

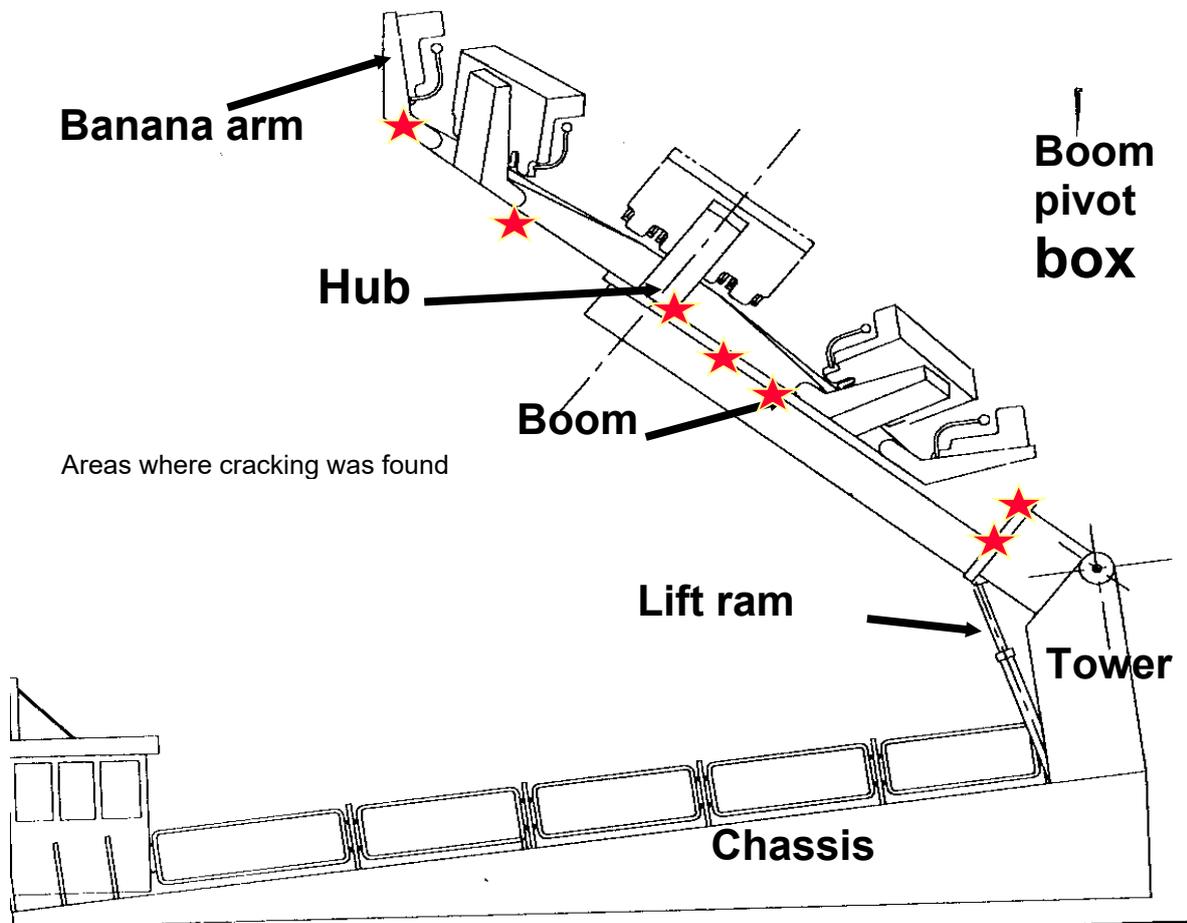
Appendix 4: Safeco Crazy Frog

Introduction
<p>The Crazy Frog type machine was subject to a Safety Action Notice (SAN) requiring controllers to conduct certain examinations, make physical alterations to the machine and/or change operational use. Certain types of the Safeco Crazy Frog machine are the subject of a recent HSL Study (see link below for detail).</p> <p>This machine has been involved in a number of serious incidents since first imported into the UK. The majority involved:</p> <ul style="list-style-type: none"> - injuries resulting from passenger ejections, - serious back injuries sustained during un-commanded catastrophic mechanical or pneumatic movements and ride arms dropping suddenly to the ground. Also ride arms failing catastrophically through metal fatigue. - back injuries resulting from high frequency, low amplitude seat movements. - bruising and minor crush injuries resulting from poor ergonomics, <p>The majority of serious hazards affecting both riders and the machine's structural integrity were attributed to the ability to make sudden changes to pneumatic pressure in the machine. This can be addressed by the fitment of a pneumatic restrictor and some Controllers have done this. These have been fitted near to the pay box so they are visible.</p>
Health and safety
<p>Ensure appropriate PPE is worn - e.g. safety footwear, & hi viz jacket</p> <p>Reference to COIN prior to visit to identify local factors e.g. violence or aggression marking</p>
Inspection
<p>Inspectors should check remedial works notified to ride controllers have been completed and that machines are operating in accordance with both the manufacturer's instructions and HSE guidance.</p> <p>Identify and record the following information on your inspection case.</p> <ol style="list-style-type: none"> 1. Specific ride details including machine name, serial number and ADIPS DoC number. 2. Required remedial work completed 3. Machine operated in accordance with manufacturer and HSE instruction and guidance. 4. Any management failings such as training, instruction etc. 5. Any SG involvement 6. Any Material Breach or Enforcement action taken
Priorities
Control of Machine
<p>Pneumatic control system (see NFIT workplan for details)</p> <ul style="list-style-type: none"> ➤ Has the machine been fitted with a valve to limit the pneumatic pressure to the rams controlling the arms? If the valve has not been fitted, has the pneumatic control pedal on the floor been disabled? ➤ If the valve has not been fitted, is the machine being NDT'ed in accordance with the HSL schedule twice per year? ➤ If the valve has not been fitted, is the machine being NDT'ed in accordance with the HSL schedule twice per year? If not, consider enforcement. If the valve has not been fitted, why not?
Non-destructive testing (NDT)
