
Summer toboggan runs —
Part 2:
Safety requirements for operation

Pistes de luge d'été —

Partie 2: Exigences de sécurité pour l'exploitation

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*.

A list of all parts in the ISO 19202 series can be found on the ISO website.

Summer toboggan runs —

Part 2: Safety requirements for operation

1 Scope

This document specifies operational requirements, signage, maintenance, repair and modifications for summer toboggan runs and their components according to ISO 19202-1.

This document is applicable to summer toboggan runs and major modification to summer toboggan runs and toboggans manufactured after the effective date of publication.

National rules on occupational safety and health first apply and they can be completed by this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

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

ISO 7010, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 19202-1:2017, *Summer toboggan runs — Part 1: Safety requirements and test methods*

ISO/IEC Guide 51, *Safety aspects — Guidelines for their inclusion in standards*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19202-1 and ISO/IEC Guide 51 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

operator

natural or legal person/organization who is responsible for operation of the summer toboggan run

3.2

person responsible for operation

suitable person who is appointed by the *operator* (3.1) and who is responsible for operational procedures

**3.3
operating personnel**

suitable person(s), who is (are) responsible for the operation, maintenance and repair of the technical equipment as well as ensuring proper ride service

Note 1 to entry: The operating personnel can also be the *person responsible for operation* (3.2).

**3.4
commissioning**
commencement of the daily ride service

Note 1 to entry: Commissioning also includes putting the technical equipment into operation.

Note 2 to entry: The term “commissioning” is also included in ISO 19202-1, but it has a different meaning.

**3.5
user**
driver (3.5.1) or *passenger* (3.5.2)

**3.5.1
driver**
user who actively operates the toboggan and who is responsible for compliance with the operating regulations

**3.5.2
passenger**
user who does not operate the toboggan, but who is jointly responsible for compliance with the operating regulations

**3.6
operating logbook**
documentation with daily reports concerning the operation, maintenance, repair, modification and route upkeep of the summer toboggan run

4 Requirements for the operator

4.1 Obligations of the operator

The operator is responsible for the safe operation of the facility in regard to users and third parties.

Hazards to the operating personnel resulting from operation, control and maintenance shall be evaluated according to national regulations under applicable health and safety laws.

The operator shall perform the operation of the facility according to this document and other applicable statutory regulations, as well as manufacturer’s instructions.

4.2 Implementation of a risk assessment for safe operation

To assess the risks associated with the safe operation of a summer toboggan run, the operator shall identify and evaluate the following hazards supplementary to the risk assessment (see ISO 19202-1):

- hazards from interfaces between the facility and the surroundings;
- hazards for users and third parties;
- hazards from foreseeable improper use of the facility.

Operating instructions shall be compiled from the complete risk assessment. The risk assessment shall be updated continuously. This shall be checked and concretized in all cases after more extensive technical modifications and after incidents.

To continuously improve safety, it is recommended that the manufacturer be informed about technical problems with discernible hazards.

Risks shall be prevented by

- a) introduction of technical measures that prevent the hazards (e.g. safety relevant retrofitting), and
- b) introduction of other measures (e.g. instructions and information to the users by the operating personnel, if risks are unavoidable).

NOTE See [Annex B](#) for an example of a risk analysis.

4.3 Operating instructions

Operating instructions shall be compiled by the operator as a result of the operation and use risk analysis. These instructions shall contain regulations for at least the following situations/operational procedures:

- for incidents, accidents and near accidents and damage;
- for first aid, rescue and recovery;
- for fire and storms.

The instructions shall be compiled in observance of applicable national regulations.

Names and functions of the responsible persons, as well as their areas of responsibility, shall also be provided.

Operating instructions shall be updated continuously. These shall be checked and adapted after technical modifications, after accidents or increased frequency of incidents.

4.4 Requirements for the operating personnel to ensure the safety of the user

The operator shall make sure that the operating personnel is trained in respect to the mode of functioning for operation, inspection and maintenance. The training shall be documented.

The training shall be conducted for the first time before commencing the activity. It shall be conducted regularly and repeated at least once a year.

The training of the operating personnel who ensure proper ride service shall also include:

- instructions of the users before travel;
- procedures for dealing with users whose conduct is incorrect;
- conduct in the event of disruptions (error messages, power failure, fire, etc.);
- conduct in the event of emergencies (rescue, recovery, evacuation, etc.), as well as exercises for these emergencies;
- requirements for special operating states:
 - conduct in adverse weather conditions;
 - conduct during night operation (if applicable).

