Predictive Maintenance for Automated and Manual Overhead Bridge Cranes

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INTRODUCTION

Cranes are subject to mechanical wear and require regular servicing and maintenance to prevent unexpected downtimes. Preventive maintenance activities are usually performed periodically according to a predefined maintenance schedule. Predictive maintenance provides a more flexible and customized approach. Predictive maintenance schedules are created and optimized based on both general and system-specific requirements and require the ability to capture real data related to how the crane positions over time. Based on the collected data key performance indicators (KPI) can be developed to establish a predictive, usage-based crane maintenance schedule that is ideal for each crane system. The result is a maintenance schedule that maximizes equipment life while minimizing maintenance costs and production downtime. This article presents key performance indicators for cranes and illustrates how these indicators can be analyzed and automatically monitored using a variety of tools, including reports, charts, and diagrams, for better maintenance decision-making.

TYPES OF CRANE SYSTEMS - OVERVIEW

Cranes can be divided into three categories. Manual cranes are controlled manually by an operator via a joystick or control panel that controls the direction of movement and the crane velocity.

Automated cranes receive commands from a host controller or an inventory control system that instruct the crane to move to predefined target positions. Once a travel command is received, the crane is controlled automatically, ideally by a closed-loop positioning controller. An operator is not involved. Automated cranes systems that include such a positioning controller have the added benefit that important data, such as motion-related data or travel commands, are automatically recorded by the positioning control system.

The third category is semi-automatic cranes. A semi-automatic crane can be controlled by an operator while a positioning system provides closed-loop positioning control. Semi-automated crane systems combine manual control with the benefits of both operator experience and closed-loop positioning control, which reduces system wear and compensates for motion cycle interferences such as oscillations. Throughput increases are often achievable versus solely manual control.