<ul style="list-style-type: none"> ➤ Does the NDT schedule for the machine include ultrasound (UT)? ➤ Has any welding been carried out to any of the arms?
Guidance
<ul style="list-style-type: none"> • HSL Report on Crazy Frog control system, mechanical integrity and ergonomics. • Crazy Frog Proforma
Contacts
<p>Andrea Harrison 0203 028 3055</p>

Appendix 5: Superstar

Introduction
<p>The Superstar was the subject of a major investigation/ intervention in 2002–2004 when catastrophic weld failures occurred. These are illustrated at positions as shown in Diagram 1 below. Investigation into the causes was extensive and resulted in all of these machines requiring remedial work and/or changes to their operation. An Enforcement Notice was issued during the investigation requiring alterations to the operating procedures and a comprehensive, in depth NDT regime. In some cases, machines have had significant re-engineering work or have a revised NDT schedule. In these or other circumstances NFIT should take action as necessary to ensure public safety. Sector can provide advice if required.</p> <p>See 'further references' section for copy of the Schedule to the Notice and letter sent to all ride controllers and inspection bodies reminding them of the standards required.</p> <p>Inspectors should check that these machines are being operated and tested either in accordance with the Schedule or to an equivalent standard.</p>
Health and safety
<p>Ensure appropriate PPE is worn - e.g. safety footwear, & hi viz jacket</p> <p>Reference to COIN prior to visit to identify local factors e.g. violence or aggression marking</p>
Inspection
<p>Inspectors should check remedial works notified to ride controllers have been completed and that machines are operating in accordance with both the manufacturer's instructions and HSE guidance.</p> <p>Identify and record the following information on your inspection case.</p> <ol style="list-style-type: none">1. Specific ride details including machine name, serial number and ADIPS DoC number.2. Required remedial work completed3. Machine operated in accordance with manufacturer and HSE instruction and guidance.4. Any management failings such as training, instruction etc.5. Any SG involvement6. Any Material Breach or Enforcement action taken
Priorities
<p><u>Condition of machine</u></p> <p>Current NDT schedule</p> <ul style="list-style-type: none">➤ Is the original HSE/HSL NDT schedule, issued with the PN, being used?➤ If not, does a NDT schedule exist – if so, please take copy and pass to Sector. If no schedule exists, consider enforcement action – Sector will be happy to advise.➤ Are there metal plates welded over the boom joints?➤ If so, are these removed and refitted during NDT testing?
Guidance
<ul style="list-style-type: none">• Superstar NDT Schedule• Letter to owners and inspection bodies of Superstar machines• Superstar Proforma
Contacts
<p>Andrea Harrison 0203 028 3055</p>

