

Accessibility and Attractions: Bright Ideas, Better Service

Demystifying the norms; specific impacts on parks

Frank Bersch

Efteling Holland

Monday, 5 Oct. 2015



Liseberg, Gothenburg
Sweden, 6–8 Oct. 2015

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Duties of the controller

13814: 7.4 select and train operators and attendants

- For every (cluster of) operational task(s) = Qualifications
what to do, how to do, theoretical knowledge, necessary skills
- Examination by team manager:
 - # **theory** = mandatory questions 100% score / optional questions 80% score
 - # **practice** = show daily tasks
- Qualifications (changes by OPL's or retraining; basic Q within 5 days)

Basic Q

Attendant tasks

Control Q

Operator level 1 tasks

Daily check Q

Operator level 2 tasks

- Planning Office: on basis of qualifications, they make the personnel planning per amusement ride

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Operating manual and log book

13814: 7.2 standard documentation

Amusement ride manual consists of:

- Checklist ride/show
(*train, ride, safety items, lift, brake sections, station etc*)
 - Explanation (how to do the) controls on checklist
-
- Daily check Q
Operator level 2
tasks
- Basic Q
Attendant tasks
- Control Q
Operator level 1
tasks
- User manual
 - Emergency rescue plan
(*incidents, fire, technical failures, weather conditions etc*)
 - Entrance conditions amusement ride (see examples next slide)
 - Improvement proposals
 - Maintenance manual

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Safety / access signs at entrances of amusement rides

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13814: 7.4.7.4 instructions to public, legible signs in appropriate language

Passenger restrictions such as length limits or medical conditions and behavior



Niet toegankelijk
voor invaliden



Niet geschikt voor
zwangere vrouwen



Niet geschikt bij
lichamelijk letsel



Niet geschikt bij
med. aandoeningen



Verboden
voor baby's



Armen binnen
voertuig houden



Mutsen en shawls
niet toegestaan



Camera's
niet toegestaan



Verboden
te staan

Examples of prohibitions



Opstaan
noodzakelijk



Duizelig
worden



Nat
worden



Angstige
effecten



Kinderen <1.00m
onder begeleiding



Kinderen <1.20m
onder begeleiding



Minimale lengte:
1.40 meter



Minimale lengte:
1.20 meter



Minimale lengte:
1.10 meter

Examples of attentions & requirements

This subject has a relation with

- ISO TS 17929: 2014 Biomechanical effects on amusement rides passengers
- ISO TC 145 Graphical symbols
- ISO TC 254 Safety of amusement rides and amusement devices

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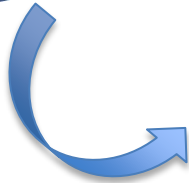
Lean tool Continuous Improvement will be used in the next years



Vision 2020

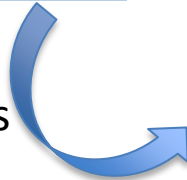
- 5 mio visits
- International destination – stay
- Effective enchanting

Strategic
plans



Every
department
has it's own
contribution to
this Vision by
working on
4 key elements:

Responsibilities
at line mngt



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Lean tool CI: daily stand-up

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Training all Line mngt Effective Enchanting:

- | | |
|------------------|--|
| - Leadership | |
| - Responsibility | |
| - Communication | |
| - Involvement | |



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Lean tool Continuous Improvement will be used in the next years



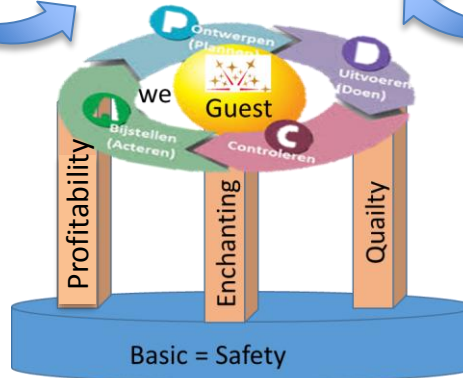
Vision 2020

- 5 mio visits
- International destination – stay
- Effective enchanting



Data from incident
& inspection
reports

Which information
do we have?