The operator shall employ suitable operating personnel who are physically and mentally capable of ensuring safe operation. This includes compliance with and implementation of the operational regulations and instructions corresponding to the area of responsibility. The operating personnel shall have appropriate maturity and authority to instil confidence in users and issue instructions.

4.5 Documents

The following documents shall be made available to the summer toboggan run:

- a) technical documentation of the manufacturer;
- b) associated test reports of the manufacturer;
- c) operating instructions of the manufacturer;
- d) documentation for inspection and maintenance;
- e) operational logbook for the daily operating documentation (see [Annex C](#));
- f) safety and emergency plan;
- g) risk assessment operation and use (see [4.2](#)).

5 Requirements for operation

5.1 Operational commencement

All information in the operating instructions (see ISO 19202-1) shall be complied with.

The following equipment in or on the facility shall be inspected for functional reliability before commencing operation (if provided):

- communication and monitoring equipment (video, intercom, radio telephony, etc.);
- safety equipment (emergency off, photoelectric barriers, etc.);
- complete course and the safety equipment installed there by slow driving;
- rail/tub shall be free of snow and ice so that hazard-free, proper operation is possible;
- rail/tub shall be free of any obstacles;
- signs;
- surroundings of the run;
- braking and conveying devices.

The toboggans shall be serviced corresponding to the maintenance and operating instructions. At least the following visual inspections shall be conducted before putting into operation. Inspection for:

- wear, cracks, deformation, etc.;
- external condition of the toboggan (e.g. chassis, buffer condition, connecting elements to the cable);
- condition of the operating equipment (e.g. brake lever, handles);
- condition of the running wheels and skids;
- condition of the brakes;
- condition of the restraint systems (e.g. back rests, safety belts).

The manufacturer's data shall be observed during all-wear inspections.

All unusual characteristics and incidents shall be entered in the operational logbook and documented comprehensibly.

5.2 Requirements during operation

The operation of a summer toboggan run without operating personnel, e.g. automatically controlled, is not permitted.

A person responsible for operation shall be present during operation.

Sufficient operating personnel shall be present in relation to the number of riders, design of the installation, weather conditions, etc. in order to ensure safe operation.

The operating personnel shall monitor the proper rider service personally and actively and supervise the users. User suitability shall be estimated by the operating personnel (see [5.5.1](#)).

The proper method of control and operation shall be explained to every user before travel (see also [Clause 6](#)). The start intervals shall be selected so that the user is able to comply with a minimum distance of 25 m between the toboggans during the downhill run. In the event of special operating conditions (e.g. wet, night operation), the start interval shall be selected so that the user is able to comply with a minimum distance of 50 m.

The clutch disengagement range on the hill shall, as a minimum, be monitored optically and connected by voice communication with the operating personnel or the range shall be occupied by personnel.

Measures shall be taken so that no hazard can result in the event of congestion at the clutch disengagement point of the uphill transport system and so that the facility is protected against damage.

The clutch engagement range in the valley and the requisite run end braking system shall be monitored optically and connected by voice communication with the operating personnel or the range shall be occupied by personnel.

5.3 Requirements for special operating states

The operation shall be stopped in the event of a storm, thunder and lightning or other weather conditions posing a danger.

In the event of wet or wintry weather conditions, the visibility of the track and braking routes shall be observed in accordance with ISO 19202-1.

If operation is permissible in wet or wintry weather conditions, the operating personnel shall observe the following:

- a) speeds shall be adapted;
- b) an extended braking path shall be taken into consideration;
- c) restricted toboggan loading shall be taken into consideration;
- d) increased lateral swing in case of tub-guided summer toboggan runs shall be observed.

The users shall be instructed about concrete actions to be taken for the special travel conditions.

If operation at night is permitted, the operating personnel shall inspect the lighting equipment for functional reliability before putting the summer toboggan run into operation. The complete lighting shall be put into operation before releasing the track.

Operation shall be stopped as soon as the visibilities of the track according to ISO 19202-1 are not fulfilled (e.g. fog).

The permissible operating states can be found in the test report that shall be provided in accordance with ISO 19202-1.

5.4 Daily end of operation

At the end of daily operation, the person responsible for operation shall ensure that no more occupied toboggans remain in the course (e.g. final test run, video monitoring, complete departure).

All toboggans shall be secured so that no uncontrolled or unauthorized departure is possible (e.g. garaging in closed building, locking toboggan).

The facility shall be put completely out of operation.

Entries in the operational logbook shall be finalized.

