Code of Safe Operation

for riding plastic spheres - Globe riding.

Version 5 – Effective Friday, October 12th 2012

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1 Committee Representation

This standard for safe operation of plastic riding spheres has been endorsed by:

Trading Name	Legal Entity	Operator Type	Countries operating
Zorb	Zorb Ltd Zorb New Zealand Ltd Zorb Smoky Mountains Inc Zorb Guam Inc	Activity provider and site operator	New Zealand Guam USA
Plascon	Plascon Limited	Manufacturer	New Zealand

Review of Standards. To keep abreast of progress in industry, standards are subject to periodic review an are kept up to date by the issue of amendments or new additions as necessary. It is important therefore that standards users ensure that they are in possession of the latest edition and any amendments thereto.

2 Preface

Globe riding is a new form of personal recreation experience. The invention of plastic riding spheres by Andrew Akers and Dwayne van der Sluis (commonly known by the registered trademarked spheres produced and used by Zorb Limited) has resulted in copy products being used to offer adventure experiences around the world.

Operators of sites that offer globe riding recognize that there is a risk of injury to their staff and the public during operations.

This Code of Safe Operation has been developed with the objective identifying and informing both operators, parties that allow the activity to take place on their land or premises and the public.

People seek challenging experiences. In virtually every activity that provides such challenges there is potential for injury.

While the customers of such activities may assume the risks and may provide waivers or other forms of legally binding releases to operators, it is trite that operators cannot simply rely on such releases, waivers or indemnities but have a duty to the consumer public to manage and improve risk outcomes.

Operators are under some for of duty to:

- identify and treat known or knowable risks
- ensure that the risks are properly and fairly explained to the potential customer
- ensure that other parties that could be liable such as landlords or agents are protected through risk management such as insurance and safe practice
- and finally, by adopting a Risk Management Plan ensure that risks identified through operation, whether by accidents or observation, are then reviewed, treated where possible and incorporated into the Risk Management Plan.

This Code of Safe Operation for Globe Riding follows a logical sequence in its layout, starting with an operator opening a new site that requires approval from various authorities depending on the site and the nature of the equipment used.

There are several ways for the public to currently experience globe riding.

Harnessed globe riding has the customer being strapped into the plastic sphere and sent rolling down a slope.

Water globe riding has the customer(s) riding free inside the plastic sphere with water creating a slippery surface on which the customer(s) slide as the plastic sphere rolls down a slope.

Flat ground globe riding has the customer walking, running and jumping within the plastic sphere on flat ground.

This Code of Safe Operation provides the framework for the operating procedures. Sites and equipment vary greatly, so each site will require its own operating manual. The content and standards required in the operating manual are set out in this Code of Safe Operation.

3 Version Changes

This Version, Version 5, includes changes regarding the participation of people with pre-existing medical conditions or disabilities in the sport of globe riding.

Version 4 had changes as a result of analysis of an accident at a temporary globe riding site established in the Czech Republic.

Version 3 was issued to address issues of unsafe practice that arose from an accident at a copy site in the Lost Valley in Maine, USA.

Both accidents are covered below.

3.1 Facts On The Lost Valley Accident

The accident caused serious injury to a young reporter.

Video footage of the accident has been posted at www.globeriding.com

The operators of the globe riding site posed as 'Zorb New England' and entered into an agreement with a local ski field.

The operators:

- had no experience of operating an adventure experience business;
- had no right to use the Zorb name
- had no Risk Management plan despite being provided with an earlier version of this document.

3.2 Analysis

There are 2 videos posted to www.globeriding.com

The video titled “Lost Valley First Test Ride” shows the globe being held up at the launch point.

The second video shows the device being run with 2 riders and the conclusion of the run with the globe heading off track and dropping down an incline. It was this run that injured the rider.

The lack of stability of the device is evident both at this point and later when the device stalls and is then physically lifted to re-start the run.

