Living and Learning in Kenya

In early February, Whirlwind Founder and Chief Engineer Ralf Hotchkiss returned from nearly 5 months in Africa. But neither political/tribal conflict in Kenya nor a severe physical injury had been enough to stop Ralf from providing needed quality control help to a local wheelchair manufacturer.

Ralf had gone to Moshi, Tanzania in mid September 2007 to participate in the Pan African Wheelchair Association conference, where wheelchair builders and others involved in the wheelchair industry all over Africa shared their latest designs and discussed problems facing the industry, foremost of which is the importation of large numbers of low quality wheelchairs that are usually given away free. In an effort to counteract such wheelchair dumping, Hubert Siefert, director of the Association for Persons with Disabilities Kenya (APDK) has been finding sources of materials in India and China to bring into Kenya by the container load, and then distributing them at cost to wheelchair shops in other East African countries, including Tanzania, Uganda, and Eritrea.

Following the conference, Ralf traveled to Nairobi, Kenya, where he worked at the APDK workshop until his return early last month. Ralf spent most of four-plus months at APDK working on quality control and on simplifying quality control testing in preparation for fulfilling a number of large orders recently received.

Quality Control

"From the moment I arrived in Kenya I heard complaints about the poor quality from consumers," said Hotchkiss. “Poorly aligned chairs that coasted in small circles; Chairs with weak fabric that ripped out of the seats; Rear spokes that came loose quickly that could not be tightened, leading to rear wheels that failed within a year or two. I heard the same from tricycle (hand cycle) riders who complained that they had to turn their front wheel to one side in order to travel in a straight line. Plus they had the same loose spoke and wheel problems as the wheelchairs, and many other smaller problems.”

To solve the problems, Ralf built better jigs and fixtures. Still, when Ralf first got to APDK, they had no organized inspection process. “If someone saw something wrong with a chair,” said Ralf, “it was up to them to fix it or let it go. Most chairs left the shop without having ever been ridden or even having been pushed to see if they would roll straight.” Ralf also attributes the problems to insufficiently trained and motivated management. “There are no wheelchair riders working in the factory,” said Ralf, “so they have less of a personal incentive to do a good job.” And also the shops can still sell their chairs to funders who will pay for chairs without checking on their quality, thus intensifying the problems. Ralf was pleased to report that by the end of his visit quality had greatly improved and as long as quality control measures continue to be exercised, the quality will be good.

Steamed Feet

About one month into his trip, Ralf suffered severe burns to his feet. From his wheelchair, Ralf was unable to reach the bathtub faucets to draw his bath water and had to get into the tub first and then fill it up. As the tub was beginning to fill, the lukewarm water suddenly changed to boiling and spurted out with clouds of steam, spraying both feet as Ralf reached to turn the water off. It took only a few seconds to reach the faucets, but the hot and cold were reversed from the positions they are in the U.S., so he first turned off the cold water losing precious seconds before he could turn off the hot water. “Hot water was ricocheting all over the place,” he said.

It wasn’t long until blisters formed covering the tops of both feet and all ten toes. Ralf found a doctor who was a burn reconstruction specialist, an Egyptian who had worked 35 years building a network of burn care experts in Kenya. “I was very pleased with Dr. Aref’s treatment,” said Ralf. “It was as
if I had signed up as an apprentice to one of Africa’s best wound care specialists. He would train me to treat myself between visits, which went from daily to weekly, and then to biweekly.” Dr. Aref described himself to Ralf as “an aggressive wound care doctor,” and according to Ralf, “aggressive he was.” When either foot showed the slightest change towards redness the doctor would attack it with topical medicines and oral antibiotics. “Each time infection began to attack,” Ralf said, “he would knock it down in a few days by changing antibiotics regularly to “trick the bacteria,” in Dr. Aref’s words. Ralf’s wounds finally closed just before Christmas and Dr. Aref gave him permission to make the long trip home, believing that his feet would stay safe from infection.

Ralf had a plane reservation for just before Christmas, but in the national turmoil that erupted between the election and when the victor was announced, Nairobi largely shut down. There was little or no street traffic. “It was as if people out of fear followed a self-imposed curfew,” Ralf said. “Of the taxi drivers I knew and whose telephone numbers I had, none would take me to the airport, so I missed the flight.” Ralf made a new plane reservation for just before New Year’s -- he couldn’t get a reservation any sooner. But there was a general rush to get out of the country and many regular flights were cancelled.

“I stayed in a small disability community until things calmed down and the APDK shop reopened,” Ralf said. “Some of the workers didn’t show up for work because they were stuck upcountry in their homelands where they had gone for the holidays. But the four with whom Ralf had worked most closely were there and ready, and together they finished building the jigs and fixtures for mass production of the Whirlwind RoughRider™ (which is being called the EasyRider in Kenya because RoughRider is the name of a condom).

**Hand Cycles**

“Being stuck in Kenya gave me the chance to discover problems of wheelchair manufacture that I had never guessed would happen,” said Ralf. But Ralf also made a lot of his time very productive when he was stuck for so long in what he likes to call “that problem-rich environment.” APDK makes more than twice the number of hand cycles than it does wheelchairs, and Whirlwind has been working on problems of alternate (other than pushing on hand rims) propulsion for hand cycles off and on for many years.

Hand cycles, or tricycles, or “trikes,” are invaluable for covering greater distances and carrying heavy loads and are widely used in the developing world by people who don’t quite need a wheelchair – those who can walk short distances, but with assistance. “When I first rode the APDK tricycle, it was difficult at best for me as a paraplegic,” recounted Ralf. “The seat was far too high and too erect, almost leaning forward. When pedaling, it was very difficult to keep the chair from going in a zigzag line left and right as I pushed the hand pedals. Drawing on designs done twenty and more years ago in the US, I modified the steering geometry of the APDK trike to the point where the zigzagging was minimal, and I changed the seating angle until I had a chair that felt very good and that I could sit in safely without struggling at every moment.”

Many experienced trike riders at APDK tried out the new cycle and were unanimous in their approval. The new steering geometry fits right into the removable trike design that Whirlwind has been working on as an alternate way of propelling the RoughRider™, and we hope to be able to finalize a design before the end of this year. “I built a prototype of that removable trike, rode it 20 kilometers in one day on the rough roads of Nairobi, cut it in half to fit in a small suitcase, and brought it home to make further improvements,” Ralf said.

We’ll likely hear more about this creative design development before the end of the year. Ralf is a living example of the popular expression, “When life gives you lemons, make lemonade.” We’re all glad he finally made it back more or less intact to the Whirlwind shop at San Francisco State University.