

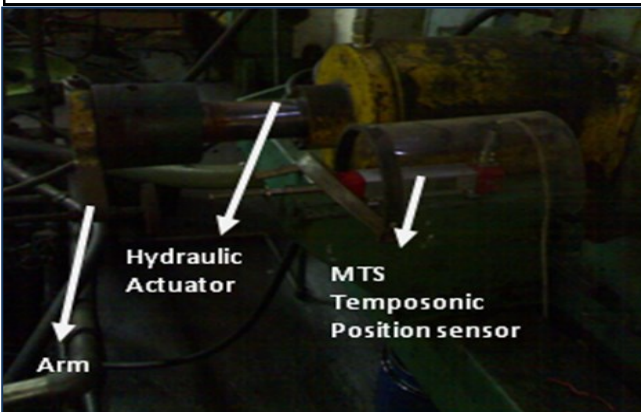
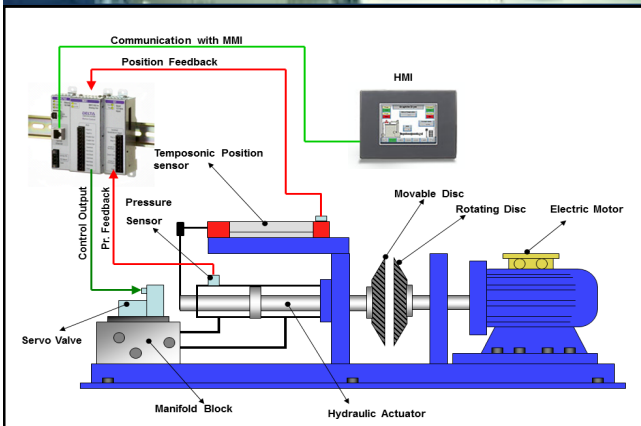


Customer: The Mysore Paper Mills, Bhadravathi

Year of Commissioning of first system: March 2011

Total systems commissioned : 5

Position control accuracy: 0.005 mm



The Mechanical pulp refining process involves the fibrillation of wood chips between grooved metal plates in a succession of refiners to produce developed fibers. Each refiner uses a movable plate and a fixed plate. The movable plate is driven by a high electric motor and is held against the fixed plate by a hydraulic servo actuator as the force of the conveyed chips tries to push the plates apart. The control process is complex because the intensity of refining varies according to the size and grade of the wood chips, as well as wood species.

Earlier days the pulp refiner machines were built using analog controllers which is very difficult to tune and troubleshoot. The refiner disc gap control is very critical application where damage of the discs can occur if discs are allowed to collide. With the analog control cards it is very difficult for the operator to know the system status and the actual disc gap.

To overcome these problems the RMC70 motion controller by Delta computer System was suggested. The RMC70 obtains continuous information on the position of the movable refiner plate from Magnetostrictive Displacement Transducer (MTS Temposonic). The MDT is mounted next to the hydraulic positioning cylinder and provides cylinder position information to motion controller .

The MTS Temposonic MDTs were added during the control system retrofit phase, replacing linear variable displacement transformers (LVDTs), in order to provide more precise position information. MDTs are highly reliable and have the advantage of providing precise position feedback without requiring a homing cycle at the start of the motion. Though not mounted inside the cylinder in this application because it is a retrofit, MDTs also have high pressure and temperature specifications that allow them to be inserted directly into hydraulic cylinders.

RMC70 motion controller performs closed loop control, monitoring the data from the MDTs up to 2000 times per second and then operating the Servo hydraulic valve, moving the piston to make the actual position match the target position. A servo valve is used so that small changes in valve position can instigate very precise hydraulic motion.

The new controller is interfaced to the Koyo make HMI through EtherNet Link. The HMI provides the refiner plate position set point. The EtherNet link carries status from the controller back to HMI.

Programming and Tuning the New Controller

The RMC70 is programmed by writing high level motion commands using programming software called RMCTools allowing an entire motion sequence to be initiated by set point information from HMI. The RMC70 Controller software has online graphing feature where user can view the online graph and can easily tune the system for optimum performance.

Advantages of New system

◆ Fast and stable response from the refiner.

By providing quicker response to changing conditions and more accurate disc loading, the power consumption of the machine has smoothed out. The machine vibration level also reduced which ensures less wear and tear of machine parts.

◆ Increased machine throughput

With the new control system the machine throughput increased by almost 20% with considerable level of power saving.

◆ Increased operator confidence

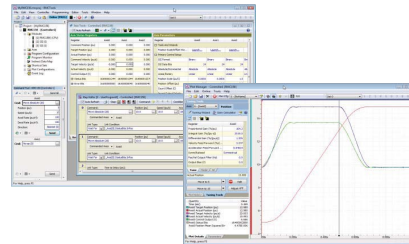
The old control system was hard to calibrate, and operators had to frequently visit the refiner, paying close attention to insure correct operation. With the new system, the controller monitors the process closely, and displays the machine status.



Delta RMC70 Motion Controller



Temposonic Position Sensor



RMCTools Software



Direct Drive Valve

Scope of Supply

- ◆ Real Time Closed Loop RMC70 Motion Controller
- ◆ MTS Magnetostrictive position sensor
- ◆ High response servo valve
- ◆ Manifold Blocks.
- ◆ Human Machine Interface (HMI)
- ◆ Pressure Sensors
- ◆ Control Cabinet

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