Diagram 1: Superstar Arm Diagram



Appendix 6: Multi-car roller coasters

Introduction
<p>Serious accidents involving multi car roller coasters are rare; there have been 3 in the United Kingdom in over 30 years of use. Whilst these machines are designed to be intrinsically safe, the incident at Alton Towers demonstrated the high level of hazard they present if not managed correctly.</p> <p>This work is designed to check that operators of such machines have systems in place for their management and to ensure they do not expose people to risk during normal use and when dealing with unplanned incidents such as stoppages/crashes etc.</p>
Health and safety
<p>Ensure appropriate PPE is worn - e.g. safety footwear, & hi viz jacket Reference to COIN prior to visit to identify local factors e.g. violence or aggression marking</p>
Inspection
<p>Inspectors should assess whether operators have appropriate management systems and arrangements in place for eliminating or controlling the risks associated with failure of the rollercoaster.</p> <p>Identify and record the following information on your inspection case.</p> <ol style="list-style-type: none">1. Specific ride details including machine name, serial number and ADIPS DoC number.2. Required remedial work completed3. Machine operated in accordance with manufacturer and HSE instruction and guidance.4. Any management failings such as training, instruction etc.5. Any SG involvement6. Any Material Breach or Enforcement action taken
Priorities
<p><u>Design and installation by a competent person (normally an ADIPS registered ride inspector).</u></p> <ul style="list-style-type: none">➤ Does the machine have a Design Review or a Maturity Risk Assessment? This should cover as a minimum: Design and operation of the control system; Suitability of the containment system; Operating instructions Inspection and maintenance schedules (including the NDT schedule)➤ Is there a report of Assessment of Conformity to Design? This should cover the entire device including the structure, mechanical, electrical, electronic, hydraulic and pneumatic assemblies.➤ Is there a Report of Initial Test showing that all of the safety critical functions of the machine function as intended? <p><u>Inspection and maintenance by competent in-house and external personnel:</u></p> <ul style="list-style-type: none">➤ Is the machine thoroughly inspected annually?➤ Is there evidence of a regular, in house test and inspection scheme to ensure the machine remains safe for use between annual tests e.g. daily pre-use checks, test runs, brake tests, etc.➤ Is there evidence of a pro-active maintenance system?➤ Is there an effective, traceable fault rectification system? <p><u>Operation:</u></p> <ul style="list-style-type: none">➤ Is there appropriate signage relating to the machine e.g. rider height, weight, disability, alcohol, keeping hands inboard, removing loose possessions etc.?➤ Are all staff (operational and engineering) trained in their roles on the individual machine?➤ Do staff have access to weather information and sufficient instruction and training about ride operation during adverse weather?➤ Is there an agreed and understood system of communication between the operator and platform staff?➤ Are the rules for loading and unloading passengers understood and followed e.g. ensuring restraints are fitted and secure, actions if a rider appears unhappy etc.?

- Is there a system for handing the machine back and forth between engineering and operational staff?
- Is there a system in place for adding or removing cars during operation?
- Is there a system for monitoring the number of cars on track at any one time?
- Is there a planned system for clearing 'block stops' to ensure cars do not crash? This will normally be automatic once the machine is put into recovery mode.
- Are there training, plans and equipment in place to reassure and rescue all passengers (including disabled if allowed to ride) from all foreseeable parts of the ride?
- Are both of the above practised?
- Is there regular contact with the emergency services?

