

NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Committee

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278. Control System Issues

An incident, not involving passengers or injury, on Disneyland's Big Thunder Mountain Railroad in Anaheim reminds us that there are often accidents and dangerous occurrences associated with control systems and PLCs (programmable logic controllers).

The problem on this occasion was associated with the blockzone system for keeping roller coaster trains safely spaced apart from each other around the circuit. As a result of a problem with the station gates, the report of the California Division of Occupational Safety and Health suggests that an emergency stop (rather than a safety stop¹) was executed and the ride was evacuated.

After the problem with the station gates was resolved the reset procedure was initiated. There was, of course, a train still located on the track and the procedure is said to have been inaccurately followed such that the system was incorrectly reset. In this case the system assumed that the track was clear and a collision resulted, without passengers, during the resetting / testing phase. The California safety authorities ordered the park to re-train two of its staff members.

This type of occurrence is not uncommon in the design of blockzone systems, sometimes resulting in serious accidents, and we note the significance of reliance upon well trained maintenance staff.

When using more than one separate train or passenger unit, the need to incorporate blockzones is generally assumed. The integrity of the control subsystem and other safety-related control systems has, in many cases, been shown by experience to be insufficient. Methodical ways of avoiding this are, of course, available and extensive discussion of some of them is included in *Safety of Amusement Devices: Design*, (see footnote 1 below).

¹ For definitions of these terms see Chapter 8 of *Safety of Amusement Devices: Design*, ISBN 0-9546161-0-3, available from NAFLIC at £20.