BS EN 1069-2:2010

BSI Standards Publication

Water slides

Part 2: Instructions

National foreword

This British Standard is the UK implementation of EN 1069-2:2010. It supersedes BS EN 1069-2:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee SW/136, Sports, playground and other recreational equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 62909 9

ICS 97.220.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2010.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1069-2

August 2010

ICS 97.220.40

Supersedes EN 1069-2:1999

English Version

Water slides - Part 2: Instructions

Toboggans aquatiques - Partie 2: Instructions

Wasserutschen - Teil 2: Hinweise

This European Standard was approved by CEN on 16 July 2010.

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Ref. No. EN 1069-2:2010: E

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Foreword

This document (EN 1069-2:2010) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and equipment”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1069-2:1999.

EN 1069, *Water slides*, consists of:

— *Part 1: Safety requirements and test methods*

— *Part 2: Instructions*

In relation to EN 1069-2:1999 the following main amendments have been made:

a) title and scope have been modified to include all water slides;

b) new definitions have been added;

c) requirements for the operation have been amended, now recalls EN 15288-2 and requires a risk assessment as a basis to determine the operational guidelines about risk reduction, proper supervision, technical operation, emergency instruction (see Clause 4);

d) requirements for the instruction for use have been amended (see Clause 5). The type of signage is now consistent with valid ISO/TC 145 standards and 5.2 "Signage at the entrance of a slide" is more detailed;

e) all graphical symbols for signage have been redesigned complying with valid ISO/TC 145 standards, and moved to a normative Annex A;

f) requirements for maintenance instruction has been amended (see Clause 7);

g) Clause 8 "Inspections" was added;

h) Annex B (informative) was added, providing examples for risk assessments.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The provision of water slide installations is increasing, also are the concerns over the number of injuries resulting from the use of water slides, many of which are of a serious nature.

Many of the injuries have resulted from foreseeable circumstances and, given proper knowledge and control, could have been prevented.

A standard or a code of practice for instructions and the operation of water slides is seen as the most appropriate way to achieve an improvement in safety.

1 Scope

This European Standard is applicable to water slides as defined in EN 1069-1:2010, 3.3.

This European Standard establishes the instructions for use, operation and maintenance as well as the documentation and commissioning of water slides.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1069-1:2010, *Water slides — Part 1: Safety requirements and test methods*

EN 1418:1997, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 15288-1, *Swimming pools — Part 1: Safety requirements for design*

EN 15288-2:2008, *Swimming pools — Part 2: Safety requirements for operation*

EN ISO 3834 (all parts), *Quality requirements for fusion welding of metallic materials (ISO 3834:2005)*

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules (ISO 15607:2003)*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*

ISO 3864-3, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 7001, *Graphical symbols — Public information symbols*

ISO 7010:2003, *Graphical symbols — Safety colours and safety signs — Safety signs used in workplaces and public areas*

ISO 20712-1, *Water safety signs and beach safety flags — Part 1: Specifications for water safety signs used in workplaces and public areas*

ISO 20712-3:2008, *Water safety signs and beach safety flags — Part 3: Guidance for use*

ISO 22727, *Graphical symbols — Creation and design of public information symbols — Requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1069-1:2010 and the following apply.

3.1
operator
company, organization, authority or person with overall control and responsibility for the water slide facility

3.2
platform
area providing access to the start section

3.3
raft
type of ride enhancement device for one or more users

4 Operation

4.1 General

EN 15288-2 applies and EN 15288-1 shall be considered if appropriate. The following subclauses give specific advice related to water slides.

4.2 Guidelines to the operational risk assessment

An operational risk assessment shall be performed by the slide operator, based on the results of the design risk assessment, as a basis for the identification of the proper supervision, following the requirements of EN 15288-2. In addition, and referring to the fact that impact between the users proved to be a critical issue, also the following risks shall be taken into consideration:

a) inappropriate spacing at the start between users;

b) sliding position (e.g. sitting) can bring the user to an involuntary stop;

c) significant differences in speed can cause collisions of users;

d) significant differences in speed caused by:

   1) different sliding positions;

   2) different bathing costume respectively wearing hardly any bathing costume (e.g. G-string type);

   3) different fitness, size, weight and age of user;

   4) changing water flow rate (malfunction of water supply);

e) reasonably foreseeable risky behaviours by the users:

   1) higher risk of collision between users at a splashdown area in contrast to a catch unit;

f) suitability for children;

g) foreseeable users categories (e.g. adults, children, both) and number of users (e.g. chain sliding allowed);

h) allowed use of ride enhancement devices (e.g. mattresses, rafts).

Examples of general and specific risk assessments are given in Annex B.

4.3 Risk reduction

The operator shall take measures to reduce possible risks to a minimum bearing in mind the risky behaviours of users by choosing an appropriate level of distance control and supervision and shall identify a risk reduction strategy from the following options:

a) permanent full supervision by the staff at the start section and at the splashdown area/catch unit, staff is in communication with each other;

b) adequate technical distance control, e.g. turnstiles at the entrance and/or exit area and/or a traffic light control at the entrance;

c) a proper level of supervision/technical measures as a result of the risk assessment.

Additional safety equipments which may be used:

d) For the user: The installation of a monitor at the start section that transmits the situation at the end of the slide and at the catch unit/splashdown area for the person who is starting to see whether the catch unit or the splashdown area of the pool is free.

e) For the supervisory staff: The installation of a monitor at the staff terminal that transmits the situation at the start and the end of the slide and at the catch unit/splashdown area. The quality of technical distance control equipment depends on the risk assessment and should be carried out in accordance with EN ISO 13849-2.

4.4 Basic elements for the identification of proper supervision

The operator, by performing the part of the risk assessment concerning proper supervision, shall take into account at least the following:

a) kind of landing:

   1) catch unit;

   2) sofa unit;

   3) special pool and its water depth at landing;

   4) general purpose pool and its water depth at landing;

b) speed at the final part;

c) presence and kind of distance control:

   1) full technical distance control;

   2) traffic lights;

   3) other types;

d) visibility for the user:

   1) slide fully visible from the start;

   2) catch unit visible from the start;

   3) pool visible from the start.

The use of mandatory and prohibition signs and public information symbols should also be considered when determining the proper supervision to enforce them.

4.5 Technical operation

Written guidelines shall be produced concerning operational instructions by the operator paying particular attention to operational safety aspects (e.g. starting procedure, sliding speed of the users – see EN 1069-1:2010, 7.13).