Guidance

- [Multi-car rollercoaster inspection programme NFIT Work Plan 2018/19](#)
- [HSG 175](#) – Fairgrounds and amusement parks: Guidance on safe practice

Contacts

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Appendix 7: Matters of Evident Concern

Introduction
When inspecting Theme Parks or travelling fairgrounds inspectors may see matters of evident concern beyond those relating to the specified machines discussed earlier. Where assessed, these matters require discussion with the ride operator or fairground organiser, and where necessary action by the inspector to address the concern.
Health and safety
Ensure appropriate PPE is worn - e.g. safety footwear, & hi viz jacket Reference to COIN prior to visit to identify local factors e.g. violence or aggression marking
Inspection
Establish the contractual arrangements for the operation and management of the fairground and the individual rides to allocate responsibilities to the correct duty holder. Identify and record the following information on your inspection case. <ol style="list-style-type: none"> 1. Processes carried out and equipment used 2. Are appropriate control measures used, checked and maintained? 3. Specific control failings 4. Any management failings such as training, instruction etc. 5. Any SG involvement 6. Any Material Breach or Enforcement action taken
Priorities
Matters of evident concern likely to be found include: <ul style="list-style-type: none"> ➤ inadequate or poor fencing on rides (e.g. access not prevented to underside of ride, fences close enough to allow reach through to moving ride, gaps between fence sections or underneath that would allow an adult or child through), ➤ inadequate protection on juvenile machines to ensure non-riders are protected. ➤ obvious electrical faults (e.g. domestic cabling, poor jointing, cable in poor condition or running across vehicle routes). It should be noted that HSE has no powers in living accommodation areas. ➤ poor control of work at height during erection/dismantling or when running the ride (e.g. work from atop open lorry sides), ➤ inadequate supervision and control of rides (e.g. one operator for two or more rides, not enough supervision to ensure access gaps are secure when ride is in operation), ➤ minimum/maximum rider heights not being enforced, ➤ ride attendants failing to conduct physical checks of restraints/containment before ride starts, ➤ inflatables not properly secured (e.g. not all tie-down points used or inadequate stakes/ballast), ➤ danger areas not guarded/closed off (e.g. generator enclosures, vehicles), ➤ poor packing of rides (e.g. 'thin edge' loading or packing badly cracked and broken), ➤ rides in obviously poor condition (e.g. bent chequer plate, broken steps/handrails), ➤ queues not controlled (e.g. people running onto ride before last passengers can clear safely), ➤ passengers waiting on open decks of waltzers, ➤ rides sited close enough to impede pedestrian access or impact upon one another, ➤ rides being run out of balance (e.g. Twists with one car full and the opposite car empty, Crazy Frog with significantly different weight loading on opposing arms);
Guidance
<ul style="list-style-type: none"> • HSG 175 – Fairgrounds and amusement parks: Guidance on safe practice • Controller guidance for guarding and fencing requirements of juvenile fairground rides - ADIPS guidance
Contacts
Andrea Harrison 0203 028 3055

Appendix 8 Initial Enforcement Expectations

NB: Should an Inspector identify that there is (or is likely to be) a risk of serious personal injury arising from any of the situations below, then they should consider issuing a Prohibition Notice, regardless of the IEE indicated in the table.

Electrical			
	Situation	IEE	Comment
	Domestic 13-amp sockets and electrical accessories used where they are likely to get wet or become damaged.	PN and/or NoC	<p>The use of domestic type electrical sockets and accessories is often found when additional lighting or sound systems are added to rides. Sockets and electrical accessories suitable for use outdoors and robust are readily available and practical to use. The issue can often be dealt with immediately by either replacement or removal.</p> <p>In any case, a follow up NoC letter should be sent even if the matter is dealt with immediately</p> <p>SG support should be sought about the correct rating of electrical fittings and accessories.</p>
	Damage to cabling. Cable cores exposed from within the cable sheath or in extreme situations, copper conductors exposed by the cable damage.	PN and/or NoC	<p>All cabling should be of a sound construction with the external sheath of the cable in good condition. Any joints or connections in cables should be made using electrical connectors or accessories suitable for the environment and intended for joining cables. The use of pvc tape to repair cabling should not be accepted.</p> <p>The replacement of damaged cabling is reasonably practicable and can often be completed immediately.</p> <p>In any case, a follow up NoC letter should be sent even if the matter is dealt with immediately</p>
	Cables routed across vehicle and pedestrian traffic routes including those buried or covered cabling that could foreseeably be damaged by vehicle or pedestrian movements.	PN and/or NoC	<p>This will include cabling that has been shallow buried or covered by tarmac or other material but could foreseeably become damaged by vehicle or pedestrian movements or may be struck by a shovel or securing peg.</p> <p>Reasonably practicable measures include the use of armoured cable, the provision of covers to provide adequate mechanical protection to the cable or routing the cable where it will not be at risk.</p>

