

*our expertise*

The Motor Control Specialists



simply  
**reliable**

# Case Study: Shipyard Crane Refurbishment

## 80 tonne Rope Luffing Crane

### Govan Shipyard

#### *Features and Benefits*

- **Improved control integrity and safety**
- **Complete control system FMEA**
- **Control of load more precise and predictable**
- **Smooth Load Control**
- **Ease of fault finding and repair**
- **Improved customer satisfaction**
- **Increased Reliability**

#### *The Challenge*

The old contactor control system failed during a luffing motion and the boom fell to the ground causing substantial plant damage and stress to personnel. The investigation into the incident reported that the failure was directly attributed to the luff motion contactor control system. It was considered that the Auxiliary Hoist and Main Hoist motions were at similar risk and that a modern control system should be installed. In addition, a complete failure mode and effect analysis had to be carried out to ensure confidence returned to the control of the cranes.

#### *The Solution*

Together with our mechanical crane engineering partner, MHA1 proposed a modern digital DC converter and AC slipring motor control system. This provided an economical and reliable solution utilising the existing DC and AC motors and AC supply. The system design was undertaken by MHA1 engineers, and a full FMEA was carried out using Relux reliability software. The DC drive employed is manufactured in the UK by SSD Parker drive. The control panel design and manufacture was undertaken by MHA1 and delivery completed within 8 weeks.

The control system was designed and manufactured to current standards and within legislation of the companies ISO 9001:2008 quality approved environment.

# Key Project Elements

## Motor and Drive Technology

- Removal of redundant Ward Leonard generator and associated control equipment
- Retention of existing DC shunt and AC slip ring motors
- Installation of closed loop, digital AC-DC converter for DC shunt motor control
- Installation of closed loop digital THYROMAT slip ring motor controller for AC slip ring motors

### Benefits

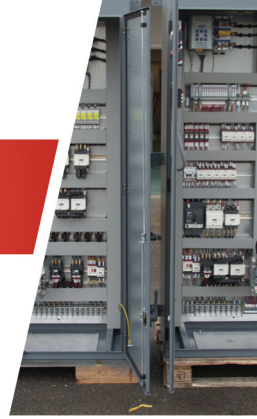
- High motor torque characteristics retained and enhanced for both AC and DC motors
- Smooth and accurate control of both motor speed and torque
- Zero current switching of contactors and fewer moving parts (contactors) therefore increased reliability and less maintenance

## PLC & Control Technology

- Installation of new joysticks which comply with current regulations
- Independent motor and control monitoring via PLC
- Introduction of positional control and zonal software limits via encoder feedback into the PLC
- Current and historical fault information available via Human Machine Interface (HMI) which is networked to all crane PLC's via CC Link

### Benefits

- Easily programmable software limits to improve operational requirements (these are an addition to hard wired safety limits)
- Real time and historical information to assist in fault finding therefore reducing downtime
- Continuous control system monitoring



## Contacts

### Physical Address

MH Automation (Pty) Ltd.  
31 Kyalami Boulevard  
Kyalami Business Park  
Kyalami  
Midrand  
South Africa

Telephone Number: +27 11 548 0600

Fax Number: +27 11 466 2266

Email Address: mhauto@icon.co.za

[www.mhautomation.co.za](http://www.mhautomation.co.za)

### Postal Address

MH Automation (Pty) Ltd.  
P.O. Box 30008  
Kyalami  
1684  
South Africa

## Where you can find us...



United Kingdom



[mhai.co.uk](http://mhai.co.uk)

South Africa



[mhautomation.co.za](http://mhautomation.co.za)

China



[mhdl.com.cn](http://mhdl.com.cn)