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The following hazard assessment deals with general, fundamental hazards pursuant

to HSG175 (Fairgrounds and Amusement Parks / Guidance on safe practice),

to BS EN 1050 : 1997 (Safety of machinery – Principles for Risk Assessment)

to BS EN 292 : Part 1 &2 / 1995 (Safety of machinery-Basic concepts, general principles for design)

to BS EN 294 : 1992 (Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs)

to EN 13814 (Fairgrounds and amusement park machinery and structures –Safety).

These standards particularly provide decision guidance regarding the safety of machines, therewith the fundamental safety requirements and health protection requirements may be observed.

Amusement devices / Fairground rides are – consciously – excluded from the scope of the Machine Directive.

For the development of the risk assessment, the principles of BS EN 1050 : 1997 (Safety of machinery – Principles for Risk Assessment)

– to the extent that they are applicable – are used analogously.

Furthermore the following specific aspects of hazards regarding the general safety of users (passengers and third parties) are included:

- Hazard profiles underlying the directives for the construction and operation of Amusement devices / Fairground rides.
- Hazard profiles for third parties in the immediate vicinity to the Amusement devices (accesses and egresses, entrances and exits, fencing).

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1. Amusement device status

Basic data:

Manufacturer:	Rides Pte Ltd.
Inspections body ref. No:	TÜV 1234567890
Year of importation:	yyyy
Passenger places:	54 passengers
No. of gondolas:	1 Gondola
Theoretical capacity per hour:	1000 - 1800 passengers
Max. swing angle:	+/- 75°
Riding time (total):	120 – 180 sec

Device description:

The calculations and the drawings deal with the design and the stress and fatigue analysis for a ride with a swinging ship. The structure is designed with two girder pivot arms fixed at a slewing hub and at the bow and the stern of the ship. The left and right axle frames of the slewing hub are fixed at main columns standing at the basic frame.

The gear of the ship is effected hydraulically with two friction wheels acting anticlockwise onto the keel of the ship. The max. possible swing angle of the ship is about 75°.

Nine seat benches one after the other but arranged as such that 4 seat benches on one side are facing the other five on the other side of the ship and accommodate up to max. 54 passengers. Each seat bench has a hydraulic operated lap bar.

Opening and closing of the lap bars are monitored by the control unit and is only possible in the parking position of the ship during standstill.

The base frame is supported at concrete foundations onto wooden packing.

Further details regarding the design may be gathered from the static calculations and design drawings.

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2. Persons

2.1 Operators

Training level/specific training:

2.1.1 Instructions of the operator:

On-the-job training by an experienced operator / instructor
The instruction should be recorded.

2.2 Maintenance personnel

2.2.1 Training level: Experienced and qualified staff members.

Maintenance is carried out by staff members of the departments mechanic, electrical.

Knowledge of maintenance of mechanical, pneumatic, electrical and electronic modules and components.

If their standard of knowledge is insufficient, specialists of other companies are required (manufacturer of the device, manufacturer of machine components, etc.).

2.3 Possible risk to third parties

2.3.1 Passengers

Where required, the passengers are instructed using information signs.

If required, the behaviour of the passenger, particularly when boarding, is monitored by the operating personnel and assisted, if necessary. Further information is available in the operating instructions for the amusement device.

2.3.2 Third parties (spectators)

Spectators in the access and egress areas have no direct access to the amusement device (fencing).

To the extent that third parties have access (e.g. entrance area), this is under the supervision of the operating personnel.

