Accidents, Psychological Incidents and Near Misses – Report 2004/2005

A Survey Compiled by the European Ropes Course Association (ERCA e.V.)

Kern, V./ Kölblinger, M./ Haselbach, M./ Rademächers, B./ Schweinheim, F.

Since 2002, ERCA has been carrying out an annual survey of accidents, near misses and psychological incidents on ropes courses. The survey covers ERCA members only. Participation is on a voluntary basis. Members' observations about accidents and incidents are recorded via a questionnaire and sent to ERCA's safety committee. This committee consists of a number of experts, who conduct a qualitative and quantitative analysis of the reported cases. The aim of this long-term study is twofold: a) to record occurrences on ropes courses; b) to undertake research into the causes of accidents on ropes courses. The overall intention is to develop knowledge and expertise, processes and tips for the prevention of accidents on ropes courses.

This report summarises the results of the ERCA survey for 2004 and 2005. It is made available to ERCA members for information and discussion purposes.
We would like to thank all those members who generously volunteered critical information about their personal experiences, and especially for their suggestions for safety improvements.
When looking more closely at the data provided by the small group of members, it becomes apparent that wherever ropes courses are being operated, similar near misses and mistakes to the ones reported have already happened, or are likely to happen in the future. It is therefore our intention to establish the frequency and extent of accidents for specific activities, to identify the causes of these accidents, and to discuss and develop relevant suggestions for the prevention of these accidents. We also want to draw your attention to the fact that the documentation of near misses and psychological incidents is of equal importance to accidents in terms of understanding safety risks. Serious accidents are often a result of multiple incidents occurring either simultaneously or consecutively (chain reaction). They may have been preceded by a number of situations which just about turned out to be okay – in other words - near misses!

Near misses are often a result of typical behavioural patterns, technical conditions, a specific situation or organisational circumstances. Experienced ropes course operators and facilitators who are attentive and cautious, recognise these conditions and take pre-cautionary measures. We can learn from near misses and take pre-cautionary steps, before people get hurt.

Data Analysis

The collation of data resulted in a vast amount of figures, data and facts, which at this stage cannot be presented at the same level of detail. The data may yet be helpful in the future, for a long-term study. The statistical data presented here include details about:

- The type of incident/accident
- The number of incidents/accidents on high and low ropes courses
- A comparison of the number of incidents/accidents on stationary and mobile ropes courses
- The type of injuries
- The point of time during the programme when the incident/accident happened.

We are publishing the quantitative statistical information in order to document first impressions and trends of our analysis, despite the fact that our sample is too small for drawing any wider conclusions. The report consists of 3 parts: Part A is a general description and summary of the number and types of recorded incidents and accidents. Part B provides a more detailed description of accidents and near misses. Part C shows a categorisation of occurrences and provides further comments. The final part briefly describes the different categories and draws conclusions about the prevention of accidents.

A. Quantitative Analysis

In 2004 and 2005, a total of 11 incidents and accidents were reported. In 2004, 8 incidents were reported, 3 near misses (NM), 0 psychological incident (PI) and 5 accidents (A). In 2005, 3 reported incidents and accidents in total shows a decline of occurrences across the board (0 NM, 0 PI, 3 A in 2005).

Year	Type of Incident/Accident			**Total 2004/2005**
	Near Miss	Psychological Incident	Accident	
2004	3	0	5	**8**
2005	0	0	3	**3**
Total 2004/2005	**3**	**0**	**8**	**11**

Previous Survey 2002/2003 (total)	7	1	20	28

Chart 1: Number and type of incidents/accidents in 2004/2005, plus comparison with the previous accident survey from 2002/2003.

Comparison of Incidents and Accidents on High and Low Ropes Courses
7 incidents and accidents were reported for high ropes courses, in contrast to 4 on low ropes courses.

