

## ACCIDENT INVESTIGATION REPORT

**Case:** Fall from Heights / Tina Werner

**Location:** Go Ape Lums Pond, LLC  
Lums Pond State Park  
1042 Howell School Road  
Bear, DE 19701

**Date/Time:** Wednesday, August 24, 2016 at 2:30pm

**Submitted by:** Michael R. Smith  
AdventureSmith, Inc.  
2434 Pleasant View Drive  
Rochester Hills, MI 48306

**Date Submitted:** September 7, 2016

### PURPOSE

I was retained by Louis Rizzo, Esq. of Reger, Rizzo, Darnall, LLP, who is counsel for Go Ape Lums Ponds, LLC, a zip line and treetop adventure course located inside of Lums Pond State Park (1042 Howell School Road, Bear, Delaware 19701) to review the available information and to investigate Mrs. Tina Werner's fall from heights which occurred on Wednesday, August 24, 2016. In particular, I was asked to determine the root cause of the accident and contributory causes and to render an opinion on the adequacy of training provided to participants prior to entering the course, the personal safety system used by participants, and operational procedures. My experience and qualifications are outlined in my curriculum vitae in Appendix G.

### SUMMARY

On Wednesday, August 24, 2016, Mrs. Tina Werner, a 59 years old female from Felton, Delaware, accompanied by her friend, [REDACTED] a 61-year old male from Dover, Delaware, visited Go Ape at Lums Pond State Park located at 1042 Howell School Road in Bear, Delaware to participate in the zip line and treetop adventure course. The pair attended a Safety Briefing led by Go Ape Instructor, [REDACTED] which lasted approximately 40-50 minutes. At approximately 2:30pm, after having completed 5 ladder ascents, 15 crossings, and 3 zip lines, Mrs. Werner fell 35 feet from the elevated platform to the ground. Go Ape staff responded to calls for help and whistle blasts. They found Mrs. Werner face down at the base of the tree (ID# 395). 911 was called by Go Ape staff and the local emergency action plan was enacted. Attempts to revive Mrs. Werner by Go Ape staff, park personnel, and paramedics were unsuccessful. She died from multiple blunt force trauma injuries sustained in the fall.

### FINDINGS

An on-site review of the course, personal safety system, company policies and procedures and participant training was conducted on Tuesday, August 30, 2016. Based on my review of the materials available, an inspection

of the personal safety equipment worn by Mrs. Werner and a traverse of the course to the point of incident, I have concluded the following:

1. Course design and equipment are in alignment with applicable standards for challenge courses, zip lines, and aerial adventure parks;
2. Course procedures and documentation meet applicable standards;
3. Training provided to Mrs. Werner prior to entering the course was sufficient and met industry-accepted practices;
4. The personal safety equipment—harness, lanyards, carabiners and trolley—worn by Mrs. Werner was in good working order and within manufacturer guidelines for use at the time of incident; and
5. The flexible lifeline system—a horizontal, overhead wire rope that spans tree-to-tree above each crossing and platform anchor (referred to in the participant safety briefing as the “red safety line”) which wraps around the tree—was in proper working order at the time of incident.

Based on my analysis of the information and materials available, I have concluded that the primary cause of incident was participant error. Fall from heights is an inherent hazard and risk of participating in adventure sports like zip lining and treetop trekking which cannot be removed without significantly altering the nature of the activity and despite a reasonable effort of the course operator. The importance of following operating procedures and the requirement to “stay attached at all times” is repeated throughout the Go Ape experience in writing, orally during the safety briefing, and by signage at each transfer point.

The processes and procedures employed by Go Ape at Lums Pond State Park are well-conceived, meet applicable industry standards and industry-accepted practices, and are effective in their implementation as evidenced by their safety record. [REDACTED]

[REDACTED] This is the first incident of its kind for the company in the U.S.

## METHODOLOGY

A site visit was conducted on Tuesday, August 30, 2016. I was met on-site by [REDACTED] Go Ape Head of Operations, and [REDACTED] Go Ape Area Manager responsible for oversight of the Lums Pond location.

A walk-through of the facility and a ground tour of the course, including investigation of the incident site, was conducted. I completed a review of Go Ape documentation, including the Cabin Log and reservation information for August 24, 2016, operating procedures, risk management plans, equipment maintenance and inspection logs, course inspection and maintenance logs, and participant training and safety briefing systems.

A visit was made to the local Delaware State Police office to meet with [REDACTED] and to formally inspect the personal safety equipment worn by Mrs. Werner at the time of incident. A video of a summary examination of the equipment was taken following a more formal and detailed examination of each piece of equipment. Photos of the personal safety equipment are available in Appendix C.

