October 3, 2017

TECHNICAL BULLETIN 171003

TO: All operators of Magic Carpet® lifts, to include Area Management, Operations Management, Maintenance Management, Risk Managers and Maintenance Personnel.

SUBJECT: Electronic Monitoring of Access Points on Conveyor Lifts Retrofit

Magic Carpet Lifts/RMCE, Inc. has developed a Safety Guard Switch option which is designed to protect maintenance workers from exposure to hazards associated with inspection work on powered conveyor lifts. While we specify that all our lifts are to be Locked Out/Tagged Out before any inspection or maintenance procedures are performed, we realize that some procedures are being done without Lock Out/Tag Out protocols being used. This Technical Bulleting mirrors the requirements of BC Safety Order SO-PR-2017-01.

This Safety Order has been issued for implementation on Conveyor lifts in British Columbia, Canada. Parts 1, 2 and 3 are to be completed by October 15, 2018. Part 4, Safety Procedures, must have been submitted by July 28, 2017

This change is applicable for all conveyor lifts but is designed specifically for the Magic Carpet® Lifts. We ask that all areas review this document with their Environmental Health and Safety or Risk Compliance Departments to determine if their lifts should be modified to incorporate Electronic Monitoring of access points on the lift, to include any vault areas or access areas under the lift, not part of the Magic Carpet® design.

Magic Carpet® lifts Electronic Monitoring option utilizes a PLd safety switch circuit that will monitor the covers we have supplied as well as any covers, hatches or doorways our customers have added to their Magic Carpet® lifts. The major goal of this design change was to monitor lift access points during inspection procedures. The existing wiring circuits with software functionality will remain. This change will involve series wiring into the existing safety circuit.

The design has a three-position transfer switch which is located at the main control panel with LOAD INSPECTION-NORMAL-UNLOAD INSPECTION positions. NORMAL positon
monitors all access points and shuts down the lift if any access points are open. The LOAD and UNLOAD inspection positions disables the access point monitoring function for either the Load or Unload end of the lift, whichever end is selected by the transfer switch.

The electrical controls allow for a jog function at the end of the lift being inspected, as selected by the transfer switch. Jog function is controlled by a 3 stage constant pressure enabling switch which shuts down the lift if either released or pressed too hard. The enabling switch is to be securely fastened to conveyor structure so that operation of the switch and contact with an entanglement point cannot occur simultaneously. All E-Stops always remain operative. Any open cover, hatch or guard at the non-selected end of the conveyor will shut down the lift or prevent the lift from starting or using any jog pushbutton.

The system meets the control reliability level of PLd per 13849. This level of reliability requires that either a dual channel system or a system with well-tried electrical components be implemented to meet control reliability. Mechanical switches were ruled out, as their low temperature rating would not meet a -25C rating due to the grease in the mechanism. Proximity sensors were ruled out as their failure mode was typically in the “ON” position. Other considerations were wire length, the number of wire conductors required, ease of making this change out, system reliability and ease of troubleshooting any switch monitoring system issues.

System Description

A KEYED TRANSFER SWITCH on the main control panel selects NORMAL Run, LOAD INSPECTION and UNLOAD INSPECTION modes of operation. In the NORMAL run position, the key can be removed and the system will work as originally intended.

If the key is moved to the LOAD INSPECTION position, all E-Stops will remain enabled, all start pushbuttons will be disabled, the guard switches on the load end of the conveyor will be disabled and the JOG ENABLE pushbutton on the load end only will be enabled.

If the key is moved to the UNLOAD INSPECTION position, all E-Stops will remain enabled, all start pushbuttons will be disabled, the guard switches on the unload end of the conveyor will be disabled and the JOG ENABLE pushbutton on the unload end only will be enabled.

Any attempt to open a monitored guard, hatch or cover on the non-inspected end of the conveyor will force an immediate E Stop condition.

The guard switches selected are non-contact type with a maximum sensing range of 15mm. They can be daisy chained on each end with up to 20 guard switches. This will allow areas to add switches on each end for any doors, hatches or guards they may have installed other than what has been supplied by the manufacturer. This switch string reports to a local evaluation unit mounted in a load end terminal junction box or within the main control panel.

