

Increasing production and reliability of motor-generator set driven cranes

Barry W. Wiles, Industry Manager – Crane Systems, Avtron Manufacturing Inc., Independence, OH, USA

Introduction

Motor-Generator set driven cranes were installed in the 1970's and 80's and continue to service ships all over the world. In many cases, the rotating equipment is in good working order but the electrical control packages have slowly deteriorated or have become obsolete. The existing controls are typically analogue and have been detuned for reliability and sensitivity to temperature variations. This reduces the crane's performance and overall TEU production. Solutions are available to upgrade these systems that correct the older system deficiencies and improve port productivity.

It's ok to be old

Age is not always a bad thing. Cranes designed and built twenty to thirty years ago tend to be structurally sound and have significant working life left. They were designed to last when properly maintained. Maintaining the electrical package tends to be the biggest issues for the ports. Older control systems tend to be of an analogue design. As their components age, they become more and more sensitive to the environmental changes and require more routine maintenance. Maintenance personnel that are familiar with these systems have also aged and retired. New maintenance personnel are typically not trained to maintain these older analogue systems. Finding reliable parts for older controls can also be an issue. Often times only repaired or remanufactured circuit boards are available and sometimes they can be unreliable.

A nip here, tuck there

Avtron Industrial Automation has developed a control system solution that gives these cranes a new life. The ADDvantage-32

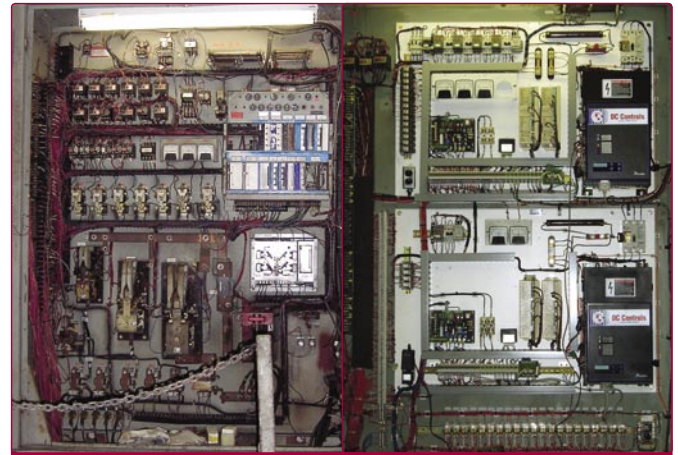


Figure 1. Field control package before (left) and after (right) conversion.

Digital Motor-Generator (DMG) system is a cost effective solution for the upgrade of motor-generator set cranes. A completely digital solution, it eliminates the reliability issues experienced with analogue systems. It also offers great flexibility in how it is implemented which offers customers a very economical approach to upgrades.

Many options are available for upgrading or replacing the crane control system. Cutting out and removing the generators will require new SCR drives to be installed to control the motors. This is very costly approach because it requires both the purchase of the new equipment and because of the amount of installation/demolition work required. This type of upgrade also requires the crane to be down for a significant amount of time.