Upon return to the site, I was outfitted with participant equipment and traversed the course with [REDACTED] following the path that Mrs. Werner is understood to have taken. Before entering the course, I observed a thorough

Safety Briefing. Because a Go Ape instructor with experience similar to [REDACTED] the second-year instructor which led the briefing for Mrs. Werner, was not available, I watched a video of the Participant Safety Briefing. The video is part of the formal online training program completed by each Go Ape instructor. An informal inspection of the trees, course structure, and elements was conducted during the traverse. Measurements were taken at random along the route to determine the tolerances of the course and flexible lifeline system. Video and still images of the course taken during my traverse. Some of the images are included in Appendix E.

Following the traverse of Sites 1 through 4, I reviewed witness statements and additional Go Ape documentation of the incident. Copies of some of the documents reviewed are included in the Appendices herein.

Since safety briefings are standardized between Go Ape courses, I visited Go Ape Mill Stream Run Reservation located at 16200 Valley Parkway, Strongsville, OH 44136 at 1:00pm on Wednesday, August 31, 2016 and recorded a participant safety briefing.

## MATERIALS REVIEWED IN PREPARATION OF THIS REPORT

The following materials were reviewed in preparation of this report:

- Site Visit
  - Go Ape Lums Pond – Tuesday, August 30, 2016 from 9:00am to 6:30pm
  - Go Ape Mill Stream Run – Wednesday, August 31, 2016 from 1:10pm to 1:45pm
- Inspection of PPE worn by Mrs. Werner at time of incident
- Go Ape Lums Pond Operating Documents for August 24, 2016
  - Cabin Log
  - Check-in Roster/Reservation System
  - August 24, 2016 12:00pm Roster
- Go Ape Documentation and Reports
  - Emergency Action Plan
  - Risk Management Plan
  - Harness Register
  - PPE Documents and Technical Specifications
  - PPE Inspections and Equipment Logs
  - Technical Inspection Report – October 23, 2015 by [REDACTED] of Vertic’ Alps Expertise
- Course Design Documents
  - Course Map and Design Drawings
  - Altus Catalog of Activities
  - Course Layout
- Staff Development Systems
  - Online eLearning Portal
  - Staff Training Documents
  - Training Agendas
- Conversations with
  - [REDACTED] – Go Ape Head of Operations
  - [REDACTED] – Go Ape Area Manager
  - [REDACTED] – Go Ape USA Managing Director
  - Delaware State Police [REDACTED]
  - Delaware State Police [REDACTED]
  - Lums Pond State Park Personnel
- Applicable Standards
  - ANSI/ACCT 03-2016 Challenge Courses and Canopy / Zip Line Tours Standards
  - ASTM F2959-16 Standard Practice for Aerial Adventure Courses.

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Findings which varied from common U.S. industry-accepted practices were sufficiently documented in the design plans provided by Altus.

I found the course to be impressively simple (a difficult task when installing elements in a forest of trees which are often irregular in shape and size) and well-built with tight tolerances for height of the life safety systems, element attachments, and platform construction. The life safety system was purposefully color-coded to facilitate participant equipment transfers and to reduce the risk of inadvertent transfers to non-critical cables or support elements.

Signs were present throughout the course to remind participants of the importance of always staying attached and to provide direction where necessary. Significant attention to detail was paid in the design, placement, and maintenance of the signage and layout of the course.

The equipment used by participants includes:

- Petzl Panji sit harness
- Cilao Akro Longe color-coded dual-leg, rope lanyard system
- 2 Petzl Vertigo auto-locking carabiners
- Climbing Technology Duetto, dual-sheave zip line trolley with custom lanyard to prevent accidental equipment drops (not-rated as PPE)
- Petzl Voltige chest harness (optional)
- D-shaped, 10mm Mallion Rapide

The equipment has been designed and is marketed specifically for use in aerial adventure parks like the Go Ape Lums Pond course. It complies with applicable standards for quality assurance testing and rated strengths. Technical specification sheets for the equipment are included in Appendix C.

Maintenance records were organized, thorough, and easily accessible. Based on my examination of the records, Go Ape is compliant with the necessary ongoing maintenance required to operate the course.

In my opinion, as a certified inspector, the course and systems which are currently in use at Go Ape Lums Pond are in alignment with applicable standards and industry-accepted practices. The course and equipment were not contributory to the accident.