These instructions shall comprise:

— detailed explanation of the controls and their function;

— recommended user access and egress procedures, exclusively allowed sliding positions and any limitations necessary to prevent static overload of the water slide;

— the prescribed limiting conditions stating any limitations for user, the limits of speed of operation, the sliding time and the maximum numbers of user to be carried;

— emergency evacuation procedures;

— any environmental limitations, e.g. conditions of wind, rain, snow during which the water slide shall not be operated;

— details of the maintenance, service or repairs, qualification of the maintenance staff and specification about selection of proper spare parts.

4.6 Emergency instructions

Written guidelines for emergency situations shall be produced for competent staff by the operator in association with the statutory authorities.

4.7 Incident logbook

All incidents, including accidents, occurring with the use of a slide shall be recorded, monitored and analysed regularly to ensure that the necessary improvement of the design, operation or maintenance of the slide are made in order to prevent accidents as far as possible in future.

5 Instructions for users

5.1 Planning and use of signage

It is the responsibility of the manufacturer to define and notify/supply the proper signage at the time of commissioning. Based on the results of the risk assessment the operator shall identify and install any possible additional signage pertinent to the safe use and operation of the specific water slide. Where safety signs are required they shall be designed in accordance with ISO 3864-1 and ISO 3864-3, and safety signs from ISO 20712-1 and ISO 7010 used when applicable.

In addition to any relevant graphical symbols from ISO 20712-1, ISO 7010 and ISO 7001, a list of safety signs and information signs related to use of water slides is presented in Annex A. Relevant graphical symbols shall be assembled on multiple signs, see ISO 20712-3. Public information symbols shall be designed in accordance with ISO 22727 and public information symbols from ISO 7001 used when applicable.

A written supplementary text, in the language(s) of the country where the slide is installed shall be added possibly with translation into other language(s). The minimum supplementary text is shown below each graphical symbol (see figures in Annex A). The minimum text height of upper case letters shall be 15 mm.

New graphical symbols additional to those given in this standard shall be designed in accordance with ISO 3864-1 and ISO 3864-3 for safety signs, and ISO 22727 for public information symbols. The graphical symbols should be tested for comprehension according to ISO 9186-1. If the comprehension score does not

meet the criteria for acceptance set for ISO 7010 or ISO 7001 as relevant, the graphical symbol shall be accompanied by supplementary text.

5.2 Signage at the entrance of a slide

The graphical symbols required to be included in the signage system shall include all those determined as a result of the risk assessment.

From slide Type 1.2 onwards minimum signage shall be clearly displayed at the entrance of the means of access and on the platform, complying with the template given in Figure 1.

In addition, where more than one slide starts from the same platform, specific information for each slide shall be displayed before entering its start section.

The following minimum required safety signs and public information symbols shall be displayed on the multiple sign:

a) the severity of the ride, by using the designated information sign and using the following colour code:

   1) blue for easy (Types 2, 3, 6.1 where relevant);

   2) red for medium (Types 4, 6.2, 7, 8, 9 and 10 where relevant);

   3) black for severe (Types 5 and 10 where relevant);

b) minimum height/age of the user and additionally for Types 1 and 2 maximum height/age of the user;

c) height of fall landing, if > 200 mm;

d) water depth in the splashdown area;

e) instructions to clear quickly the landing area after the ride;

f) the only mandatory sliding position or, if more that one position is allowed, the relevant information signs;

g) the mandatory use of ride enhancement devices (e.g. single or multiple rafts, mattresses).

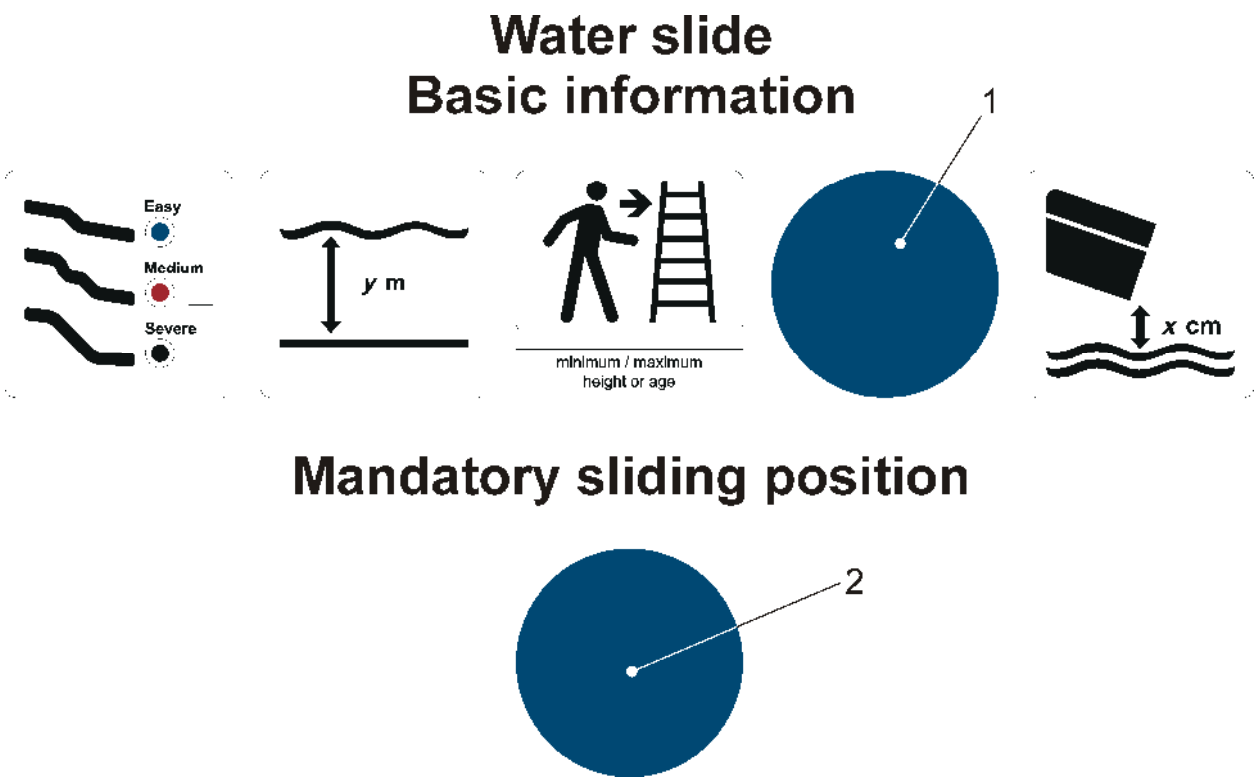
It is the responsibility of the manufacturer to define the above mentioned information and requirements to display them at the time of commissioning.

If a special feature has been incorporated in the design, e.g. the possibility of becoming involuntary airborne, special water/light/sound effects, then the user shall be warned at least prior to use the slide.