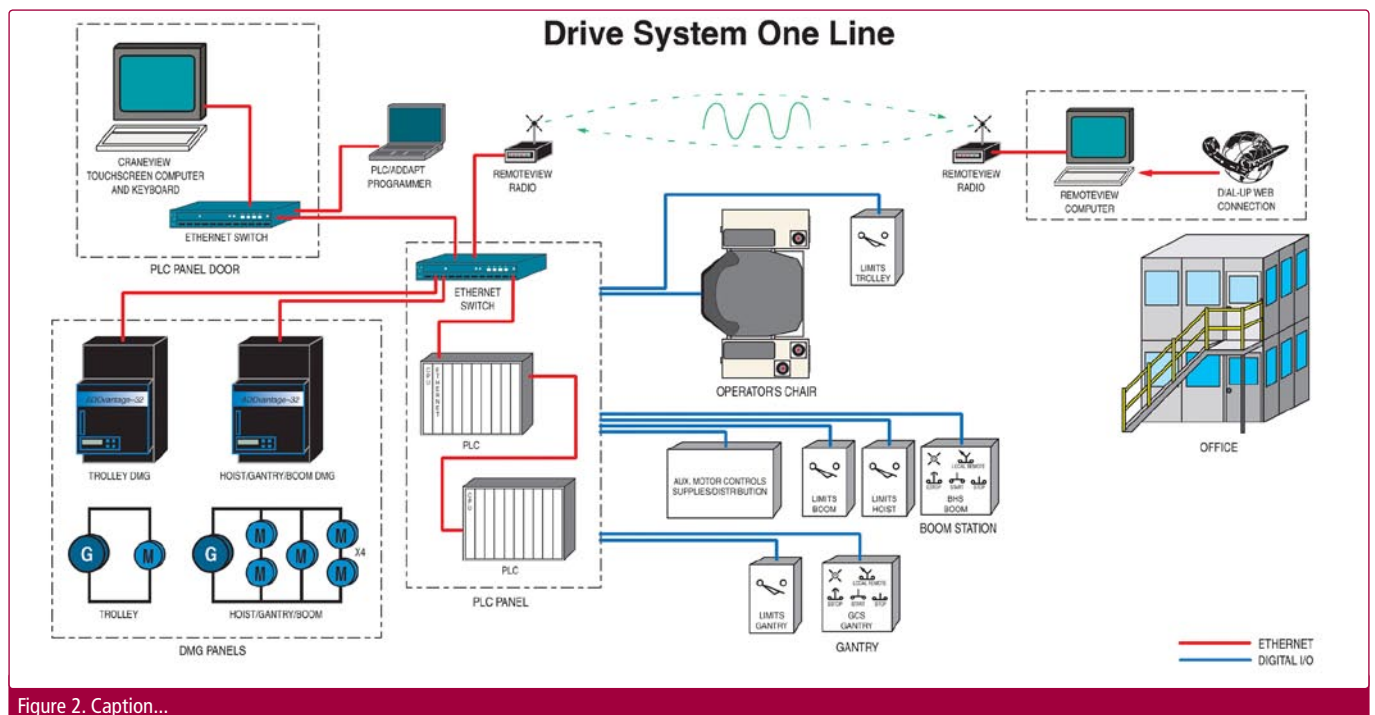


Figure 2. Caption...

A more cost effective approach is to replace the analogue field control system with a new digital package. Avtron has developed the ADDvantage-32 Digital Motor-Generator (DMG) package for this purpose. The DMG is a three phase field supply that provides digital control of the generator field. In addition, it has a built in motor field supply that can optimise the motor torque and speed through field control. A built-in Ethernet communication interface allows the system to be connected to most major brands of Programmable Logic Controllers offering a very flexible integration package.

Included in the DMG is Avtron's proven crane control firmware. Having a dedicated firmware for cranes operations offers the end users several key features that can increase the crane's production and reduce down time. Torque proving, brake control, multiple motor control, etc. are all built into the controller. Special functions including Avtron's Load Weigh feature, allows the speed to be optimised based on crane's actual load. Customers implementing the Avtron solution have seen crane productivity improvements as high as 20 per cent or more.

ABOUT THE COMPANY

Avtron Industrial Automation's Crane System Group, offers high tech solutions for the dockside and overhead crane markets. An engineering and service oriented company, our product and automation expertise provide state-of-the-art solutions for all types of cranes. Avtron offers a high level of service and support to ensure that cranes operate in a safe and reliable manor.

Conclusion

Motor-Generator set driven cranes offer an economical way to service ships. Upgrading the crane's older control package can provide the following benefits:

- Elimination of obsolete and non-supported parts
- Elimination of the risk of extended downtime when parts can't be found
- Increase up-time of the crane while in production
- Potential production increases of 10-20 per cent
- Improved diagnostic information that reduces time for crane service and repair
- Extended capabilities for enhanced diagnostics and remote connectivity for remote service

Upgrading an M-G set crane control system is very economical and can provide years of additional service for your crane.

ENQUIRIES

Barry W. Wiles, Industry Manager – Crane Systems
Avtron Manufacturing Inc.
7900 E. Pleasant Valley Road
Independence, OH 44131
USA

Tel: +1 216 642 1230

Fax: +1 216 642 6037

Email: bwiles@avtron.com