Type of Ropes Course	Year	Type of Incident/Accident			**Total**
		Near Miss	Psychological Incident	Accident	
High Ropes Course	2004	3	0	3	6
	2005	0	0	1	1
	Total 2004/2005	**3**	**0**	**4**	**7**
	Previous Survey 2002/2003 (total)	7	1	15	23
Low Ropes Course	Period 2004	0	0	2	2
	2005	0	0	2	2
	Total 2004/2005	**0**	**0**	**4**	**4**
	Previous Survey 2002/2003 (total)	0	0	5	5

Chart 2: Number and type of incidents/accidents on high and low ropes courses in 2004/2005, plus comparison with the previous accident survey from 2002/2003.

Comparison of the Frequency of Incidents and Accidents on Stationary and Mobile Ropes Courses

Chart 3 shows the frequency of incidents and accidents on stationary and mobile ropes courses. 8 occurrences were reported on stationary ropes courses, only 3 were reported on mobile ropes courses.

Type of Ropes Course	Year	Type of Incident/Accident			**Total**
		Near Miss	Psychological Incident	Accident	
Stationary Ropes Courses	2004	3	0	3	6
	2005	0	0	2	2
	Total 2004/2005	**3**	**0**	**5**	**8**
	Previous Survey 2002/2003 (total)	7	1	16	24
Mobile Ropes Courses	Period 2004	0	0	2	2
	2005	0	0	1	1
	Total 2004/2005	**0**	**0**	**3**	**3**
	Previous Survey 2002/2003 (total)	0	0	4	4

Chart 3: Frequency of incidents and accidents on mobile and stationary ropes courses in 2004/2005; plus comparison with the previous accident survey from 2002/2003.

A word of caution against a more comprehensive interpretation of this set of data:

- The number of reported incidents and accidents is too small to make statistically sound and reliable statements or to draw conclusions.
- At this stage, we have hardly any figures indicating the ratio between participant days and frequency of incidents/accidents. Yet the numbers that we do have access to show a very high number of participant days on high ropes courses in comparison to mobile ropes courses.

Reported Number of User Days in 2004

As in previous years, we asked members for the number of participant days in 2004/2005. ERCA members provided their figures on a voluntary basis at the end of the calendar year.
NB: We do not have any figures for the year 2005.

In line with ERCA's membership structure (i.e. ropes course trainers, training organisations, ropes course builders and associations), the reported figures range between 24 and 7800 participant days per year (NB: figures apply to 2004 only). The total number of participant days in 2004 is 106.949 days. Based on those figures, the ratio for incidents and accidents in 2004 is 1:13368; and the ratio for accidents is 1:21389.

This means that based on the numbers provided for incidents, accidents and overall participant days, our records show one incident for every 13368 participant days, and one accident for every 21389 participant days.

		Frequency	Percentage	Valid Percentage	Total Percentage
Valid	48	1	10	10	10
	72	1	10	10	20
	121	1	10	10	30
	177	1	10	10	40
	481	1	10	10	50
	1.150	1	10	10	60
	1.200	1	10	10	70
	3.700	1	10	10	80
	8.000	1	10	10	90
	92.000	1	10	10	100
Total	**106.949**	**10**	**100**	**100**	

Chart 4: Total number of participant days in 2004

Time of the Incident/Accident

Information regarding the collation of data: The table shows all data provided. Some members reported the exact time of the incident/accident; other members provided either a description of the time or no information at all. This is why the table is split into two parts.

The analysis of the timing of an incident or accident during a ropes course programme shows that the highest number of accidents happens during the second hour of a ropes course programme. All accidents within this timeframe happened on the Mohawk Walk Activity.