Safety culture
measurement
(0 status)

Where are we now?

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Questions?

Thank you for your attention

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Demystifying the norms

Gianni Chiari

CEN/TC 152 - ISO/TC 254 – ASTM F24 Member

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ISO/FDIS 17842-1:2015 (Published)

Safety of amusement rides and amusement devices - **Design and manufacture**

ISO 17842-2:2015 (Published)

Safety of amusement rides and amusement devices - **Operation and use**

ISO 17842-3:2015 (Published)

Safety of amusement rides and amusement devices - **Requirements for inspection during design, manufacture, operation and maintenance**

ISO/TS 17929:2014 (Published)

Biomechanical effects on amusement ride passengers

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the “ European sisters of ISO standards”

prEN 13814-1:2015

Safety of amusement rides and amusement devices - **Design and manufacture**

prEN 13814-2:2015

Safety of amusement rides and amusement devices - **Operation, maintenance and use**

prEN 13814-3:2015

Safety of amusement rides and amusement devices - **Requirements for inspection during design, manufacture, operation and maintenance**

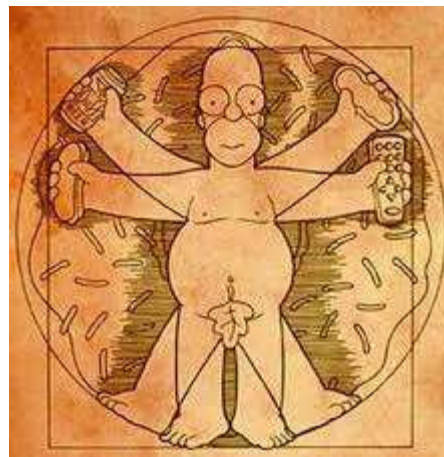
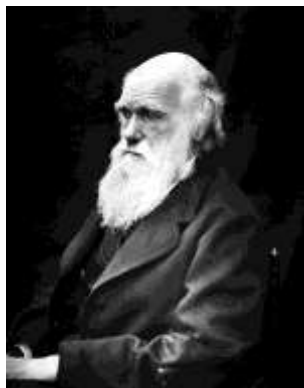
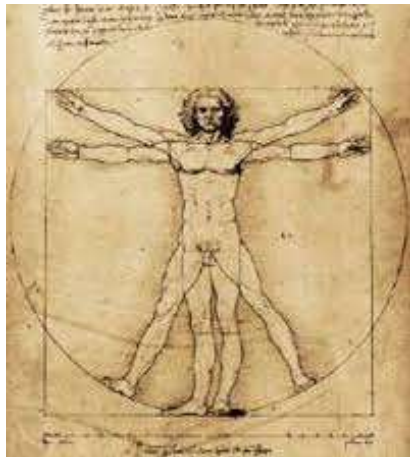
Ready for enquiry

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A RIDE FOR «EVERYBODY»



Guest evolution

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REALLY «EVERYBODY»?

There are so many
body differences

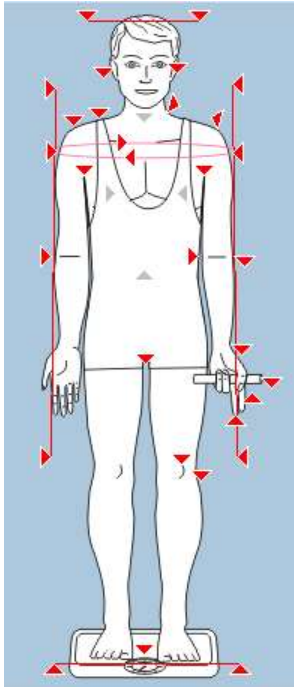
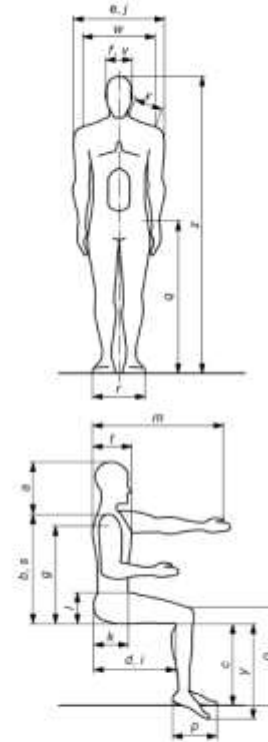