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3. Documents

The following documents are available for the amusement device:




- **Approved** drawings and calculations, the reports (mechanical and electrical) on design review and the report on acceptance Test.
- Operating and maintenance instructions by the Manufacturer

KEYS TO TERMS CONTAINED WITHIN THE RISK ASSESSMENT

Key Severity		Key Probability	
Critical/Fatal	Crit/Fat	Highly Probable	H/P
Severe	Sev	Probable	PRO
Signifiant	Sig	Possible	POS
Marginal	Mar	Unlikely	UNL
Negligible	Neg	Very Unlikely	VU

CODE TO EFFECTS OF RISK

High Risk	H	Medium Risk	M	Low Risk	L
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CALCULATING RISK RATING : MULTIPLY PROBABILITY BY SEVERITYFD						Severity Index
Possible (3) X Significant (3) = Risk Rating of (9) : Medium Risk						
		Critical/Fatal	Severe	Significant	Marginal	Negligible
High risk : >16 Medium risk : 9 – 15 Low risk : <9						
Probability Index	Highly Probable	25	20	15	10	5
	Probable	20	16	12	8	4
	Possible	15	12	9	6	3
	Unlikely	10	8	6	4	2
	Very Unlikely	5	4	3	2	1
						  

Probability Index			Severity Index (inc damage to property/ enviroment)		
1	Very Unlikely	Not to be expected	1	Negligible	Paper Cut/ No Lost Time/ No Damage
2	Unlikely	Unusual / rare	2	Marginal	Minor Injury/ Less than 3 Days absence
3	Possible	Even Chance 50/50	3	Signifiant	Minor Injury/ Over 3 Days absence
4	Probable	Not a Surprise	4	Severe	Major Injury/ Over 3 Days absence
5	Very Probable	Not to be expected anytime	5	Critical/ Fatal	Critical Injury/ Over 3 Months absence Fatal – obvious

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Ref. No	Hazard profiles EN 1050 Hazards/Controls	Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures		
		1	2	3	4	5	1	2	3	4	5				Constructi on	Operation	
1	mechanical hazards due to:	Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P						
	- Amusement device components - stability - mass and speed - mechanical durability					X	X					5	L	Reviewed technical documents . "Report of Design Review" and "Report on Acceptance Test available	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check	
	- Accumulation of energy inside the amusement device - elastic elements - liquids and gases under pressure				X			X				8	L	Hydraulic system and Pneumatic system with Pressure vessel etc.	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check, inspection depending on local regulations	
1.1	Hazard due to crushing				X			X				8	L	Fencing, access and exit observed	Consideration of DIN 4112	Operating instructions incl. regular check	
1.2	Hazard due to shearing				X		X					4	L	No	Consideration of DIN 4112	Operating instructions incl. regular check	
1.3	Hazard due to cutting or cutting off													Not applicable			
1.4	Hazard due to gripping or winding up				X			X				8	L	Fencing, access and exit observed	Consideration of DIN 4112	Operating instructions incl. regular check	
1.5	Hazard due to pulling in or catching				X			X				8	L	Fencing, access and exit observed	Consideration of DIN 4112	Operating instructions incl. regular check	
1.6	Hazard due to impact				X			X				8	L	Fencing, access and exit observed	Consideration of DIN 4112	Operating instructions incl. regular check	
1.7	Hazard due to penetration or grooving													Not applicable			
1.8	Hazard due to friction or abrasion													Not applicable			
1.9	Hazard due to penetration or spurting out of liquids under high pressure				X		X					4	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check, inspection depending on local regulations	

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Ref. No	Hazard profiles EN 1050 Hazards/Controls	Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures		
		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Construction	
2	Electrical hazards due to																
2.1	direct contact of persons with wiring and electric parts supplied by voltage					X	X						5	L	No	Consideration of BS 7671 and technical rules	Operating and maintenance instructions incl. regular check
2.2	contact of persons with parts being energized due to fault conditions				X			X					8	L	No	Consideration of BS 7671 and technical rules	Operating and maintenance instructions incl. regular check
2.3	approaching of persons to electrical devices on high voltage														Not applicable		
2.4	electrostatic processes														Not applicable		
2.5	thermal radiation or processes such as spinning off of melted particles or chemical processes basing on short circuits, overloading, etc.														Not applicable		
3	thermal hazards with the consequence of	Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P						
3.1	Burns and other injuries of persons by means of contact with very high temperature objects or materials, through flames, explosions and high temperature radiation				X		X						4	L	Fencing, access and exit observed	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
3.2	Damage caused to health or cold working environment														Not applicable		
4	Hazards due to noise with the consequence of																
4.1	Hearing loss (deafness), other physiological restrictions (e.g. loss of equilibrium, reduction of concentration)														Not applicable		
4.2	Damage to verbal communication, damage to acoustic signals, etc.				X		X						4	L	Fencing, access and exit observed	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
5	Hazards due to vibration																
5.1	Use of hand operated tools with the result of neural violation and blood vessel violation														Not applicable		

