

Nylon Highway

Issue #58



... especially for the Vertical Caver



#58

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... especially for the Vertical Caver

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Nylon Highway

Terry Mitchell Chair
4207 Brant Drive
Springdale, AR 72762

Raymond C. Sira Vice-Chair
5134 Prices Fork Rd.
Christiansburg, VA 24073

Bill Boehle Secretary/Treasurer
1284 Lower Ferry Road
Ewing, NJ 08618-1408

Miriam Cuddington At-Large
109 Beacon St.
Moulton, AL 35650-1801

Mike Rusin At-Large
1301 McKeone Ave.
Cincinnati, OH 45205

Tim White Editor
2830 Olde Savannah Cove
Suwanee, GA 30024

Bruce Smith Education Coordinator
6313 Jan Lane Drive
Harrison, TN 37341-9419

Bill Cuddington Vertical Contest Chairman
109 Beacon St.
Moulton, AL 35650-1801

Terry Clark Vertical Techniques Workshop Coordinator
7124 Cairo Dixie Road
Corydon, KY 42406-9735

Please send articles, art, exchange publications and other material for publication in the Nylon Highway to:

Tim White
2830 Olde Savannah Cove
Suwanee, GA 30024
e-mail: southeast@ncrc.info

See our web page at:
<http://www.caves.org/section/vertical>

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The *Nylon Highway* is published by the Vertical Section of the National Speleological Society on a regular basis pending sufficient material. Material is posted on the Vertical Section's web site soon after being received by the Editor. A volume of all material is printed and distributed to those not having access to the electronic version on an annual basis.

It is the intent of this publication to provide a vehicle for papers on vertical work. All submitted articles containing unsafe practices will be returned to the author. Opinions expressed herein are credited to the author and do not necessarily agree with those of the Editor, the Vertical Section, its members or its Executive Committee. The reader should understand that some material presented in the *Nylon Highway* may be of an experimental nature and is presented herein for peer review. The reader should exercise good judgment and use common sense when attempting new vertical techniques or using new equipment.

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Should I Use a Polypropylene Lifeline?

Bob Mehew, Roy Rodgers and Steve Richards

(Reproduced from text of article published in *Speleology*, Issue 17, April 2011)

This article arose from a simple question on the UK Caving forum about the use of polypropylene hawser laid rope as a lifeline. The British Caving Association's Rope Test Rig was used to run a quick drop test on a dry 12mm diameter sample of polypropylene hawser laid rope which demonstrated

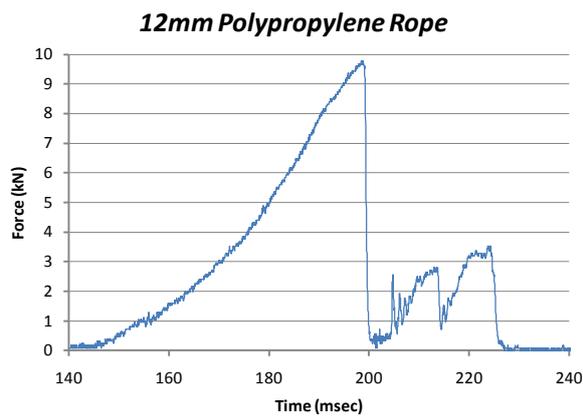


Figure 1

that the rope could not hold a single 80cm Fall Factor (FF) 1.0 drop of a 100kg test mass.

Unfortunately this single test provided no data on the margin of failure; did the rope only just fail, or was it totally inadequate for the task? Further tests were required. Toward the end of a day's work on the recently upgraded Bradford Pothole Club (BPC) rope test rig another drop test was run on an 80cm length of 12mm diameter polypropylene rope. Figure 1 shows the resultant force/time plot. The test mass was 100kg, and the Fall Factor 1.0. This three peak curve was new to us, as previously we had limited our testing to kernmantle ropes.

Note that all the tests reported in this article used dry but otherwise unconditioned rope.



Figure 2

A look at the broken ends of the rope (Figure 2) revealed a number of interesting details.

The rope consisted of three strands. Two of the strands had parted at a similar length whilst the third had straightened from its lay in the hawser rope and extended further. The third strand exhibited two distinct lengths, both extending beyond the first two strands. The rope had parted at the knot, as predicted by both practical experience and theory (Ref 1).

Since the test mass keeps moving in the same direction it seems reasonable that the more extended strands broke later in the sequence. If we postulate that the three strands did not share the load equally the following chronological sequence of events seems likely (of course other interpretations are possible):

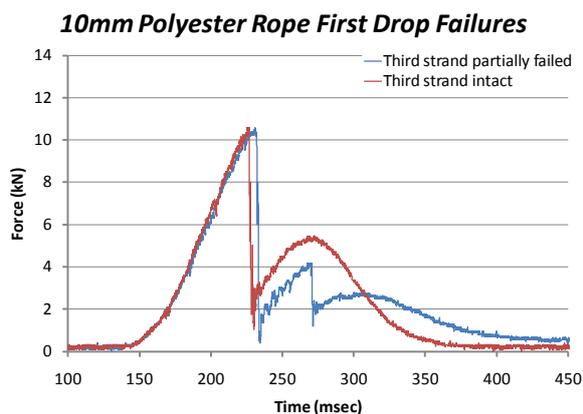
1. Two strands take the lion's share of the load. They are well-matched and break at about the same time, giving rise to the first peak.
2. As the load on the third strand increases a subgroup of the strand's fibres assume a disproportionate share of the load. They break, causing the second peak.
3. The load on the remaining fibres of the third strand increases until they break. This is the third and final peak.