The information shall be given that young children up to the age of eight years should always be supervised by parents or responsible carers, see EN 15288-2:2008, 6.1.1.3.

Conforming to the result of the operational risk assessment (see EN 15288-2) the operator may add, under his responsibility, more information/warnings/prohibitions/mandatory signs or alter those given by the manufacturer, except a), paying attention to the possibility to reach all users categories in the specific environment.

Figure 1 gives the template about how to combine the information that needs to be displayed, using the defined graphical symbols.



Key

1 either Figure A.13 or Figure A.14 shall be inserted.
2 the relevant figures of the sliding position shall be inserted (see Annex A).

Figure 1 — Template of minimum signage to be displayed at the entrance of a slide

If more than one sliding position may be allowed at one water slide, change the heading into "Allowed sliding positions" and insert those signs which describe the positions in form of an information sign according to ISO 7001 (see Figure A.6 to Figure A.11). More than one mandatory action sign in this case is not allowed.

NOTE It is advisable to show allowed and recommended behaviours instead of prohibited ones.

5.3 Additional user information

The instructions for use shall address possible additional hazards in accordance with the risk assessment, including e.g.:

— medical conditions of the users;

— jewellery and spectacles worn by the users;

— locker keys/bracelets worn by the users;

— voluntary stopping along the slide;

— possible misunderstanding of the displayed signs.

For information to be effectively imparted to user's signs inside the changing areas or inside lockers may be used e.g. about removing jewellery and spectacles. Complex safety messages and vital information concerning the severity/difficulty of the water slide may also be given through video clips shown on screens at the point of payment and in the changing room. This would help the user make an informed decision about his willingness to use a specific slide.

6 Documentation

Each manufacturer/supplier/importer/installer shall provide for the following information, at the time of commissioning:

a) manufacturer's/supplier's complete address, web address, telephone number, and a manual to enable the operator to request instructions or assistance. Special advice or details of special qualifications for personnel shall be given where appropriate;

b) all safety relevant design documents as built drawings and calculations of the complete water slide installation and parts list; documentation of foundation, durability, design analysis and inspection, certificates of manufacturing, materials, components, test reports, electric circuit diagrams. The results of the various inspections shall also become an integral part of the logbook;

c) technical data and other important technical characteristics;

d) detailed maintenance and technical operational program relating to the water slide as installed;

e) if delivered in the area of application of EN 1069-1 and EN 1069-2 this manual shall be written in the language of the user and shall provide, as a minimum, the instructions specified in Clause 7;

f) the results of the design risk assessment and every other requirement/information relating to 4.2 and concerning manner of use (e.g. position, use of raft, numbers, etc.).

7 Maintenance instructions

7.1 General

Maintenance instructions for slides and accessories as given by the manufacturer/supplier shall be followed under the responsibility of the operator.

Frequency of maintenance if not regulated by statutory requirements or manufacturers instructions shall be at least once a year.

Maintenance, repair and modification shall be recorded, in a maintenance logbook, and monitored by the operator.

These instructions shall comprise:

— lifespan;

— a list of those components (e.g. joints, surfaces) which require regular inspection, the recommended frequency of inspection (preferably expressed in service hours), and the method of inspection, e.g. visual;

— a list of any specific tests to be carried out;

— recommendations regarding electrical maintenance;

— requirements for cleaning and maintenance particular of stressed stainless steel and GRP (glass-reinforced plastics);

— recommendations regarding removing deposits from the slide itself, e.g. calcium, body fats.

Whether contracted or not, all maintenance work on a water slide shall be carried out by, or under the direct supervision of persons trained or experienced in the maintenance procedures.

These procedures shall include preventive maintenance and component monitoring, taking into account any instructions from, or consultation with, the manufacturer and the independent inspection body. All guards, fences, equipment enclosures and access doors, which are removed for servicing or maintenance purposes, shall be replaced and effectively secured in position before operation.

Safety signs may need to be displayed during any of the operations (see ISO 7010 for relevant safety signs).

7.2 Servicing

The servicing intervals recommended by the manufacturer shall not be exceeded, unless any extension in the period has been agreed and approved either with the manufacturer in writing or with the approval of the independent inspection body.

The frequencies at which servicing is carried out shall be in compliance with manufacturer's recommendations.

Servicing recommendations shall deal with all components that have to be checked, tested, adjusted or replaced at specified intervals.

7.3 Repair

The repair of damaged parts shall be carried out with caution, as this could lead to an alteration of the approved original design. For example, the stiffening or strengthening of one component can produce higher stresses in adjacent components which, in turn, fail. Welding shall follow the provisions in standards EN ISO 15607, EN ISO 3834 (all parts), etc. Welding may be a safety-critical modification, requiring approval by the manufacturer and inspection body. A welder shall follow the appropriate European Standards and shall be qualified to EN 1418:1997, Clause 6 and shall use the correct materials and techniques. Changes of this kind shall be regarded as modifications and dealt with in the manner specified below.

7.4 Modifications

Any modification to:

— structures and mechanical parts;

— safety critical components;

— emergency equipment;

— performances

shall only be carried out after consultation with the manufacturer and/or the independent inspection body.

Following any such modification, those parts involved, shall be subjected to further thorough inspection by an independent inspection body and update of the risk assessment before the water slide is taken back into use. The approved documentation shall be included in the logbook.

Even apparently insignificant modifications may lead to the accelerated failure of the components of a device, and using a device outside the manufacturer’s specification or the specific environment for which it was designed, is a safety-critical modification.

The inspection report concerning a repair or modification shall be included in the logbook.

8 Inspections

8.1 Inspection by the operator

8.1.1 Routine visual inspection

Daily checks are intended to identify obvious hazards that can result from vandalism, use or weather conditions. The pool attendant or equivalent staff shall be responsible to check the slide daily for cleanliness, structural integrity, damage, changes, excessive wear and foreign bodies, before starting operation. These checks shall be documented in the diary (logbook).

8.1.2 Periodic inspection

This shall be carried out every one month to three months, or as indicated by the manufacturer's instruction.

Inspection, more detailed than routine visual inspection, to check the operation and stability of the equipment. These checks shall be documented in the diary (logbook).

These checks include:

— check of the slide surface (from inside the slide);

— check of the junctions in order to detect possible breaks or cracks;

— detection of possible oxidations;

— check of the stability of the structure during its use;

— inspect for wear.

Adequate reasonable access should be possible to all parts of the slide for the purposes of inspection, maintenance and repair.

8.2 Independent periodic thorough inspection

8.2.1 General

Water slides Types 3 to 10, together with all its ancillary parts, shall be periodically inspected, at least once a year, by an independent third party expert with the necessary technical and operational knowledge and experience in the field of water slides.