		If remedial action is undertaken immediately a follow up NoC letter should be sent.
Damaged sockets and other electrical accessories	PN and/or NoC	<p>The replacement of damaged sockets and other electrical accessories is reasonably practicable and can often be completed immediately.</p> <p>If the damage exposes potentially live parts within the accessory, then this is likely to present immediate danger and action should be taken to make the system safe.</p> <p>In any case, a follow NoC letter should be sent even if the matter is dealt with immediately</p>
Chocolate block type connectors used to make electrical connections	PN and/or NoC	<p>Chocolate block connectors are not suitable for joining together flexible cables where there is any likelihood of strain being placed on the connection. They are not suitable for use where they may become wet unless suitably enclosed and wrapping with pvc tape will not provide adequate weather protection nor adequate strain relief.</p> <p>If used in fixed wiring systems, the connectors should be in an enclosure and the cabling supported or fixed to prevent strain on the connection.</p> <p>Purpose designed cable connectors, or in-line plugs and sockets can be used to join flexible cables when needed. Replacing cables rather than repairing damage with connectors may be practical.</p> <p>If remedial action is undertaken immediately a follow up NoC letter should be sent.</p>
The use of domestic flat twin and earth cable in circumstances where mechanical stress and/or damage is foreseeable	PN and/or NoC	<p>Twin and earth cable should not be used in situations where it will be subject to mechanical stress or damage. This type of cable should not be used to make extension leads or for the direct connection of portable appliances.</p> <p>This type of cable is designed for fixed wiring installations only. The provision of suitable cable is reasonably practicable and can often be changed immediately.</p>
The use of damaged electrical distribution units i.e. distribution units with damaged or missing covers allowing access to live conductors	PN and/or NoC	Equipment damaged so that potentially live conductors are exposed presents immediate danger and action should be taken to make the equipment safe. The replacement or repair of damaged distribution equipment is reasonably practicable to expect.

			<p>Distribution equipment should be suitable for use in the environment in which it is being used. Domestic type distribution boards (consumer units) should not be in use where they are likely to get wet.</p> <p>A PN should be considered in circumstances where immediate repair cannot be undertaken or the area in which the distribution unit is positioned secured to prevent access. In any case, a follow NoC letter should be sent even if the matter is dealt with immediately</p>
	Cables incorrectly terminated into electrical equipment.	PN and/or NoC	<p>Where cables enter electrical equipment, the cable sheaths should be maintained by the connection into the equipment. Cut outs for cables should not compromise the integrity of the equipment enclosure by allowing water ingress if the equipment is outdoors or access to potentially live parts inside. The cut outs should not cause damage to the cables.</p> <p>Cables should not be routed into equipment through doors or covers so that it is not possible to close the doors or replace the covers.</p> <p>If cables appear likely to become damaged, for example by cable cores being exposed as the cables enter metallic enclosures or if covers cannot be replaced or doors closed potentially exposing live parts, enforcement action should be considered.</p> <p>The appropriate action will depend on the foreseeable risk.</p> <p>In any case, a follow NoC letter should be sent even if the matter is dealt with immediately</p>
Mechanical			
	Passenger Security (safety critical restraint)	PN\poss. Proactive prosecution	<p>This relates to mechanical and integrated ride safety restraints i.e. locking lap bars etc. These should be in excellent condition without loose fixings, any damage or the actual system being over-ridden. The condition of this equipment is an aspect of the DoC, though be aware like an MOT for a car the DoC relates to the day of inspection. Where defects are seen, even where it may be possible to correct quickly, this is an indication of poor maintenance regime between inspections and a prohibition notice is the expectation.</p> <p>Where a proactive prosecution is considered SG, input is required.</p>