5.5 Conveyance conditions

5.5.1 Preconditions for conveyance

The following data represents the fundamental prerequisites for conveyance and shall be indicated in a suitable manner at a location visible to the user.

- a) Children under the age of 3 years may not generally use the run.
- b) Children under the age of 8 years may only travel on two-seater toboggans if accompanied by an older person (aged over 8 years). This person shall be familiarized with the toboggan run and shall have been assigned responsibility by a person authorized to provide supervision/training.
- c) The toboggan may only be loaded with X¹⁾ kg maximum.
- d) The driver shall be able to operate the controls over the entire travel period.
- e) Persons who are not able to properly ride on the toboggan owing to physical or mental impairments, etc., or operate it properly, shall be prevented from travelling for reasons of safety. If necessary, use is possible accompanied by experts or a person of trust who will then assume responsibility for the users.
- f) Owing to the method of operation established, persons with health problems who might adversely affect practicing of the tobogganing sport or pregnant woman may not travel on the facility.
- g) Persons who are under the influence of intoxicants (alcohol, drugs, medicines affecting the senses, etc.) may not use the facility.

5.5.2 General conveyance conditions

The following data represents minimum requirements and shall be indicated in a suitable manner at a location visible to the user.

- a) Every user travels this sport facility at their own risk.
- b) Upon buying a ticket, every user recognizes the conveyance conditions irrevocably.
- c) Entry to the facility is only permitted at designated entry points.
- d) It is prohibited to damage the operational equipment and the toboggans, create obstructions to travel, put the facility into motion without authorization, operate equipment without authorization or perform other actions that disrupt or endanger operation.
- e) The users may only begin and end travel at designated points.
- f) The use of the facility is only permitted by means of the toboggans provided.
- g) Smoking is prohibited during travel.

1) See manufacturer's data.

- h) Accidents shall be reported immediately to the operating personnel.
- i) Travel on the toboggan run and uphill transport system is only allowed if the safety equipment/controls on the toboggan are used as intended.
- j) The start intervals indicated shall be complied with.
- k) The restraint system of the toboggan may not be opened during travel.
- l) Animals or umbrellas, walking sticks and other bulky, sharp, pointed or loose objects may not be taken aboard the toboggan.
- m) Loose clothing (belts, scarves, shoelaces, etc.) and long hair (plaits) shall be kept away from the course or running wheels.
- n) It is prohibited to lean out of the toboggan or extend arms and legs out from the toboggan. Do not touch the course.
- o) A considerate method of operation shall be complied with (e.g. braking in sufficient time, observing minimum distances, arrival at the end of the toboggan run at a slow speed, choosing the speed so that you do not put yourself or others at risk).
- p) Ramming other toboggans is strictly prohibited.
- q) Do not travel too slowly, only stop in an emergency.
- r) The upper body shall always point in the direction of travel. Do not turn around, kneel or stand.
- s) Information signs shall be observed and the driver shall concentrate on the course.
- t) Drivers shall always keep their hand/hands on the brake lever(s).
- u) The larger of two persons shall always sit at the rear. The driver shall have a clear and free view.
- v) The instructions of the personnel shall be followed. Use shall be prohibited upon failure to observe the conveyance conditions.

5.6 Rescue

Rescue and recovery shall always be performed following the instructions of the operating personnel.

The concrete procedure of the rescue, deployment of operating personnel, defining routes on the grounds, additional use of rescue vehicles on the grounds, assembly locations, etc. are incumbent on the operating instructions of the operator.

A rescue exercise shall be conducted regularly (e.g. once a year) with the involvement of the operating personnel and documented in the operational logbook.

6 Signs

6.1 General

The size of the signs on the course shall correspond as a minimum to the values according to [Table 1](#), in order to ensure legibility at 25 m.

Table 1 — Minimum size of the signs

Dimensions in millimetres

| Triangular | Rectangular | Square | Round |
|----------------|-------------|-----------|-------|
| 500 leg length | 600 × 400 | 400 × 400 | 400 |

6.2 Minimum signage

The minimum signage supplied by the manufacturer shall be erected in coordination with the operator.

The safety signs according to [Annex A](#) shall be used for the minimum signage of a summer toboggan run.

The conveyance conditions according to [5.5](#) shall be indicated at a point visible to the user at the entry area.

The correct conduct shall be pointed out to users on the route of the uphill transport system.

Instructions for correct conduct (e.g. before tunnel, sharp curves, crests and end of course) shall be provided on the downhill toboggan run after risk assessment.

Where safety signs are required, these shall be designed according to ISO 3864-1 and ISO 3864-3.