Yellow signs in the shape of a triangle that read “Always stay attached” are secured directly above all transfers from the crossing line to the red safety line. Proper connection points are denoted by the color red—the color of the jacket safety line that participants clip into while on a platform and the color of the red bumper on the horizontal life safety line which spans from tree-to-tree over each crossing.



## Course procedures and documentation meet applicable standards

Written into the current applicable standards is the requirement for technical inspections of the course and associated safety equipment by a qualified third-party inspector on a schedule to be set by the manufacturer, but not less than once per annum, and guidelines for periodic and pre-use inspections. The standard for operational review/program audit by an external, qualified person(s) is at least once every five (5) years (ANSI/ACCT 03-2016 Chapter 2, B.2.7, p. 28).

My review of Go Ape Lums Pond produced a series of refined procedures, written documentation, and staff development systems which are second to none in the market. The company's documents were thorough, organized, and appropriate for the systems they employed. The procedures and written documentation are in alignment with current ANSI/ACCT 03-2016 Operating Standards and industry-accepted practices.

I did not find that procedures employed at the course were contributory to the accident.

## Training provided to Mrs. Werner prior to entering the course was sufficient and met industry-accepted practices

Prior to entering the course, participants at Go Ape complete the following steps:

1. **Read, complete, and sign a document titled "Rules of Participation, Assumption of Risk & Release of Claims".** The document is professionally printed and each copy is individually numbered. Scans of the agreements completed by Mrs. Werner and [REDACTED] on August 24, 2016 are included in Appendix A. The document presents the rules for participation and legal concepts in easy-to-read language. In addition to warning participants of the inherent risks of participation, it twice reinforces the rule, "You must be attached to the safety system with at least one safety line at all times when above the ground" in prominent, bold print.
2. **Pre-briefing.** Before beginning the formal briefing, participants are introduced to the safety equipment and they are harnessed by a trained instructor. The instructor checks each harness prior to introducing the course. Participants are led to a small practice area on the ground consisting of a crossing cable between two trees, red safety lines around each tree, and a simulated transfer to a Tarzan Swing. Participants are first asked to follow signs posted at each transfer point to a) learn to use the equipment and b) to reinforce the importance of reading safety signs. Each participant must make the traverse. An instructor assists with coaching and instruction as needed.
3. **Safety Briefing.** Prior to starting the formal briefing, the instructor radios in the start time and number of participants in attendance. The formal briefing begins with a legal disclaimer which must be memorized and repeated verbatim by each instructor. A copy of the procedures and processes for leading the briefing is included in Appendix D. The instructor then works through the same ground course as completed by the participants offering additional information and asking questions of participants to ensure comprehension and reinforce key points.
4. **Site 1.** Before continuing to Site 1, the instructor radios in that the group is proceeding to Site 1. Along the way, there is a short presentation on how to use the key lock to access the course. Each section of the course is secured by a fenced area, or stockade, which can only be accessed by key lock. This system prevents participants who have not completed the training from accessing the course.

Site 1 consists of three elements: a ladder climb, platform-to-platform crossing and a zip line. The instructor ascends the ladder climb, transfers to the red safety line, transfers to the crossing, and then transfers back to a red safety line to demonstrate and reinforce the procedures. Once the instructor has reached the platform before the zip line, a volunteer makes the traverse and demonstrates the zip line. Each participant must make the same traverse and demonstrate comprehension of the procedures before proceeding to Site 2.

Once all participants complete the process, the instructor exits the course by the zip line, cleans and resets the area, and places a call to the office to record the time.

The process of training participants before they enter the course is formal and consistent. In my expert opinion, it is the most comprehensive and honest process I have witnessed. Go Ape does not shy away from presenting, in clear terms, the risks that are involved in participating in the course, including the risk of serious injury or death. Participants who do not wish to continue past the Safety Briefing are presented the opportunity to return to the office and receive a refund.

The participant training process is repetitive and utilizes multiple instructional techniques including but not limited to interactive demonstrations, coaching, instruction, signage, and hands-on activity. Catchy phrases like "Blue to blue, all the way through" are used to remind participants that the blue-colored lanyard must always be connected to the trolley which is also blue in color. During the training, participants are provided multiple opportunities to practice the skills that they will need on the course and are frequently reminded to "Always stay attached".

The training and safety briefing process is repeated across Go Ape courses. During my inspection, I watched a training video of the procedures for pre-briefing, briefing, and completing Site 1. The process matched exactly the training I observed the following day at the Go Ape course at Mill Stream Run Reservation near Cleveland, Ohio and the Safety Briefing I had participated in previously at the Go Ape course at North Park near Pittsburgh, Pennsylvania.