	Point in Time	Type of Incident/Accident			**Total**
		Near Miss	Psychological Incident	Accident	
Description of the Point in Time	No information provided	3	0	2	**5**
	Installation of a High Ropes Course	0	0	1	**1**
	Unauthorised Usage	0	0	1	**1**

and

Exact time of incident/accident given (Data shows number of hours after programme start)	1	0	0	0	**0**
	2	0	0	2	**2**
	3	0	0	0	**0**
	4	0	0	1	**1**
	5	0	0	0	**0**
	6	0	0	0	**0**
	7	0	0	0	**0**
	8	0	0	1	**1**
Total		**3**	**0**	**9**	**11**

Chart 5: Frequency based on time of incident/accident (2004/2005)

Type of Injury

Reported accidents on low ropes courses included abrasions, friction burns of hands, contusion of the back, torn tendons and light sprains of limbs. Mostly these injuries were caused by falling off a low ropes course element.
On high ropes courses, the severity of reported injuries is greater due to the greater height and stronger impact when participants fall down from elements.

Type of Injury		Type of Ropes Course		**Total**
Type of Injury	Affected Body Part	High Ropes Course	Low Ropes Course	
None		4	0	**4**
Broken limbs	Thumb	1	0	**1**
	shoulder, back, pelvis, hip	1	0	**1**
Light sprain	foot and ankle	0	1	**1**
Giddiness	head and shoulders	1	0	**1**
Back pain		0	1	**1**
Friction burns	palms	0	1 Accident (4 Participants)	**1**
Torn tendon	elbow	0	1	**1**
Total		**7**	**4**	**11**

Chart 6: Type and frequency of injuries on low and high ropes courses in the period of 2004/2005

A more in-depth data analysis has not been attempted in this survey due to the small sample of reported accidents and incidents.

B. Accident Reports

The ERCA questionnaire consists of a range of open and closed questions about the location of the accident/incident, the sequence of events and other relevant questions. Some of those questions were answered in great detail; others were not answered at all. We have written the following cases strictly based on the information provided by our members' questionnaires. This means that some cases are described much more comprehensively than others.
We have categorised the accident reports according to causal effects. Therefore we have listed accidents and incidents on low ropes course elements before accidents and incidents on high ropes courses.
In addition we have made a distinction between the following functional categories:

- Injuries caused by falls
- Injuries caused whilst jumping
- Accidents and incidents due to unauthorised access
- Accidents and incidents linked to environmental factors and weather conditions
- Accidents and incidents linked to logistics and organisation
- Accidents and incidents caused by types of construction or construction parts

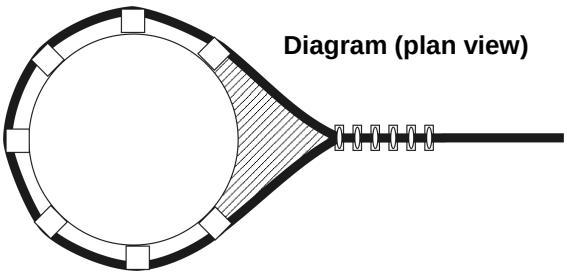
Naturally, almost any of these accidents and incidents can be listed under more than one category.

B.1 Low Elements
B.1.1 Injuries on and Falls from Low Elements

Fall off the Mohawk Walk (2004-U004)

A female participant stood at the end of a low ropes course element (a 3 meter long steel cable under tension, without any further support). With one hand, she was holding on to the tree to which the steel cable was fixed, whilst reaching over towards another participant. At this point, she lost her balance and fell backwards, and the tip of her left foot got caught in the triangular opening of the steel cable construction (see shaded section in the diagram below). The participant fell off the steel cable and suffered from pain in the ankle of her left foot.

Diagram (plan view)



Description of the Diagram: When fixing a steel cable to a tree by wrapping the cable and a wooden protection piece round the tree, a triangular gap is created between the steel cable and the tree trunk (= shaded area in the diagram).

The female ropes course trainer went on to report that at this point, the female participant was highly motivated to help the other participants and that she was therefore less concerned about her own safety. Up to this point, the whole participant group had been very unfocused and rushed. The responsible spotter had not paid enough attention and had not been able to cushion the fall.