In the particular case of water slides which are used on a seasonal basis, this thorough inspection should be carried out where practicable before the beginning of each season, but in any case before the expiry of the inspection report as documented in the logbook.

8.2.2 Inspection procedure

As a minimum, the following steps shall be carried out:

— consult the logbook especially the reports from the last inspection(s);

— perform a visual inspection, which may need to be supplemented by non-destructive testing;

— check if the water slide appears to be complete and unmodified;

— check all components (disassembling when needed) for signs of wear, internal or external corrosion or cracking;

— examine the surface protection;

— perform a functional test of all components including the electrical installation;

— check that water flow and the distance control are within the design specification;

— investigate the necessity to perform a practical test conforming to EN 1069-1;

— sign and issue the report.

8.2.3 Periodical practical sliding test

A practical sliding test shall be performed at intervals not longer than three years apart, to confirm that basic conditions as tested at the time of commissioning are still valid. The result of this test shall be recorded.

The test shall be carried by a slider approved by the third party expert.

9 Commissioning

To ensure that the water slide as built complies with all requirements, it shall be commissioned in cooperation with the appropriate authorities before public use.

10 Quality of Water

The quality of the water used:

a) for water slides installed in a pool, shall comply with the specific requirements for swimming pool water;

b) for water slides installed in a lake or on the sea-shore, shall comply with the specification of the statutory requirements for bathing in natural water.

A catch unit shall be self-emptying due to hygiene requirements.

Annex A
(normative)