Table D.2 — Body dimensions

Measurement	Body dimension
a	Shoulder – crown
b	Sitting shoulder height
c	Popliteal height
d	Buttock – popliteal length
e	Shoulder breadth (bideltoid)
f	Head width
g	Sitting shoulder height (deltoid)
h	$g/2$
i	Buttock – popliteal length
j	Shoulder breadth (bideltoid)
k	Abdominal depth
l	Thigh clearance
m	Forward reach
n	Slip diameter
o	Knee height
p	Foot length, heel ball length
q	Hip height
r	Foot breadth, hip breadth
s	Sitting shoulder height
t	Chest depth
u = b - i	Sitting shoulder height – Thigh clearance
v	Head width
w	Interscromion
x	Shoulder length (to acromion)
y	Thigh to toe length
z	Body height



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The figure consists of two side-by-side technical drawings of a seated passenger's lower body and leg area, showing dimensions and zones for footrest design.

Left Diagram: Passenger has NO possibility of inclining

- Dimensions:**
 - Overall width: 1345(6)
 - Overall height: 1615(8)
 - Seat height: 140(9)
 - Lower surface of the seat: 1040(7)
 - Max. level of the station floor with the restrained leg: 540
 - Max. level of the station floor with the unrestrained leg: 305
 - Footrest height: 710
 - Min clearance: min 440
 - Angle: 120°
 - Angle: 30°(2)
- Zones:**
 - Zone 1: Area near the seat.
 - Zone 2: Area below Zone 1.
- Curved Boundaries:**
 - R415
 - R820
 - R830
- Other Labels:**
 - +Z (vertical axis)
 - +Y (horizontal axis)
 - "0"

Right Diagram: Passenger has a possibility of inclining

- Dimensions:**
 - Overall width: 1375
 - Overall height: 1680
 - Seat height: 880
 - Footrest height: 1200
 - Min clearance: min 440
 - Angle: 70°(4)
 - Angle: 33°(3)
 - Angle: 120°
 - Angle: 30°(2)
- Zones:**
 - Zone 1: Area near the seat.
 - Zone 2: Area below Zone 1.
- Curved Boundaries:**
 - R415
 - R820
 - R830
 - R215
 - R375
- Other Labels:**
 - +Z (vertical axis)
 - +Y (horizontal axis)
 - "0"



REMEMBER !!



Demonstrating the
Safety of our Industry

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Accidents at permanent ride facilities in Europe are rare:

5.7 injuries per million visits

0.8 injuries per million rides taken by park guests

9% of injuries fall within the serious definition.

(Broadly in line with recent years)

45% of injuries occur when guest are getting in and out of rides and

55% when rides are in motion

Location of injuries:

–23% occur on Children's rides

(which account for 35% of rides and 18% of ride volume)

–51% occur on Family rides

(which account for 52% of rides and 53% of ride volume)

–26% occur on Roller coasters

(which account for 12% of rides and 29% of ride volume)

Causes of accidents:

–72% guest behaviour;

–19% operational

–9% technical



ISO 17842-1 (and prEN 13814-1:2015)

Annex G (informative) **Guest Behaviour**

G.2 Terms and Definitions

G.2.1 Boarding passengers

G.2.2 Riding passengers

G.2.3 Exiting passengers

G.2.4 Waiting passenger

G.2.5 Behaviour

G.2.6 Foreseeable behaviour

G.2.7 Parent or Supervision Companion

G.2.8 Child

G.2.9 Information to public

G.2.10 Parents or Supervision Companions accompanying children

G.3 Classification of age and basic capabilities

G.5 General Strategy of Risk mitigation in Guest Behaviour

G.5.1 Adults

G.5.2 Refusal of access

G.5.3 Normal Behaviour

G.5.4 Unacceptable behaviour

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G.3 Classification of age and basic capabilities

This subclause contains some general indications to help to decide the limits in rides with respect to age and standard cognitive ability:

— **L0)** Children between 2 and 4 years who are approximately 90 cm and 105 cm in height

Cognitive abilities and perceptual abilities:

2 years old: Need parents' assistance;

3 years old: Need parents' assistance;

4 years old: Not able to evaluate what a hazardous behaviour and a risk situation is; need parents' assistance.