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Hazard profiles EN 1050 Hazards/Controls		Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures	
		1	2	3	4	5	1	2	3	4	5				Construction	Operation
		Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P					
5.2	Full body vibration, specifically in association with adoption of forced posture													Not applicable		
6	Hazards due to radiation															
6.1	Radiation with low frequency, radio frequency, microwaves													Not applicable		
6.2	infrared, visible and ultraviolet light													Not applicable		
6.3	x-ray and gamma ray													Not applicable		
6.4	alpa ray, beta ray, electron or ion ray, neutron ray													Not applicable		
6.5	Laser beam													Not applicable		
7	Hazards due to materials and substances (and due to ingredients), which are used															
7.1	Hazards due to contact or breathing in of dangerous liquids, gases, moisture, steam and dust													Not applicable		
7.2	Hazard due to fire or explosion				X			X				8	L	see "Fire protection"	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
7.3	biological or microbiological hazards (due to viruses or bacteria)													Not applicable		
8	Hazards due to neglecting ergonomic principles with the design of the amusement device , such as hazards due to															
8.1	unhealthy posture or special stresses													Not applicable		
8.2	insufficient observance of the anatomy of hand/arm or foot/leg													Not applicable		
8.3	careless use of personal protection equipment				X			X				8	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check

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		1	2	3	4	5	1	2	3	4	5				Construction	Operation
		Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P					
8.4	non-adapted local lighting			X				X				4	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
8.5	mental strain, underchallenged, stress				X			X				8	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
8.6	human misconduct, human behaviour				X			X				8	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
8.7	improper design, improper placement or identification of control elements				X		X					4	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
8.8	improper design or placement of visual displays				X		X					4	L		Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
9	Combinations of hazards													Concurrent occurrence of independent hazard profiles is not viewed, see e.g. analogously EN 12292-1		
10	Unexpected start up operation and overspeed															
10.1	breakdown / failure of the control system					X	X					5	L	No	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular check
10.2	reconstitution of power supply after a break / failure					X	X					5	L	No	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular check
10.3	external effects to electrical operating devices					X	X					5	L	No	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular check
10.4	other external effects (gravity, wind, etc.)		X							X		8	L	No	Consideration of DIN 4112	Maintenance instructions incl. regular check

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		1	2	3	4	5	1	2	3	4	5				Construction	Operation
		Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P					
10.5	software error													Not applicable		
10.6	Operating error (resulting from insufficient adaptation of the machine to human features, see 8.6)					X	X					5	L	No	Control check, errors do not lead to operational failures	Operating and maintenance instructions incl. regular check
11	Missing facilities for stopping the amusement device in optimal terms and conditions					X	X					5	L	Devices available (emergency stop)	Consideration of BS 7671 and technical rules	
12	Change of the revolution speed of tools													Not applicable		
13	Power supply failure		X						X			6	L	Results in secure shutdown	Consideration of BS 7671 and technical rules	maintenance instructions incl. regular check
14	Feedback control, feed forward control failure		X						X			6	L	Results in secure shutdown	Consideration of BS 7671 and technical rules	maintenance instructions incl. regular check
15	Faulty assembly					X	X					4	L	Reviewed technical documents and maintenance instr.	Acceptance inspection prior to start-up	maintenance instructions incl. regular check
16	Rupture during operation					X	X					5	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
17	Falling objects or thrown out objects				X				X			8	L		Fencing	Operating instructions and Instruction plates at the entrance and at vehicles
18	Loss of stability/ canting over of the amusement device					X	X					5	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
19	Slipping, stumbling or falling by persons (in connection with machines)		X						X			4	L	Reviewed technical documents	Consideration of technical rules	Maintenance instructions incl. regular check