6.2.1 Additional signage

The operator shall determine and provide possible additional signs based on the risk analysis (see [4.2](#)), if they are required for safe use and safe operation.

Additional safety signs can be found in ISO 7010.

Graphic symbols should be a part of the signage. New symbols should be provided with an explanatory text, either as part of the sign or as additional text.

It may be necessary to add multilingual explanatory texts.

7 Maintenance, repair and modifications

7.1 General

All maintenance and repair work, tests and inspections specified by the manufacturer with the required intervals shall be consulted in the operating instructions of the manufacturer, performed by the operator and documented in the operational logbook (see [Annex C](#) for example).

A recurrent test shall be commissioned by the operator corresponding to the operational approval of the facility.

7.2 Maintenance

The maintenance intervals specified by the manufacturer may not be exceeded, unless an extension of the maintenance period has been agreed in writing with the manufacturer.

All components and assemblies that have been tested, lubricated, adjusted or replaced during the maintenance intervals shall be documented in the operational logbook.

The operator shall ensure that the replacement parts installed during maintenance work correspond to the correct specifications. If replacement parts other than those specified by the manufacturer are used, the operator shall regard this as a modification and undertake the measures explained in ISO 19202-1:2017, 7.5.

7.3 Repair

Repairs may only be carried out in accordance with the manufacturer data. If welding work is to be performed, the procedure shall follow ISO 19202-1.

7.4 Modifications

All modifications outside the manufacturer specifications in relation to

- a) construction parts,
- b) mechanical parts, and
- c) safety equipment and control technology

may only be carried out after consultation with the manufacturer and or other competent persons.

If it is decided after such a consultation that the modification is permissible, the manufacturer or other competent person shall approve the modification proposal in writing.

All modification shall be documented in the operational logbook and the associated test report of the test body shall be added to the technical documentation according to ISO 19202-1.

7.5 Course care

The operator shall regularly secure and look after the course with the following aspects in view (if applicable):

- a) safety measures for proper ground fixation of the supporting structure (e.g. rod anchors, slope stabilization, drainage);
- b) vegetation (e.g. grass, trees, bushes);
- c) stone chippings, snow avalanches, landslides;
- d) rescue routes on the grounds;
- e) additional structures (e.g. platforms, underpasses, overpasses).

All care work shall be documented in the operational logbook.

8 Environmental aspects

The following aspects shall be taken into consideration to enable environmentally friendly operation:

- a) non-use of environmentally harmful pesticides;
- b) non-use of environmentally harmful de-icing agents (e.g. road salt) during winter operation;
- c) preservation of natural resources (e.g. water);
- d) energy-saving operation;
- e) prevention of excessive noise;
- f) refuse prevention, waste separation and waste disposal (e.g. proper disposal of lubricants and used oil).

Annex A
(normative)

Minimum signage — Safety signs/Combination signs



**Figure A.1 — Mandatory action sign with additional text —
Safety statement "Keep distance between toboggans"**



Stopping
prohibited!

Figure A.2 — General prohibition sign (ISO 7010-P001) with additional text — Safety statement “Stopping prohibited”



Do not
ram into
toboggans!

Figure A.3 — Prohibition sign with additional text — Safety statement “Do not ram into toboggans”



Figure A.4 — General warning sign (ISO 7010-W001) with additional text — Safety statement “End of toboggan run”



Accelerate!

Figure A.5 — Graphical symbol with additional text — Safety statement “Accelerate”



Brake!

Figure A.6 — Graphical symbol with additional text —
Safety statement “Brake”



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Figure A.7 — General warning sign (ISO 7010-W001) with additional text —
Safety statement “Slow! X m until end of toboggan run!”



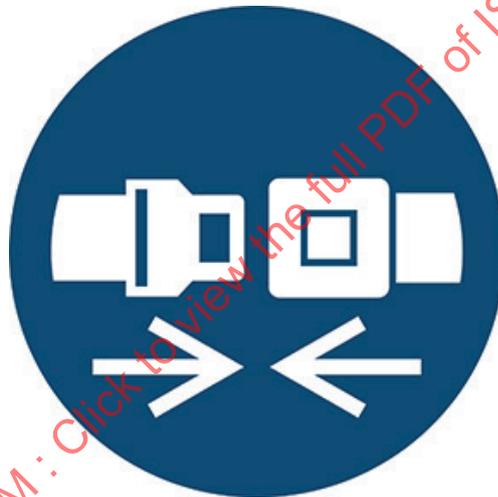
Figure A.8 — Prohibition sign with additional text — Safety statement "Do not lean out of toboggan"



Figure A.9 — Mandatory sign — "Please alight from toboggan to left"



Figure A.10 — Mandatory sign — “Please alight from toboggan to right”



NOTE According to ISO 7010-M020.

