

SAFETY ALERT/ACTION NOTE

KMG BOOSTER

Background.

There have been at least two serious accidents in the last 24 months involving these rides. Both have resulted in serious physical injuries to the operator and both appear to have the same root cause. Examples of the KMG Booster, one set up to run and another ready for transport can be seen at Figs 1 and 2.



Fig 1.



Fig 2.

Following the latest incident an investigation was carried out by HSE NFIT inspectors assisted by an HSE Specialist Mechanical Engineer. The ride involved had been manufactured by KMG in 2006 and at the time of the accident the ride was being assembled and erected prior to being used.

During both erection and dismantling of the ride a 5.56mm steel wire rope (SWR) runs between a winch fitted on the ride's king pin frame and the main arm and is used to lift the frame into place before pins are fitted to secure it. This SWR is under considerable load during this procedure. The winch fitted to this machine was a manual Dutton-Lainson version with a rating of 545kg with one winding. This rating decreases as more windings are run onto the drum. A photo of the winch attached to the king pin frame is at Fig 3.



Fig 3.

During the lifting/lowering operation the operator is required to be very close to the machine to insert/remove pins when the SWR is under greatest load. In both of the recent accidents it was reported that the SWR snapped and the frame fell onto the operator causing serious injuries. Some similar machines have been retrofitted with electrical winches which allows the operator to stand away from the machine whilst the actual lift is in progress, an obvious improvement in safety standards for the operator. The fitment of such a winch is recommended. The Operator will still be required to approach the machine to insert/remove the pins and the condition of the SWR should be examined before and after every use to ensure it is in good condition e.g. not frayed or twisted. The way SWR runs back onto the winch should also be observed to make sure it does not twist or become damaged.

These types of winches (manual and electrical) are known to cause deterioration and damage to the SWR spooled onto them when they are loaded unevenly under pressure. It is also possible that damage to the SWR could have been caused or made worse if it had been left under tension whilst the machine was being transported. Whilst it is possible that in both accident cases, the SWR was in a damaged/poor condition prior to its failing, there is no evidence to support this as it has not been possible to recover the SWR for observation/testing.

Ride controller action required: The SWR used in this operation suspends a large piece of metal in a position where it becomes a potential threat to life if it breaks. It is imperative that controllers ensure that the condition of the SWR is checked before and after each use to ensure it has not become damaged. If damage is apparent they are to check with their ride inspector whether its continued use is acceptable or whether replacement is required.

It is the recommendation of the HSE Specialist Inspector involved in the accident investigation that the SWR be replaced at least at 12 monthly intervals. This is based on the fatigue bending life calculations made by SWR manufacturers when such ropes are passed around pulleys.

Ride examiner action required: The Lifting Operations and Lifting Equipment Regulations 1998 do not apply in this circumstance. The following is a quote from an HSE sector Information Minute (SIM) published in 2004:

LOLER is unlikely to apply to the ride itself, even those that have been described as "having a lifting element", for example "big wheels" or drop towers themselves, or to the rams or pulley systems used to re-position a ride from the horizontal travelling position to its working position.

Ride examiners are to ensure however that they conduct thorough examinations of individual winches and SWRs to the standard required in LOLER as part of the annual thorough examination and a DOC should not be issued if either are in poor or unserviceable condition.

Ride Examiners are to check that the controller has replaced the SWR at least in the previous 12 months.

HSE action: This note is being passed to HSE NFIT Inspectors for information.

Further information if required from M Sandell (HSE) on 07527002689.