Safety and information signs for water slides

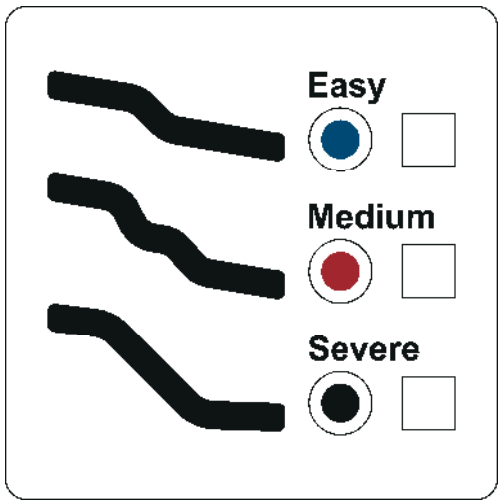


Figure A.1 — Severity of ride

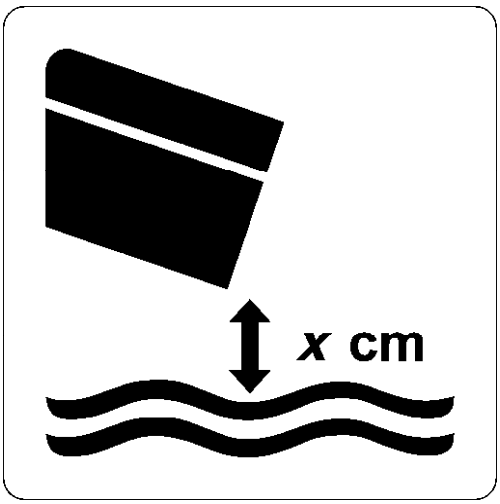


Figure A.2 — Falling height *x*, indicated in cm

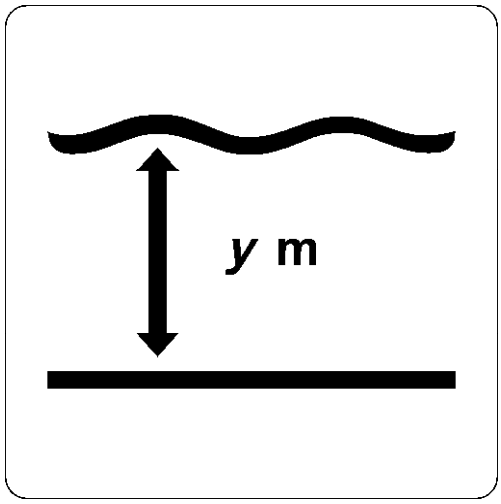


Figure A.3 — Water depth *y* in metres

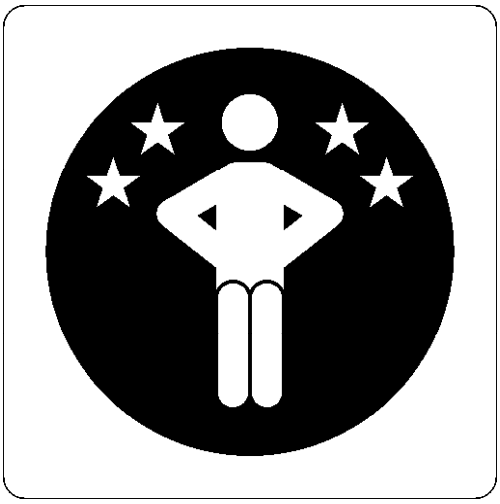


Figure A.4 — Black Hole

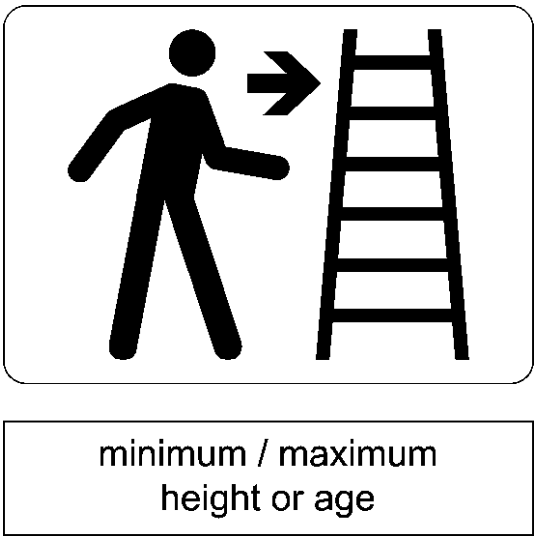


Figure A.5 — Minimum / Maximum height or age of the user

Figure A.6 — Lie on your back, feet forward

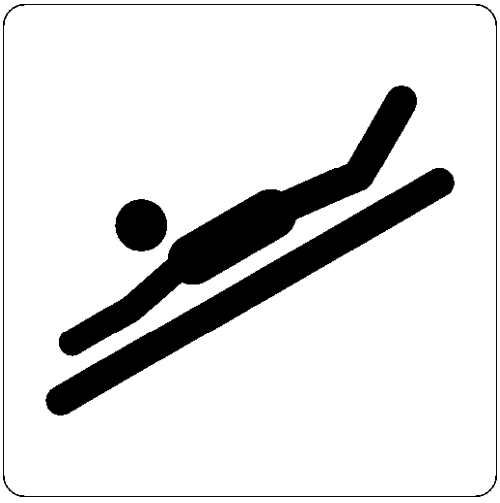


Figure A.7 — Lie on your stomach, facing forward

Figure A.8 — Sitting, facing forwards

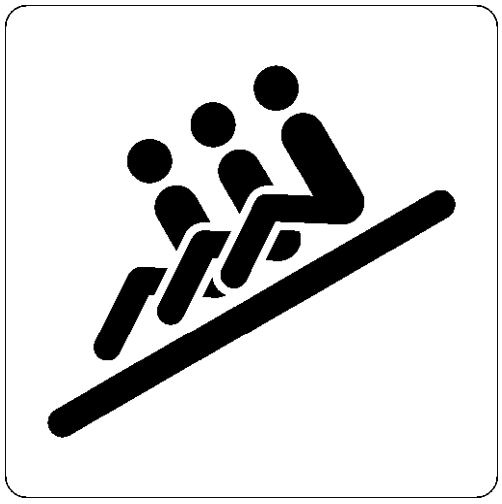


Figure A.9 — Chain sliding

Figure A.10 — Lying with a child between your legs, feet forward

Figure A.11 — Sitting with a child between your legs, facing forward

Figure A.12 — Warning – Getting airborne feature

Figure A.13 — Clear immediately the catch unit

Figure A.14 — Clear immediately the splashdown area

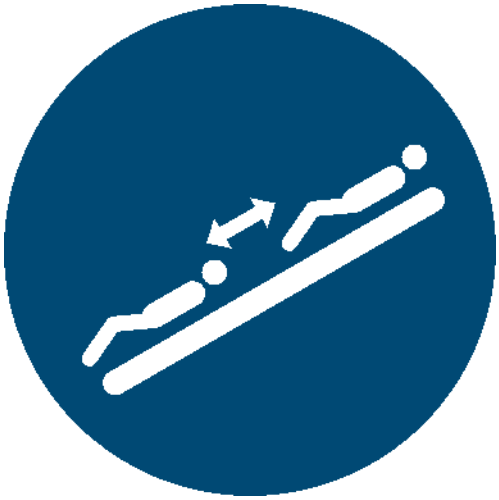


Figure A.15 — Keep distance, lying

Figure A.16 — Keep distance, sitting

Figure A.17 — Lie on your back, feet forward

Figure A.18 — Lie on your stomach, facing forward

Figure A.19 — Sitting, facing forwards

Figure A.20 — Slide in a chain

Figure A.21 — Place a child in front of an adult, lying feet forwards

Figure A.22 — Place a child in front of an adult, sitting facing forwards

Figure A.23 — Use provided single raft

Figure A.24 — Use provided multiple raft

Figure A.25 — Use provided mattress

Figure A.26 — Do not lie on your back, feet forward

Figure A.27 — Do not lie on your front, facing forwards

Figure A.28 — Do not sit, facing forwards

Figure A.29 — Do not slide in a chain

Figure A.30 — Do not place a child in front of an adult, lying feet forwards

Figure A.31 — Do not place a child in front of an adult, sitting facing forwards

Figure A.32 — Do not use a single raft

Figure A.33 — Do not use a multiple raft

Figure A.34 — Do not use a mattress

Figure A.35 — Do not grasp the top returns

Annex B
(informative)

Example of the risk assessment

B.1 Example of general risk assessment procedure

B.1.1 Terms and definitions

For the purposes of this annex, the following terms and definitions apply.

B.1.1.1
risk management
careful examination of what, in your work, could cause harm to people, so that you can weigh up whether you have taken enough precautions or should do more to prevent the harm

B.1.1.2
hazard
something with the potential to cause harm

B.1.1.3
risk
likelihood or chance that the hazard could occur and its severity

B.1.1.4
control measures
elements implemented to reduce the level of risk

B.1.1.5
procedure
formal document developed as the usual way of working or addressing a specific discipline or activity within the business

B.1.2 Risk assessment guidance

— The Company should have developed a risk assessment and Procedures Information Document (RAPID) file system. The principle of the RAPID file is that it contains an A 3 or A 4 pad of departmental risk assessments supported by guidance examples. The pad will also contain procedural documentation applicable to the department.

— The risk assessment should identify significant risks arising out of work, which means that the trivial risks may generally be ignored.

— The risk assessment should be appropriate to the nature of the work and valid for a reasonable period of time. The site management, in conjunction with the Safety Services Team should be able to prioritise the measures that need to be taken to comply with any legal requirements. The assessment should be reviewed periodically, if the risk changes or if new hazards develop to ensure that it remains effective. Moreover, the assessment may need to be reviewed following serious accidents or as industry standards and best practices develop.

B.1.3 Conducting a risk assessment

Following a decision on what activity or process is being risk assessed there follows five key Steps:

1) identify who could be harmed;
2) identify the hazards;
3) evaluate the risk along with current control measures;
4) introduce further controls in line with legal requirements and best practice as necessary;
5) monitor and review the assessment.

Table B.1 — Steps of conducting a risk assessment

Step 1 – Identify who could be affected *Find out who could be affected by the identified hazards:*			
Employees	**Guests**	**Visitors**	**Others**
Young employees Inexperienced Disabled	Holiday makers Day visitors	Contractors Local authorities Delivery drivers Salesmen	Trespassers Rights of way
Step 2 – Identify the hazards *Hazards could be in many forms – some examples of which are:*			
Task		**Environment**	**Other factors**
Handling, storage and use of chemicals Movement and connection of gas bottles Use of machinery Use of work equipment Work with electricity or gas Housekeeping Use of vehicles Confined spaces Working at heights Construction Manual Handling Security operations Delivery and dispatch of goods Waste removal Dealing with guests Cleaning of kitchens and venues, etc. General use of facilities		Accommodation Children's play areas Swimming pools/Spa's Bars and Entertainment venues Grounds Wildlife Park Shops Kitchens Workshops Crèche Funfairs Stores Changing Rooms Toilets Grounds & Car Parks	Design Health hazards Fire Pollution Structural failure Assault Overcrowding Adverse weather Stress Structural hazards Human factors

