

*our expertise*

*The Motor Control Specialists*



*simply  
reliable*

# Case Study: Upgrade & Refurbishment

## 500 tonne Hot Metal Ladle Crane

### Tata Steel - Port Talbot

#### *Features and Benefits*

- **Improved control integrity and safety**
- **Elimination of contactor wear**
- **Substantially reduced maintenance**
- **Increased production capacity**
- **Control of load more precise and predictable**
- **Smooth load control**
- **Ease of fault finding and repair**
- **Increased reliability**

#### *The Challenge*

- 33% increase in output using the same cranes
- Cranes identified as bottleneck and essential area of improvement
- Additional lifting process added increasing duties of cranes
- Capacity of crane increased from 425T to 500T

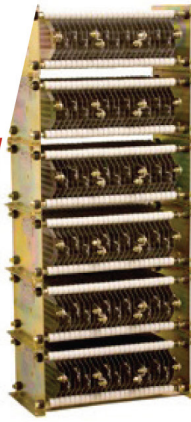
#### **Crane availability impaired by:**

- Breakdowns (mechanical and electrical)
- Contactor maintenance
- Availability of spares
- Poor positioning and speed control
- Brake wear and maintenance
- Mechanical failure due to uncontrolled torque and shock loading on drive train

#### *The Solution*

- Simplicity of design
- Use existing motors without costly modification
- Ability of existing staff to repair drive or get crane operational after any stoppages
- Robust design - resistant to mechanical shock
- Reliable operation in dust laden environment
- High ambient temperature rating : 65 - 70°C
- Economical solution
- Excellent support and 24 hour backup

# Key Project Elements

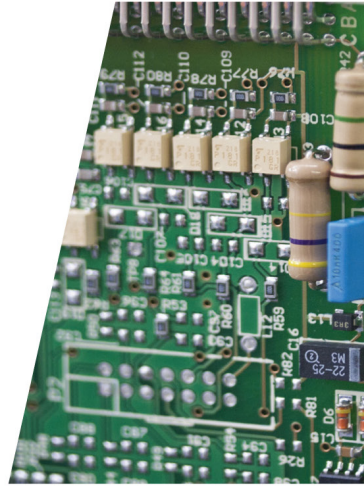


## Motor and Drive Technology

- Motors - 2 off 600kW (10 pole)
- 950 Amps - Nominal full load stator current (per motor)
- 1340 Amps - Nominal full load rotor current (per motor)
- Brakes - 4 off 30" thruster brakes (2 per motor)
  - 4 off emergency disk brakes (2 per barrel set)
- Epicyclic Gearbox
- Two sets of barrels driven via 2 motors
- Automatic switching to single motor operation
- Safety monitoring of drive train - gearboxes, couplings etc.

## Solution

- 2 off 1500A Thyomat drives - 1 per motor
- Supplied in forced ventilated cubicles without the need to introduce girder air conditioning
- New stainless steel rotor resistance rated for 125% continuous duty, supplied in easy access custom designed enclosures
- Emergency brake panel with control and field device interface and latching circuits for safety related trips
- Alarm displays and NVR healthy sequence
- PLC monitoring of motor and barrel speeds, currents, operational data and logging



## Conclusion

- No electrical contactor wear
- Significantly reduced planned maintenance activities due to user friendly design
- Motor heating reduced due to minimal current transients and fewer start/stops performed by driver
- Brake wear reduced to a minimum due to effective dynamic braking
- Better control of load position
- Short return to service time - ease of repair
- Smoother control of heavy and light loads resulting in great reductions in mechanical wear and tear
- Drivers more productive due to increased predictability of load placement at different speeds





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