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		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation	
20	In connexion with the drive of the amusement device (e.g. train / vehicle, / et cetera)																
20.1	drive when starting the amusement device		X					X				4	L	No	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular check	
20.2	drive during the operator is not at the operator panel		X				X					2	L	No	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular check	
20.3	drive without all parts being secured					X	X					5	L	No	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular check	
20.4	speeding of a pedestrian controlled machine													Not applicable			
20.5	excess of vibrations during drive		X					X				4	L	No	Consideration of DIN 4112	Maintenance instructions incl. regular check	
20.6	insufficient facilities for slowing down, stopping and fixing the device		X					X				4	L	emergency stop is available	device will be stopped securely	Maintenance instructions incl. regular check	
21	In connexion with the workplace at the amusement device																
21.1	falling while entering or leaving the workplace		X					X				4	L			Operating and maintenance instructions	
21.2	emissions / oxygen deficiency at the workplace													Not applicable			
21.3	Fire					X	X					5	L	see "Fire protection"	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check	
21.4	mechanical hazards at the workplace: a) contact with rotating parts b) knocking over c) falling down objects d) fracture of parts with high rotating speed e) contact of persons with machine parts or tools (machines controlled by pedestrians)					X	X					5	L	see section "Maintenance"		Operating and maintenance instructions incl. regular check	

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		1	2	3	4	5	1	2	3	4	5				Construction	Operation
		Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P					
21.5	insufficient visibility from the working position			X					X			6	L	No		Operating and maintenance instructions
21.6	insufficient lighting			X				X				6	L	No		Operating and maintenance instructions
21.7	unsuitable seat	X						X				2	L	No		Operating instructions
21.8	noise at the workplace		X						X			6	L			maintenance instructions incl. regular check
21.9	vibration at the workplace	X						X				2	L	No		Operating instructions
21.10	insufficient evacuation opportunities/emergency exits				X			X				8	L	Reviewed technical documents	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
22	Resulting from the control system															
22.1	unsuitable positioning of operating elements			X			X					3	L	No	Consideration of BS 7671 and technical rules	maintenance instructions incl. regular check
22.2	unsuitable design of the operating elements and their mode of operation			X			X					3	L	No	Consideration of BS 7671 and technical rules	
23	Due to work carried out on the amusement device(loss of stability)					X			X			15	M	Comprehensive instruction necessary		Maintenance instructions
24	Resulting from the energy source and energy transmission															
24.1	hazards due to engine and batteries				X		X					4	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
24.2	hazards due to energy transmission between machines				X		X					4	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
24.3	Hazards due to couplings and cable winches													Not applicable		

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		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation	
25	Due to/for third parties																
25.1	unauthorised start-up/use			X				X				6	L	Start device not within the area of passengers		Operating and maintenance instructions incl. regular check	
25.2	motion of a machine part beyond its target position			X				X				6	L		Consideration of BS 7671 and technical rules	Operating and maintenance instructions incl. regular check	
25.3	unavailable or lacking suitability of optical or acoustic warning device													Not applicable			
26	Insufficient instructions for the operator					X		X				10	M	Comprehensive instruction of the operator necessary		Operating instructions incl. regular check	
27	Mechanical hazards and hazard events due to lifting up cargo																
27.1	due to falling goods, collisions, impacts to the machine:													not applicable			
27.1.1	due to lack of stability				X			X				4	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check	
27.1.2	due to incorrect loading, overloading, exceeding the overturning moment				X			X				4	L	Reviewed technical documents	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check	
27.1.3	due to uncontrolled motions		X							X		8	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check	
27.1.4	due to unexpected/unintended charge motion		X							X		8	L	No	Consideration of DIN 4112	Maintenance instructions incl. regular check	

