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Roland Verreet
The Rope Pope

Roland Verreet sits in the boom tip of a 6000t crane of the Thialf, the largest floating crane in the world.

A Lively Interview with Roland Verreet: "The Rope Pope"

by Barbara Spencer

With no intention of retiring, Verreet travels worldwide as perhaps the most well-known wire rope designer, inspector, consultant and speaker. He says he was once introduced as "the man who makes wire rope sexy." But he thinks that wire rope has always been sexy.

In Germany he is called "Seilpapst." In English, Roland Verreet is "The Rope Pope."

We caught up with him at his hometown of Aachen, Germany. In his lab there, he develops and tests steel wire rope for specific applications.

At 67, Verreet has 42 years of expertise in the wire rope lifting industry, and speaks throughout the world for companies and organizations, including the International Organization for the Study of Ropes (OIPEEC) and the Associated Wire Rope Fabricators (AWRF). In fact, he'll be the keynote speaker at the AWRF meeting near Scottsdale, Arizona in April. (See side box on page 5 for details.)

Known by many as "The Rope Pope," Roland Verreet travels worldwide to share his expertise as a wire rope consultant, inspector, and speaker. Here he speaks at a seminar in Tasmania.
All images courtesy of Roland Verreet unless othewise noted.

Catapulting humans at Euro Disney

Verreet has been involved in designing rope for decades. He says that as a consultant you get two kinds of jobs, "the jobs the companies don't want to do themselves (these are the bad ones) and the jobs the companies cannot do themselves (these are the very interesting and fascinating ones). The latter jobs normally lead you into unknown territory, and you can be sure that you'll learn something new in the process."

One of the jobs he enjoyed working on was the Eiffel Tower elevator renovations. Another was the layout of the new Panama Canal locks. But perhaps the most fascinating is the catapult used in Space Mountain at Euro Disney in Paris.

He tells this story:

"In 1993 I attended an ISO standards meeting. One of the attendees pulled out this letter he'd received proposing the idea of building a machine that would shock load wire rope. Others said they had received the same letter and all agreed it was a crazy idea to build a catapult using wire rope. I didn't say anything, but I had also gotten the letter and even though it sounded crazy, I was intrigued and called the author of the letter, Jean Marc Teissier.

"Jean Marc is a mechanical engineer, and at the time didn't know much about wire rope. But we succeeded in convincing Disney of a design using wire rope, and today this concept is used in catapult systems all over the world."

Every 36 seconds, 24 passengers on the Space Mountain train are shot into a huge dome by means of a rope-driven catapult. First, gravity pulls the train to the bottom of the canon slope. Then, after the catapult pusher loads the canon, the train gets into position and accelerates 1,3g, reaching a speed of more than 50 km/h in less than 2 seconds.

"In our joint paper we thanked Disney for funding our $120 million wire rope test machine," Verreet says.

Today Verreet's colleague Jean Marc Teissier is a wire rope expert in his own right, building rope-driven structures like the opening roof of the Singapore Stadium. *Wire Rope News & Sling Technology* will feature an interview with Jean Marc Teissier in a future issue.

Analyzing wire rope, discovering sea creatures

Verreet was born in Germany. He graduated in 1975 with a Mechanical Engineering degree from RWTH University in Aachen, and still lives and works in Aachen. His resume states that he has 42 years of experience in the design, manufacture and testing of steel wire ropes and reeving systems. That consists of nine years as head of R&D at Casar Drahtseilwerk Saar GmbH, the largest German wire rope

manufacturer, and 33 years as an independent consultant.

A self-described perfectionist, Verreet says he likes to work by himself. "You make your own mistakes. It shapes you."

Married for 40 years, he and his wife Regine have two sons (40 and 39 years) and three grandchildren. "My younger son stopped working for me because I am too demanding. For me 'good enough is not good enough.' I think that this thrive for perfection is what you need in our industry where overlooking a little nasty detail might lead to a catastrophe. This attention to detail is of course especially important for people who, like me, work as a one man show and who have nobody else to double-check their calculations."

Verreet counts many in the U.S. industry as friends, including Don Sayenga, who is still referred to as "Mr. Wire Rope."

In his lab, Verreet has four scanning electron microscopes (SEM's). "Don's definition of a major research institution is one that has an SEM machine. I have four."

Verreet uses them for his profession, and his hobby. On his office walls are large, stunning photos of what appear to be intricate sea shells. They're actually single-celled sea creatures called foraminifera.