This curious result prompted us to look at a range of hawser based ropes to contrast them with the kernmantle rope experience we had gained so far. Three lengths of 10mm diameter hawser rope were purchased from Timko Ltd (www.ropesandtwines.com) made from polypropylene, polyester and nylon, see Table 1 for properties.

	<i>Material</i>	<i>Polypropylene</i>	<i>Polyester</i>	<i>Nylon</i>	<i>Nylon</i>
	<i>Lay</i>	<i>Hawser</i>	<i>Hawser</i>	<i>Hawser</i>	<i>Kernmantle</i>
Diameter mm		10	10	10	10
Weight g/m		36	75	68	65
Cost £/m		0.14	1.10	0.45	1.10 (1)
Breaking Load kg (2)		1400	1590	2080	2700
Samples used		3	4	2	1
Minimum Drops Survived		0	0	9	26
Peak Force kN (3)		7.0 (4)	10.9	7.6 / 13.7	8.4 / 16.4
Peak Rise Time ms		40	90	140	120
Jolt kN/sec (5)		175	121	54.3 / 97.9	70 / 137
Heat Capacity J/kg °K (6)		1925	1850	1310	1310
Heat Capacity J/°K meter of rope (7)		69	140	89	85
Thermal Conductivity W/m °K		0.1 – 0.22	0.42 – 0.51	0.25	0.25
Deflection Temperature °C (8)		100	70 (9)	160	160

Notes to Table 1

- 1 – Approximate price.
- 2 – Data from supplier, believed to be for testing without knot terminations.
- 3 – First value is peak load from first drop; second value is peak load from penultimate drop.
- 4 – Rope failed.
- 5 – Calculated by dividing Peak Force by Peak Rise Time.
- 6 – For the bulk material. Sources <http://www.matsceng.ohio-state.edu/mse205/lectures/chapter20/chap20.pdf> and http://www.kayelaby.npl.co.uk/general_physics/2_3/2_3_6.html
- 7 – Rope diameter 10mm. Source http://www.engineeringtoolbox.com/thermal-conductivity-d_429.html
- 8 – Source <http://www.matweb.com/reference/deflection-temperature.aspx> based on 0.46MPa load per BS EN ISO 75-2:2004 Method B.
- 9 – Used PET value (alternative name for Polyester).



all of the failures showed the multiple peaks on the force/time plot characteristic of uneven load sharing. Two of the four polyester samples failed on the first drop, with the remainder failing on the second. Both of the first drop failures exhibited the symptoms of uneven load sharing. Both of the

Figure 3

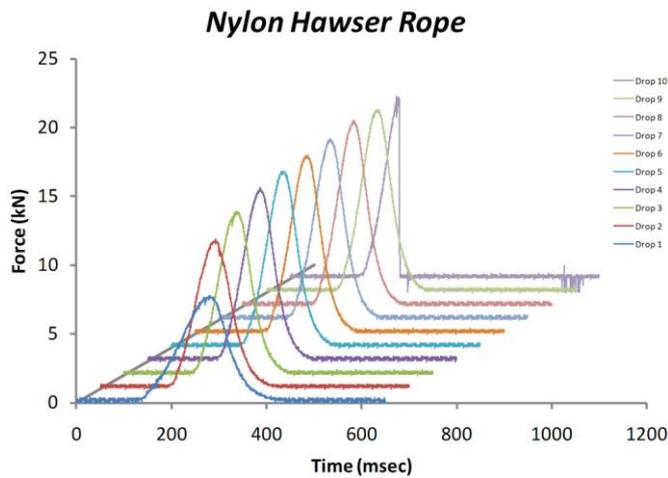
Rope Drop Test Results

All of the drop tests used an 80cm drop, a Fall Factor of 1.0, and a 100kg test mass. The results of the polypropylene and polyester hawser tests have many features in common. All three polypropylene samples failed on the first drop;



Figure 4. Partial Third Strand Failure

second drop failures were simple breaks, without evidence of uneven load sharing. The first drop failure polyester samples did not fail completely, but left one of the three strands either partially or completely intact due to the weight reaching the end of its travel before complete failure. The force/time plots for the first drop failures are shown in Figure 3, and the partial third strand failure in Figure 4. Interestingly the force/time plot for the drop that left the third strand intact does not exhibit the abrupt drop in force at 270 msec, which seems to support the chronological sequence of events suggested above.

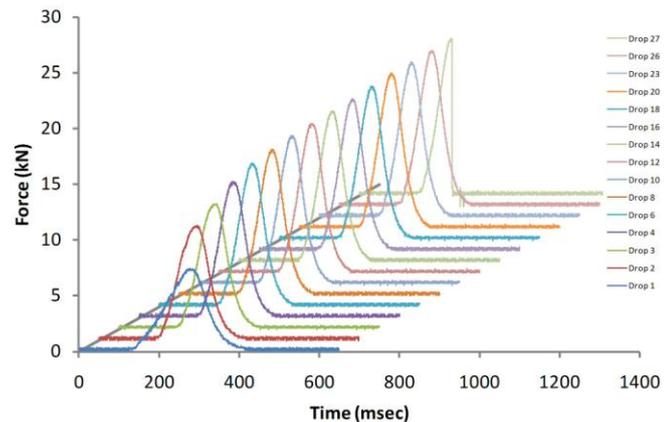


The results of the nylon hawser and nylon kernmantle tests are shown in Figures 5 and 6 respectively. A single sample was tested in both cases. The nylon hawser rope survived nine drops; the nylon kernmantle survived 26.