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		1	2	3	4	5	1	2	3	4	5				Construction	Operation
		Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P					
27.1.5	unsuitable fasteners / accessories					X	X					5	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
27.1.6	collision of several machines													Not applicable		
27.2	due to the access of persons to load carriers			X										Not applicable		
27.3	due to derailment													Not applicable		
27.4	due to insufficient mechanical rigidity of structural parts			X			X					3	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
27.5	due to unsuitable design of load-bearing hooks and drums					X	X					5	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
27.6	due to the unsuitable choice of chains, cables, lifting devices and accessories and their unsuitable assembly into the machine													Not applicable		
27.7	due to lowering down the load while monitoring the friction brake													Not applicable		
27.8	due to abnormal conditions for assembly/testing/use/maintenance					X		X				10	M	Comprehensive instruction necessary		Maintenance instructions incl. regular check
27.9	due to the impact of the load on persons													Not applicable		
28	electrical hazards															
28.1	due to lightning					X								No Operation during during thunderstorm	Consideration of BS 7671 and technical rules	Operating instructions incl. regular check

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		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation	
29	Hazards due to neglecting ergonomic principles																
29.1	insufficient visibility from the position of the operator			X			X						3	L	Comprehensive instruction necessary		Operating instructions incl. regular check
30	Mechanical hazards and hazard events due to work underground due to:																
30.1	lack of stability of gallery / tunnel structures														Not applicable		
30.2	failure of drive or brake control of rail bounded hoisting devices														Not applicable		
30.3	failure or lack of deadman's switches of rail bounded machines / devices														Not applicable		
31	Restricted motions of persons					X	X						5	L	Reviewed technical documents	Fencing , Comprehensive instruction necessary	Operating instructions incl. regular check
32	Fire and explosion														see "Fire protection"	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
33	Emission of dust, gases, etc.														Not applicable		
34	Mechanical hazards and hazard events due to lifting up or transporting persons :																
34.1	unsuitable mechanical rigidity					X	X						5	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
34.2	failure of loading control														Not applicable		
34.3	failure of the control system in passenger transport devices (function, stability)					X	X						5	L	Reviewed technical documents	Consideration of BS 7671 and technical rules	Operating and maintenance instructions incl. regular check

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Hazard profiles EN 13814 Hazards/Controls		Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures	
		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation
34.4	excess speed with passenger transport facilities					X	X					5	L	Reviewed technical documents	Consideration of BS 7671 and technical rules	Maintenance instructions incl. regular checking
35	Persons falling from passenger transport devices					X	X					5	L	Reviewed technical documents	Consideration of DIN 4112	Operating and maintenance instructions incl. regular check
36	Tilting over or turning over of passenger transport facilities					X	X					5	L	Reviewed technical documents	Consideration of DIN 4112	Maintenance instructions incl. regular check
37	Human error, human behaviour					X			X			15	M	Comprehensive instruction necessary	Consideration of BS 7671 and technical rules	Instruction Plates, Operating and maintenance instructions incl. regular check
38	Intensity and duration of accelerations and jerky motions															
	Are the accelerations monitored, measured and evaluated at regular intervals (e.g. every 1, 2, 3 years)?				X			X				8	L	Regular measurement of the max. angle bracket	Consideration of DIN 4112	Maintenance instructions incl. regular check
	Are the passengers informed about increased acceleration at the entrance through signs? (only if required)				X			X				15	M	Instruction plates at the entrance necessary	Consideration of DIN 4112	
39	Intensity and duration of the force emitted by parts of the passenger unit															
	Is the cushioning (seat/back/side/knee space/clamp) still in a fault-free condition?				X			X				12	M	Comprehensive instruction necessary		Maintenance instructions incl. regular check
	Is this checked every day?				X			X				12	M	Comprehensive instruction necessary		Maintenance instructions incl. regular check