Passenger Security (non-safety critical restraint)	NOC	<p>This relates to the chain style restraints seen on rides such as chair-o-planes etc. where the movement of the ride pushes the rider back into the seat and the restraint is for confidence and/or to prevent riders jumping from the ride as it operates.</p> <p>Securing of the restraint chain\lead should not be by dog-lead clip style fixing and any clip used should require dexterity to open it e.g. spring-loaded twist lock style karabiners. Where clips are seen to be easy to open due to weak or worn springs or the easy to open dog lead style verbal advice should be given at the time of the visit and followed up with an NOC</p>
Safety Critical Bolts	PN (where bolts are not suitable at pivot points)	<p>This relates to the replacing of high tensile fastenings i.e. bolts with strength designations on the heads etc. with unmarked fastenings which will not have the same strength. There is also an issue where bolts are used as pivots on twisting connections where strength is critical. Threaded bolts are meant for joining non-moving parts.</p> <p>Questions should be asked about the use of bolts as pins and where doubt remains request SG Mech support.</p>
Ride Furniture Damaged	PN and/or NoC	<p>This can relate to missing rails on cars or ride framework, bent or damaged ride make up, signage etc. Action will depend upon the foreseeable risk judged but such errors can be seen as the operator not having a robust on-going maintenance regime. Where the issues can be rectified at the time of the visit then verbal advice followed by an NOC is the expected outcome.</p> <p>Where the issues present a clear danger to either employees or public and cannot be corrected at the time then a PN should be considered.</p>
Ride Packing\Use of Jacks	NOC/ consider IN depending upon arrangement seen. SG support for IN advised.	<p>Invariably the ground upon which travelling rides stand changes from week to week and as such packing is used to steady/level rides. With traditional rides i.e. waltzers/carousels etc. it is common to use blocks but independent jacks, not fitted to or part of the ride, may be used. Where jacks are seen extended on top of blocks questions should be asked as to how they are suitable for use and operator should be able to say why the motion of the ride will not dislodge the jack or jacks.</p> <p>Where there is no information then an NOC should be considered along with an IN for improved control measures on the provision of packing as a means of reducing the risk to riders and operators.</p> <p>Just because there is no information does not mean the arrangement is dangerous. Where an inspector has serious concerns relating to the arrangement for ride levelling and packing then SG support should be considered either by a second visit to the ride or use of technology at the time of initial visit e.g. digital photos\facetime.</p>

Ride Operator			
	Lack of suitable and sufficient supervision of the ride including loading and unloading of the ride, including the application of any height restrictions and/or the checking of restraints etc.	PN and/or NoC	<p>If the matter requiring attention cannot be immediately rectified, then PN should be served if the failings constitute and immediate and serious risk of personal injury.</p> <p>If the matter requiring attention can be dealt with immediately, and levels of adequate supervision can be demonstrated either through a verbal undertaking and/or observation of the ride in operation a follow up NOC letter should be sent addressing the issues.</p>
	Inadequate arrangements to deal with rider misbehaviour e.g. permitting or encouraging passengers to stand up or walking across the drum whilst Tagada ride in operation	PN and/or NoC	<p>If the matter requiring attention cannot be immediately rectified, then PN should be served if the failings constitute and immediate and serious risk of personal injury.</p> <p>If the matter requiring attention can be dealt with immediately a follow up NOC letter should be sent addressing the issues.</p>
	Operators permitting the use of their machines in an unsafe manner i.e. crazy frog rides being run in reverse and/or the foot pedal is operational allowing the control system to be overridden and the arms bounced excessively	PN and/or NoC	<p>If the matter requiring attention cannot be immediately rectified, then PN should be served if the failings constitute and immediate and serious risk of personal injury.</p> <p>If the matter requiring attention can be dealt with immediately a follow up NOC letter should be sent addressing the issues.</p>
	Inadequate or absent emergency procedures for the safe evacuation of users in the event of either a mechanical breakdown or other emergency situation of ride or attraction	IN	<p>Ride operator unable to demonstrate adequate and realistic arrangements for the safe evacuation of users in the event of a mechanical breakdown or emergency situation. Consideration should be given to the provision of suitable rescue equipment and the training provision for the person(s) undertaking the rescue.</p> <p>Rescue arrangements should not only be reliant on the emergency services.</p>