Table B.1 *(continued)*

Step 3 – Evaluate the risk along with current control measures *Evaluate the most probable outcome – keep it realistic, taking into account:*	
Type(s) of possible injury Severity of possible injury Age profile of persons exposed	Number of persons exposed Frequency of exposure Experience of persons exposed
Evaluate existing control measures taking into account:	
Do they reflect legal requirements and/or industry best practice? Do they reflect the Company H&S policy? Do they address all those who could be affected? Are they proportionate to the risk? Do they balance cost and risk? (Reasonably practicable) Cost versus risk Cost = Time, Effort, Resources, Money Risk = high, medium or low	
At this point ask – Are the controls adequate?	
Step 4 – Introduce further control measures	
If they are not adequate:	
Prioritise further action on basis of risk Complete all low cost items as soon as possible	
When considering further controls apply the hierarchy of controls:	
Elimination or substitution Enclose or amend the process or activity Use a safe system of work Change employee behaviour Use of PPE Monitoring and surveillance	
Decide on the time scale in which the further controls should be completed:	
High risk 0 – 1 month Medium risk 0 – 3 months Low risk 0 – 12 months	
Step 5 – Monitor and review *Decide upon a latest date when the risk assessment will be reviewed, usually one year − also:*	
Monitor if controls are effective Ensure employees are adhering to the controls If controls are not working – re-assess Following incidents/accidents – re-assess If the process/activity changes – re-assess Document all subsequent assessments Train-in the significant findings of assessment Ensure General Manager is aware of problems Take the RAPID file to monthly meetings	

B.1.4 Use of the risk assessment form

B.1.4.1 Who completes the form?

Generally head of department, Supervisor or Team Leader; however, any Team Member trained in risk assessment.

B.1.4.2 Completion of the risk assessment

The heading section is required to be completed in full giving brand and site, complete department name and a readily understood venue title (do not use nicknames of venues).

B.1.4.3 Reference number

A department specific reference number is to be allocated and recorded on the Departmental risk assessment Register (attached).

B.1.4.4 Activity or process being assessed

The subject activity of the risk assessment should be adequately defined. For example, "Bench Grinder" may be insufficient. "Use of the bench grinder in Maintenance Workshop" may be better if a bench grinder is also provided in another area of site.

B.1.4.5 Persons at risk

The numbers and types of people exposed should be listed. It may be necessary to consider team members, guests and contractors.

B.1.4.6 Hazards

This section should be used to detail all the hazard(s) related to the subject. Consider the whole task or process involved. For instance in a warehouse or cellar a hazard could be falling loads.

B.1.4.7 Controls presently in place

All measures that are currently in place should be listed. This will include:

— guarding of machinery: Signage;

— training given: Task design;

— restrictions on whom may undertake the task: Supervision;

— environmental factors such as lighting, heating: PPE;

— safety equipment.

NOTE This list is not exhaustive.

B.1.4.8 Most probable outcome

Decide on the most probable realistic outcome or outcome of the risk being realised – use common sense to choose one of the options given but bias should be towards the worst-case scenario.

B.1.4.9 Probability

Use judgement and experience to choose the probability that the event could in fact occur. Take into account the frequency of exposure to the hazards identified while deciding the probability. A minor injury, e.g. bruising, encountered frequently would warrant further consideration.

B.1.4.10 Risk ranking

Having decided on both the most probable outcome and probability indicators, take note of the letters detailed against the side of those choices. Look at the risk ranking matrix (see Table B.3) to ascertain what risk ranking that combination of letters warrants.

B.1.4.11 Controls present OK or NOT OK

Having taken consideration of the risk ranking you should be aware of all the necessary controls that the process or activity requires. Should the risk ranking have been controlled, the controls presently in place may be suitable for the process and you may deem them OK. If satisfied that no more need be done indicate that work can commence, sign the risk assessment and detail the date of this and the next risk assessment at the foot of the page.

If the risk ranking was high or medium the present controls may not be sufficient and the controls NOT OK. If so, encircle NOT OK, sign below the controls present box and detail any improvements to be made in the action plan section of the form (see Table B.2).

B.1.4.12 Controls adequately managed Yes or No

Evaluate how current controls are managed. Consider if improvements need to be made to ensure maintained effectiveness of the controls and detail such recommendations in the action plan.

B.1.4.13 Can work commence: Yes or No

In exceptional circumstances, some action plan items may prevent the activity or process being continued safely until they have been completed. If so the head of department shall stop the work, indicate that work may not continue, sign the assessment and await completion of relevant items of the action plan before work commences. In most cases however, action plan items will add further controls to enhance safety of the activity without preventing the activity from proceeding.

B.1.4.14 General notes

The person completing the risk assessment shall ensure that all persons who need to be aware of the information recorded in the risk assessment, e.g. hazards; control measures, etc. have been fully trained in the controls required.

For both hazard and exposure, the terms high, medium and low are not definite. Different people may decide that a hazard is high or medium, etc. particularly in borderline cases.

It is not mandatory or possible to reduce all activities to a low rating – the control measures shall however complement any risk ratings of high, medium or Low – a balance shall be struck.

Table B.2 — Departmental risk assessment Register

Name of Site: _____ Department: _____				
Reference Number	**Subject**	**Date Developed**	**Date of 1st Review**	**Signature of Reviewer**

B.2 Example of risk assessment about users spacing in Type 3 slide

B.2.1 General

A water slide with characteristic features as follows is subjected to a risk assessment concerning interference between users.

B.2.2 Description

Water slide: Type 3.

Description: curved slide, uncovered construction, length = e.g. 55 m, landing area: splashdown area.

Visibility: only parts of the sliding path and the splashdown area are visible from the start.

Technical distance control: none.

Supervision: by the staff at control point (control room), monitors transmit the situation at the start and the splash down area.

B.2.3 Limits of the water slide – Use limits

Use limits include the intended use and reasonably foreseeable misuse.

Use of the water slide:

Intended use of the water slide:

a) according to the displayed basic information, particularly:

   1) minimum height/age;

   2) instructions to clear quickly the landing area after the ride;

   3) mandatory safe sliding position (e.g. lying on one's back facing forwards, sitting facing forwards). If more than one sliding position may be allowed at one water slide, see 5.2;

   4) keep distance;

   5) do not slide in a chain;

b) according to the supervision by the staff:

   1) reasonably foreseeable misuse:

      i) users do not clear quickly the landing area after the ride;

      ii) users or non-user entering the landing area;

      iii) users do not keep distance;

   2) anticipated levels of training, experience or ability of users:

      i) general public.

B.2.4 Term explanation for risk assessment

Risk estimation

SH Severity of harm: **Slight** (usually reversible injury)**, serious** (usually irreversible injury including death)

POH Probability of occurrence of that harm: **Minor, moderate, high**

PM Protective measure to achieve risk reduction (three-step method):

— inherently safe design;

— application of safeguarding and complementary protective measures information for use with notice of any residual risk;

— operating procedures defining the expected ability of user and operator: Instruction for use, required supervision sufficient information, including warning about residual risks.