The system Go Ape uses to train instructors to present the Safety Briefing and pre-course training is extremely thorough. It includes a combination of online learning classes and instructor-led presentations. Once training is complete, Go Ape instructors are formally reviewed on a regular basis to ensure consistency of presentation. Record of each instructor's training, assessment, and formal reviews are documented and kept on-site.

The training received by participants is complimentary with course design. While each tree/transfer on the course has somewhat different characteristics (i.e. the diameter of the tree, azimuth of the approaching and departing crossings, type of crossings, elevation of platform above the ground, etc.), the consistency of design (i.e. placement of signs, color-coding of materials, height of the crossing cables, position of the red safety line, etc.) is excellent. The safety briefing area and Site 1 course are consistent with what participants will encounter throughout the course. As such, transference of practices from the pre-briefing, safety briefing, and Site 1 is extremely high.

It is my expert opinion that training provided to Go Ape participants exceeds industry-accepted practices. It is one of the most consistent and detailed processes I have witnessed in the market. Further, it is my opinion that the training is sufficient to provide participants the skills necessary to use the safety equipment and safely complete the course.

The personal safety equipment (harness, lanyards, carabiners and trolley) worn by Mrs. Werner was in good working order and within manufacturer guidelines for use at the time of incident and was not causal to the incident

Inspection of the personal safety equipment worn by Mrs. Werner on August 24, 2016 revealed that the lanyards and equipment had been removed from Mrs. Werner by paramedics who cut the webbing with EMT shears. The cuts from the shears were clean and easily discerned from normal wear, or even accidental damage.

A thorough inspection confirmed that the equipment was in reasonably good working condition and that there was no evidence of malfunction, unusual wear, or damage that might have led to equipment failure. Here is a summary of findings.

- **Petzl Panji sit harness.** Go Ape ID LP022. The harness was first put into use in June 2013. Overall, the webbing was in good condition. There was no sign of significant fraying or abrasions. The cuts made by the EMT shears were clean and obvious. The stitching was present and in good condition. The leg loops were easily adjusted and secured. The harness hard-point was intact and showed no signs of fatigue or damage. The whistle pocket was attached and the whistle was present. The harness was within manufacturer guidelines and duty cycle.
- **Cilao Akro Longe color-coded, dual-leg, rope lanyard system.** Go Ape ID LP022. The rope lanyards were first put into use in February 2015. The lanyards were properly secured to the Panji harness using a girth hitch. The rope was in good shape. There was no evidence of unusual wear or damage to the sheath, core, or sewn loops. Identifying tags were present and readable. Red and blue sheaths were visible and easily discernable. The lanyards were within manufacturer guidelines and duty cycle.
- **Petzl Vertigo auto-locking carabiners (2).** The gates of both carabiners opened, closed, and latched without fail. The spring was strong and effective. Identifying information for each carabiner was recorded. Color coding of the gates (blue and red) was clear. Discernable wear was present in the basket (the prominent bend in the carabiner where the carabiner sits on the cable or connects to a malleon rapide) of both carabiners. The wear was not significant enough to warrant the equipment unserviceable or to require retirement. The carabiners were within manufacturer guidelines and duty cycle.
- **Climbing Technology Duetto, dual-sheave zip line trolley with custom lanyard.** The trolley was in good-working condition and showed normal signs of wear for its age. The custom aluminum horns attached to the top of the trolley to hold the red Vertigo carabiner during crossing were present and secured. The custom lanyard which is not part of the personal safety system but designed to prevent participants from dropping the trolley was cut by EMT shears. It was otherwise in reasonable working condition. The trolley was within manufacturer guidelines and duty cycle.
- **D-shaped, 10mm Malleon Rapide.** The malleon rapide was painted green. Identifying information was present and readable. The gate was securely fastened. There were no signs of unusual wear.

Based on my experience as an inspector and my review of the personal safety equipment used by Mrs. Werner, there is no evidence to suggest that the equipment was causal in the accident. In fact, my findings would suggest that the lanyards were not secured to the life safety system (either the overhead, horizontal wire rope known as the "crossing cable" or the red safety line which wraps around the tree) at the time of the incident.



The flexible lifeline system—a horizontal, overhead wire rope that spans tree-to-tree above each crossing and platform anchor (referred to in the participant safety briefing as the “red safety line”) which wraps around the tree—was in proper working order and not causal to the incident

A review of the life safety system attached to the platform between the Plank Crossing and Zip Line at the end of Site 4 was conducted on August 30, 2016. All components of the system were in proper working order and met applicable standards.