Referring to Table 1, it can be seen that the lowest peak force for a survived drop is for hawser laid nylon, followed by kernmantle nylon and then polyester. The polypropylene value is discounted since the rope failed. These results show no correlation with the

supplier's breaking load values, which may be attributed to the difference between the supplier's static testing technique and our dynamic approach. Jolt (the rate of change of force) is another characteristic of dynamic testing; the higher the jolt, the more abruptly the force is applied. Table 1 shows that, of the hawser laid ropes, polypropylene experienced the highest jolt, followed by polyester and finally nylon.

Nylon Kernmantle Rope



Thermal Factors

In 1974 the first UK caving fatal SRT accident occurred when abseiling with polypropylene rope (Ref 2). Though it is likely the rope parted due to a mixture of abrasion and shock loading, concern was raised at the time over the low melting point of polypropylene. Clearly, thermal properties are a vital factor in the rope selection process. In the interests of simplicity the discussion will be restricted to dry ropes.

Two key properties govern the temperature the rope's surface will attain when it is heated by friction. The first of these, heat capacity, is a measure of how much heat input is required for a given temperature rise. A lower heat capacity will result in higher temperatures. To compare heat capacities it is necessary to transform the bulk values (usually quoted per kilogram of material) into heat capacity per meter length of rope; both values are included in Table 1. As can be seen, polyester has the best (highest) value, followed by nylon and finally polypropylene. The second important thermal property is thermal conductivity, a measure of how easily the bulk material conducts heat. A material with a high thermal conductivity will quickly conduct heat away from the surface, lowering its temperature. Here again polyester has the best (highest) value, followed by nylon and finally polypropylene.

Both thermal properties rank our materials in the same order of desirability, so it will come as no surprise that for a given frictional load the polyester rope will be the coolest, the nylon rope will be in the midrange, and the polypropylene rope will be the hottest. However there is one more factor that influences our choice – the rope’s ability to withstand high temperatures. This is characterized by its deflection temperature, the temperature at which the rope will start to deform (also included in Table 1). Nylon offers the best high temperature performance, followed by polypropylene and polyester. Of particular note is that polyester’s 70°C deflection temperature means that it does not even gain the benefit of the energy sink when water is turned into steam.

Discussion

Polyester’s deflection temperature is so low that it is effectively ruled out as a viable choice for abseiling or even life lining when using metal devices such as a stitch plate. Additionally, hawser laid polyester rope’s price is similar to nylon kernmantle’s, so there is no point in considering polyester further. The choice is between nylon and polypropylene. Polypropylene rope just does not have the strength of nylon in either static or dynamic measurements. The choice is clear – nylon rope is the one to use.

With the rope’s material chosen, one choice remains; kernmantle or hawser laid rope? Referring to Table 1 for one last time we see that the kernmantle rope is stronger both statically and dynamically, and that it survived almost three times as many drops as the hawser laid rope. However this performance comes at a price; nylon kernmantle rope is more than twice the cost of nylon hawser laid rope.

The force/time plots for both hawser laid and kernmantle nylon ropes (Figures 5 and 6) show significant increases in peak force and jolt as the sequence of drops progresses. In both sequences the increase between the first and second drops is by far the largest, almost a factor of two. This may be attributed to knot tightening, and leads us to another important point of rope care; relax the knots after every trip, and, if a rope takes a fall during a trip, retie the knots before further use on that trip. If this precaution is taken consistently the safety margin will be increased by a factor of nearly two, an improvement well worth the effort required.

Three caveats:

1. All these deductions are based on results from new, dry ropes. Wet kernmantle is known to lose around half of its dynamic strength when measured in drops survived (Refs 3 and 4) and, as yet, no work has been done on wet hawser laid nylon rope. Nor has hawser laid nylon rope been tested to see how its strength is affected by usage. It is moderately well documented (Refs 5 and 6) that nylon kernmantle rope loses a considerable part of its drops survived performance after very few (less than 100) uses. This fall off in performance then abates and the rope’s capability degrades very slowly over the remainder of its life.
2. The dynamic tests reported here used an 80cm sample length, while the Standard (Ref 7) specifies a 2m sample length. The influence of the knot on the behaviour of the sample is known to increase as the sample length decreases. The question of the relationship between a real-world falling caver and a 2m (or 80cm) Fall Factor 1 drop test remains.
3. Hawser laid rope is known to have a lot more bounce than kernmantle rope. Although we are still developing the rig to investigate this area, it has been accepted from the early days of SRT usage that one should not use hawser rope for this reason.

Conclusions

The clear answer to the title of this article is NO, you should not use hawser laid polypropylene rope either for SRTing or as a lifeline. It simply is not strong enough.

Acknowledgements

Thanks go to Bradford Pothole Club for the loan of their rope test rig and to Dave Elliot for his efforts in its design; also to Bob Mackin and Mike Sainsbury of the University of Lancaster for calibrating the load cell.

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- Ref 7 British Standard "PPE for the prevention of falls from a height – Low Stretch kernmantle ropes", BS EN 1891:1998.

Bolt Climbing - Vertical from the Bottom Up

Mark Minton

Disclaimer: Vertical caving is a potentially hazardous activity. The following discussion is not intended to teach proper bolting techniques or to cover all details of vertical caving. Get proper training before entering any vertical cave.