Figure A.11 — Mandatory sign — “Use restraint system”

Annex B (informative)

Example of a risk analysis — Help for actions

B.1 General

The safety checks are derived from the analysis of

- general hazards, and
- facility-specific hazards at summer toboggan runs.

The risk assessment is combined with a risk analysis according to the Zurich method (see [Table B.1](#)). This procedure is practically oriented.

Table B.1 — Zurich-method

| | | | | | | | |
|----------------------------------|----------------------------------|---|---|---|---|---|---|
| Consequence/ Severity | A | | | | | | |
| | B | | | | | | |
| | C | | | | | | |
| | D | | | | | | |
| | E | | | | | | |
| | F | | | | | | |
| | | 6 | 5 | 4 | 3 | 2 | 1 |
| | Probability of occurrence | | | | | | |

B.2 Explanation of the Zurich method

B.2.1 General

The “Zurich method” is a suitable method to indicate hazards and risks quickly and systematically, and derive suitable measures for dealing with the risk. It has been considered for evaluation of the accident and health hazards for the operating personnel in the present safety check. In addition, the method may also be applied for estimating risks that can lead to hazards for users, environmental harm or material damage.

B.2.2 Procedure

The procedure should be carried out in a team, if possible. If this is not possible, at least the results should be discussed with another person with appropriate competence.

As a rule, the application field and purpose shall be defined first when applying the Zurich method. The application field and purpose are already specified by the safety check to be conducted and by the activity and hazard according to [Table B.4](#) and [B.5](#), columns 1 and 2, for the consideration within the safety checks.

The hazards are classified into categories according to their consequence/severity and according to their probability of occurrence. The categories of the consequence/severity typically depend on the number of deaths, the injuries, the severity of the injuries, the environmental consequences or material damage for the enterprise (see [Table B.2](#)).

Table B.2 — Consequence and severity

| Level | Effect | Material damage | Examples of possible incidents |
|-------|--|-----------------|---|
| A | Catastrophic Multiple deaths | >€1,000,000 | — Accident with multiple deaths — Environmental incidents outside the operational grounds — Very extensive material damage |
| B | Very critical One death, permanent harm to health | >€250,000 | — Accident with one death or with permanent harm to health — Occupational illness, notifiable environmental incident — Extensive damage |
| C | Critical Accident with lost working days | >€50,000 | — Accident or illness with lost working days — Environmental incident with considerable internal consequences — Considerable damage |
| D | Less critical Accident without lost working days | >€10,000 | — Accident with minor injury — Hazardous substance escape without significant danger to the environment or persons — Damage |
| E | Minor “First-aid” accident | >€1,000 | — Accident with first-aid provision — Entry in first-aid log, hazardous substance escape with minor danger to the environment or persons — Minor damage |
| F | Insignificant No injury | >€100 | — Improbable incidents with minor consequences (acceptable risk) — Minor damage from operational routine |

The hazards (consequences/severity) are linked to relative occurrence probabilities. If the probability of occurrence cannot be indicated, the frequency of such incidents in the enterprise or in the sector can be adopted as a starting point for this. A classification into six levels has proven effective (see [Table B.3](#)).

Table B.3 — Probability of occurrence

| Level | Probability of occurrence | Frequency in the enterprise/sector |
|-------|---------------------------|---|
| 1 | Frequent | Once a week or more frequently |
| 2 | Often | Occurred several times already in the company |
| 3 | Occasionally | Occurred already in the company |
| 4 | Seldom | Occurred several times already in the sector |
| 5 | Very seldom | Occurred already in the sector, already of it |
| 6 | Improbable | Never occurred, not known in the sector |

All recognized hazards are evaluated according to their consequence/severity and probability of occurrence and entered in the risk matrix (actual state). If the incident is in the green range, measures are not necessary because the acceptable residual risk is not exceeded. The red range indicates a very high risk and requires immediate measures. Further measures are also required for the yellow range, e.g. special operating instructions explaining the correct conduct of the employees.

The measures shall be selected so that the hazards in respect to consequences and/or probability of occurrence are reduced to the extent that they are within the acceptable residual risk.

The compiled risk profile is also a good action aid for recognizing priorities and consequently helps to initially eliminate the greatest risks. As a rule, however, all recognized risks are to be minimized.