Before the accident happened, the trainer had already stopped the programme once because it did not “feel right”, and to remind the group of the safety aspects of the situation.
With hindsight, the female trainer explains that she had underestimated the behavioural issues of the group, to which she had been alerted before the training programme began. She had also underestimated the group dynamics during the low ropes course programme, which had developed as a result of those behavioural problems. Her recommendation for working with groups that have behavioural problems is to make changes to the methodology, such as splitting groups or reducing the number of programme activities.

Fall off Mohawk Walk

On the first day of an incentive programme, 12 participants were taken through the low ropes course element called “Mohawk Walk”. The ratio between trainers and participants

was 1:12. During the exercise it started to get dark, it was raining lightly (drizzle), and the temperature was about 3° Celsius.
During the exercise a female participant fell backwards and was unable to regain her balance, neither by holding onto a tree nor by holding onto another participant. Afterwards the participant complained about back pain. After a short conversation with the trainer, she was able to continue with the programme.

Other information shared by the person who submitted the incident report included that the participants were not properly equipped for outdoor training (the client had not informed participants about the equipment needed). As a result, participants were wearing inadequate footwear. In addition, it was reported that even before the beginning of the programme the project leader in charge had deemed the height of the Mohawk Walk as too high, yet failed to instruct someone to alter the height or to adjust the height himself.

As part of the assessment of the incident, the person who reported it advised that participants must be thoroughly briefed about the content of the programme before the programme start so that they can prepare themselves adequately. Other recommendations include: installing the Mohawk Walk at low height and giving a higher number of participants the responsibility to act as spotters during the exercise.

Injuries of Hands during the Swing Rope Activity „Disc-Jockey“

During a training programme for ropes course trainers, the low ropes course element “Disc-Jockey“[1)] was run as part of a series of activities. A few minutes after the exercise had finished, four participants asked for plasters. They all had injuries (friction burns) on their palms. The person who reported the incident stated that participants had not noticed these injuries during the activity. When the group reviewed the activity, participants shared that they had felt uncomfortable during the exercise and had been doubtful whether they would be able to complete it. Despite feeling anxious, no one had made use of the “stop” rule, which according to the person reporting the incident was probably due to high levels of peer pressure in the group. The person acknowledged that the exercise had been too demanding and participants’ skills levels had been overestimated.

The respondent strongly recommends using appropriate ropes in order to minimise the danger of friction burns. In addition, all participants should be given the opportunity to try the exercise out and take a few swings to familiarise themselves with the activity, before going through the entire exercise as a group.

Additional information about [1)] : The low ropes course element “Disc Jockey” entails participants holding on to a vertical swing rope and to swing from starting point A to the end point B. This means that during the swinging movement, participants need to be able to hold their full bodyweight supported only by their hands/ using only both their hands.

B.1.2 Injuries caused by Jumping on Low Elements

Rapture of Tendon in Elbow during „Trust Fall“[2)]

During the interactive exercise called „Trust Fall“, one of the participants tore the tendon in his elbow when catching the person doing the trust fall. A detailed description of how the exercise was run was not given.

Additional information about [2)]: A member of the group undertakes a controlled fall backwards into the arms of the rest of the group members who act as spotters.

B.2 Accidents and Incidents in Connection with Environmental Factors and Weather Conditions

Heavy Snow: Participants in Danger during Ropes Course Programme in a Forest – Branches breaking off due to heavy snowfalls

On a day in November 2004, large amounts of wet and heavy snow had fallen overnight. The following day, during the use of a High Ropes Course in a forest, large numbers of branches of deciduous trees nearby the ropes course fell down from the treetops. The programme was stopped as a continuation of the programme would have been highly irresponsible. As the trees had still had many leaves in November 2004, the heavy snow fall had put enormous weight on the branches. As a result, large amounts of branches were damaged and broke off. The real extent of the damage could not be seen until the day after, when it became obvious that thousands of deciduous trees in the region had suffered severe damage to the branches and crowns.

The crown of a tree which had been used as Multivine-Traverse had also been badly damaged.