Introduction

The majority of vertical caves are rigged from the top down. In other words, one enters the cave and descends various drops to get to the bottom. This is certainly the easiest approach, because pitches may be rigged with the aid of gravity. However, occasionally one encounters a vertical drop from the bottom, with no ready access to the top. In this case more involved procedures are required to get up the drop. A few very deep caves have been explored almost exclusively from the bottom up. The most famous is Austria's Lamprechtsofen, which was explored to a depth (height) of over 1000 meters before an upper entrance was connected.

Many techniques have been used to climb vertical drops from the bottom, some quite ingenious. The simplest drops may be scaled by free climbing or chimneying. Sometimes one caver can boost another up into a high lead. When the climb is relatively short a rigid ladder can sometimes be brought in to gain access. A related technique involves a scaling pole, where a segmented metal pole is carried into the cave and assembled at the climb. A rope or cable ladder is suspended from the top of the pole and climbed to gain access to the upper passage. If there are appropriately positioned projections or formations a rope may sometimes be used to lasso an anchor, or a grappling hook can be used. In a few cases helium balloons or sling shots have been used to drape a line over an anchor so that a rope could subsequently be pulled up. These latter techniques are rather risky because one cannot examine the anchor to see if it is strong enough or if the rope is securely in place. Special care must be taken when approaching the lip of such a climb, because the change in direction of pull on the rope as one tops out may dislodge it.

Bolt Climbing

The most reliable method of reaching a high lead from the bottom is bolt climbing. Before the 1990s this was a laborious process using hand-driven expansion bolts. Two technological innovations have changed this dramatically for the better. Lithium-ion batteries have made battery-powered drills much lighter and more practical, and LED lights have allowed cavers to see much further up domes and tall passages in search of high leads. Nowadays bolt climbing has become almost routine, so much so that any dome can now be considered a viable lead. A great deal of additional passage has been discovered in this way. By way of example, in Shoveleater Cave in Germany Valley, WV we have climbed almost every dome in the cave, and there are dozens. Of the cave's 5.3 miles total length, 3.5 miles (66%) has been accessed by bolting on multiple fronts.

The route to be followed on a bolt climb is best determined in advance, although this can be difficult because one may not be able to see the top of the climb. Even if one can see the entire route, unanticipated sections of bad rock may force a deviation from the plan partway up. Examples of bad rock include mud, shale, chert, flowstone, shattered zones, and breakdown. The best routes follow clean, solid bedrock and avoid falling water and overhangs whenever it is practical to do so. While it is certainly possible and often necessary to bolt up overhangs and even across a flat ceiling, it requires much more effort and is less efficient when there is nothing solid for the climber's feet to push against.

To bolt up a drop, one sets an expansion bolt in the wall as far overhead as is possible. A short section of webbing ladder called an etrier is suspended from the bolt. This typically

contains from three to six steps and provides an easy method for progressing vertically up the wall. A daisy chain is also attached to the bolt and is used to pull the climber's waist up to the bolt and keep him/her upright while climbing the etrier. Traditional daisies consisted of a length of nylon webbing with fixed loops sewn into place. A more versatile modern version is the adjustable daisy consisting of a single piece of webbing that can be drawn up through a buckle to provide a variable length attachment. Similarly adjustable etriers are available and provide variable length steps for the feet. (Other items such as the Raumer Stick-Up and bolting platforms have been developed to make bolt climbing more efficient, but these are not in widespread use, at least in the U. S.)

A quickdraw (short piece of sewn webbing with a carabiner at each end) is also attached to the bolt. A dynamic belay rope tied to the climber's sit harness runs through the other end of the quickdraw, much the same as in rock climbing. A separate person controls the belay, which will catch the climber in the event that a bolt or other hold fails. Ideally the belayer should be in a sheltered position away from the fall zone, but still within sight of the climber. By repeating the process with another bolt, etrier, daisy chain and quickdraw, the climber advances up the wall, alternately moving the etriers and daisy chains upward as he goes. What is left is a trail of bolts and quickdraws running up the wall and holding the dynamic rope.

In addition to the bolting gear, a bolt climber also wears normal vertical gear and trails a static rope to be rigged at the top of the climb. All of this equipment hanging from one's body gets heavy, and careful attention to gear management is required to keep from getting tangled. One must also consider the order in which pieces of gear will need to be moved during the climb, in order to avoid weighting something out of turn. When hanging from a single point of attachment it can be very difficult to remove a piece that is underneath something else that is weighted.

Many bolt climbs can be completed as a single pitch in a matter of a few hours. How far one can go is mainly limited by the number of bolts and quickdraws available, and the length of the belay rope. (For safety, the belay rope should be twice as long as the pitch being climbed so that the climber can be lowered back down at any point if necessary.) On longer climbs one or more intermediate belay stances may need to be established. Ideally this will occur where a ledge, alcove or other feature is present to provide some footing and shelter for the belayer. In the absence of such features, one can establish a hanging belay where the belayer is suspended from bolts on the shear face of the climb. In especially long or difficult cases one may use a portaledge, but transporting it far into a cave can be a major effort.