The **risks** are easily enumerated:

1. the instability in the device at the launch point could cause injury to the rider and launch staff;
2. the device instability during run could cause the globe to 'fall' over injuring the rider and deviate from a safe path causing risk of injury to both the rider and the public;
3. the primitive harness provided no lateral support to the rider and risked soft tissue injury through twisting of the rider during the launch loading and run. Furthermore to use such a primitive harness with 2 riders exposed the riders to the extra risks known with double or triple harnesses, namely failure causing one rider to fall on to the other and the hygiene and choking risks of having one rider vomit over another. The inventor of the sport, Zorb Limited, does not recommend and does not provide any harness rides with more than one rider.;
4. the contact of the globe with the ropes and the potential for harm by cutting the plastic due to the use of ropes. Globes attract considerable kinetic energy. Kinetic energy

calculations should be known to the operator and should be used to construct burst and tear test results for the 'fabric'. The impact with the ropes at the top of the course demonstrates that 2 risks need to be considered:

(a) the risk of harm to the device and rider

(b) the pin-balling effect on the device may cause emotional distress the rider

5. the other telling incident is when the device in the first run mounts the ropes at the end of the course. This should have told the operators that ropes are not a barrier. The appropriate response would have been to evaluate the run, and with the results set up a testing regime to learn about how to both design the course and manage the device before putting anyone else at risk. To continue at that point to even contemplate the second run with people in the device demonstrated a lack of risk awareness and management that apart from the danger to the public might expose the operator to action by the authorities.
6. Finally, the injured rider was removed from the globe without proper emergency services evaluation.

Mitigation is also straight forward:

1. Globes should be constructed to be true rounds and designed to sit flat at launch;
2. Pre-operation testing should ensure that the device is not operated if it exhibits the 'wheel wobble' is so clearly demonstrated by the device falling on its side after stopping half way;
3. the harness should provide substantial lateral and vertical support to the rider and be designed to minimize the risk of soft tissue injury through twisting of the rider during the launch loading and run;
4. the harness ride experience should contain one rider at any time and the ride harness system should not be mounted on the inner sphere but positioned so as to minimize the energy forces on the rider that arise with the rider being positioned on the inner sphere.
5. kinetic energy gained during a run should be managed to ensure safe operation of the globe.
6. ropes should never be used as a barrier.
7. The risk of serious injury makes provisions for emergency procedures and proper accident training essential.

3.3 Facts On The Czech Republic Accident As At 5 June, 2009

The accident caused the death of a 47 year old teacher and serious injury to a pupil.

The operators:

- appear to have set up a temporary site using 'nets' to catch the globes
- have set a run down a 35 degree slope.

3.4 Analysis

At the date of release of this version of the Code the facts are inadequate to provide a full analysis however the **risks** from the bare facts are easily enumerated:

1. using nets and ropes to catch or contain globes is a known danger. A 3m high plastic globe running at 20kph with the weight of 2 people cannot be stopped safely by having the globe hit a barrier. The globe will potentially climb or destroy the barrier and the impact will almost certainly result in impact to the occupants. Globe riding sites should ensure that the globe always follows (and win can be a major factor) a safe path.;
2. the slope, if correctly reported, is simply far too steep.

Mitigation is also straight forward:

1. Globes should be operated in a safe run. This does require proper barriers and run-out areas and generally the best and most economic way to achieve that is through earthworks.;
2. kinetic energy gained during a run should be managed to ensure safe operation of the globe and avoid excessive speed.
3. ropes and nets should never be used as a barrier.

   The risk of serious injury makes provisions for emergency procedures and proper accident training essential.

4 Scope & Interpretation

4.1 Scope

This Code of Safe Operation provides guidance on:

- the selection of safe activities;
- the design, testing and approval of equipment;
- the risk management of the operation;
- essential operating procedures;
- handling emergency provisions and;
- complying with this Code.

4.2 Interpretation

For the purposes of this Code of Safe Operation the word “shall” refers to practices which are mandatory to be in compliance with the Code of Safe Operation. The word “should” refers to practices which are advised or recommended.

In this Code of Safe Operation “globe riding” includes and refers to harnessed, water and flat ground globe riding.

This Code of Safe Operation is designed to be applicable to all operators providing globe riding whether for development, demonstration, private or public use and their business partners.

4.3 References

This document is intended to be a complete Code with the exception of references to the terms used in ISO/IEC Guide 73:2002 *Risk management -- Vocabulary -- Guidelines for use in standards* and the draft ISO/CD 31000 *General guidelines for principles and implementation of risk management*.