Inadequate arrangements for the segregation of members of the public from the ride i.e. unsupervised means of access and egress onto the ride. Includes inadequate perimeter fencing.	PN and/or NoC	If the matter requiring attention cannot be immediately rectified, then PN should be served if the failings constitute an immediate and serious risk of personal injury. If the matter requiring attention can be dealt with immediately a follow up NOC letter should be sent addressing the issues.
Working at height where it is reasonably practicable to carry out the work without working at height	IN / PN	Enforcement action will depend on the level of risk as to how quickly the work at height should cease.
Working at height is taking place where control measures higher in the work at height hierarchy are not in place but are reasonably practicable to achieve	IN / PN	The work at height hierarchy should be applied to the task to determine the safest reasonably practicable way of working safely at height. Ladders are near the bottom of the hierarchy and should not be accepted as a default option where other measures are safer and reasonably practicable. Where unsafe work at height practices are observed they should be prohibited.
Work at height access equipment or accessories (tower scaffolds, pedestals, pop-ups mini towers, ladders, ropes, walk lines, carabiners, harnesses etc.) are in an unsafe condition	PN	If there is a risk of persons falling distance liable to cause serious personal injury from use of unsafe equipment then its use should be prohibited
Ladder or other access equipment in poor condition	PN	Ladders used on site should be "industrial class" and be in good condition. Poorly maintained ladders e.g. with missing feet, damaged rungs or stiles should not be used.
Based on the level of risk it is reasonably practicable for hazardous manual handling / repetitive tasks to be eliminated or reduced as far as is reasonably practicable.	IN	Hazardous manual handling tasks that pose a risk of serious personal injury can often be eliminated by the provision of mechanical aids
Organiser (Fairground Controller)		
No risk assessment in place to assess risk caused by workplace transport movements during set up and dismantling phase	NoC	A plan showing the site layout often accompanies the workplace transport risk assessment and is a useful visual aid to show traffic routes etc. Even when vehicles are operating in a field with pickers a risk assessment should be carried out to identify and address significant risk
The findings of the workplace transport risk assessment have not been communicated to employees	NoC	While some of the risks identified in the risk assessment may be addressed through provision of barriers, walkways etc. it is still important that the risks and control measures are communicated to employees

	and operators working on the site during the set up and dismantling phase		
	Inadequate segregation of pedestrians and vehicles during the set up and dismantling phase	PN and/or NoC	Enforcement action will depend on the level of risk. Workplace transport and pedestrians should be segregated so far as is reasonably practicable.
	Fairground rides placed too close to each other so that it is not possible for perimeter fencing to be positioned in such a way to prevent access to dangerous moving parts, or the safety envelope of the rides is compromised	PN and/or NoC	If the matter requiring attention can be dealt with immediately a follow up NoC letter should be sent on the ride operators addressing the issues, otherwise a PN should be served. A NoC letter should also be sent upon the Fairground Controller where there is sufficient evidence to demonstrate that they have failed in their duties i.e. inadequate provision of space for rides or adequate means to demarcation for each of the rides.

Inflatables (Bouncy castles, slides etc.)		
Inflatables not properly secured (e.g. not all tie-down points used or inadequate stakes/ballast, tie down points damaged and not in use),	PN and/or NOC	Check PIPA tagged/ADIPS Doc. Check operator manual for information that inflatable complies with BS EN 14960:2013 Inflatable play equipment. Safety requirements and test methods
No means of measuring wind speed available (anemometer)	PN and/or NOC	BS EN 14960 recommends that the maximum windspeed in which inflatable play equipment should be used outdoors is 38 km/h which is Force 5 on the Beaufort Scale (small trees in leaf begin to sway).
Electrical equipment including blowers in poor condition	PN and/or NOC	