When a pitch is completed, the route needs to be cleaned. After setting a permanent anchor with static rope attached, the climber may clean the route as he rappels down, removing the bolt hangers and quickdraws as he goes. More laboriously, he can also downclimb the route in reverse, retrieving each piece as he moves below it. Alternatively the belayer or other member of the party cleans the route while ascending the static and/or dynamic rope. When the route of the climb is substantially overhung or deviates a long distance sideways, cleaning from the bottom up is generally the more practical approach. Sometimes removing pieces under tension can be difficult, and may involve interesting gymnastics and significant swings on the rope. If

the bolt holes have been slightly over-drilled, one may pound the cleaned bolts into the wall, leaving little evidence of the climb.

To retreat from a climb that does not go or is no longer needed, one may either downclimb the drop in reverse as described above or rig a pull-down, which usually involves leaving some sort of anchor behind. The former is more efficient in terms of hardware, but is more time-consuming. For a pull-down, the main rope is doubled through the top anchor and the caver rappels on one side with the other end tied off or blocked, or on both of the ropes simultaneously. Once on the bottom of the drop, the caver pulls the free end of the doubled rope through the anchor until the rope falls to the ground. Some sort of hardware at the top of the drop is generally sacrificed in this case.

Domes over 300 feet high have been climbed by this method, and much passage has been discovered that would never have been seen otherwise. In West Virginia, of the 8 known drops over 200 feet deep (all in Germany Valley), all but one have been climbed from the bottom up. This includes the three longest drops in the state, two of which are over 300 feet. We are currently working on another very high dome that could be the deepest (highest) yet, with potential to go over 400 feet. For the well initiated, bolt climbing has become an almost routine exploration technique that should continue to grow in popularity. It has the potential to breathe new life into caves once considered completely explored.

Remember, vertical caving is a potentially hazardous activity. Get proper training before attempting any of the techniques discussed above.

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Minutes of the
NSS Vertical Section Executive Committee E-Meetings
July 2012 to July 2013

The NSS Vertical Section Executive Committee held a series of E-meetings on a variety of issues during the period from July 2012 to July 29, 2013. Executive Board members participated in the meetings via email, telephone and regular mail.

January 23-28, 2013 - Approval of minutes from VSEC regular and E-meetings

The minutes from 2011-2012 E-meetings Part 2 (covering May and June 2012), and from the Sunday June 24, 2012 VSEC meeting were approved by unanimous consent of the VSEC as of the close of the E-meeting on January 28, 2013.

October 2, 2012 to February 21, 2013 - Development of Recommended Minimum Safety Guidelines for JSS Vertical Activities

At the 2012 NSS Convention Vertical Section business meeting, Geary Schindel who is the Administrative Vice President (AVP) of the NSS stated that he wants the help of the Section to address a couple of issues that he is concerned about. He requested that the NSS would like for the Vertical Section to come up with a safety plan for JSS vertical activities. Jim Wade and Ken Alwin volunteered to work with the VSEC and in compiling existing information and guidance into a safety plan for JSS vertical activities.

Discussion carried on over the winter and a first draft of proposed Vertical Safety Guidelines for use by the JSS was circulated on January 31, 2013. Much discussion and editing followed, with version 2 distributed on February 7, 2013 and version 3 on February 13, 2013. Following a flurry of last minute comments and edits, an e-meeting of the Vertical Section Executive Committee to approve the VS Recommended Vertical Safety Guidelines (Version 4) for the Junior Speleological Society was called on February 18, 2013. The meeting was called to order on February 20, 2013, and the following motion was made by Terry Mitchell: "I move that Version 4.1 of the NSS Vertical Section Recommended Vertical Safety Guidelines for the Junior Speleological Society be approved and forwarded to the NSS Administrative Vice President, Geary Schindel." The motion was seconded by Bill Boehle. Next, Terry Mitchell moved to Suspend the Rules that require a 5-day discussion period for motions during e-meetings. The motion to Suspend the Rules was seconded by Mike Rusin. There being no objections to approval of this motion by Unanimous Consent, the motion to Suspend the Rules was approved by Unanimous Consent. We then proceeded to vote on the main motion. Eight votes were received in favor of the motion, with no vote received from Tim White. The motion passed and the e-meeting was adjourned on February 21, 2013.

April 14, 2013 to July 29, 2013 - Development of Safety Manual for NSS Convention Vertical Activities

AVP Geary Schindel, having oversight responsibility for the NSS conventions, asked the VS to create a written "safety manual" for our convention vertical events. On April 14, 2013 Version 1 of the proposed "Safety Manual" was circulated. It was proposed to spend several weeks critiquing and improving the

draft until we have consensus and then to formally convene an e-meeting to vote on the final document. Much discussion followed, particularly concerning the use of "shoulds" versus "shalls" and the acceptability and use of "homemade" equipment. Version 2 was circulated on May 15, 2013. Discussion continued and Version 3 was circulated on June 15, 2013. Much discussion followed concerning NSS BOG legal issues and misconceptions and their position that these should be "procedures" rather than "guidelines". Version 4 was circulated on July 10, 2013. After more heated discussions with the NSS, Version 5 was circulated on July 12, 2013. In a turnaround following NSS legal review, IO autonomy issues were resolved and much of our problematic language was removed from the document. Protective headgear will be required by all minors under the age of 19. Helmets are encouraged but not required for others in the climbing contest. Version 5.1 was circulated on July 17, 2013 incorporating all the latest changes.