- **Overhead wire rope which spans the crossing for the Plank Crossing activity.** The wire rope was appropriate and in reasonable condition. The tension on the wire rope was within standard parameters. Terminations on both ends of the crossing showed no sign of damage or cable slip. The red buffers which cover the terminations were present and in good condition. The height of the cable was consistent with other termination heights at 63.5 inches above the deck. Blocking around the tree which was installed to prevent the cable from damaging the tree was present and in reasonable condition.
- **Red safety line around the tree.** The red, jacketed wire rope anchor that wraps around the tree was properly secured and showed no signs of unusual wear. The jacket was in good shaped. There were no signs of fatigue, slipping, or cracking. The wire rope clips were securely and properly attached. The lowest point of the cable was 37 inches above the deck which was consistent with other loops on the course.
- **Signs.** The yellow triangle sign which warns participants to “Always stay attached” was present and secured just above the horizontal life line which spans the crossing. The element crossing sign (in this case, a zip line) was present and secured just above the zip line cable.

All other connections associated with the incoming element, referred to as “Plank Crossing”, and the outgoing element, “Zip Line”, were in good working condition and in alignment with applicable standards. The deck was secure and in good condition.

Based on the findings of my inspection of the course components in the area of the fall and a lack of evidence showing that a component of the life safety system failed, I must rule out that the fall was caused by an equipment malfunction or failure.

## SUMMARY CONCLUSIONS

My professional conclusion is that the systems employed by Go Ape are thorough, well-conceived, and simple in design. The procedures each participant must follow prior to entering the course—Pre-Briefing, Safety Briefing and Site 1—meet industry-approved practices and provide sufficient training. The information provided to participants in written agreement before the training, orally during the safety briefing, and on signs situated throughout the course neither hides nor down plays the risks of participation. Further, the need for participants to “always stay attached” is repeatedly stressed.

The participant equipment, training, and course design at Go Ape are in alignment with industry-accepted practices and applicable standards. The company’s execution of processes, procedures, and documentation are among the most comprehensive and exacting which I have observed in the market. Further, the tight design tolerances on the course, unique color-coding of equipment and anchors, and professional signage make learning to use the personal safety equipment simple and routine.

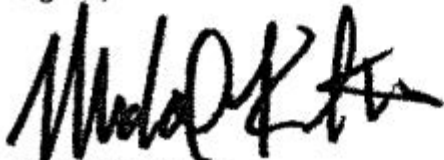
My inspection of the personal safety equipment used by Mrs. Werner on August 24, 2016 showed that the equipment was in good working condition. There were no signs of damage or indications that the equipment may have malfunctioned or failed. My inspection of the course, life safety system, and signage in the area of the incident also revealed systems which were well-maintained and in good working order. These findings support the conclusion that Mrs. Werner was not attached at the time of her fall. The root cause of her fall and subsequent injuries which resulted in death was operator error. These conclusions are further supported by [REDACTED], a participant on the course in close proximity to Mrs. Werner, who stated to Go Ape instructors that she saw that Mrs. Werner was not connected just before she fell.

While accidents like these are unfortunate, participating in adventure sports like zip lining and treetop trekking is inherently dangerous. Courses like the zip line and treetop adventure at Lums Pond include inherent risks and hazards that cannot be otherwise removed without changing the nature of the activity. Go Ape repeatedly reminds participants of these risks and hazards in writing, orally, and through visual displays. The need to always stay attached is reinforced over and over throughout the experience. Mrs. Werner accepted these risks when she read and signed the Rules for Participation, Assumption of Risk & Release of Claims document. She was provided opportunities to change her mind following the disclaimer portion of the Safety Briefing and on Site 2 when she was assisted by a Go Ape instructor. In both cases, she chose to continue and proceed forward. It is my firm recommendation that Go Ape not rush to any conclusions or make reactionary adjustments to their system as consequence of this accident. The current systems and procedures which Go Ape has created have been time-tested and, in my expert opinion, are extremely well thought out, effective at mitigating risk, and are in alignment with current applicable standards and industry-accepted practices.

\* \* \* \* \*

The opinions expressed herein are based on my understanding of the materials provided to me; my visit to Go Ape Lums Pond on August 30, 2016, my significant experience in the challenge course and commercial aerial adventure park market as a guide, operator, trainer, inspector, installer, and designer; and my education in training, organizational practices, and wilderness leadership. I reserve the right to amend and/or supplement this report based on new information and findings.

Signed,



Michael R. Smith

Dated: September 7, 2016