4.4 Definitions

For the purposes of this Code of Safe Operation the following definitions shall apply:

activity provider	organization or person that supplies plastic sphere experiences whether as a site operator or otherwise
anchor	point of connection for the straps or strings that join the inner and outer spheres
approving authority	any territorial body or person who has the authority to issue permissions, directions, registrations or approvals, with the force of law
breaking load	minimum load which, when applied under specified loading conditions, causes the equipment or component to break
catcher	person responsible for customer handling at the bottom of a plastic sphere run

competencies	skills necessary to enable a person to perform a specified task
control barrier	earth or other obstacle that creates the enclosed area within which the plastic spheres are operated and contained – see the next definition for *controlled land-based environments*
controlled land-based environments	area for Globe riding which has control barriers
CORE (acronym = Customer Operating Risk Equipment)	all equipment used in close proximity to customers as part of delivering the experience including the plastic spheres, powered or manually operated devices to inflate, launch, hold or move plastic spheres and vehicles used to transport customers and the plastic spheres.
direct supervision	supervision where a person (or persons) is in direct visual and audible contact
entry tunnel safety device	part of the plastic sphere that seals off the tunnel in a plastic sphere thereby preventing the customer or any body part from entering the tunnel and, in the case of water rides, preventing water from escaping out of the tunnel during the ride
ground care equipment	all equipment used all equipment used on the site for ground care
harness	any assembly within plastic spheres by which the customer is secured to the inside of the plastic sphere
incident	any event that could or does result in harm to a customer including damage to the plastic sphere or loss of control of the plastic sphere
launch gate	mechanism that prevents the plastic sphere from leaving the launch pad until everything is ready
launcher	person that is responsible for launching a plastic sphere
launch pad	area around the launch gate
plastic sphere manufacturer	any organization that builds plastic spheres
rider	person engaged in the experience of globe riding
site operator	activity provider that has a permanent or semi-permanent site
safe working load	maximum rated load of any equipment that is CORE
spheres	double chamber plastic ball constructed in a similar manner as characterized by the original patented invention of Andrew Akers and Dwayne van der Sluis of New Zealand and initially commercialized by Zorb Limited of New Zealand
tunnel	part of the plastic sphere through which the customer gains entry to the inner sphere
valve	part of the plastic sphere at which air is added or removed via the inflation device

5 Plastic Sphere Experiences

5.1 Classification Of Plastic Sphere Experiences

As an object that can be deployed in many environments and in the early days of R&D generalised portrayals of different experiences have been avoided in favour of listing known safety concerns. This section reflects the current knowledge of operators relating to types of operations and the associated risks.

5.1.1 Uncontrolled globe riding environments

5.1.1.1 Land-based activities

Risks	Treatment
Regardless of terrain plastic spheres can quickly move if caught by wind and maybe flammable (material dependent). Known risks include: • spheres blowing over fences and rope barriers • moving in a manner that cannot be controlled by one or two people • coming into contact with dangerous objects – cars, buses, sharp objects, sources of flame.	Spheres should be contained in land forms or pens or corrals at all times that provide sheltering from wind and ensure, particularly during any ride experience, that there is no chance of the sphere leaving the safe area.

5.1.1.2 Water-based activities

Risks	Treatment
As plastic spheres can quickly move if caught by wind and can sink if the water depth permits. Known risks of operating spheres on water include: • spheres blowing away • spheres sinking.	Spheres are not a safe device for operating on any open body of water such as a lake or sea especially if the depth is such that a sinking sphere could trap a customer. Note this is depth is not the height of the sphere or the tunnel. Customers caught in a sinking sphere may be trapped in shallow water and the weight of the plastic and water may make it impossible to get access to the tunnel. Risks to life include drowning, asphyxiation and stress related to panic.

5.1.2 Controlled land-based globe-riding environments

5.1.2.1 Flat areas

Risks	Treatment
Plastic spheres used on flat ground are heavy to move. Known risks of operating spheres on flat ground include: • risk to customers if mechanical devices are used to move the the spheres • risks to staff if staff try to push or otherwise move spheres especially if customers are in the spheres • risk to customers if they are propelling the sphere by walking or running the sphere • risks to staff and customers when using water on entry, exit and if staff are pushing or maneuvering the sphere or are on poorly drained ground or wet grass	Flat ground Globe riding with mechanical assistance is likely to require approval as a mechanical amusement device. Check regulatory and insurance issues. Flat ground Globe riding where the customers are walking or running to propel the sphere relies on the athletic capabilities of the customer. Risks include soft tissue injuries. Risks of slipping on wet ground are known and result in lower limb injuries including broken ankles and tendon and muscle damage.

5.1.2.2 Hill areas under 1:12 gradients: formed straight runs

Risks	Treatment
Plastic spheres used on hills can be affected by wind, the design of the track and the length of the slope. Known risks of operating spheres on hills runs include: • the run width allows the sphere to bounce off the barriers • the run is subject to windage • the length of the track adds to the previous 2 risk factors	Runs should be tested for: • trueness of the run • windage • adverse health effects on customers and adverse effects mitigated.

