and installation services. These services include on-site supervision and technical support of customer or third party manpower resources, complete turnkey responsibility for installation and commissioning and many other related on-site services including system audits, vibration analysis, training, and maintenance services.

Other ABB services

Condition monitoring and assessment upgrades

For customers that are considering upgrades/replacement of their turbine vibration/condition monitoring systems, ABB has a family of products to meet all your condition monitoring and assessment needs. ABB's conditioning monitoring suite of products includes ABB's DCS platform specific I/O modules or ABB's stand-alone system, for protection & monitoring. ABB also offers a diagnostic package, Analyst, that allows users to perform graphical analysis of rotating machinery data. ABB can provide an option, as part of our services, an upgrade to your vibration/condition monitoring systems.

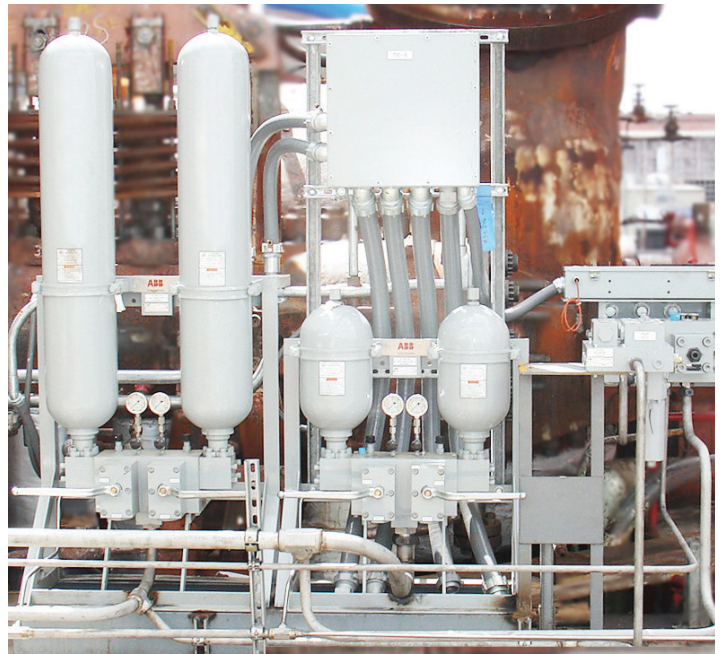


ABB services

ABB offers a complete portfolio of value-added support services to enhance and increase productivity and performance. We are continually working to expand our services beyond traditional offerings, focusing on improving the utilization and optimization of our customers' assets.

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