With hindsight, the trainers said that they did not assess the situation correctly in the morning, and also failed to do so during several further checks once the programme had started. Thus they warn others to be aware of the dangers of doing ropes courses in a forest in snowy conditions. The trainers recommend to be extremely cautious and to closely observe the weather conditions and any changes. Another useful precaution they recommend is listening to the weather forecast and weather warnings provided by the weather service. In their case, the weather service had already reported regional power cuts early in the morning due to heavy snow falls.

B.3 Incidents and Accidents due to Unauthorised Access

Serious Injuries after Using a Climbing Wall without Authorised Access

Three people entered a high ropes course at 10 o’clock in the evening. They were drunk and entered the ropes course without permission. When they tried to climb up the climbing wall giving each other a leg-up, one of them plunged to the ground.

The person, a man aged between 30 and 35, badly injured his shoulder, back, pelvis and hips. He was admitted to hospital and had to be treated for several weeks before he could be released.

The person who reported the accident states that as a result, additional safety signs such as “Private Property” and “No Unauthorised Access” were put up across the location.

B.4 Accidents and Incidents Linked to Logistics and Organisation

Incident during Free Playtime during Lunch break

A school class which participated in a ropes course programme remained within the grounds of the ropes course during their lunch break. They were supervised by their teacher. The trainer had assigned the lunch time supervision to the teacher and reminded him that no pupil was allowed to go anywhere near the ropes course during break time. At this point, a 4 meter long leaning ladder was positioned against a tree with a Jacob’s ladder. During the break, a 16 year old female student ran towards the ladder and pushed against it. The ladder fell over and hit the student on her head and shoulders. The student did not have any visible injuries but felt slightly dizzy for about half an hour. Afterwards, she rejoined the ropes course programme.

The trainers stated in their report that in future they will inform participants and their accompanying staff much more clearly about the dangers involved and that they want to impose stricter rules about appropriate behaviour during break times.

B.5 Accident and Incidents Linked to Types of Construction or Construction Parts

Accident due to the Tearing of a Prusik Knot in a Pulley

A team of trainers was meant to install several rope bridges for an outdoor event. The equipment had not been packed by the lead trainer but by a work experience student. Not all the materials required to build a pulley system had been packed, and were not all available on the day. The slings for the installation of the return stop with the help of a Double Fisherman’s Knot (german word: ‘Kreuzklemmknoten’) were missing. As a substitute the trainers used a 5 mm Prusik knot, although they had learned the proper installation technique in previous training programmes, and had also been taught about the dangers involved when using Prusik knots.

The rope way was installed in the following manner:
- the tree was used as an anchor point, anchorage with a sling
- Deviating point pulley
- return stop with Double Fisherman’s Knot

The system was tightened with a simple pulley, which was then fixed onto the belay rope with the Prusik knot as mentioned before. Three trainers tightened the system with the pulley, whilst a fourth trainer, who had happened to walk past, applied the Double

Fisherman's Knot (return stop). Due to the tension that was put onto system by the pulley via the Prusik Knot, the Prusik Knot burst. As a result, the pulley wheel, which was attached to the Prusik Knot with an HMS carabiner, was hurled backwards. Because of the massive force, the bone of the trainer's thumb resting on the return stop was smashed.

Near Miss on a Zip line

The incident happened on a zip line, which had been installed with a 10mm steel cable. Using a connecting device called „Energica", the participant was attached to the carabiner (type Vertigo-carabiner[4]) of the TRAC pulley wheel[4] made by Petzl. The braking mechanism used to slow down the participant was a second belay rope that was clipped into the Vertigo carabiner attached to the pulley. A second carabiner was hung onto the steel cable that was fixed with a connector at the harness, and which ran alongside the main cable as a backup device.

The braking of the participant was quite abrupt and the participant started to swing strongly. Apparently, the swinging developed such a force that the pulley wheel jumped off the cable. Under this strong force, the steel cable was mangled between the carabiner and the side part of the pulley wheel.