5.1.2.3 Hill areas under 1:12 gradients : formed non-straight runs

Risks	Treatment
Plastic spheres used on hills can be affected by wind, the design of the track and the length of the slope. Known risks of operating spheres on hills runs that are not straight include: • the run turns causes the sphere to bounce off the barriers • the run is subject to windage • the length of the track	Non-straight runs should be tested for: • impacts to customers in the turns in the run • windage • adverse health effects on customers and adverse effects mitigated.

5.1.2.4 Hill areas over 1:12 gradients

Risks	Treatment
Plastic spheres used on hills can be affected by wind, the design of the track and the length of the slope. Known risks of operating spheres on hills runs that are over 1:12 slope include: • the run slope causes the sphere to run over a safe speed • the run slope causes the sphere to bounce off the barriers • the run is subject to windage • the length of the track	Hi-degree slope runs should be tested for: • speed at the catching station • trueness of the run • windage • adverse health effects on customers and adverse effects mitigated.

5.1.2.5 Hill areas: launch stations

Risks	Treatment
Launch stations are a key known risk area for customers. Known risks with spheres at launch stations include: • windage and the sphere and the launch station structure • water risk to customers (falls from slipping) • fright or terror reactions at the launch station • accidents in water spheres due to customers standing or walking during launch	Operators can treat the risks by : • wind protection for riders and spheres • use of non-slip surfaces • fright and terror can be dealt with by absolute refund policy • accidents in water spheres during launching can be mitigated by having customers seated during launch and the sphere being pushed or set to roll out of a gate.

5.1.2.6 Hill areas: catching areas

Risks	Treatment
Catching areas are a key known risk area for customers and staff. Known risks with spheres in catching areas include: • windage and the sphere causing the sphere to travel at higher speeds than normal resulting in collisions and undue impact with barriers • water risk to customers primarily falls from slipping on exit) • staff accidents in handling spheres usually	Operators can treat the risks by : • ensuring spheres are only run in safe conditions and not over-inflated • good run-out design at the catching area • non-slip surfaces for customers and careful unloading procedures

resulting in soft tissue injuries	

5.1.2.7 Hill areas with runs over 300m

Risks	Treatment
Plastic spheres used on hills can be affected by wind, the design of the track and the length of the slope. Known risks of operating spheres on hills runs that are over 300m slope include: • the run slope causes the sphere to run over a safe speed • the run slope causes the sphere to bounce off the barriers • the run is subject to windage • the length of the track causes nausea or contusions from harness stress	Hi-degree long slope runs should be tested for: • speed at the catching station • trueness of the run • windage • adverse health effects on customers and adverse effects mitigated.

5.1.3 Spheres

5.1.3.1 General construction

Risks	Treatment
Known risks of sphere construction causing failure or harm to customers include: • device failure through collapse of the device due to inadequate breaking load and safe working load design and testing • inadequate design, internal location and testing of harnesses and adequate breaking load and safe working load design and testing • internal seams that cause skin cuts and lacerations • inadequate design and testing of water sphere tunnel barriers resulting in the tunnel either loosing water (which can cause plastic burns) or catching a limb (with possible dislocations or fractures) • seem failure resulting in the globe deflating and the riders falling through the seams	Manufacturers of spheres should construct and test to meet the following design parameters and operators should require safe working load metrics and adopt those in their operating training and procedures and, in particular: • harnesses should be constructed so that the customer is not at risk of contusions from bouncing against the harness during the ride or release from the harness during the ride but safe release if injured during the ride • internal seams in the inner sphere should be manufactured so as to avoid skin cuts • tunnels in water spheres should be blocked by some barrier during the ride to prevent loss of water or the possibility of a limb being trapped and twisted in the tunnel • operators should have a system of on-going testing to ensure that all seams are in good operating condition and are not de-laminating at any point.

5.1.3.2 Type: harness

Risks	Treatment
In addition to the known risks above further known risks of sphere construction causing failure or harm to customers include: • inadequate design of the customer support resulting in possible soft tissue or skeletal injuries • inappropriate harness device components that could cause injury to customers or staff.	Manufacturers of spheres should construct and test to meet the following design parameters and operators should require safe working load metrics and adopt those in their operating training and procedures and, in particular: • harnesses should be constructed so that the customer is not at risk of contusions from bouncing against the harness during the ride • operators should give consideration to providing the customers with clothing that provides extra padding and support to the customer in the harness.