RR Residual risk

B.2.5 Hazards identification, risk estimation, risk evaluation

Table B.3 — Hazards identification, risk estimation, risk evaluation

Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk			Risk evaluation Adequate risk reduction is achieved
A 1 Collision between users at the sliding path and/or plash down area	Different sliding positions cause significant differences in speed and/or bring user to an involuntary stop	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Slight / Serious **POH** high	**PM** Permitted safe sliding position only: Lying on one's back, feet forward **RR** User do not keep distance (reasonably foreseeable misuse and the staff cannot take action in time)	OR	Operator insists on both safe sliding positions: Lying on one's back, feet forward and Sitting, facing forwards **PM** Technical distance control by installing a traffic light, sensor at the start section and final part **RR** User ignore the technical distance control (traffic light)	NO
Permitted safe sliding position: only Lying on one's back, facing forwards						Operator insists on both safe sliding positions: Lying on one's back, facing forwards and Sitting, facing forwards	
A 2 Collision between users at the sliding path and/or splash down area	Users do not keep distance (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Slight / Serious **POH** high	**PM** Technical distance control, at minimum timer controlled traffic light, sensor at the start section **RR** User sit up during sliding, this causes significant differences in speed and/or brings user to an involuntary stop (reasonably foreseeable misuse and the staff can not take action in time) (continue with A 3)			**NO**

Table B.3 *(continued)*

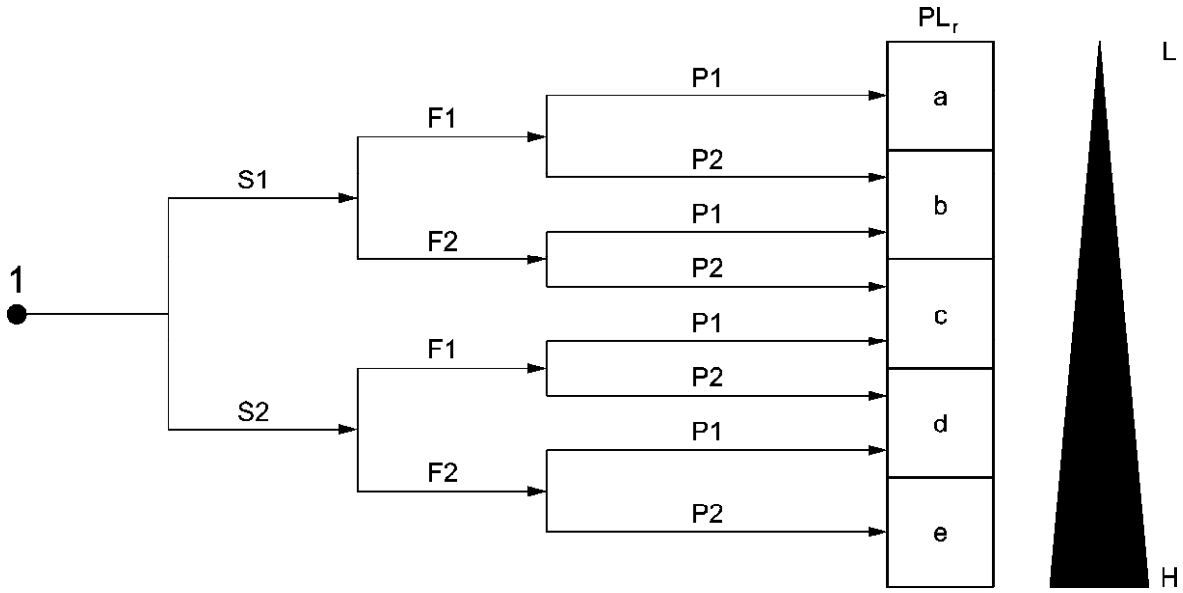
Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk	Risk evaluation Adequate risk reduction is achieved
A 3 Collision between users at the sliding path and/or splash down area	User sits up during sliding, this causes significant differences in speed and/or brings user to an involuntary stop (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Slight / Serious **POH** moderate	**PM** Technical distance control by installing a traffic light, sensor at the start section and final part, PLC (programmable logic control), PL Performance level = a (see Figure B.1) **RR** Fault in the control and/or sensors of the technical distance control (continue with A 4)	 NO
A 4 Collision between users at the sliding path and/or splash down area	Fault in the control and/or sensors of the technical distance control	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Slight / Serious **POH** moderate	**PM** Control carried out in accordance with EN ISO 13849-1, PL at least c (see Figure B.1) or depending upon the user group (e.g. undisciplined users, unruly teenagers, rowdies, etc.): **RR** Users ignore the technical distance control (traffic light) (reasonably foreseeable misuse and the staff cannot take action in time) (continue with A 5)	YES NO
A 5 Collision between users at the sliding path and/or splash down area	Users ignore the technical distance control (traffic light) (reasonably foreseeable misuse, depending from the user group, e.g. undisciplined users, unruly teenagers, rowdies, etc., and the staff cannot take action in time)	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Slight / Serious **POH** moderate	**PM** Additional to the technical distance control (traffic light) depending from the user group: special supervision by the staff at the start	YES
For permitted safe sliding position: only Lying on one's back, feet forward, risk assessment continues at C					

Table B.3 *(continued)*

Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk	Risk evaluation Adequate risk reduction is achieved
Operator insists on both safe sliding positions: Lying on one's back, feet forward and Sitting, facing forwards					
B 1 Collision between users at the sliding path and/or splash down area	Users ignore the technical distance control (traffic light) (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Slight / Serious **POH** high	**PM** Additional to the traffic light with a sensor at the start section and the final part, the entrance of the slide is locked by technical means by installing a turnstile. **RR** Fault in the control and/or sensors of the technical distance control (continue with B 2)	NO
B 2 Collision between users at the sliding path and/or splash down area	Fault in the control and/or sensors of the technical distance control	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Serious **POH** moderate	**PM** Control carried out in accordance with EN ISO 13849-1, PL at least c (see Figure B.1) **RR** User jump over the turnstile into the catch unit (reasonably foreseeable misuse) (continue with B 3)	NO
B 3 Collision between users at the sliding path and/or splash down area	Users jump over the turnstile into the sliding path (reasonably foreseeable misuse)	Injuries caused by a crash between users at the sliding path and/or splash down area	**SH** Serious **POH** high	**PM** Installation of a warning sign: General prohibition sign ISO 7010 P001 with the supplementary text "DO NOT JUMP OVER THE TURNSTILE"	YES