"There are many different foraminifera," he says, pointing to a photo of one with encircling rings. The rings are chambers, which the creatures expand in number over time, "in order to increase the size of their living room."

Verreet uses the same tools and methods that he needs for rope analysis. "People send me sand from beaches all over the world. I look at the sand under the microscope and when I find a foraminifera, it is so tiny that I have to extract it from the sand using a wet hair." He puts them onto a specimen holder, peers at them with the scanning microscope and takes images.

The foraminifera images are printed, enlarged up to a meter by a meter, and displayed on aluminum or behind acrylic glass. The final art is so beautiful that Verreet has been invited to display his photographs in art galleries around the world.

Holding in his hands the oldest wire rope in the world

Communicating via video app from Germany, Verreet stands up in his Aachen office and grabs a sample of old, rusty rope about a foot long. "This is one of only four pieces of the oldest wire rope in the world," he says.

Wire rope was invented in 1834 in Clausthal, Germany (about 4½ hours from Verreet's office) by Julius Wilhelm Albert. A mining engineer, Albert sought to find a means of hoisting that was better than his options at the time: hemp rope or iron chain. Combining the best aspects of both, he designed a hand-twisted iron wire rope that consisted of three strands, each with four 3.5mm wires.

Forming the rope was extremely labor intensive. "First small iron lumps were hammered into a long shape and then, after sharpening one end, they were successively pulled through the bores of a die…which became thinner and thinner until they finally became the desired diameter. At that time many wire drawers spent their working day on a swing: after they had set it in motion they grasped the wire end sticking out from the die with a pair of pliers and pulled it out bit by bit using the energy stored in the movement. Of course, the swing would abruptly slow down so that it had to be 'recharged' before the proce-

Here, in Norway, Roland Verreet stands next to the 6000t hook block on the deck of the Thialf, the largest floating crane in the world.

dure could be repeated." **

Albert continued to test and perfect his rope, and eventually determined that three strands created a triangle shape, which was not the best shape for wear. So he created the four strand rope. "Of course," Verreet chuckled, "that made it more like a square."

The rope that Verreet owns was discovered in a flooded mine after WWII. When the mines were operating, they were pumped out regularly. But as Verreet says, "after the war people had more important things to deal with." U.S. troops were ordered to pump the mines for possible treasures left behind by Hitler. In one in Clausthal, a mining engineer discovered two meters of what he thought was strand. But it was iron rope, and it fit the description of Wilhelm Albert's three-strand rope which had operated in this mine.

"My wife got it for me for my 50th birthday," Verreet says, smiling, "She never told me how she got it. I'm the only person who has pieces of both the 3 and the 4 strand rope designed by Albert."

Today Clausthal celebrates Albert's invention, says Verreet. "In 2009 a symposium was held in Clausthal for the 175th birthday of steel wire rope at the Technical University of Clausthal. People remarked that steel wire rope was invented in Clausthal. The town has a very respected University of Technology, but nobody at the Clausthal University would lecture about steel wire rope. So it was decided that I would teach about ropes and reeving systems there. I have had the honor of giving these lectures every year since 2010."

Verreet, who inspects wire rope for clients worldwide, checks the equalizer drum of an 800t crane.

Past his "discard state" but still unstoppable

"I was born in June 1950, and in June 2015 I reached my discard state, as rope engineers would call it," Verreet said in his introduction for his presentation at the 21st International Offshore Crane & Lifting Conference.*

"But I did not retire. The crane and rope businesses are far too interesting for me. I started school at the age of five, one year earlier than usual. The effect of that was that wherever I went, I was always the youngest… You get used to a situation like that, until one day you look around and you find that something has changed: all your former colleagues have retired and now you are the oldest. That is shocking! Then you begin to realize that all these youngsters around you have little or no idea what their industry was like 40 years ago. Many of them were not even born at that time."

But Verreet remembers. He's played an important role in using ever-more-sophisticated technologies to improve wire rope fabrication methods, resulting in longer rope life and better safety.

In the 21st century, when engineers design steel wire ropes with advanced computer programs, many forget that the computer age was in its infancy as Verreet began his career in the 1970s.

"At that time steel wire ropes were designed using empirical factors for strand diameters, wire diameters, and rope and strand lay lengths. These factors were arrived at through trial and error, and the customers were the guinea pigs."

How can you make wire rope without wire?

Embracing the latest advances in technology, Verreet uses his own 3D printer to design and test rope. Although the printing material is plastic filament, "I try to establish a relationship between the test I make on steel rope and plastic rope. Up to a point the difference in modulus doesn't matter."

