

# NAFLIC

*National Association For Leisure Industry Certification*

## Standards & Related Documents Committee

### TECHNICAL BULLETIN - SEPTEMBER 2002

#### **250. Tivoli Orbiter Accident**

In an accident in Columbus, Ohio, USA in mid-August two men escaped serious injury when a passenger unit broke off a dangling-leg Orbiter (known as the "Re-Mix"). The unit hit an adjacent trailer and landed face-first on the ground. The passengers were very lucky and were later released from hospital after treatment.

These rides are made in the UK by Tivoli although it is thought that the cars are supplied by the Dutch manufacturer KMG. Much the same car design is employed in other KMG rides.

The failure occurred as a result of a fatigue crack which propagated around a transverse butt weld on a permanent backing strip. The weld connects two lengths of circular steel tube end to end. The tube carries the two seater passenger unit at one end and is attached at the other end to a large steel block by which the arrangement is bolted into a hub. There are 3 such passenger units on each hub and 6 radial arms carrying the hubs, making a total passenger capacity of 36.

We have not seen the fatigue life calculations for this device and it is not, therefore, clear whether the fatigue failure occurred as a result of a limited design life, or whether there were manufacturing flaws in the welding, or a combination of the two. One thing, however, is clear - since the ride is thought to be no more than 3 years old, the design and / or the welding quality had serious problems.

Committee Members :- Dr Garry Fawcett (Chairman), Mr Richard Barnes, Mr Peter Smith, Mr Ian Grant, Mr David Geary, Mr Steve Parker, Mr Eddy Price and Mr Mike Preston

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