

Project Title: Charge Crane Electrical, Control and Motor Upgrade

Location: Southeastern Michigan

Customer Comments at Completion of Project:

"Great job guys! I know you did your best and we have the crane back in service! It is important that we did what we were supposed to, on time, and without any safety incidents! This is really important!!!"

Summary of Project:

Replace both of the existing control houses with new control houses containing Magnetek Series 4 VFDs for main hoist, aux hoist 1, aux hoist 2, trolley, and bridge. Replace main hoist, aux hoist-1, trolley and bridge motors. Remove line shaft between main hoist motors for load sharing software. Replace festoon system and festoon junction boxes. Replace all wiring on the crane with SRML high-temp wiring.

Capacity Rating of Equipment: 185-ton main hoist, 25-ton aux hoist-1, 10-ton aux hoist-2

Project Completion Date: 9/2019

All work was performed as the prime contractor.

Scope of Work:

Simmers managed the upgrade project from beginning to end, turnkey. The crane was returned to the customer for production at the end of the scheduled outage. Simmers engineered and designed the controls for the crane, as well as rigging plans and all needed modifications required for the upgrade (i.e. motor bases). Simmers also supplied and installed all of the following material:

- Two (2) complete control houses with 100% redundant Frigortec air conditioning system
- All new Magnetek Series 4 VFD controls on sub-panels, pre-installed in the control houses
 - Pre-mounted and pre-wired spare drives for each motion so that if there is a VFD failure, knife switches allow for the spare drive to be put into service

- Blower motor starters mounted in the control houses so that all motors are being cooled whenever the mainline contactor is pulled in
- SYMEO collision avoidance system
- SYMEO positioning assistance system mounted with HMI in the operator's cab
- o Magnetek Braketronics controls mounted in the control houses
- All new pre-wired and pre-mounted dynamic braking resistors
- Marathon totally enclosed blower cooled motors for all motions on the crane except the aux hoist-2. Avtron encoders were installed on the main hoist, aux hoist-1, and bridge motions
- Complete replacement of the festoon system with high-temp wiring and heatsleeving. The fixed-end and mobile-end festoon junction boxes were also replaced.
- All wiring on the crane was replaced with SRML high-temp wiring
- New JR Merritt joystick-type master switches installed in the operator's cab
- New main safety switch and man-mag

A factory acceptance was completed at the shop prior to shipment of material to test the crane controls, "hot-swap" of spare drives, motors, and air conditioning system.

As-built electrical and mechanical drawings, maintenance manuals and training were provided after the crane was commissioned into service.

The customer personnel, local and corporate, are very happy with our execution of the of the project.



Pictures BEFORE Upgrade

Before - Controls Page 2 of 14



Before - Controls



Before - Controls Page **3** of **14**



Before – Control Houses



Before – Aux Hoist-1 Motor Page 4 of 14



Before – Main Hoist and Trolley



Before – Main Hoist Motor



Before – Festoon

Pictures AFTER Upgrade



After – Main Hoist VFDs (Pre-wired spare shown in middle)



After – Aux Hoist-1 Dynamic Braking Units (contactors for pre-wired spare) $$\operatorname{Page}7$ of 14$$



After – Control Relays



After – Traverse VFDs (pre-wired spare shown in middle)



After – Positioning Assistance System HMI in Operator's Cab



After – Aux Hoist-1 Motor



After – Main Hoist Motor

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After – Main Hoist and Trolley Motors



After – Control Houses



After – Redundant Firgortec Air-Conditioning Units



After – Festoon System (Symeo sensors also shown at top of picture) $${\rm Page}\,12{\rm \,of}\,14$$



After – Fixed-end Festoon Junction Box



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