He also sends rope designs to a metal printer, which uses steel powder, and makes wire rope. "I actually own and patented the first wire rope not made out of wire."

He says if he wanted to design a rope, he could produce it in five different variations using the 3D printer within hours, saving time and money. And he could make a rope with terminations at either end, all in one continuous piece.

That funny cartoon with the guy that has a cigarette hanging from his mouth

Despite his hard work and awards, Verreet claims that he has frequently been upstaged by a funny guy with a cigarette hanging from his mouth. He is featured in cartoons that illustrate Verreet's papers.

"It is the cartoons that I seem to be

For many years, Verreet worked with artist Rolf Bunse to find humorous ways to illustrate his technical papers. Bunse sketched this cartoon to show an important aspect of inspection: looking at all the right places.

Ropes and Reeving Systems, The last 40 Years, by Roland Verreet, www.ropetechnology.com.

***A Short History of Wire Rope*, by Roland Verreet, www.ropetechnology.com.

known for," Verreet says without complaint. "I was looking for a cartoonist 30 years ago to illustrate my papers." He found Rolf Bunse, who Verreet said was not only a good artist, but also technically precise. Through the years they developed a close friendship. Despite his serious demeanor, "Rolf is the most humorous person I've ever met.

"The figure with the cigarette hanging out of his mouth is Rolf's self-portrait. Rolf smoked constantly," says Verreet, who lost his friend to lung cancer last year. He's sure he'll never find a worthy replacement.

Investigator, speaker, expert witness

Verreet seems to have no intentions of slowing down.

He says the manager of a distributor once introduced him as "the person who makes wire rope sexy." But, he says, "I think that rope has always been sexy.

"I am a long-term member of AWRF and OIPEEC." For the latter, Verreet has served as secretary for 8 years, and as vice president and president. Now he is an Honorary Member.

"I'm probably the best known person in the field of ropes and reeving systems in Germany because of the fact that I give two-day courses at Haus der Technik (House of Technology) in Essen two or three times a year. Almost everybody in the German rope and lifting industry has attended my lectures at least once.

"I work as an expert witness in court worldwide. I have dealt with cases where my fee was larger than a damage caused by the rope failure, and I have dealt with others where the damage caused by the rope failure cost hundreds of millions and even more than a billion dollars. (In these cases, my fee was lower than the damage.)

Of course, Verreet asserts, wire rope experts are not known or distinguished outside their field. "They don't collect Nobel prizes," he jokes. But he has received "some nice awards," he says. "I am very proud of the custom-made award I received from Bob Cabana, the director of the Kennedy Space Center, for the work I have done for NASA. I helped with a problem related to the space station assembly crane, and did crane and safety training for the NASA lifting engineers. This is better than a Nobel prize, because there is not a second one like it."

It is an apt award for Roland Verreet, whose work in the wire rope field is often inventive and unique.

For instance, he was involved in the design of the highest vertical-lift bridge in Europe. It crosses the Seine River in Rouen. The Pont Gustave-Flaubert is 670m long, with a span of 116m. It allows ships up to 55m tall to pass under it.

"What I regret is that because of the Non Disclosure Agreements you have to sign with your customers, you cannot share the most interesting insights with others. In the end this means you can talk about the boring stuff, but you must keep the most interesting things to yourself. This is especially bad since it would be cheaper to learn from other people's mistakes. 'Because,' as Eleanor Roosevelt says, 'you do not live long enough to make them all yourself.'"

Luckily for the industry, Verreet plans to continue his work in the foreseeable future.

"I find it fascinating," he says, "that after more than 42 years in the wire rope lifting industry I can still learn something new every day." WRN

Roland Verreet will speak at the AWRF meeting this April

Verreet will speak to the Associated Wire Rope Fabricators organization at their spring meeting, April 22-25, near Scottsdale, AZ. The title of his talk will be, *Ropes: From Fiber to Steel and Now Back to Fiber?*

"When Kevlar was introduced in 1975, many predicted the demise of wire rope," says Verreet. "Today a myriad of fibers are available, and wire rope is often still the choice." Why?

Verreet will discuss the challenges of creating discard criteria for fibers. And he'll delve into ideas for creating standards that would reduce confusion and ensure safety.

For more information, go to: https://awrf.org/events/

"I was involved with the design of the highest vertical-lift bridge in Europe," says Verreet. The Pont Gustave-Flaubert is 670m long, with a span of 116m. Spanning the Seine River in Rouen, it allows ships up to 55m tall to pass beneath it. *Photo © Christine Bird | Dreamstime.com*

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