An e-meeting of the Vertical Section Executive Committee was called on July 20, 2013 to approve Version 6 the "Vertical Safety Procedures for Vertical Section Activities during NSS Conventions". It was requested that we expedite the process by Suspending the Rules through the use of Unanimous Consent. A quorum reported "present" and the e-meeting was called to order on July 25, 2013, and the following motion was made by Terry Mitchell: "I move that Version 6 (Final) dated 7-20-13 of the "Vertical Safety Procedures for Vertical Section Activities during NSS Conventions" be approved". The motion was seconded by Bill Boehle. Next, Terry Mitchell moved to Suspend the Rules that require a 5-day discussion period for motions during e-meetings. The motion to Suspend the Rules was seconded by Bill Boehle. There being no objections to approval of this motion by Unanimous Consent, the motion to Suspend the Rules was approved by Unanimous Consent. We then proceeded to vote on the main motion. Seven votes were received in favor of the motion, one abstention (Bruce Smith), with no vote received from Tim White. The motion passed and the e-meeting was adjourned on July 29, 2013.

NOTE: There were other discussions on various topics between Executive Committee members throughout this period. None of these are recorded in these minutes since no motions were made or voted on and they did not constitute E-meetings.

Respectfully submitted,
Bill Boehle

(Rev.1)
Approved by EC e-meeting 11/27/2013

Minutes of the
NSS Vertical Section Executive Committee Meeting
August 4, 2013

The NSS Vertical Section Executive Committee held a meeting on Sunday, August 4, 2013 at the Shippensburg Inn near the 2013 NSS Convention in Shippensburg, Pennsylvania. Executive Board members present were Secretary-Treasurer Bill Boehle, At-Large Executive Members Terry Mitchell and Ray Sira, Vertical Techniques Workshop Coordinator Terry Clark, and Education/Training Coordinator Bruce Smith. Nylon Highway Editor Tim White could not attend the convention. Contest Coordinator Bill Cuddington could not attend the meeting and Bruce Smith was designated as proxy. At-Large member Miriam Cuddington could not attend this meeting and Terry Clark was designated as proxy. Vertical Section member (and rebelay course coordinator) Gary Bush was also in attendance.

Meeting opened at 7:45 PM by Chair Terry Mitchell.

The purpose of the meeting was to discuss and deal with various issues that needed to be addressed before the annual business meeting on Wednesday.

1. Terry Mitchell gave a summary of the development and history of the vertical safety guidelines and procedures recently developed and approved for the JSS and the VS. He also showed some of the lightweight helmets that were purchased by the NSS for use by the climbing contest. New liability releases have been developed and will be used for this years vertical activities.

2. Bill Boehle handed out copies of the Secretary's Report and Treasurer's Report. Relative to Symbolic Items, it was reported that we recently ordered items that have been out of stock for a while. This should help our sales. Additionally, a new pin was obtained to replace the prior pin that was sold out. The new pin came from the supplier slightly different than what was ordered. There is nothing wrong with the pin other than this minor design change from the proof. The supplier is willing to give us a significant discount if we accept the pins as delivered. They will redo them if we insist. Bill Boehle recommended that we accept the pins and the discount, which will improve our profitability with the pin sales. The EC concurred with this recommendation.

Bill Boehle announced that he is not running for Secretary/Treasurer this year. To cover the interim until the replacement can establish new bank accounts, he recommends that he be appointed Acting Treasurer to allow for business activities until the new Treasurer is fully functional. The Chair appointed Bill Boehle as Acting Treasurer until the new Secretary/Treasurer establishes new bank accounts.

Bill Boehle agreed to continue to act as Symbolic Devices Chair. The Chair appointed Bill Boehle as Chair of the Symbolic Devices Committee and authorized him to maintain a bank account (existing) for purposes of symbolic device sales.

3. Awards Committee Chair Bruce Smith reported that there will be one award this year. A Past Presidents Plaque and Gavel recognition will be presented to Dick Mitchell at the business meeting on Wednesday.

4. Education/Training Coordinator Bruce Smith had nothing to report this year.

5. Outreach Committee Chairman Marty Reames was unable to attend convention this year and has asked to step down due to personal issues. She recommends that Jon Schow be appointed to replace her. Jon was on the committee and was responsible for putting together the Facebook page for the Vertical Section, including

generating the initial content for the site as well as responding to questions as they arise. A motion was made by Bruce Smith to accept Marty's recommendation and appoint Jon Schow as Chairman of the Outreach Committee. The motion was seconded by Mike Rusin and passed by acclamation. Jon sent in an email report that we currently have 219 people following the NSS Vertical Section page on Facebook. He posts something to the page periodically, but is looking for others to write some content for the page that could be posted once a month. He suggested short articles on the rappel/climb in Ellison's and other locations would be interesting.

6. Vertical Contest: Terry Mitchell reported the Bill Cuddington is bringing some extra rope to convention to replace some of our older existing rope. He also reported that there may be some rigging challenges due to the high ceilings in the gym, but we should be able to manage. We should be ready to go with the rigging beginning at 8:00 am on Monday.

7. Vertical Workshop Coordinator Terry Clark reported that he will be buying some tote boxes to better store the ropes he maintains for the section. Regarding the safety concerns the NSS AVP had with the JSS at the last convention, he stated that it is up to our individual instructors to decide if they want to volunteer to help the JSS out with their vertical training. He also reported that 12 people have preregistered for the Workshop thus far. Several more are expected to sign up.

8. Rebelay Workshop Coordinator Gary Bush reported that he has a separate liability release worked up for use by those participating in the workshop. The new safety guidelines require that lowering systems be incorporated into the rigging of all ropes. This presents some challenges for the Rebelay Workshop, but John Woods and Terry Mitchell think they have worked out a way for this to be done. We will adapt, as necessary.