— **L1)** Children between 4 and 6 years who are approximately 105 cm and 120 cm in height

Cognitive abilities and perceptual abilities:

5 years old: Can understand some very evident risk situations.

6 years old: Cognitive abilities at a fair level, also for hazardous situations; can discriminate among risks, difficulties and so on.

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G.3 Classification of age and basic capabilities

— **L2)** Children between 6 and 8 years who are approximately 120 cm and 130 cm in height

Cognitive abilities and perceptual abilities:

8 years old: Thinks using the logic of “here and now”; can discriminate among risks, hazardous

behaviours, difficulties, and are able to observe and understand rules.

— **L3)** Children between 8 and 10 years who are approximately 130 cm and 140 cm in height

Cognitive abilities and perceptual abilities:

10 years old: Good comprehension of risks for themselves and others, rules to be observed,

correct and incorrect behaviour to have in certain situation.

— **L4)** Children 10 and 14 years who are approximately between 140 cm and 160 cm of height

Cognitive abilities and perceptual abilities:

Over 10 to 14 years old could be classified as teenagers: Should be considered “morally responsible” for his/her actions; capable of understand signals and written instructions.

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Annex H (informative)

Limited accessibility to amusement devices

Sensory and cognitive abilities

The risk assessment and OURA should take into consideration the hazardous situations potentially generated by the listed limited sensory abilities and any combination thereof

(e.g. not hearing the bell before the ride start)

Physical abilities

The risk assessment OURA should take into consideration the essential physical abilities to use the ride

safely, such as the following:

.....

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ISO 17842 & EN 13814 Risk Assessment Strategy

Design Risk Assessment (DRA)

This is a document that shall be produced by the designer of every amusement device. The DRA shall be used to guide the designer into making the correct decisions in the total design ethos (e.g. material selection, PLC programme, ergonomic characteristics, etc.) so that an acceptable level of risk resides (residual risk) from each design decision. Although not an operation risk assessment, The DRA shall be used to guide the structure and contents of the operating & maintenance procedures.

Information for Use

Residual Risks.



Operation & Use Risk Assessment (OURA)

This is a document that shall be produced by the controller and operator of every amusement device. The OURA shall be used to guide the operator and controller into making the correct decisions in the total operation ethos (e.g. age/height limit, loading/offloading of passengers, foreseeable misuse, etc.) so that an acceptable level of risk resides (residual risk) from each hazard analysed. It shall be constructed in close consultation with the designer and DRA and shall demonstrate total management of any residual risks highlighted in the DRA.

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Operation & Use Risk Assessment (OURA)

This is a document that shall be produced by the controller and operator of every amusement device. The OURA shall be used to guide the operator and controller into making the correct decisions in the total operation ethos (e.g. age/height limit, loading/offloading of passengers, foreseeable misuse, etc.) so that an acceptable level of risk resides (residual risk) from each hazard analysed. It shall be constructed in close consultation with the designer and DRA and shall demonstrate total management of any residual risks highlighted in the DRA.

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Risk management — Principles and guidelines

First edition
2009-11-15

Management du risque — Principes et lignes directrices

2.1

risk

effect of uncertainty on objectives

[ISO Guide 73:2009, definition 1.1]

2.14

risk assessment

overall process of **risk identification** (2.15), **risk analysis** (2.21) and **risk evaluation** (2.24)

[ISO Guide 73:2009, definition 3.4.1]

2.15

risk identification

process of finding, recognizing and describing **risks** (2.1)

NOTE 1 Risk identification involves the identification of **risk sources** (2.16), **events** (2.17), their causes and their potential **consequences** (2.18).

