

NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Sub-Committee

TECHNICAL BULLETIN - SEPTEMBER 1997

154. Looping Coaster Accident - Walibi Park, Belgium

A recent accident, at Walibi Park, Belgium, received a great deal of media attention. This involved a fully loaded roller coaster train, built by Schwarzkopf, which found itself jammed totally upside down for a period of one and a half hours.

This is the first time that members of this Committee have become aware of a roller coaster train jamming totally upside down in a loop, although partial inversion in a helix has been known. We believe that the ride structure is about 15 years old although we do not know whether the train is of the same age.

Unfortunately we are still awaiting detailed information on the mechanics of the accident. However, the word on the street is that an axle failed and managed to sprag the train in the inverted position. On this "Missile" type of ride the highest axle forces and stresses occur as the train passes through the neck of the inverted pear-shaped loop. A likely point of axle failure therefore corresponds to the car passing through this position, and spragging immediately after this in the top part of the loop becomes a feasible proposition.

We are aware of axle and wheel cluster fatigue problems, including failures, over the years on a variety of roller coaster rides, not just Schwarzkopf. It is our belief that there is a global problem associated with the loadings used in roller coaster design, and fatigue lives of roller coaster components are invariably overestimated. Very often, but not always, this can be reduced to a problem of serviceability (rather than safety) but it relies on the specification of a programme of careful inspection. It is helpful in specifying and reviewing such a programme to carry out some in-service measurement to examine the extent by which design calculations have underestimated life. Until improved design information becomes available this problem is one which we must live with and risk assessment will remain imperfect.

Committee Members :- Dr Garry Fawcett (Chairman), Mr Richard Barnes, Mr Bob Nicholls, Mr Robert Casey,
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