5.1.3.3 Type: double or triple harness

Risks	Treatment
In addition to the known risks above further known risks of sphere construction with double harnesses causing failure or harm to customers include: • inadequate design and testing of the customer support resulting in possible collisions between the two customers in the sphere • multiple harness designs that increase the risk of harm to the riders through potential failure of the harness or sudden deflation of the globe resulting in one rider falling on the other(s). • multiple harness designs increase the risk of harm to the riders through the risk of one rider vomiting during the ride. This risk has not been an issue for signle harness rides where the customer is mounted in a near center postion or in water-globe riding where the customers 'slide' rather than rotate. The extra centrifugal force experienced through the rotation in other than center positions. The consequent health and choking risk for the other riders is particularly extremen if involuntary ingestion of vomit or other fluids occurs which could result in choking and/or bacterial or viral contamination..	Manufacturers of spheres should construct and test to meet the following design parameters and operators should require safe working load metrics and adopt those in their operating training and procedures and, in particular: • harnesses should be constructed by the manufacturer so that the rider is not at risk of contusions from bouncing against the harness during the ride AND the degree of movement does not permit physical contact between riding customers AND that the harness design and components are at the very highest level of quality in order to avoid failure that results a rider falling out of the harness. • Double harness design should be such that in the event of sudden deflation there is no risk to the riding customers of impact between them. Operators should : • give consideration to providing the riders with clothing that provides extra padding and support to the rider in the harness • consider the risks of multiple harness systems and in particular seek advice and **approval**, if such systems are to be used, **from their insurers and the local regulatory authorities**.

5.1.3.4 Type: water ride

Risks	Treatment
In addition to the known risks above further known risks of sphere construction water sphere risks include: • catastrophic fabric failure due to aspiration into the fabric resulting the sphere failing during a ride • water in spheres should be included in the safe working load testing • infection risk from using contaminated water	Manufacturers of spheres should construct and test all fabrics to ensure that surface abrasion and water do not result in aspiration into the fabric. Manufacturers of spheres should construct and test all so that the spheres specified design parameters that have been proven through destruction testing to meet the safe working load metrics adopted by the manufacturer. Operators should ensure that water used is potable and safe for immersion.

5.1.3.5 Type: snow

Risks	Treatment
The known risks construction of spheres for use in the snow include: • catastrophic fabric failure due to cracking as wind-chill causes ice to form on the fabric and the fabric is then (assuming the fabric is rated for the relevant temperature) abraded during run as the ice is removed from the surface	Manufacturers of spheres for use in snow should construct and test all fabrics to ensure that ice does not cause surface abrasion and water entry into the fabric or sphere or if there is such damage to the fabric the safety parameters for use and replacement or maintenance can be advised to the operator.

5.1.3.6 Type: sand

Risks	Treatment
The known risks construction of spheres for use in sand include: • catastrophic fabric failure due to cracking as a result of sand abrading the fabric and in particular fabric joins	Manufacturers of spheres for use in snow should construct and test all fabrics to ensure that the effects of sand abrasion is understood in terms of safe use and the identification of wear that requires the device to be removed from service.

5.1.3.7 Run design and sphere performance

Risks	Treatment
The known risks from run design include: • failure to centre the run with the effect that the sphere runs wide in the run causing the sphere to bounce hard off the barriers	Operators should: • ensure that the run is concave between the barriers and that the sphere does not exhibit side-to-side movement that results in high impact outcomes. Curved tracks should

• failure of the run barriers to hold the globe within a safe area	have barriers that guide the sphere rather than cause impacts. • Barrier design and construction should avoid elements known to cause globes to exit the safe run such as posts (which can cause a pinballing effect) and ropes (which globes generally run through or over and can cause tearing of the globe fabric) and nets (which can cause ruptures and injuries).

5.1.3.8 Other land type or temperature concerns

Risks	Treatment
The known risks for use of spheres for use in very cold and hot temperatures include: • customer **hypo**thermia (usually defined as abnormally low body temperature - under 36.6°C) • customer **hyper**thermia (usually defined as abnormally high body temperature to the point of a fever)	Operators should ensure that customer care includes prevention of circumstances that could induce either hypothermia or hyperthermia in customers or staff. Special risk includes high temperature build up inside spheres during launching and launching procedures should ensure that customers do not remain in the sphere exposed to such heat build up.