Additional information about [4] : Petzl sells a pulley wheel system specifically made for the use on zip lines on ropes courses. It consists of the TRAC pulley wheel with a carabiner firmly attached (type: Vertigo). For further details, see the Petzl catalogue or the manufacturer's instructions and manuals.

Near Miss on a Zip line

The incident happened on a zip line, which had been installed with a 10mm steel cable. The participant was attached to the Vertigo carabiner of the TRAC pulley wheel made by Petzl[5] with a webbing sling. A second carabiner was hung onto the steel cable that was fixed with a connector at the harness, and which ran alongside the main cable as a backup device.
On this zip line, the braking of the participant was done through gravitation.

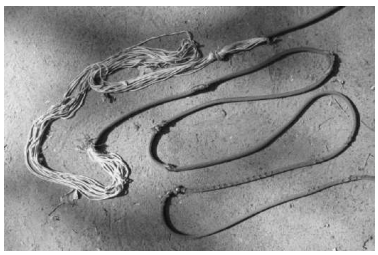
When the participant started running to jump onto the zip line, the vertical force onto the pulley was not applied evenly. This is likely to be the reason why the pulley jumped off the cable.

Additional information about [5] : Petzl sells a pulley wheel system specifically made for the use on zip lines on ropes courses. It consists of the TRAC pulley wheel with a carabiner firmly attached (type: Vertigo). For further details, see the Petzl catalogue or the manufacturer's instructions and manuals.

Splitting the mantle of a rope whilst participant is lowered from a Top Rope Ropes Course Element

The accident happened when participants were lowered from the high ropes course element “High Y”. On the belay steel cable running horizontally across we used a tandem pulley made by Petzl. Within the pulley we used the steel carabiner "Steel-Dee Triplelock" made by Edelrid.

The participants on the High Y element were about to be lowered by the trainers. Both participants were therefore standing on a platform fixed to the tree. One participant clipped onto the rope and was supposed to be lowered by the trainer. The rope jammed and got stuck. The trainer noticed that the carabiner had jumped out of position (sideways - the locking mechanism pointing downwards). Yet the trainer was unable to move the carabiner back into its normal position. The trainer continued to lower the participant. During the process the rope ran directly along the edge of the gate. This edge was so sharp that it basically split the mantle of the rope on a length of 2 meters. Fortunately, the core of the rope was not damaged. After lowering the participant by a few meters, the carabiner jumped back into the normal position. No one suffered any physical injuries.



The following measures were taken:
- The manufacturer was contacted.
- The carabiners were replaced.
- All trainers in the team were alerted to the problem and urged to pay particular attention to this problem.

C. Final Analysis of the Accidents, Incidents and Near Misses

We have asked ourselves which primary categories of causes and connections we can develop, which will help us explain and understand similar accidents, incidents and near misses.

We came up with 5 categories, which will be outlined below:

C.1 Injuries and Falls from Low Elements

In two cases, injuries happened after falling off a Mohawk Walk; in the third case participants suffered friction burns during an exercise on a swing rope (Disc-Jockey); and in the fourth case the injury happened during an exercise called “Trust Fall”.

Like in the previous survey period (Accident report 2002/2003: 4 cases of injuries on low elements), participants were again particularly affected whilst completing the Mohawk Walk. Spotting by the trainers or fellow participants was ineffective in these cases because those balancing on the Mohawk Walk fell too quickly or because the spotters were unable to minimise the impact of the fall.

The following factors need to be considered in order to minimise the risk of injury on low ropes course elements:

Type of Construction and Selection of Construction Materials

It is the responsibility of ropes course builders to ensure that they install ropes courses that are safe and that they use materials that are appropriate for ropes course purposes (see ERCA Standards).

For Mohawk Walks, the anchoring should be designed in such a way that the triangular shaped open space (see p 8, 2004 U-004) is either covered or that no open space is created in the first place in order to avoid creating a stumbling block.

The construction height should also not be set too high. On a Mohawk Walk, the stepping height should not exceed 50cm in order to minimise the risk of injury when falling off.