NOTE 2 Risk identification can involve historical data, theoretical analysis, informed and expert opinions, and **stakeholder's** (2.13) needs.

[ISO Guide 73:2009, definition 3.5.1]

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English version

Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

- 3.12 **risk:** combination of the probability of occurrence of harm and the severity of that harm
- 3.13 **residual risk:** risk remaining after protective measures have been implemented
- Note 1 This International Standard distinguishes
- the residual risk after protective measures have been implemented by the designer,
 - the residual risk remaining after all protective measures have been implemented.
- Note 2 See also Figure 2.
- 3.14 **risk estimation:** defining likely severity of harm and probability of its occurrence
- 3.15 **risk analysis:** combination of the specification of the limits of the machine, hazard identification and risk estimation
- 3.16 **risk evaluation:** judgment, on the basis of risk analysis, of whether the risk reduction objectives have been achieved
- 3.17 **risk assessment:** overall process comprising a risk analysis and a risk evaluation
- 3.18 **adequate risk reduction:** risk reduction that is at least in accordance with legal requirements, taking into consideration the current state of the art
- Note Criteria for determining when adequate risk reduction is achieved are given in 5.6.2.

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The new standards series ISO 17842 and EN 13814 are harmonized with ASTM F24 and offer many new data and answers

For any supplementary information please contact

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Thank you for your kind attention!



Questions and Wrap Up

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Ken Rundle

ISO/TC 254 –WG3 Convener

CEN/TC Member

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ISO 17842:2015 & pr EN13814-2015

Safety of amusement rides and amusement devices

These standards have been developed taking into account industry best practice and harmonising with existing standards and guidance from around the world.

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Safety of amusement rides and amusement devices

These standards are in three parts

1 - Design and manufacture

2 - Operation and use

3 - Requirements for inspection during design, manufacture, operation and maintenance

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Safety of amusement rides and amusement devices – Operation and use

These parts specify the minimum requirements necessary to ensure the safe maintenance, operation, inspection and testing.

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Safety of amusement rides and amusement devices – Operation and use

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There is a new concept to address the outstanding hazards identified by the designer and due to the location or method operation.

Operation & Use Risk Assessment (OURA)

This is a document that shall be produced by the controller and operator of every amusement device.



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Safety of amusement rides and amusement devices – Operation and use

Operation & Use Risk Assessment (OURA)

The OURA shall be used by the operator and controller to achieve an acceptable level of residual risk from each hazard analysed

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ISO 17842-3:2015 & prEN13814-3:2015

Safety of amusement rides and amusement devices – Requirements for inspection during design, manufacture, operation and maintenance

These parts define the requirements for the necessary inspections to be carried out during each phase of the life cycle of the device.

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Safety of amusement rides and amusement devices – Requirements for inspection during design, manufacture, operation and maintenance

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There are two main parts of the inspection requirements

1. The Initial Approval (pre-use inspections)
2. The In-service inspections (periodic test)



ISO 17842-3:2015 & prEN13814-3:2015

Safety of amusement rides and amusement devices – Requirements for inspection during design, manufacture, operation and maintenance

Initial Approval

This is split into three parts

1. Review of design documents
2. Inspection of the manufacturing process
3. Initial inspection and testing



ISO 17842-3:2015 & prEN13814-3:2015

Safety of amusement rides and amusement devices – Requirements for inspection during design, manufacture, operation and maintenance

In-service Inspection (periodic Testing)

The purpose of in-service inspection is for an inspection body to check on the fitness of an amusement device for continued further use during its operational life.

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Thank You
Any Questions

Accessibility and Attractions: Bright Ideas, Better Service

Massimiliano Freddi - VP Strategic Development

Leolandia

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What the associations expect us to do

- Be 100% accessible
- Be prepared
- Be transparent
- Be passionate



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What we know we couldn't do

- Be 100% accessible

Leolandia

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IAAPA

Our mission

To become Italy's No. 1 park
for families with children under 10.