Table B.3 *(continued)*

Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk	Risk evaluation Adequate risk reduction is achieved
For both versions: Permitted safe sliding position: only Lying on one's back, feet forward and Operator insists on both safe sliding positions: Lying on one's back, feet forward and Sitting, facing forwards					
C Collision between users at the splash down area	Users do not clear quickly the landing area (splashdown area) after the ride (reasonably foreseeable misuse, searching for contact lens, etc. and the staff cannot take action in time)	Injuries caused by a crash between users at splash down area	**SH** Serious **POH** moderate	Water flow at the splashdown area, tending to move users away to minimise collisions risks; or in addition depending upon the user group (e.g. undisciplined users, unruly teenager, rowdies, etc.): special supervision by the staff at the splashdown area	YES or YES
D Collision between users at the splash down area	users go back to the splash down area after the ride or non-user(s) entering the splash down area (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users or users and non users at splash down area	**SH** Serious **POH** moderate	Water flow at the splashdown area, tending to move users away to minimise collisions risks; or in addition depending upon the user group (e.g. undisciplined users, unruly teenagers, rowdies, etc.): special supervision by the staff at the splashdown area	YES or YES



Key

1 starting point for the evaluation of the contribution to risk reduction of a safety function
L low contribution to risk reduction
H high contribution to risk reduction
PL_r required performance level
S severity of injury
S1 slight (usually reversible injury)
S2 serious (usually irreversible injury including death)
F frequency and/or exposure to a hazard
F1 seldom to less often and/or the exposure time is short
F2 frequent to continuous and/or the exposure time is long
P possibility of avoiding the hazard or limiting the harm
P1 possible under specific conditions
P2 scarcely possibly

Figure B.1 — Risk chart to determine the required performance level (PL_r), for each safety function

B.3 Example of risk assessment about users spacing in Type 5 slide

B.3.1 General

A water slide with characteristic features as follows is subjected to a risk assessment concerning interference between users.

B.3.2 Description

Water slide: Type 5.

Description: curved slide, constructed as a tube, Landing area: catch unit.

Visibility: the sliding path and the catch unit are not visible from the start.

Technical distance control: traffic light, sensor at the start section and final part, PLC (programmable logic control), PL Performance level = a, according EN ISO 13849-1.

Supervision: by the staff at control point (control room), monitors transmit the situation at the start and the catch unit.

B.3.3 Use limits of the water slide

Use limits include the intended use and reasonably foreseeable misuse.

Use of the water slide:

Intended use of the water slide:

a) according to the displayed basic information, particularly:

    1) minimum height/age;

    2) instructions to clear quickly the landing area after the ride;

    3) permitted safe sliding position: Lying on one's back, feet forward;

    4) do not slide in a chain;

b) according to the supervision by the staff:

    1) reasonably foreseeable misuse:

        i) users do not clear quickly the landing area after the ride;

        ii) users or non-users entering the landing area;

        iii) users ignore the traffic light and do not keep distance;

    2) anticipated levels of training, experience or ability of users:

        i) general public.

B.3.4 Term explanation for risk assessment

Risk estimation

RR Residual risk

SH Severity of harm: **Slight** (usually reversible injury)**, serious** (usually irreversible injury including death)

POH Probability of occurrence of that harm: **Minor, moderate, high**

PM Protective measure to achieve risk reduction (three-step method):

a) inherently safe design;

b) application of safeguarding and complementary protective measures;

c) information for use with notice of any residual risk:

    1) operating procedures defining the expected ability of user and operator: Instruction for use, required supervision;

    2) sufficient information, including warning about residual risks.

B.3.5 Hazards identification, risk estimation, risk evaluation

Table B.4 — Hazards identification, risk estimation, risk evaluation

Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk	Risk evaluation Adequate risk reduction is achieved
A 1 Collision between users at the catch unit	Users do not clear quickly the landing area (catch unit) after the ride (reasonably foreseeable misuse, searching for contact lens, etc. and the staff cannot take action in time)	Injuries caused by a crash between users at the catch unit	**SH** Serious **POH** high	**PM** Traffic light turns green only after user has left the catch unit **RR** User goes back to the catch unit after the ride or non-user(s) entering the catch unit (reasonably foreseeable misuse and the staff cannot take action in time) (continue with A 2)	NO
A 2 Collision between users at the catch unit	Users go back to the catch unit after the ride or non-users entering the catch unit (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users or users and non users at the catch unit	**SH** Serious **POH** high	**PM** Traffic light turns green only after user has left the catch unit and the exit opening of the catch unit is locked by technical means. Turnstile at the exit opening of the catch unit prevents entrance to the catch unit from outside. **RR** User or non user(s) jump (back) over the turnstile into the catch unit (reasonably foreseeable misuse and the staff cannot take action in time) (continue with A 3)	NO
A 3 Collision between users at the catch unit	Users or non-users jump (back) over the turnstile into the catch unit (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the catch unit	**SH** Serious **POH** moderate	**PM** Installation of a warning sign: General prohibition sign ISO 7010 P001 with the supplementary text "DO NOT JUMP OVER THE TURNSTILE"	YES

Table B.4 *(continued)*

Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk	Risk evaluation Adequate risk reduction is achieved
B Collision between users at the slide path	Users ignore the technical distance control (traffic light) and do not keep distance (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the slide path	**SH** Serious **POH** Minor	**PM** Traffic light as described for distance control, no additional safety measure is needed	YES
C 1 Collision between users at the catch unit	Users ignore the technical distance control (traffic light) and do not keep distance (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the catch unit	**SH** Serious **POH** high	**PM** Additional to the traffic light the entrance of the slide is locked by technical means by installing a turnstile. **RR** Fault in the control and/or sensors of the technical distance control (continue with C 2)	NO
C 2 Collision between users at the catch unit	Fault in the control and/or sensors of the technical distance control	Injuries caused by a crash between users at the catch unit	**SH** Serious **POH** high	**PM** Control carried out in accordance with EN ISO 13849-1, PL at least c (see Figure B.1) **RR** Users jump over the turnstile into the slide (reasonably foreseeable misuse and the staff cannot take action in time) (continue with C 3)	NO

Table B.4 *(continued)*

Reasonably foreseeable hazards, hazardous situations	Origin	Potential consequences	Risk estimation	PM Protective measure to achieve risk reduction RR Residual risk	Risk evaluation Adequate risk reduction is achieved
C 3 Collision between users at the catch unit	Users jump over the turnstile into the slide (reasonably foreseeable misuse and the staff cannot take action in time)	Injuries caused by a crash between users at the catch unit	**SH** Serious **POH** high	Installation of a warning sign: General prohibition sign ISO 7010 P001 with the supplementary text "DO NOT JUMP OVER THE TURNSTILE"	YES

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