As the evaluation benchmarks change over longer periods, all hazard assessments should be checked regularly and adapted to the new requirements.

B.3 Application

B.3.1 General

The application of [Tables B.4](#) and [B.5](#) is explained below.

The activities occurring most frequently are indicated in the process-oriented representation in the first column. The second column indicates the hazards resulting in this context. The following column contains an estimation of the hazard without further protection measures as defined by an initial hazard according to the Zurich method. The “Measures” column lists concrete measures for minimising the hazard, which have proven to be effective in practice. The relevant measures already undertaken shall be check marked. Supplements shall be implemented if the facility-specific hazards require further measures. These should also be classified with the Zurich method.

Requisite instructions are already marked with the “I” column.

The “Result” column indicates the evaluation according to the Zurich method, if all relevant measures are undertaken. The completion of pending measures shall be noted in the following column. It is also necessary to indicate whether external consultancy by an occupational safety specialist (OSS) or a company medical officer (CMO) may be required for this.

If further hazards not indicated in [Tables B.4](#) and [B.5](#) result from the activities at the facility, these shall be supplemented, assessed according to the Zurich method and adequate measures defined.

The applicable legal regulations shall be taken into consideration for the application of [Tables B.4](#) and [B.5](#).

NOTE Relevant legal regulations are listed in the Bibliography section.

B.3.2 Documentation

The fully recorded safety check represents the documentation of the risk assessment. The situation in the enterprise shall be checked regularly for changes, if necessary a renewed risk assessment shall be conducted.

B.3.3 Checking the effectiveness

It is particularly important for the maintenance of the attained state of the facility and compliance with the specified workflow to be ensured within the framework of the operational organization after implementation of all measures. If defects or discrepancies are determined, these shall be rectified immediately.

B.4 General risks for employees

An example of a risk analysis is cited in Reference [1]. General hazards for employees can also be indicated in [Table B.4](#).

B.5 General hazards

The user is permitted to duplicate the form in [B.5](#) irrespective of the rights of ISO to the entirety of the document.

Table B.4 — General hazards

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|---|---|------------|---|---|--------|--------------|--|
| General | Tripping, slipping and falling on traffic routes and floors | C3 | <ul style="list-style-type: none"> — Floor coverings and stair steps are non-slip and even — Tripping points and objects lying around are removed, remaining tripping points are marked — Stairs with more than four steps have at least one handrail — Traffic and access routes are regularly freed of vegetation and are adequately illuminated — Traffic routes and areas are kept free of ice or skid-proof — ... — ... | <ul style="list-style-type: none"> x x x | D4 | | “OSS” ^b “CMO” ^c none |
| General | Stay in the open air | C4 | <ul style="list-style-type: none"> — If a storm and/or thunder and lightning is discerned, operations are stopped — For protection against lightning, all metal course components and equipment in contact with them are earthed — ... — ... | <ul style="list-style-type: none"> x x | E4 | | “OSS” ^b “CMO” ^c none |
| General | Absence of sanitation facilities and rooms | D3 | <ul style="list-style-type: none"> — Toilets are located in the vicinity of the facility — ... — ... | <ul style="list-style-type: none"> | F4 | | “OSS” ^b “CMO” ^c none |
| General | Fire and explosion | B4 | <ul style="list-style-type: none"> — A fire safety ordinance according to DIN 14096 is established — Fire loads are kept as low as possible — Flammable substances and objects are stored in suitable containers/rooms — Ignition sources are to be avoided as extensively as possible — Smoking and naked flames are prohibited in hazard zones; these areas are marked | <ul style="list-style-type: none"> x x x x | E5 | | “OSS” ^b “CMO” ^c none |
| ^a I: Instructions. ^b OSS: External consultancy requirement by an occupational safety specialist. ^c CMO: External consultancy requirement by a company medical officer. | | | | | | | |

Table B.4 (continued)

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|---|----------------------------|------------|---|---|--------|--------------|--|
| General | Fire and explosion | B4 | <ul style="list-style-type: none"> — Smoking prohibitions are observed — Sufficient and suitable extinguishing equipment is provided and tested regularly — Escape and rescue routes are provided, marked and kept free — Escape doors open in the direction of escape — ... — ... | <ul style="list-style-type: none"> x x | E5 | | "OSS" ^b "CMO" ^c none |
| General | No or inadequate first-aid | C4 | <ul style="list-style-type: none"> — The first-aid is organized (e.g. rescue chain) — Trained first-aiders are on site — First-aiders participate in further training regularly — A sufficient number of first-aid boxes is provided — First-aid boxes are regularly checked for completeness and the expiry date of the material — Emergency plan is provided — Staff have (e.g. via the first-aid notice) the most important information in regard to first-aid (first-aiders, emergency phone numbers, doctors, hospitals) — Equipment for rescue on the grounds is provided — ... — ... | <ul style="list-style-type: none"> x x x x x x x | E4 | | "OSS" ^b "CMO" ^c none |
| ^a I: Instructions. ^b OSS: External consultancy requirement by an occupational safety specialist. ^c CMO: External consultancy requirement by a company medical officer. | | | | | | | |

