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AK Rides Swing Tower gondola unintentional rotation

NAFLIC is in receipt of a safety bulletin published by AK Rides s.r.o. in Slovakia relating to the company's M40 Swing Tower ride. The bulletin is provided below for information purposes.

We would remind controllers and IBs that the recommended action to be taken would constitute a safety critical modification so would be subject to a design review. Controllers and IBs are also reminded that any such modification, being a safety critical modification, would be subject to a safety critical review under HSG 175 (paragraphs 202 – 207).

The information contained within is that of the manufacturer and not NAFLIC. When following the advice from the manufacturer, you are reminded of your duties and responsibilities under HSG175 regarding modifications.

M40 Swing Tower

SAFETY ISSUE No. 1

Contacts:

Manufacturer:

AK rides s.r.o.

Alžbetin Dvor 4

900 42 Miloslavov

Customer:

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Description of safety issue

The Swing Tower attraction lacks sufficient diagnostic coverage with respect to national legislative requirements pertaining to the control systems of such devices. The Swing Tower attraction may not indicate an occurrence of failure during the ride cycle which may lead to a dangerous situation if accumulation of the fault goes unnoticed.

Fault Description:

Gondolas unintentionally rotating at or near the loading/unloading platform may result in passenger(s) colliding with guard railing and other nearby objects.

Corrective/Preventive Measures

Additional pre operation checks are required before opening the attraction to the public. In addition to the pre operation checks outlined in the M40 Operators manual, the operator shall perform the following checks:

1. Perform the standard instructions as described in the M40 Operators manual and ensure that all functions on the control panel operate as described.
2. Check lapbar restraining lock for proper operation by leaving one of the 12 restraints unlatched and attempting to initiate the ride cycle. Repeat for each lock. The ride cycle should **NOT** initiate with any of the seat locks unlatched.
3. Ensure that rotation cannot be activated below $8 - 10 [m]$ from the loading platform. This can be checked by attempting to initiate the rotation function at the control panel below this height. Powered rotation should **NOT** be possible in this instance.
4. Ensure that the gondolas do not continue to descend approx. $8 - 10 [m]$ above the loading platform if gondolas are still being driven. Gondola drive should **NOT** be powered below this height and further toggling of the down function shall **NOT** lower the gondolas until power to the drive motors has been deactivated.
5. Check function of the emergency stop during ascending/descending and rotation of the gondolas. Ensure that the reset function works correctly once the emergency stop button is released. The gondolas should **NOT** be under power nor should they continue to ascend/descent when the emergency stop is activated.



6. Check that the state (LED) of sensor relays (**KA5, KA6, 1KA6, KA7, KA8, KA9, and 1KA9**) change correctly according to the ride cycle as follows (refer to *page 11* of the electrical schematics for relay locations in main cabinet):
 - a. In loading position before initiating the ride cycle, LED's **KA5, KA6, 1KA6, KA7** are "ON" while LED's **KA8, KA9, and 1KA9** are "OFF".
 - b. After initiating the ride cycle and gondolas begin ascent, LED's of relays **KA9** and **1KA9** should switch "ON" followed by **KA8** after some time. Once the gondolas have ascended past *8 – 10 [m]* LED's from **KA5, KA6, and 1KA6** should switch "OFF" while the LED on **KA7** should also switch "OFF" as the gondolas reach the top of their travel (operating height).
 - c. Relay **KA7** is triggered by the proximity sensor SP03 which should turn off the hydraulic power unit when its LED turns "OFF".

Action

If during any of the above mentioned tests, as well as those described in the M40 operators manual, results in an abnormal or faulty condition, the attraction must be shut down and the fault investigated/resolved before reopening to the public. If a fault does occur where rotation starts or persists at or near the loading platform, operators are to immediately use the emergency stop function on the operator's panel or on the side of the electrical cabinet. Following any use of the emergency stop function operators should refer to the operator's manual for the correct procedure in removing passengers from the attraction.

Remarks

The additional pre operation checks allows for manual diagnostics of the control system by identifying faults before the attraction is opened to the public. It also serves to remind operators of the correct function of the attraction so that they can identify faults in real time and take the correct action when they occur.

Reference documentation:

1. Electrical schematics (kolotoc RK)
2. Cabinet Layout (kolotoc RK)
3. Operators manual (M40 Operators manual)