9. Webmaster Gary Bush reported that the the website is up to date including the posting of Nylon Highway #58. As usual, we still need new articles.

10. The Bylaws Committee had nothing to report for this year.

11. Nylon Highway Editor Tim White is not at the convention and there is no report submitted.

12. Under New Business Terry Clark reported that the JSS has again asked if they could use one of our ropes on Wednesday morning for its vertical orientation session. A motion was made and passed approving the use of our ropes by the JSS. The new coordinator of the JSS (Zach Schudrowitz) was invited to our Sunday VSEC meeting, but was unable to attend. Zach is a recent member of the VS and has been in communication with Terry Mitchell. Zach seems like he is trying to do the right thing regarding vertical activities. Terry Clark reported that he has some shorter rope lengths that we can't use that he will be giving to the JSS.

Adjournment - Motion to adjourn was made and carried. Time of adjournment was approximately 9:15 PM.

Respectfully submitted,
Bill Boehle

(Rev.1)
Approved by EC e-meeting 11/27/2013

Minutes of the
2013 NSS Vertical Section Meeting
August 7, 2013

The 2013 NSS Vertical Section meeting was held Wednesday, August 7, 2013 at Shippensburg University in Shippensburg, PA. Executive Board members present were Chair Terry Mitchell, Secretary-Treasurer Bill Boehle, At-Large Executive Members Miriam Cuddington, Ray Sira (Vice Chairman), and Mike Rusin, Vertical Techniques Workshop Coordinator Terry Clark, Education/Training Coordinator Bruce Smith, and Contest Coordinator Bill Cuddington. Nylon Highway Editor Tim White could not attend the convention. Approximately 22 additional Vertical Section members were in attendance.

I. Meeting opened at 1:03 PM by Chair Terry Mitchell.

A. Announcements - Welcome to everyone who came. Agenda, minutes, and other information available in packet. Membership/Attendance roster circulated. Introduced EC members present.

II. Minutes of the Last Meeting - Minutes of the 2012 VS business meeting were published on the website and there were no amendments or changes. A motion was made and seconded and the minutes were accepted as published.

III. Officer's Reports:

A. Chairman's Report - Terry Mitchell. The Executive Committee has been busy since last years convention. Geary Schindel (NSS AVP) requested that the section draft safety requirements for the JSS. This was done and approved by the EC. Geary also asked that the section put into writing the safety procedures for all our other activities at convention. The NSS legal advisors recommended that these be developed to provide some protection in the event of any accidents resulting in a lawsuit. This was begun in March and after six revisions was finalized in late July just before convention. These procedures were used this week and seemed to work out okay. As part of this activity, we also updated our liability waivers, making them stronger. This also included a separate new liability waiver for those climbing contest participants who choose not to wear a helmet while climbing. An issue that was clarified during all of this process was that all I/O's, while chartered by the NSS, are independent organizations. We probably haven't heard the end of this yet.

B. Secretary's Report - Bill Boehle. See attached. Our membership numbers have continued to slowly grow, but we hope to do better. Efforts to grow the membership will be continue to be addressed by the new Outreach Committee. Accepted as presented.

C. Treasurer's Report - Bill Boehle. See attached. No further discussion. Accepted as presented.

D. VS Symbolic Items - Bill Boehle. See Treasurer's Report for sales numbers. We restocked our clothing items produced a new section pin. Both of these will were a major expense that will show on next years report. It was also pointed out that we finally raised prices on some items as of this convention since the cost of restocking those items has increased.

E. Nylon Highway Editor's Report - Tim White could not attend convention and no report was submitted. Tim is in need of more articles for the Nylon Highway.

Bill Boehle stated that even if you feel that you can't write an article, chase down articles from friends on subjects that interest you.

IV. Committee Reports:

A. Contest Committee - Bill Cuddington. Thanks to the convention and the college for the nice facilities for this years contest. Thanks to PMI for the ropes and all who helped during the vertical contest. We appreciate any help from section members and others with timing, pulling rope, running the rack, etc. Regarding the use of helmets during the climbing contest, it was noted that they have been recommended, but optional. The availability of the lightweight helmets worked out well. Mike Rusin was our onsite medic during most of the events.

B. Vertical Workshop - Terry Clark. Last year we had 24 students. This year we have 17 people signed up with another 2 who cancelled because they didn't have the minimum gear required. Terry can still use some additional instructor help. Terry noted we retired a lot of the ropes that the workshop had for some time. We are continuing to cut up the contest ropes for use in the workshop and Bill Cuddington donated some of his personal ropes to the workshop.

C. Training/Education - Bruce Smith. Bruce stated that this has been a quiet year. People are downloading the training material and using it.

D. Re-Belay Course / "Dial In Your Gear" Session - Gary Bush, Terry Mitchell and John Woods. This year was a busy day for the rebelay training. Gary reported that there were 12 climbers doing the "basic" rope setup with another 8 doing the "intermediate" setup. It worked well using three instructors and was well received by all who participated. John spent most of the time with people setting up and adjusting their systems. This continues to be a very educational and productive session. In accordance with the new safety guidelines, the course ropes were rigged with a lowering system which provided a means to lower anyone on rope who might get into trouble.

E. Awards Committee - Bruce Smith. Bruce presented a Past Chairman's Award to Dick Mitchell for his service from 2008 to 2012. A loud standing ovation followed the presentation.

