

Smarter maintenance for lifting systems

3 tips for updating maintenance strategies for lifting systems



Lifts and lifting system are designed to transport persons and goods comfortably and safely. In addition to traditional lifts in residential buildings, lifting systems also include automatic escalators and walkways, airport jetways, goods elevators, and tower cranes.

Companies and organizations across all industries—from construction to building automation and aerospace—rely on the safety, efficiency, continuity of operation and compliance of lifting equipment and machinery.

Lifting systems need to handle heavy loads smoothly and with precision, also in harsh conditions. Consequences of accidents involving lifting systems, although infrequent, could be catastrophic, for both the individuals involved as well as the organizations responsible. This is why the installation, testing, operation and maintenance of lifting equipment and machinery are intensively monitored and regulated. Owners of lifting appliances must ensure that they are properly maintained and free from defects.

Unplanned downtime for maintenance is very costly. While wear and tear are the most common causes of failure in lifting systems, a proactive inspection program is one of the most efficient ways to reduce the risks. The aim is to ensure the continuity of all components in lifting systems, such as motors, brakes, electronic controllers, communication systems and doors. Traditional maintenance of lifting systems consists of mostly routine and repetitive tasks. How could these tasks be made smarter?

Smart maintenance for lifting systems

In a nutshell, the maintenance of industrial machines aims to restore a system (or one of its components) from a state of failure to a state of good operation. Maintenance is smart when the process reduces manual checks using automatic analysis, takes advantage of condition monitoring and smart sensors, as well as diagnostic functions of devices, and remote connection options.

Preventive vs smart maintenance?

While preventive maintenance is performed according to a schedule that reflects historical events, predictive maintenance monitors asset condition in real time and prompts interventions before failures cause a disruption. Advances in sensors, analytics, and communication technologies are making predictive maintenance increasingly practical and affordable.

Preventive maintenance or also called scheduled maintenance consists in cyclic maintenance to reduce faults or malfunctioning. Preventive maintenance has the main objective of extending the life cycle of assets and limiting downtime, to prevent excessive qualitative and quantitative degradation of systems.

Predictive maintenance is a type of preventive maintenance that is carried out following parameters that are measured and processed to identify the remaining operating time of the machine, before failure. For this purpose, different methodologies are used, such as vibration measurement, thermography and analysis of absorbed currents.

Maintenance Tip 1

Prevent transport chain issues when lifting goods

Issue:

A transport chain is used for example in a belt on a moving walkway or a conveyor belt for lifting goods. If foreign matter or debris is caught in the belt mechanism, it cannot move along smoothly, eventually causing stoppage due to deterioration.

Solution:

By installing a K6CM-C12M condition monitoring device, foreign matter trapped in the carrier chain can be detected with comprehensive current diagnosis. Anomalies in the absorbed current's waveform can be easily detected with

this method, even before changes in speed or vibrations can be detected. When the measurement value reaches the set warning or critical alarm threshold, OMRON's Remote Access Solution RT1 can send the data securely to a cloud-based system. This data can be accessed remotely to find out exactly what the issue is, and for example the debris can be removed before any major disruption is caused. This ensures continuity of operation and reduces the impact of stoppages. Maintenance staff can remove the debris and repair or replace the part before it stops due to deterioration.



Maintenance Tip 2

Get visibility on crane performance and prevent crane deterioration thanks data collection and instant overload and wind warnings

Issue:

Abnormal crane use, overloads or excessive emergency stops can over time affect efficiency in crane operation and pose safety risks.

Solution:

Condition monitoring devices can collect all relevant data on the crane operation, such as the working hours and loading cycles. OMRON's K8 monitoring relay can carry out checks on motor coil temperature and phase monitoring to protect the equipment and increase safety. OMRON's K6 condition monitoring devices can perform current analysis, as well as monitor motor vibration and insulation resistance to quantify the status of three-phase induction motors. Complemented with remote monitoring, this allows you to get a full picture of crane utilization, as well as receive instant overload and wind warning messages. Safety alerts can be transmitted by email or text message. Remote monitoring in combination with condition monitoring can help identify and give advice on potential problems in crane use, as well as reveal which cranes need attention within a fleet.



Maintenance Tip 3

Ensure uninterrupted power supply and passenger comfort in

Issue:

Unexpected power outage is something to be avoided at all times in lifts and lifting systems.

It is important to have a plan in place for the safety and comfort of passengers and workers, including freight lifts.

Solution:

OMRON's uninterrupted power supply (UPS) BU1002 provides AC buffering for several components in charge of different tasks. While there is usually little space for a UPS in

lifts, OMRON's UPS system can be installed vertically in the door of the control cabinet or horizontally in the elevator shaft, to safely move the car to nearest floor in case of power off. In addition, the UPS controls are easily accessible for maintenance. While the operation and maintenance of lifting equipment and machinery are intensively monitored, OMRON's remote connection solution ensures that people or loads in an elevator can trigger an emergency call if necessary and safely reach the next floor.

OMRON offers a complete range of products for monitor building equipment 24/7 with high-performing technologies.

- Advanced predictive maintenance with data collection and visualization from key assets of the plant to monitor parts, and process data to reduce the impact of failure.
- Notification on usable parts and spare parts needed for maintenance.
- Immediate connection for a quick troubleshooting and when possible, fixing the issue.
- Positive impact for society by CO2 reduction thanks to reduced travel for maintenance.

OMRON offers a complete range of products for smarter maintenance solutions.



Remote access

Access machine data everywhere via a secure connection WIFI/4G/LAN connection. Execute a quick connection to a machine to get relevant information and to monitor machine status. Access to IP camera can help understand the issue.



Compact automation

Get full equipment data visibility and remote access with a controller that can collect data produced by sensors and actuators.



Condition monitoring

Monitor key assets of the machine (motor current/vibration/temperature/insulation resistance), detect abnormal working conditions and share information and trends via EtherNet/IP.



Monitoring relay

The smarter way to protect your system and increase safety, thanks to redundancy with the inverter protection functions. Monitor for incorrect phase sequence and phase loss. No heat generation due to nearby inverters installation. Meet safety regulations.



Power supply

Visualize and control the condition of power supplies and load check centrally. Visualize the time to replace power supplies.



Inverters

Be proactive against potential failures and predict drive failures with ageing models for critical components (fan, IGBT, ...). Crane control features. Coated PCB boards as standard. Designed for 10 years of maintenance-free use.

For more details on OMRON's solutions for smart maintenance, please contact us or visit <http://industrial.omron.eu>.