5.2 Customer Safety Issues With Plastic Sphere Experiences

Globe riding is an experience that generally involves mild physical contact with the device and, if more than one person rides in a sphere, with those other riders.

Any contact sport or experience involves risk of injury. The purpose of this section is to identify known or obvious risks and provide practical risk mitigation/treatment steps for operators and manufacturers.

Common risk mitigation/treatments are simply to adopt the Safety Code set out in this document.

5.2.1 Death through pre-existing medical condition

Possible / Likely Cause	Standard Practice
Mild exercise in the activity or adrenalin reaction causing a physiological reaction such as a heart attack	**Operator:** 1. Customers self-select out by documented advice given during customer training 2. reserving right to refuse to provide the experience to a customer that presents with obvious risks (e.g. Late pregnancy) 3. customers are appropriately warned that Globe riding is a mild contact activity, therefore disabilities or amputation may be a

	reason for the operator to refuse a customer from entering a harnessed sphere. Decisions have to be made case dependent to ensure the safety of the rider.

5.2.2 Death through accident

Possible / Likely Cause	Standard Practice
Contact resulting in fatal injury	**Operator:** 1. providing a safe run 2. ensuring that safety harnesses are designed to **exceed** the *safe working load.* *3.* ensuring that launching and catching procedures meet the safety standards set out in this Code of Safe Operation.

5.2.3 Death through asphyxiation

Possible / Likely Cause	Standard Practice
The customer choking on a foreign object or drowning	**Manufacturers:** Ensuring that no object can come free to become a choking risk **Operators:** 1. ensuring that safety checks include checking for possible loose objects 2. on drowning ensuring that the spheres are no operated in an environment that could create a risk of drowning 3. not operating double or triple harness globes thereby reducing the risk of ingestion and choking on vomit from other riders.

5.2.4 Injury – broken bones, dislocations or other skeletal injuries

Possible / Likely Cause	Standard Practice
Customer impact or strains and in particular: • in harnessed spheres – from the g-force against the harness, contact with the ground, twisting in the harness, falling out of the harness and poor harnessing resulting in undue movement in the harness • in dual harness spheres - as above but in addition as a result of collisions	**Manufacturer:** Superior design and testing with safe load metrics supplied to operator The special danger of limbs being caught in tunnels should be prevented by the manufacturer supplying a device to ensure tunnel closure during the ride. **Operator:** Well documented procedures and training including: • ongoing testing of the devices to ensure that the condition of the device is not dangerous in use • ongoing training of staff on safety steps in loading and launching and correct inflation

with the other harnessed party • in water spheres – from collisions and falls and limbs caught in tunnels • in water spheres – from collisions and falls and limbs caused by the spheres impacting with berms or other spheres	• absolute protection of customers from tunnel injuries. • correct berm design • ensuring that catching areas only receive one sphere at a time and having run separation to avoid collisions when multiple launches take place

5.2.5 Injury – skin abrasions, cuts, contusions

Possible / Likely Cause	Standard Practice
Customer contact with the device elements and in particular: • in harnessed spheres – the harness and harness fittings • in water spheres – with the internal seams	**Manufacturer:** Superior design and testing with safe load metrics supplied to operator and all joins and fittings manufactured to provide the customer with the best protection possible from cuts **Operator:** Inspection of seams and fitting to ensure that there is no deterioration that could cause undue risks. All operators should have both procedures and training programs to deal with the hazards created by bodily fluids such as blood. Clean-ups need to be supervised and recorded so as to ensure that there is no risk to subsequent customers and staff.

5.2.6 Injury – broken finger or toenails

Possible / Likely Cause	Standard Practice
Customers can experience injuries to fingernails or toenails being caught on harnesses or seams	**Operator:** Well documented procedures and training including: • warning customers of the risks during enrollment • providing customers the opportunity to protect nails primarily toenails by sale of socks to protect toenails

5.2.7 Injury – Soft-tissue injuries

Possible / Likely Cause	Standard Practice
Known risks during globe riding includes soft tissue injuries	**Operator:** Apart from injuries from the device as set out above, soft tissue injuries can arise from the strains imposed on the body during the ride.

	Operators should: • ensure that harnesses provide full body support • water spheres are launched with the customers in a sitting position • customers are appropriately warned that Globe riding is a mild contact activity and does require some body fitness

5.2.8 Injury – other possible injuries

Possible / Likely Cause	Standard Practice
The above risk have been established by risk analysis, expert medical advice and known accidents. Once any further risks during globe riding become known to any signatory to this Code they are obligated to report that risk to all signatories so that the risk can be considered and appropriate amendments made to this Code	**Operators:** Reporting of new risks.