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		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation	
40	Catapulting out of passengers																
	Do the passenger seats and safety restraints comply with the condition of initial testing?					X		X					10	M	Comprehensive instruction necessary		Maintenance instructions incl. regular check
	Are they checked every day?				X			X					12	M	Comprehensive instruction necessary		Maintenance instructions incl. regular check
	Are operating experiences known (e.g. near-accidents), which suggest upgrading (e.g. seat hunch)?			X				X					6	L	No		Regular check
41	Predictable behaviour of the passengers																
	Do specific operating experiences exist?			X				X					9	M	Comprehensive instruction necessary		Operating instructions incl. regular check
	Are these systematically recorded? (e.g. in the daily reports)			X				X					9	M	daily ride operation log necessary		
42	Predictable operating errors																
	How are the operating experiences monitored?					X		X					10	M	daily ride operation log necessary		Comprehensive instruction necessary
	Who is responsible for updating the operating instructions?			X				X					9	M	Operating/safety engineer, amusement device management		

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Hazard profiles EN 13814 Hazards/Controls		Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures		
		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation	
43	High wind force																
	Is the wind speed defined for decommission the amusement device?			X				X				9	M	Reviewed technical documents	Consideration of DIN 4112	Operating instructions incl. regular check	
	Is this wind speed known to the operator?			X				X				9	M	The maintenance chief closes the amusement device	Comprehensive instruction necessary	Operating instructions incl. regular check	
	How and where is the wind speed measured?													Centrally record is necessary			
44	Hazards due to snow																
	Is the operation of the amusement device permitted if it's frosty ? (e.g. freezing of sensitive parts)				X			X				8	L	Yes	Consideration of DIN 4112	Operating instructions incl. regular check	
	Where is the information regarding this point recorded. ?				X			X				8	L	Operating instructions		Operating instructions	
45	Lightning strike																
	Will the operation be stopped on approaching thunderstorms?				X			X				12	M	Yes ! Comprehensive instruction necessary		Operating instructions	
46	Special features in the case of rescue																
	Is a plan drawn up due to rescue?				X			X				12	M	Necessary ! Comprehensive instruction necessary		Check necessary	
	Will rescue drill be trained?				X			X				12	M	Necessary ! Comprehensive instruction necessary		Check necessary	
	In the case of rescue, will appropriately competent members of staff make the decisions?				X			X				12	M	Necessary ! Comprehensive instruction necessary		Check necessary. Maintenance staff only	

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Hazard profiles EN 13814 Hazards/Controls		Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures	
		1 Neg	2 Mar	3 Sig	4 Sev	5 Fat	1 V/U	2 Unl	3 Pos	4 Pro	5 H/P				Construction	Operation
47	At water rides: drowning															
	Are the passengers restrained (e.g. prevented from standing up)?													Not applicable		
	Are there supplementary provisions due to operation supervision?													Not applicable		
48	Maintenance/inspection under water															
	Are maintenance/inspection arranged due to device parts under the waterline ?													Not applicable		
	Are there special directives within the operating instructions.													Not applicable		
49	Projectiles															
	Shall be expected the catapulting of objects e.g. due to acceleration?				X				X			12	M	Yes	Fencing necessary	Instruction plates at the entrance and operating instructions
	Are loose objects taken away from the passengers before boarding, if applicable?				X				X			12	M	Necessary ! Comprehensive operating instruction necessary		Instruction plates at the entrance and operating instructions
	Are indicating labels available?				X				X			12	M	Necessary !	Check Instruction plates at the entrance	
	Do specific operating experiences exist?				X				X			12	M	Yes		
50	Crushing due to crowding															
	Is there real the eventuality of crushing ?				X				X			12	M	In case of Fire possible if the access and the exit is small. Check installation.		

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Hazard profiles EN 13814 Hazards/Controls		Severity					Probability					Risk Rating	Risk : L/M/H	Comments	Measures/Substitute Measures		
		1	2	3	4	5	1	2	3	4	5				Construction	Operation	
		Neg	Mar	Sig	Sev	Fat	V/U	Unl	Pos	Pro	H/P						
51	Bottlenecks with evacuation																
	Are there bottlenecks on the escape route?				X				X				12	M	In case of Fire possible if the access and the exit is small. Check installation.		
	Shall be counted on crowding in the case of an evacuation?				X				X				12	M	In case of Fire possible if the access and the exit is small. Check installation.		