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Keeping skiers safe
with wire rope

*Dale Walters of Mountain Wire Rope Service
making a long splice as used on ski lifts*



Wire rope keeps many a skier safe on the long haul up the mountain

By Peter Hildebrandt

Early skiers expended far more energy and sweat lugging skis, equipment and themselves up the mountain than in the few minutes it took to descend. Simple rope tows came into existence in the early 1930s, and then in 1936 James Curran, a Union Pacific engineer who had worked on the engineering of banana conveying systems in warmer climates, built the first known chair lift for a new ski resort at Sun Valley, Idaho.

Skiers haven't looked back nor seemed interested in returning to the days of long repeated hikes to reach the top of the mountain. Likewise, the earlier fixed rope tows and their inescapable slower speeds and inherent hazards during loading and unloading have been replaced by high-speed detachable lifts. Some in the ski rope business have witnessed many of those changes over the past decades.

Present at the dawn of the ski rope industry

Dale Walters, owner of Dale R. Walters Mountain Wire Rope Service in Sunbury, Pennsylvania, has worked in the wire rope business since 1968. Walters worked for Paulsen Wire Rope, now known as Wirerope Works. Shortly after starting with them they began making ski ropes for the ski industry. (Walters refers to wire ropes as "ropes," not to be confused with the fiber rope used in the old rope tow-style ski lifts.) Back in the late 1960s production started on cables for the Hall Ski Lift Company (one of the largest) and a few of the other ski lift manufacturers.

The early 1970s were the heyday of the ski industry. As many as 300 lifts a year were being installed. There were a lot of ropes being sold, and Paulsen needed a service person. Walters just happened to be there talking about it one day and he suggested giving it a try.

Walters spent two years with another splicer out of Massachusetts in an apprenticeship program. After that he was with Paulsen until 1984 when the company wanted to get out of the service end of the business. In July of 1984, Walters decided to go out on his own and is now the owner and sole proprietor of his ski rope company.

He now purchases a lot of wire rope



Preparing for long splice.

through Wirerope Works. There are a number of other manufacturers of such ropes around the country today, but not many, according to Walters. For some of the specialty lifts, such as the high-speed detachable lifts, the ropes may have to be purchased in Switzerland.

The Walters currently service some 135 ski areas in the Eastern and Midwestern U.S. The Midwest (Iowa and Minnesota) is as far as they go, as there are enough service personnel and companies in the western U.S. to cover such operations.

A family business

After his daughter, Whitney Walters-Anderson, had graduated from college she said she'd like to join Walters and become an inspector. She'd been around the business all her life. He trained her; she became an inspector, and when she married in 1990, her husband, J.T. Anderson also wanted to get into the business. He is now a splicer and an inspector.

Walters' wife Sandy runs the office at their home and they also have another daughter JoLynn Edwards who is a legal secretary who does some of the legal work they need done, and her daughter

- Sydney still in high school - does the typing of the reports for the company.

"It's a real family affair as a good part of the entire family is involved in our operations," says Walters. "We physically inspect about two million feet of wire rope per year on ski lifts as well as ten amusement parks which contain cables in their various rides. We recently visited 'Six Flags over Georgia' where we did a shortening splice on some wire rope."

Walters services "Ghost town in the Sky," "Tweetsie Railroad" and three other amusement parks, plus eight

different ski areas in the North Carolina mountains. They both physically inspect and use a magnetic rope test (MRT) involving some machinery. That's not required on all ropes, according to Walters but for some of them it is. Normally they perform a visual inspection.

Ski ropes are different from general purpose wire rope. Each lift manufacturer has their own specifications on what they need made for their piece of equipment. All of these ropes have fiber cores within them, either a polypropylene core or a solid plastic core. This insures flexibility.

What wears the ropes out is going around the bull wheels as the straight pulling of the ropes is not much of a real strain. A five to one safety factor is required and the flexing going around the bull wheels is what wears the ropes out.

In the late 1960s, fiber cores were used on the ropes which were hemp or sisal, according to Walters, but their longevity was not very good. In the early 1970s everybody went to the polypropylene core, all the manufacturers.

Important change in lift technology

In the late 80s and early 90s the high-speed detachable lifts came into use.

The purpose of the detachable lifts was to increase lift speed. Ropes on the detachable lifts are able to travel at approximately 1,000 feet per minute. With the development of detachable lifts, the polypropylene core was not dense enough and had too much stretch. Manufacturers went to a solid plastic core placed hot within the rope which was constructed around it. Very minimal stretch occurs with such construction.

When the chair enters the terminal with a detachable lift, the grip opens up, the chair comes off the rope and goes onto a track. This type of operation is designed so that skiers can both enter and exit the lift chair much more easily and safely. Once a chair grips back onto the rope the rider will feel the sudden increase in speed as the lift does its work of carrying the skiers up the mountain. Detachable ski lifts move skiers up the hill twice as fast as the fixed-grip lifts did.

The maximum speed on the fixed-grip lifts is 500 feet per minute, a speed which is used mainly for loading and unloading purposes. When the detachable lifts came on the scene, skiers who'd experienced these newer lifts never wanted to go back to riding the older fixed-grip lifts again. "When you arrive at the top, it slows down and the skier simply stands up and safely leaves the lift, not worrying about skiers behind in the next chair," says Walters. "The splicing on the detachable ropes is a little more precise



Cutting rope with grinder.

because the chair grip, when it launches, can launch right on a tuck, as on these ropes you can fix tucks. These are buried inside so in effect it becomes an endless rope."