5.2.9 Physiological harm – epilepsy

Possible / Likely Cause	Standard Practice
Globe riding is considered as having a risk of triggering epilepsy due to rotation of the customer during a harness ride or disorientation during a water ride.	**Operator:** Operators should ensure that this risk is specifically mentioned to potential customers during the enrollment phase and that customers acknowledge that they have been advised of this risk.

5.2.10 Physiological harm – nausea, vomiting

Possible / Likely Cause	Standard Practice
Harness Globe riding is known to have induced nausea and is considered as having the risk of triggering vomiting due to rotation of the customer during a harness ride or disorientation during a water ride.	**Operator:** Operators should ensure that these risks are specifically mentioned to potential customers during the enrollment phase and that customers acknowledge that they have been advised of this risk and that customers that are visibly affected by drugs (including alcohol) are not permitted to ride.

5.2.11 Physiological harm – post-ride shocks

Possible / Likely Cause	Standard Practice
Customers have been known to experience shock at the launch pad.	**Operator:** Operators should ensure that staff are trained to detect any customer that may have experienced shock during a ride and that potentially affected customers are asked at the catching station whether they are 'okay' and if appropriate, offered medical assistance.

5.2.12 Physiological harm – infection

Possible / Likely Cause	Standard Practice
Known risks include: • customers that are suffering from infections • customers that have open wounds (however small) • operators failing to use fresh potable water on each run • water temperature that contributes to hyperthermia or hypothermia	**Operator:** • should ensure that these risks are specifically mentioned to potential customers during the enrollment phase and that customers acknowledge that they are in good health before being permitted to ride. • should ensure that the water used in water-Globe riding is (a) potable and (b) flushed at the end of each of each run • water temperature should be appropriate to the conditions i.e. warm/hot in cold weather and tepid/cold in hot weather

5.2.13 Emotional harm – fright or terror

Possible / Likely Cause	Standard Practice
Customers have been known to experience shock at the launch pad.	**Operator:** Operators should ensure that customers do not feel in anyway compelled to complete the experience. An absolute refund guarantee and staff training to ensure that customers that do not want to proceed are not made to feel any sense of failure mitigates this risk.

6 Safety Standards Statements

6.1 Design

6.1.1 Design – Harness Spheres

Manufacturers that are signatories to this Code should produce a harness sphere design statements that should contain objectives in relation to minimizing the risk of injury and customer discomfort from the fittings and the placement of those fittings within the sphere.

6.1.2 Design – Multi-Harness Spheres

Manufacturers that are signatories to this Code should produce a multi-harness sphere design statements that should contain objectives in addition to those contained in the single harness sphere design statement in relation to minimizing the risk of injury and customer discomfort from the presence of the multi-harness set up and be able to demonstrate that in the event of harness failure or sudden deflation the risk of injury from the impact from the other rider(s) is minimized to ensure that there is minimal risk of serious injury..

6.1.3 Design – Water Spheres

Manufacturers that are signatories to this Code should produce a water sphere design statements that should contain objectives in relation to minimizing the risk of injury and customer discomfort from the plastic joins in the inner sphere and tunnel and must provide a statements as to the protection system deployed to ensure that the tunnel does not cause water loss during the ride (the plastic burn risk) nor is there any risk of a customer limb being caught in the tunnel (possible fracture or dislocation risk).

6.1.4 Design – Runs

Operators that are signatories to this Code should produce a sphere run design statement that should contain objectives in relation to minimizing the risk of injury and customer discomfort from the spheres running into rather than being guided by the barriers.

Run design should be checked for impact and spin points by sample run observation and testing prior to commissioning. Wind protection test should be run to determine safe wind strengths for operation.

6.1.5 Design – Launchers

Operators that are signatories to this Code should produce a sphere launch design statement that (in conjunction with operating procedures) should contain objectives in relation to minimizing the risk of injury and discomfort to customers and staff on the spheres being loaded (slipping, exposure to the elements) and launched (particularly the risk of injury on customers standing during water ride launching).

6.1.6 Design – Catching areas

Operators that are signatories to this Code should produce a sphere catching area design statement that (in conjunction with operating procedures) should contain objectives in relation to minimizing the risk of injury and discomfort to customers and staff on the spheres being received in the catching area (slipping, exposure to the elements) and stopping (particularly the risk of injury on customers in spheres that impact on end barriers).

