

NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Sub-Committee

TECHNICAL BULLETIN - OCTOBER 1993

067. Blackpool - Grand National Accident

Ten people were treated in Blackpool's Victoria Hospital for minor injuries following an incident on Blackpool Pleasure Beach's Grand National roller coaster in August 1993.

During the course of the ride, which sees two trains racing on parallel tracks, the towbar connecting cars two and three on one of the trains fractured, causing the train to separate into two parts. When the front part of the train arrived back at the station the brakes came on and the rear part of the train ran into the back of it. The injuries were bruised ribs, injured noses and mouths, and shock to some of the riders.

No information has yet been provided about the detail of the broken component and the mode of failure. A further Bulletin will be issued if and when this becomes available.

An earlier NAFLIC Technical Bulletin (No. 040) dealt with another case of connecting bar failure. Many roller coasters are of "piggyback" type in which all but one car have only one axle. In such rides the security of the connection is crucial. However, it is clear from the Grand National experience described above that two-axle cars may also be seriously affected by failure of one of the interconnections between cars.

We believe, then, that connecting bars between roller coaster cars are positively safety critical components. Their examination demands care. In theory, many recent designs should have had proper calculation and independent design review as required by the Code of Practice. The calculated fatigue design lives should therefore have been confirmed and the required examination periodicity and method should be known.

In some rides, the provision of secondary devices (e.g. chains, wire ropes, etc.) connecting adjacent cars is thought to provide a degree of redundancy which relieves the need for careful examination of the primary components. These, however, have normally been fitted without calculation and design review and, because of impact effects, very few of them would succeed in holding the cars if the main connection failed. We therefore consider that Appointed Persons should be wary of a false sense of security from secondary devices unless the appropriate calculations (plastic energy analysis) have been reviewed as adequate.