In addition, it is important that the support ropes, swing ropes and any other ropes or all other devices providing support for participants are made of materials which are pleasant to touch and safe to hold onto and do not cause any friction burns on hands. Equally, the diameter of the rope plays a major role in the safe use of ropes. Therefore you should use ropes that are too thin or slippery. Knots tied into the rope at the level where people hold onto and the use of gloves can also help to avoid friction burns.

Choice of Location

A basic requirement is that the soil around the low ropes course elements is soft (to lessen the impact of falls) and that there are no stumbling blocks (such as roots, stones etc) or holes in the ground. In addition, the wider area where the activities take place should be kept clear from objects (such as boxes, wooden beams, planks, benches, tables, large or sharp and pointy stones etc) and all tree branches should be removed (not only those at head level).

Safety Instructions Regarding Spotting and Adequate Numbers of Spotters
Safety instructions at the beginning of the programme should cover practice runs of exercises and a demonstration of the spotting techniques required in the exercises to follow so that participants know exactly how to carry out their role as spotters. Spotters must be close to the person they are safeguarding and they must follow them closely at all times so that they can provide support quickly when needed. A high level of concentration and focus is paramount, together with clear and effective communication.

Time for participants to do warm – ups and practise techniques must be incorporated into training programmes

Enabling Participants to Maintain Focus
When participants lose concentration, get tired, violate rules or when group members start to fool around, the trainer has to call for „time out"(i.e. stop the activity and impose a break) as a means of avoiding accidents.

Specific Advice Regarding the Trust Fall Activity:
As described in this survey, a spotter suffered an injury during the Trust Fall activity. Not enough detail was given about the actual sequence of events, so the direct cause of this accident should not be analysed any further in this context.
Irrespective of this specific accident, it can be assumed that the Trust Fall activity carries a high risk of injury due to the high speed at which the participant moves when falling backwards.

We see the reasons for injuries during the Trust Fall in particular in:
- The extremely strong force that results from the person falling backwards. This force can impact both on the person who is falling, as well as on the group members catching the person (the spotters).
- The velocity of the person falling: as soon as the person begins to fall, any trainer intervention becomes impossible.
- The position and body posture (catching technique) of the participants who spot.

If, after weighing up the costs and benefits of this exercise, you do decide to run this activity despite its potential risks, the following precautions can reduce the risk of injury:
- Choose soft ground.
- Trainers need to be qualified and competent.
- Participants need to be clearly and openly briefed on the safety implications of the exercise. The principle of voluntary participation needs to be explained and made optional.
- Before the start of the exercise, participants should receive detailed instructions.
- A dry run of the exercise should be carried out to ensure that participants are able to complete the exercise safely.
- During the exercise, trainers must observe the process closely and stay in control of the safety procedures.
- The trainer must constantly raise and challenge concentration levels in the group.
- With large groups or during longer exercises, the trainer must stop for breaks and introduce exercises to loosen up, stretch and relax.

C.2 Weather Conditions

Weather conditions and the elements have a major impact on the safety of ropes course programmes and must not be underestimated. Wrong decisions or the inability to make decisions (such as waiting anxiously) are likely to have serious consequences. On the one hand weather conditions can increase the risk of injuries, for instance by influencing the wellbeing of participants and trainers. They can also cause stress, lack of concentration, tiredness and/or reduced levels of awareness (for instance through heat, cold, wind, dampness resulting in thirst, being cold, sweating, …). On the other hand, weather conditions can even be a trigger factor and negatively influence the technical safety of the ropes course.

Snowfall Situations – Branches braking because of heavy snow fall

As weather conditions are outside our control, the following precautions should be taken:

- Trainers should be given a comprehensive briefing about snow and safety the implications of heavy snowfall, and should be given guidelines regarding what decisions to make (safety concept)
- Weather conditions and changes to the weather (weather report and weather warnings) must be incorporated into the risk analysis on site
- In case of heavy snow falls and the risk of branches braking due to the weight of the snow, the forest must not be entered under any circumstances.
- If the weather conditions change and there are signs of branches breaking under the weight of snow, everyone should leave the area immediately.