Catching area design should provide for run out and avoid impact zones.

A further key design issue with catching areas is drainage to avoid customers and staff slipping during handling the exit, Zorb return and customer return to the safe area. Decking and drainage solutions should demonstrate reduction of slip risk.

6.1.7 Design – Transport areas

Operators that are signatories to this Code should ensure that areas for parking, loading and unloading of customers meet all local codes for parking including parking for persons with disabilities. Loading, transport and unloading of customers in site transport should be designed to ensure that customers are queued and transported in safety.

6.1.8 Design – Mechanical equipment

Operators that are signatories to this Code should ensure that all moving mechanical equipment is properly shielded and guarded or is operated in areas that are not open to customers.

6.2 Manufacture

6.2.1 Manufacture - Harness Spheres

Manufacturers that are signatories to this Code should manufacture their harness spheres to their design statements and provide operators with test data sheets that establish that the sphere performs to the design statement.

6.2.2 Manufacture - Water Spheres

Manufacturers that are signatories to this Code should manufacture their water spheres to their design statements and provide operators with test data sheets that establish that the sphere performs to the design statement.

6.3 Operations

6.3.1 Over-inflation

As over inflation poses risks in relation to speed and the risk of the sphere bouncing Operators that are signatories to this Code should produce a sphere inflation procedures and training material to ensure that their staff do not over inflate spheres.

6.3.2 Launching

As launching contains several critical customer safety steps Operators that are signatories to this Code should produce a sphere launch procedure and training material to ensure that their staff understand and can handle the many tasks and associated risks related to this part of the experience. special attention at the catching point such as runs that include rogue barrier collisions.

Suggested guidelines include:

- correct processing of customers waiting to load especially customers that may be wanting to withdraw from the experience
- observation of customers for at risk signs such as being affected by drugs or exposure to the elements

- correct loading procedures including clear guidelines on physical interaction with customers during loading which address cultural,gender, race and disability issues.
- Correct launching control including when and what category or customer can engage in extra risk activities such as running launches.

6.3.3 Catching

As catching contains several critical customer safety steps Operators that are signatories to this Code should produce a sphere catching procedure and training material to ensure that their staff understand and can handle the many tasks and associated risks related to this part of the experience.

Suggested guidelines include:

- identification of sphere runs that may require special attention at the catching point such as runs that include rogue barrier collisions
- correct processing of customers waiting to unload especially customers that complain in any form as to the effect or quality of the experience
- observation of customers for at risk signs such as nausea, contusions or soft tissue injuries and handling procedures for customers that complain of any form of injury that places them in the at risk category for spinal or neck damage, which must be reviewed by emergency medical specialists for correctness
- correct unloading procedures including clear guidelines on physical interaction with customers during unloading which address cultural,gender, race and disability issues.
- Correct post-unload procedures in relation to complaints including how to identify and escalate potential claims for notification, which should be approved by the operators insurer and management actions to be taken after any notifiable event. Post accident analysis processes should include suggested re-testing processes.

6.3.4 Terrain

As each terrain type will bring its own set of risks (for example rock outcrops represent a collision hazard) each operator should develop both a design statement followed by construction and finally operating procedures to ensure that the hazards relate to the specific terrain are identified and mitigated.

6.3.5 Staff Skills & competencies

As Operators can only demonstrate provable procedures and training if staff skills required and competencies are documented through both operating procedures and training manuals both sets of materials should be developed by the Operator and tailored to the specific site and Globe riding experiences offered.

6.3.6 Insurance

All operators that are signatories to this Code must continuously carry CGL cover with a AA rated insurer that is licensed to offer such cover in the territory/ies where any globe riding experience (whether temporary or permanent establishments) and to an amount that is adequate for the liability that might arise in that territory or jurisdiction on a negligent act that causes serious harm.

Operators should seek advice from a reputable broker on the adequacy of cover and provide this Code and the operators and munfacturers risk management plans to both the broker and insurer.

The wordings should generally accord with the ISO standard wordings for such policies.

All operators that are signatories to this Code must invite inspection of their site by their insurers and must provide their insurers with a copy of this Code before any such inspection..

All operators that are signatories to this Code must have a documented and permanent system of identifying, recording, notifying and tracking events that might give rise to a claim under their CGL policy.

As CGL is a claims made policy Operators that change insurers should ensure that before changing insurers they seek and obtain retro-active cover for all prior policy periods where claims may be made under any statute of limitations but are not made during the policy period.