The evaluation units monitor the guard switches on both ends and sends a dual channel signal to the existing safety PLC that the guards are in place for operation. This evaluation unit is overridden when commanded by the keyed transfer switch. At the load end, the evaluation unit
is mounted in a NEMA 4X enclosure with terminal strip and 20 watt heater as required. A heater is required on the load end for any unit that has operational temperatures below -10C. At the unload end of the conveyor the evaluation unit is mounted inside the main control panel.

The enabling pushbutton is mounted at the load end on the existing control post in close proximity to the existing E-Stop pushbutton. At the unload end the enabling switch is mounted on the main control panel. Jog speed can be preset for any speed independent of the normal run speed by a parameter change in the VFD.

**Features of the Electrical Control System**

1. Maintenance Keyed Transfer Switch  
   a. Mounted on main control panel with drive.  
   b. Three position key – captured/released/captured all maintained (no spring return)  
   c. Middle position “NORMAL”  
      i. Drive START input enabled  
      ii. Drive JOG input disabled  
      iii. All door switches via MSCs will disable the drive through the e-stop string  
   d. Turn key CCW for “LOAD SIDE” maintenance enable  
      i. Drive START input disabled  
      ii. Drive JOG inputs are enabled from Load Side Maintenance Jog switches  
      iii. Transfer switch bypasses the guard door switches on the load end of the conveyor  
      iv. Unload side door switches stay enabled, if these doors open system is shut down.  
      v. Unload side Jog switches are disabled  
   e. Turn key CW for “UNLOAD SIDE” maintenance enable  
      i. Drive START input disabled  
      ii. Drive JOG inputs are enabled from Unload Side Maintenance Jog switches  
      iii. Transfer switch bypasses the guard door switches on the unload end of the conveyor  
      iv. Load side door switches stay enabled, if these doors open system is shut down.  
      v. Load side Jog switches are disabled  

2. Evaluation Unit [Modular Safety Control (MSC)]  
   a. On each end; Load end and Unload end. Power supplied from main control panel as required.  
   b. Base Unit Euchner 121289  
   c. Pentair or equal heater, finger safe  
   d. MSC Inputs are all local (Load End or Unload End) Door switches in series to dedicated input modules  

3. Discrete outputs to main control panel  
   a. Jog Command, supervised by Maintenance Key transfer switch  
   b. Interrupt door detection monitoring, which only can be bypassed by Maintenance Key transfer switch
c. Enabling switch allows jog function based on transfer switch mode
   i. Additional sensors can be supplied for owner installed door openings

d. At either end, jog switches are located at the existing pendant station. E Stop
   pushbuttons are part of the existing pendant control station and will remain.
   The jog signal is supervised by the Maintenance Key switch (above)

**REQUIRED ACTION**

BC Customers, by October 15, 2018, Parts 1,2 and 3 of the Safety Order must be
implemented. Prior to the completion of Parts 1, 2 and 3 outlined in the BC Safety
Order, Part 4 of the Safety Order must be met.

Operators of Magic Carpet® lifts not affected by the Safety Order must review this
Technical Bulletin with their Environmental Health and Safety Manager for applicability
at their respective resorts.

With different generations, control panel differences and lengths of lifts, a single
component description must be prepared for each lift. The accompanying table
describes the components we offer and the quantities involved of each part. The
Electrical solution we are offering may be provided by us or by a Professional Engineer
as regulated by the authority having jurisdiction. If you are making this change, please
advise us of the year your Magic Carpet lift was originally installed and the model
number on the VFD in the control panel.

Guarding may be used in place of an electrical solution. Besides the guarding details
released by any Safety Authority, we require any guarding that may be stepped on or
fallen into, be manufactured as a structural design that prevents any movement of the
guard if contact occurs. Existing covers may be permanently welded in place in place of
electronic monitoring. Magic Carpet Lifts/RMCE, Inc. is not currently pursuing a
guarding solution to meet any Safety Orders.

This Technical Bulletin does not take the place of Lock Out /Tag Out requirements as
stated in our manuals. NO adjustments of the Magic Carpet® lift should ever be made
with the lift under power. The controls we are offering are for visual inspection
purposes only.

Please go to our ftp site and follow the link [http://www.rmce.com/technical.html](http://www.rmce.com/technical.html) or
contact Magic Carpet Lifts/RMCE, Inc. with any questions or comments.

Magic Carpet Lifts/RMCE, Inc.

FTP Site Enc; Wiring Diagram, component Sheet, Function Block Diagram