Table B.4 (continued)

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|--|---|------------|---|---------------------|--------|--------------|--|
| General | Inadequate suitability and knowledge of the employees | D3 | <ul style="list-style-type: none"> — The suitability of the employees is determined for the relevant activities — Employees are trained upon recruitment, before assuming a new activity and regularly afterwards and motivated to be aware of safety in their conduct — ... — ... | x | E4 | | “OSS” ^b “CMO” ^c none |
| General | Physical strain | E2 | <ul style="list-style-type: none"> — Operating personnel are deployed corresponding to their physical resilience — Work in a non-ergonomic posture is only carried out for a short period — ... — ... | x | F5 | | “OSS” ^b “CMO” ^c none |
| Lifting and carry of loads | Excessive load weights | C3 | <ul style="list-style-type: none"> — Loads over 25 kg are not moved alone, if possible — ... — ... | x | E4 | | “OSS” ^b “CMO” ^c none |
| Repair work | Electric current | C3 | <ul style="list-style-type: none"> — Work on electrical systems is only carried out by qualified electricians — Switch cabinets are locked — The “five” safety rules (disconnect, secure against reactivation, established absence of voltage, earth and short-circuit, cover or shield adjacent live parts) are complied with — ... — ... | x x x | E4 | | “OSS” ^b “CMO” ^c none |
| <p>^a I: Instructions.</p> <p>^b OSS: External consultancy requirement by an occupational safety specialist.</p> <p>^c CMO: External consultancy requirement by a company medical officer.</p> | | | | | | | |

Table B.4 (continued)

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|---|--|------------|---|--|--------|--------------|--|
| Repair work | Moving parts in or on systems and work equipment | C3 | <ul style="list-style-type: none"> — Hazard points in the work and traffic area (apart from cable inlet points on supports and stations) are secured by interlocking guards — Protective guards may not be removed or rendered ineffective without good reason — Protective guards are reattached after completing the work — ... — ... | <ul style="list-style-type: none"> x x | E4 | | "OSS" ^b "CMO" ^c none |
| Repair work | Falling and toppling objects | C3 | <ul style="list-style-type: none"> — When working at heights material and work equipment is secured against falling — Stacked objects are secured against toppling over — ... — ... | <ul style="list-style-type: none"> x | E4 | | "OSS" ^b "CMO" ^c none |
| Repair work | Repair work on the facility | B2 | <ul style="list-style-type: none"> — Repair work and fault rectification while the facility is operating may only be carried out if a hazard does not result from this; if this cannot be safely ruled out, the repair is only carried out when the facility is switched off and protected against reactivation — Wearing suitable PPE (e.g. shoes, gloves, goggles, safety helmets, protective work clothing, etc.) — ... | <ul style="list-style-type: none"> x | E3 | | "OSS" ^b "CMO" ^c none |
| Course care | Working with hedge cutters and motorized chainsaws | C3 | <ul style="list-style-type: none"> — Sufficient distance to third parties in accordance with manufacturer data, usually 20 m to 25 m, is complied with — Suitable personal protective equipment (PPE) is work — ... — ... | <ul style="list-style-type: none"> x x | E3 | | "OSS" ^b "CMO" ^c none |
| ^a I: Instructions. ^b OSS: External consultancy requirement by an occupational safety specialist. ^c CMO: External consultancy requirement by a company medical officer. | | | | | | | |

B.6 Particular hazards for summer toboggan runs

The user is permitted to duplicate the form in B.6 irrespective of the rights of DIN to the entirety of the document.