C.3 „Incidents and Accidents due to Unauthorised Access“

In order to avoid incidents and accidents due to unauthorised access to ropes courses, ropes course operators must put appropriate measures into place to stop unauthorized access to their property.

For example, appropriate measures include:

- Installation of safety signs which clearly state that entering the site or climbing on the ropes course or climbing wall is not permitted to unauthorised users.
- Removal of all equipment which can be used to climb up a ropes course up to the height of 4 meters.
- Removal of all devices such as ladders which could enable people to climb onto a ropes course.

C.4 „Incidents and Accidents Linked to Logistics and Organisation“

Again and again, building parts, support devices and tools which are not fixed or unsecured are the cause of dangerous situations on ropes courses, especially for those people who are situated on the ground.

Ladders
We recommend to principally fasten and secure ladders used in connection with elements, in order to avoid the ladder from falling over during the use of the ropes course.
In connection with the accident described in this survey, we would like to advise you that incidents and accidents often happen during break times or at the end of an exercise because participants or trainers loose attention.
During break times, if at all possible, groups should stay in a safe area that they are familiar with, and any danger spots should be secured.

C.5 Accidents caused by Types of Construction or Construction Parts

Further Information regarding the sharp gates of the carabiner (Type: Edelrid):

At this point in time, we have not yet received a reply from the manufacturer, which could shed light on the cause of the problem. We cannot say whether the respective carabiner was the result of a rare production error, a technical design error (state of the technology) or other causes. As soon as we receive an explanation from the manufacturer we will send the reply on to you so that you can form your own opinion about the usage of this type of carabiner and how to handle the situation.

Further Information regarding the pulley “Trac” manufactured by Petzl:

The manufacturer of the pulley “Trac” has been informed about the incident. The new version aims to avoid the so called process of “eating up the rope” (i.e. tearing the rope) through a technical modification. The problem of the pulley tilting when the tensile load is insufficient or temporarily missing remains though. Equally, the issue of the slide closure mechanism of the integrated vertigo carabiners remains unresolved, which means that for the time being it does not provide an optimum safety mechanism for connecting with PPE. In addition, there is still no way to install a redundant system for the pulley itself because only one carabiner can be clipped into the pulley.

The product information about the Trac Pulley now includes a drawing of a separate backup belay. The way it works is that an additional connector is guided from the harness using two webbings to two carabiners, which run alongside the load cable behind the pulley.

Plans for the Future

Again, feedback from our members has confirmed that the recording of accidents, incidents and near misses was very time-consuming. Despite members recognising the value of contributing to the accident survey, they do not see the relevance of recording near misses.

In order to motivate more members to participate in the survey, we have planned a few changes for 2006 and 2007, which will make the process easier for our members:

- We will focus our efforts on the collation and analysis of Accidents only. In future, our members will only be asked to submit information about accidents, and only accidents will be analysed as part of the survey.

- Irrespective of the above changes, you can still report near misses and psychological incidents via the web based report mechanism. From our point of view, it is those near misses which reveal a great deal of potential dangers that can be reduced from a preventative point of view. This is why we will continue to collate and analyse near misses which have been reported on a voluntary basis. If there are cases which we need to draw your attention to, we will share the information in the form of our safety alerts.

- The modification of the online survey systems is meant to provide a data base of reported accidents, and to help members and ERCA record and analyse the information more effectively.

We therefore hope that next year we will be able to motivate more members to take part in the ropes course accident survey, and we look forward to continuing with ERCA's long-term study.

In the future, we will produce an annual safety report, which will be presented each year to the ERCA AGM in spring. Our aim is to provide an up to date report about the latest accidents and their causes, which can be shared and discussed during a workshop before the start of the new season.

Reference:

Dewald, W.; C. Häußler: On-Line Spiele und Abenteuer mit dem Seil.
Ziel GmbH, Augsburg 2005