How we measure it

- 6.000 in-park surveys every year
- Tripadvisor: from being out of the top 10 attractions
to becoming No. 2 in 2015
- Smiles



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What did we put in place?

The biggest change in 40 years:

**How we select,
train
and care for people.**



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Recruitment process

- Introduced in 2013
- Assessment center run by 2 managers, 1 animator, 1 psychologist
- 50 pax per day
- Introduction is very clear: what you should know to work for Leolandia, what you should care about.
- We discourage people to work for us!



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Training process

- General introduction: 5 S (Safety, Service, Team, Smile, Sensitivity)
- Safety training: safety first
- Special Guests' training
- Guest service: we can't accept anything but excellence
- Practical training
- Tools: LeoManual, dedicated map



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Day by day operation

- Every guests with special needs can receive a free ticket
- When picking it up, she/he receives:
 - Special LeoMap
 - Form with clear information and acceptance of responsibility
- Helping out: with access, with dedicated experiences (i.e. Minitalia for vision-impaired)



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Arti inferiori
con accompagnatore e trasferimento necessario

2 Carovana Western	29 Zattere
3 Tren8 West	4 Wild Avvoltoi
7 Ruota dei Pionieri	11 Bici da Vinci
8 Giostra Cavalli	15 T
10 Sgulavià	16 B
13 Oregon Express	33 S
17 Raganelle Sentinelle	37 S
19 Bucanieri all'arrembaggio	38 S
24 Mediterranea	

3 Tren8 West          **90cm**

SOLLECITAZIONI: nessuna in particolare.
ACCESSIBILITÀ: vagone piuttosto costretto per persone corpulente o molto alte.
SISTEMI DI RITENUTA: cinture addominali manuali. Il passeggero potrebbe essere in grado di aprirle da solo anche durante la marcia.
EVACUAZIONE D'EMERGENZA: nessuna problematica.

4 Wild Avvoltoi          **105cm 105cm**

SOLLECITAZIONI: movimento rotatorio e sussultorio a media velocità. Possibilità di capogiri, nausea e/o vertigini.
ACCESSIBILITÀ: posizione del corpo orizzontale, soggetto piuttosto costretto per persone corpulente con necessità di chiusura completa del maniglione.
SISTEMI DI RITENUTA: telaio mobile a bloccaggio manuale. Il sistema di ritenuta forma una gabbia che limita profondamente la possibilità di movimento, potendo causare sensi di costrizione.
EVACUAZIONE D'EMERGENZA: nessuna problematica.

6 Gold River          **105cm 120cm**

SOLLECITAZIONI: salite ripide e discese con significative accelerazioni e brusche frenate nell'acqua, possibilità di tamponamenti con altri tronchi durante il percorso. Possibilità di vertigini sulla rampa più alta.
ACCESSIBILITÀ: salita e discesa del tronco difficoltose a causa del dislivello e del movimento continuo del tronco in fase di carico e scarico passeggeri in stazione. Presenza di gradini per uscire dalla pedana di carico.
SISTEMI DI RITENUTA: nessun sistema di ritenuta, solo maniglie laterali dove tenersi aggrappati e pedana vagomata per puntarsi con i piedi. In quanto giostra acquatica i passeggeri non vengono trattenuti forzatamente nel tronco e potrebbero quindi decidere di scendere lungo il percorso mettendosi in grave pericolo a causa anche dell'interferenza di un'altra giostra all'interno del perimetro.
EVACUAZIONE D'EMERGENZA DIFFICOLTOSA: difficoltà ad uscire dal tronco fuori stazione, possibilità di dover utilizzare scale ripide o scale a castello, possibilità di attesa in quota nel tronco e scale di evacuazione di emergenza dalla seconda rimpa inadatta a chi soffre di vertigini o di deambulazione difficoltosa.
NOTE: è importante tenersi ben saldi ai maniglioni e mantenere una corretta postura, probabilità di bagnarsi abbondantemente.

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don't search for good PR.



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Guido Giovanelli
Leolandia Safety Manager



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