Valve Actuator Assembly

The valve actuator replaces the existing hydraulic servomotor operating the steam valve. A hydraulic cylinder sized to match the force and travel of the existing servomotor develops the valve actuator force. A dedicated hydraulic power unit supplies hydraulic pressure. An aluminum manifold mounted to the cylinder contains the associated check valves, solenoid valves, servo valves, poppets, etc. required to control the motion of the hydraulic cylinder. Test points designed into the actuator manifold provide the capability to sense critical pressure values for on-line testing and troubleshooting. The valve actuator and hydraulic manifold are shipped as an assembled unit. Valve position feedback (LVDTs, limit switches, etc.) may be incorporated as part of the actuator assembly or shipped as a separate assembly depending on the turbine design.

The hydraulic cylinders used by ABB are custom designed and manufactured specifically for turbine control system applications. Multiple rod seals with gland leakoffs, rod scrapers, and oversized external bearings allow the hydraulic cylinders to withstand the rigors of the steam turbine environment. The piston assembly is one piece with high side load capacity ductile iron with two centrally located cast iron piston rings. The piston rod and cylinder interiors are chrome plated to provide extended hydraulic cylinder life compared to standard cylinder designs.

Specifications:

- **Cylinder Bore:** 3 ¼ in, through 8 in. diameter
- **Cylinder stroke:** 1 inch to 20 inches
- **Actuator type:**
  - Single acting
  - Double acting
  - Included spring can (optional)
- **Maximum operating pressure:** 3,000 PSI
- **Maximum Pressure Intensification:** 7,500 PSI with a minimum safety factor of 1.25 based on yield strength.
- **Maximum operating temperature:** 300°F (400°F reduced life)
- **Seal Material:** Viton™
- **Piston Rod Bearing:** High side load capacity
- **Test Connections:** M16-2
- **Trip time:** 100 ms to 1 second
- **Servo Valve:** Dual coil design
- **Servo Valve Input:** 4-20ma
- **LVDT output:** AC Volts
Hydraulic Schematic
Hydraulic Actuator Assembly

- Hydraulic Cylinder
- Manifold Block
- Poppet Valve
- Poppet Adjustment
- Servo Valve
- Test Point
- Check Valve
- LVD7 Driver
- LVD7 Assembly