



3000 tonnes of coal per hour to transport

**At variable speed with fast
but smooth ramp up and down
under extreme loading conditions**

- ▶▶ When RWE npower in the United Kingdom decided to upgrade the jetty at their Tilbury power station to be able to handle the larger Panamax-size vessels, Hägglunds compact drive system was chosen to drive the Belt Conveyor.

The jetty improvements at Tilbury were made to increase the capacity of the power plant by enabling the jetty to handle the larger Panamax-size vessels (vessels of the maximum dimensions that will fit through the locks of the Panama Canal). These improvements included a new 3,000 tonnes per hour Belt Conveyor that is transporting coal from two ship unloaders into the existing coal storage system.

Amco *Birtley*, the specialist bulk handling division of Amalgamated Construction Company Ltd, chose Hägglunds to provide the variable

speed drive system for this Belt Conveyor. The system includes a direct drive Compact motor that mounts directly on the conveyor head shaft, as well as a power unit positioned conveniently close by, connected simply by flexible hoses to the drive motor.

Extreme loading conditions

Alan Wootton of AMCO *Birtley* comments:

“We had a requirement for a variable speed drive which would be capable of accelerating the conveyor from rest under the most extreme of loading

scenarios. The layout of the existing plant meant space was very limited. The Hägglunds hydraulic drive offered an ideal solution. The compact nature of the motor and the constant torque characteristic offered great benefits over the more traditional electrical drive arrangements”.

By showing other references Hägglunds could demonstrate the reliability of their drive systems. One example is the large Belt Conveyor at Foster Yeomans Glensander quarry, which was installed in 1992 and has been running successfully ever since.

During the jetty improvements the ship unloaders were also modified by the original manufacturers, Noell Konecranes. The mechanical and electrical works were undertaken by Amco *Birtley*, the specialist bulk handling division of Amalgamated Construction Company Ltd. The main contractor for the project was Volkerstevin Ltd (formally Harbour and General).

Hägglunds complete drive system at the Tilbury plant comprises the Compact CA motor as well as a Power Unit. The power unit is cabinet style with small footprint and sound insulation. It comprises a fixed speed AC induction motor coupled to an axial piston pump which provides variable flow in response to an electrical signal. Thereby producing variable speed of the

conveyor. The conveyor can be stopped and started simply by controlling the pump without the need to stop the electric motor. The hydraulic drive provides dynamic braking too so ensuring a short stopping time which was essential on this conveyor to prevent flooding the two downstream conveyors in the event of an emergency stop situation.



The new belt conveyor, which has been substantially upgraded and lengthened from the existing conveyor, utilised some of the previous conveyor structure. It is now 200 m long with a speed range up to 2.5 m/sec giving a capacity of 3000 tonnes per hour of coal from the ship unloaders. The conveyor is the only means of transporting materials from the jetty into the station and therefore it is a critical piece of the plant. ■

Some features of using hydraulic drives on applications such as conveyors

- Variable speed from zero to maximum without compromise
- Conveyor can be inched and reversed easily for maintenance
- No limits to starting and stopping conveyor
- Full torque, 2 or 3 times nominal torque available from zero to maximum speed. No need to oversize electric motors for starting or unusual loading conditions
- Smooth acceleration and deceleration with inherent dynamic braking. No chance of overload damaging the belt due to very low inertia and fast accurate pressure control in the system
- Simplicity, no gearboxes, belts, fluid couplings or foundations needed
- Compact dimensions and shaft mounted so no alignment problems
- The natural characteristics of hydraulic drives ensures perfect load sharing when two or more drive motors are used
- Using two or more pumps gives back up and redundancy possibilities