Table B.5 — Particular hazards for summer toboggan runs

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|---|---|------------|--|---|--------|--------------|--|
| Repair of the toboggan run (e.g. fault rectification, course repair, vegetation care) | Work on the toboggan run | C3 | <ul style="list-style-type: none"> — Entry to the course is safely prevented during work on the toboggan run — The facility is only operated again after a clear release — A test run is conducted before assuming ride service — Rails/Trough are only cleared with suitable work equipment and in a suitable way — ... — ... | <ul style="list-style-type: none"> x x x | E4 | | “OSS” ^b “CMO” ^c none |
| Repair of the toboggan run (e.g. fault rectification, course repair, vegetation care) | Tripping, slipping and falling on the grounds and on the toboggan run | C3 | <ul style="list-style-type: none"> — A continuous, safely accessible path is provided along the toboggan run — Toboggan run points that have to be crossed regularly are designed so that the risk of tripping and falling is minimized (e.g. options for holding safely, non-slip properties) — Additional measures against falling or sliding out (e.g. rope protection) are provided on very steep ground — ... | xx | D4 | | “OSS” ^b “CMO” ^c none |
| ^a I: Instructions. ^b OSS: External consultancy requirement by an occupational safety specialist. ^c CMO: External consultancy requirement by a company medical officer. | | | | | | | |

Table B.5 (continued)

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|---------------------|---|------------|--|----------------|--------|--------------|--|
| Toboggan occupancy | Overloading the toboggan Non-operability and operational malfunction | C3 | — The conveyance conditions are complied with | x | E3 | | "OSS" ^b "CMO" ^c none |
| | | | — The supervision/instruction is provided by the operating personnel | x | | | |
| | | | — The users are positioned correctly (e.g. smaller person at front) | x | | | |
| | | | — A brake test is carried out before commencing the run | x | | | |
| | | | — The operating personnel monitor whether seats offer sufficient space for users | x | | | |
| | | | — Compliance with the permitted total weight is monitored | x | | | |
| | | | — It is ensured that feet and legs can be kept in the toboggan | x | | | |
| | | | — ... | | | | |
| Use of the toboggan | Ramming | C3 | — The sign "Keep your distance" and "No ramming!" is located for clear recognition | x | E4 | | "OSS" ^b "CMO" ^c none |
| | | | — The conveyance conditions are complied with | x | | | |
| | | | — The supervision/instruction is provided by the operating personnel | x | | | |
| | | | — Start intervals are observed | | | | |
| | | | — ... | | | | |
| | | | — ... | | | | |

^a I: Instructions.
^b OSS: External consultancy requirement by an occupational safety specialist.
^c CMO: External consultancy requirement by a company medical officer.

Table B.5 (continued)

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|--|--|------------|---|--|--------|--------------|---|
| Use of the toboggan | Falling/ Leaning out of the toboggan | B4 | <ul style="list-style-type: none"> — The sign “Do not lean out!” is located for clear recognition — Adequate crash space is provided for the trough run — Sufficient free space is provided — Safety belts are used in the toboggan — The sign “Lock safety belt!” is located for clear recognition — The belt cannot be opened inadvertently — The conveyance conditions are complied with — The supervision/instruction is provided by the operating personnel — ... | <ul style="list-style-type: none"> x x x x x x | E4 | | <p>“OSS”^b</p> <p>“CMO”^c</p> <p>none</p> |
| Use of the toboggan | Arriving at the station too rapidly | C3 | <ul style="list-style-type: none"> — The end of the toboggan run is clearly marked, e.g. by a warning tape — The conveyance conditions are complied with — The supervision/instruction is provided by the operating personnel — The sign “Brake” and “End of toboggan run in X m” is located for clear recognition — The toboggan end brake is provided and functional — ... | <ul style="list-style-type: none"> x x x x | E5 | | <p>“OSS”^b</p> <p>“CMO”^c</p> <p>none</p> |
| <p>^a I: Instructions.</p> <p>^b OSS: External consultancy requirement by an occupational safety specialist.</p> <p>^c CMO: External consultancy requirement by a company medical officer.</p> | | | | | | | |

Table B.5 (continued)

| Activity | Hazard due to | Evaluation | Measures | I ^a | Result | Completed on | External advice |
|-----------------------------|--|------------|--|----------------|--------|--------------|--|
| Alighting from the toboggan | Users remain seated at the end of the toboggan run and do not alight | C3 | — The signs “Alight to left/right” and “Attention! End of toboggan run” is located for clear recognition | | E5 | | “OSS” ^b “CMO” ^c none |
| | | | — The conveyance conditions are complied with | x | | | |
| | | | — The supervision/instruction is provided by the operating personnel | x | | | |
| | | | — The safety equipment is active | | | | |
| | | | — ... | | | | |
| | | | — ... | | | | |

^a I: Instructions.
^b OSS: External consultancy requirement by an occupational safety specialist.
^c CMO: External consultancy requirement by a company medical officer.

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