

NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Committee

TECHNICAL BULLETIN - JUNE 2004

277. Barriers, Platforms and Stairways

This bulletin concerns incidents associated with amusement device barriers, platforms and stairways.

The first example involved the collapse of a roller coaster stairway; part of an emergency evacuation route. It was, thankfully, not carrying the weight of any persons at the time of the collapse, indeed it was not under any particular load.

Secondly we have been informed of defects, in a rotating ride in a fixed park, which didn't directly result in any incident, but which could feasibly have experienced early failure. This followed from a repair to some damaged barrier attachments in which inappropriate mixed materials were used - a MIG-welded repair of stainless steel components.

The third case we quote affected a cableway in an amusement park. The main columns were subject to vibration as the passenger units passed, causing particularly significant forced vibration of the inspection platforms. The platforms, bolted to the structure, constituted mass / spring systems having natural frequencies in a range which was excited by the ride's motion. Some of these bolted platforms, which in the absence of vibration would not experience significant fatigue, failed in service. As well as cableways we are aware of induced vibration in monorail structural components leading to fatigue failures.

Finally we mention vibration of the maintenance platform of the Fabbri Drop ride. This is an integral part of the pick-up trolley with significant vibration, which is both visible and audible, being initiated each time the passenger unit is released. The resultant dynamic stress fluctuations lead to cracking of the maintenance platform's handrails and floor supports.

One conclusion from this Technical Bulletin is that barriers, platforms and stairways, which are nominally statically-loaded components, may be subject to deterioration in service as a result of secondary effects. Sometimes these will not have been foreseen in the design analysis.

Committee Members :- Dr Garry Fawcett MBE (Chairman), Mr Richard Barnes, Mr Peter Smith, Mr Ian Grant, Mr Steve Parker, Mr Eddie Price, Mr Mike Preston & Mr Dave Inman

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PO BOX 752, SUNDERLAND, SR3 1XX
TEL: (0191) 5239498 FAX: (0191) 5239498