



YASKAWA

Application Report Blast Furnace Conveyor

Yaskawa's vector drive eliminates down time on blast furnace conveyor line.

The vertical conveyor which feeds taconite pellets, illimite, coke, slag and recycled steel to the main blast furnace at a major mid-western steel facility, is a vital part of the mill's production operation. Used to transport very heavy loads, it is massive in size; more than 150 feet long. The furnace itself is nearly four stories tall!

Reliability of the conveyor and its mechanical components is critical to operation of the furnace. Down time must be kept to a bare minimum – and until recently that presented a problem. As originally built, the conveyor was driven by a 100 HP AC motor with a mechanical clutch assembly providing power to a gear motor. The clutch assembly, designed to limit torque transients caused by across-the-line motor starting, presented costly limitations in conveyor operation and loading. Limitations that not only caused additional downtime, but expensive conveyor maintenance as well.

However, their local Yaskawa sales representative, has virtually eliminated those problems with the installation of a 100 HP AC drive.

The drive, housed in a NEMA 12 enclosure with an input circuit breaker, eliminated the mechanical clutch and its associated problems. It also provided the added benefit of enabling the conveyor to operate at variable speeds to optimize mechanical loads and performance. As installed, the drive operates in the open loop vector mode, improving motor speed regulation and optimizing amps for minimum motor current.

10 HP drives were also applied to feed conveyors which carry melt ingredients to the main conveyor for transport to the furnace with the pellets. Utilizing an analog output signal from the 100 HP (main conveyor) drive to a PLC, feed conveyors automatically respond to the main conveyors loading. This is accomplished by the main drive signalling the PLC when the load increases or decreases. The signal is then relayed to the feed conveyor drives which compensate to avoid either overload or delivery of too little material to the main conveyor.

According to the customer, "the combination of drives and PLC communication has not only eliminated down time caused by the mechanical limitations of the clutch assembly, but has expedited trouble-free delivery of feed materials to the blast furnace. Errors and overloads from both conveyors have been virtually eliminated".