F. Bylaws Committee - Bill Boehle and Terry Mitchell. Terry Mitchell reported that there were no new changes this year. There are a few minor housekeeping items that may be addressed next year.

G. Web Page - Gary Bush webmaster. Gary reported that Nylon Highway #58 has been posted. We add content throughout the year as we receive it. The website could use some new content and people should submit material to him or make suggestions for what they would like to see.

H. Outreach Committee - Jon Schow. Terry Mitchell reported that Marty Reames had to step down as committee chair due to personal reasons. She was replaced by Jon Schow who was on the committee and did the development of the section Facebook page. Jon reported that the Facebook page has 219 followers and could use more people submitting content. Any material would be welcome.

V. Old Business:

A. None.

VI. New Business:

A. Dick Mitchell reported that Geary Schindel requested that the Section do an educational webinar on vertical activities, rebelay, etc. Bruce Smith expressed some concerns about this. Dick expressed that maybe the message should be "what you need to know" and "where to get the training" rather than "how to do it".

B. Dick Mitchell reported that Geary Schindel requested that Bill Cuddington consider being a luminary speaker at the 2014 NSS Convention.

C. It was pointed out by Terry Mitchell that Bill Boehle is not running for Secretary/Treasurer this year, but that he will be staying on as Symbolic Devices Chairman. Terry asked if Ray Sira would be willing to do the job. Ray stated that he was willing provided he could get some assistance with the minutes, which is an area he feels he is not too good at. Terry said something could be done to assist there, perhaps appointing a Recording Secretary to assist with the minutes.

VII. Elections:

A. Secretary/Treasurer (1 year term) - Ray Sira was nominated and elected by acclamation.

B. At-Large Board Members (2 year term, 2 to be elected) - Miriam Cuddington and Bill Boehle were the only persons nominated and were elected by acclamation. [Note: Current At-Large members Terry Mitchell and Mike Rusin have 1 year remaining in their terms.]

VIII. Adjournment - Motion to adjourn was made and carried. Time of adjournment was approximately 2:20 PM.

[Additional note: Subsequent to the Meeting, the Board Members elected Terry Mitchell as Chair and Miriam Cuddington as Vice Chair. The four appointed members were re-appointed to serve for another year. They are:

- * Contest Committee - Bill Cuddington
- * Vertical Techniques Workshop Committee - Terry Clark
- * Education Committee - Bruce Smith
- * Nylon Highway Editor - Tim White

Respectfully submitted,
Bill Boehle

(Rev. 0)

To be approved at 2014 Convention meeting

NSS VERTICAL SECTION

SECRETARY'S REPORT

August 2013

By Bill Boehle

Number of Members (current/just expired)	.....	297
Number of Members Current as of 2013	.....	297
Number of Subscribers Current as of 2013	.....	15
Number of Annual Volumes Paid for 2013	.....	1
Number of Complementary Subscriptions	.....	2

YEARS PAID:	MEMBER	SUBSCRIBER	ANNUAL VOLUME
Comps			2
2013	109	3	1
2014	87	8	0
2015	46	2	0
2016	13	0	0
2017	34	2	0
2018	8	0	0
2013 Totals:	297	15	3
Expired 2012:	0	0	
Totals:	297		

NSS VERTICAL SECTION

TREASURER'S REPORT (through 6/30/2013)

August 2013

By Bill Boehle

INCOME:

Nylon Highway Annual Volume Sales	.....	\$10.00
Vertical Training Course Sales	.....	\$0.00
2012 Convention Workshop Registrations	.....	\$600.00
Symbolic Item Sales	.....	\$246.00
Nylon Highway Back Issue Sales	.....	\$7.00
Shipping/Postage Charges	.....	\$4.15
Donations (Pass the hat)	.....	\$200.00
Bank Interest (Ally) June 2012 - June 2013	.....	\$183.56

TOTAL INCOME: \$1,250.71

EXPENSES:

Shipping/Postage Costs		\$3.73
NSS - wesite hosting fees (2012 & 2013)		\$xx.00
2011 Vertical Workshop Transportation Expense Subsidy (Terry Clark)		\$350.00
2012 Vertical Workshop Transportation Expense Subsidy (Terry Clark)		\$xxx.00
2012 Climbing Contest prizes		\$199.86
Vertical Workshop & Rebelay Course Supplies/Expenses		\$0.00
Nylon Highway Annual Volume Production & Mailing Costs		\$0.00
Symbolic Items Restocking (T-shirts, Sweats, etc.)		\$xxx.00
Symbolic Items Restocking (VWS Instructor T-shirts)		\$0.00
VS Recognition Awards		\$136.56
Climbing Contest Record Boards (2011 updates)		\$68.91
Climbing Contest Record Boards (2012 updates)		\$xx.00
Printing/Photocopying - Climbing Contest		\$0.00
Photocopying/Supplies for 2012 NSS Convention administration		\$13.18
Petty Cash for postage		\$20.00
Training/Education Committee Printing Costs		\$628.95
NSS Headquarters Fund donation (Buy-a-Brick)		\$200.00
NSS Headquarters Fund donation (benefactor)		\$1000.00

TOTAL EXPENSES: \$2,621.19

ACCOUNT BALANCES: (as of 6/30/2013)

TD Bank (NJ)	.....	\$3,052.28
Ally (formerly GMAC)	.....	\$9,593.54

TOTAL: \$12,645.82