The length of the splice is 1200 times the rope diameter. On a one inch rope, that would be 100 feet long. There are six strands in these ropes with points where when you are making the splice, the strands cross each other. That's where the braided tail is inside to make a tuck, so there are six tucks to make splices. And for detachables, these spots must be done real well so that when the grip launches on them it makes good contact, closes properly and releases properly. This is important because it may launch anywhere on the rope. Also, there are switches at the terminals and if the chair does not attach properly to the haul rope, the switch is set off, shutting the entire lift down before those skiers occupying it start up the hill. On a fixed-grip lift this is not something which those maintaining the ropes must be so cautious about.

All in a day's work

"Every job that we do is a little bit different," says Walters. "Our typical day is a day driving in the truck to reach a different ski area or amusement park and sleeping in a different bed every night, eating in a different restaurant at each meal – it's life on the road.

"We hear the comment, 'boy you're lucky you get to go to all these fancy resorts all the time'. But we arrive when they are closed, in the fall and summer months, when nothing is going on at the resorts. In the winter we are sitting back and relaxing. The ski areas don't need us at that time, though there are a few emergencies here and there for us to handle."

Most of those problems arise on such lifts as so-called T-bar or J-bars. Sometimes these will get a de-rope and

the lift will get a tear in a strand. As far as safety, Walters feels that there will be many things which will have to happen before a cable ends up breaking. With a de-rope the cable might come off the wheels, if the rope drops down it can throw people from the chairs or with roll-backs where the lift rolls backwards it may throw skiers from the chairs as well.

"But as far as rope breaking, the chances of that are slim to none," says Walters. "It's a five to one safety factor; every tower has stop switches on them and in the

terminals where loading and unloading takes place there are switches. If things are not in proper alignment and the rope comes off the shiv the lift will shut down immediately. The ladders built onto the ski towers are not designed for skiers to climb down; they're for maintenance purposes."

If a lift must be evacuated for some reason, the area's ski patrol, typically will come and assist skiers. A rope is thrown up to the chair. These contain a small seat which can be used to help bring people down off the chairs. Walters mentions that in all the time he has worked on ski lift rope he has never been evacuated, but he also feels if he had been it would have been pretty interesting. To a large extent, the cable may often be the safest part of the whole lift. Very seldom is there ever a rope problem.

"People hear about such things as the cable being snapped by the U.S. jet in Italy and then worry," says Walters. "But such things really are freak accidents. For the most part ski lifts are quite safe. And within the ski industry as a whole, things are now quite solid. Ski areas operating today are all fairly solid as far as operations go. We're not losing many these days, perhaps one or two small mom and pop operations here and there." If an area does not have snowmaking capabilities it usually cannot survive nowadays. This has even been realized by areas in the western U.S. All areas operating today are good areas and all have snowmaking.

What it takes to survive

Walters did his first splice back in 1969 at a ski area in north-central Pennsylvania called Blue Knob. That splice was on a small surface, platter lift. This area is one of the few in the country which is "upside down" meaning its lodge facilities are at the top of the mountain. As a result skiers must not be caught at



Checking samples of damaged ropes.



Unlaying strands to marriage point.

the bottom of the mountain at days' end. When bad weather occurs the conditions at the top of the mountain lodge can be brutal. Snowshoe ski area in West Virginia is also one of the few upside-down resorts.

Walters finds one of the roughest mountains for him to work on in the course of their work, such as changing a cable, is Gore Mountain Ski Area in North Creek, New York. Gore is a rocky mountain, and has beautiful skiing during the winter. "But it's a really rough mountain to get around on when it has no snow on it, which is when we are there working on it. Work on Gore ended up being much more physical than most other areas.

"Another mountain nearby, Oak Mountain in Speculator, has recently installed a new chair lift. Further north, the old ski area of Tupper Mountain has reopened this year as well. Locals with a lot of volunteer labor put things together and an individual from the ski industry was brought in to operate it for the year. We also helped them out to get things up and running. When an area is struggling and I can help them out, I really don't mind doing that. But I guess if the larger areas hear that they may want me to help them out too!"



Cutting out core at marriage point.



Removing strand from one end of rope and laying in strand from the other end.

A future among the flakes

Walters sells a Multi-Lift handle tow that can be used for "tubing" in chutes that are banked and sculpted into a kind of miniature bobsled run that controls the direction of the tube and keeps the

tube in the chute. (Don't we wish they'd had those when we were kids!) Taking away the walk up the hill has made a fun activity even more enjoyable, and tubing has become the latest rage at many ski areas. The specially designed tubes have a handle that attaches to a Multi-Lift wire rope handle tow that transports the tube and the tuber back up to the top for the next ride down.

The lift is used for no more than 1,000 feet. This may also be used for cross-country skiers and Walters has a few of them installed on cross-country courses.

Walters has skied for years, though he hasn't participated for a few years now because his "knees are shot." The Walters have two grandsons, 14 and 10 who are around this type of work all the time because of the family involvement. He is not sure they will take this up as an occupation, but "the opportunity is here for them if they are interested."

Besides being a family business, Walters feels the industry is really like a fraternity. "We all know each other. The other splicers out there, if they need anything I can supply them with, they call me. We have no competition; we all have our own clientele. And we all have about all that we can handle, too." **WRN**