Eric Loewen: All systems go

The 57th president of the American Nuclear Society is an avid cross-country skier, can spin a good yarn, and is a tireless advocate for nuclear energy.

BY RICK MICHAL

ERIC LOEWEN WAS born in Denver, Colo., in 1961, on a day when NASA had scheduled a space launch. The launch piqued the interest of Loewen's very pregnant mother, who sat listening on the car radio as Loewen's father drove her to the hospital. Mr. Loewen panicked, however, when Mrs. Loewen remained in the car once they had reached their destination. No, she said, things can wait until after the launch is completed.

The launch was eventually made, and Mrs. Loewen eventually entered the hospital. The delivery of baby Eric Loewen was, using NASA jargon, all systems go.

Things have appeared to be all systems go for Loewen since then. Now the 57th president of the American Nuclear Society, Loewen is chief consulting engineer for GE Hitachi Nuclear Energy, in Wilmington, N.C., where he leads the company's efforts to deploy an integral fast reactor—the PRISM—that would burn used nuclear fuel and excess weapons-grade materials. His background includes a stint in the nuclear Navy and several years at a national laboratory. A dedicated family man, he and his wife, Jennifer, have two children of their own and have been foster parents to 11 other childen.

For fun, Loewen likes to surf the low waves near his home just off the North Carolina coast. He is also an avid cross-country skier (when he is able to find snow), and he plans to get back into triathlons (swim/bike/run). He also can tell a good story while sitting at the table enjoying a Blue Moon beer without the orange slice, and, for relaxation, he likes to crochet, although he only mentions it in passing.

These days, Loewen crisscrosses the country giving presentations on nuclear science and technology because he believes so passionately in it. In fact, *Esquire* magazine has called him the man who is going to save the world, because of his advocacy for nuclear power.

In the beginning

When Loewen was 10 years old, he moved with his parents and two younger sisters from Denver to Leadville, Colo., an old silver-mining town in the Rocky Mountains, which, at an elevation of 10 152 feet, is the highest incorporated city in the United States. That is where young Loewen learned to cross-country ski, a sport that remains one of his passions. Loewen's father was a Fuller Brush salesman, and his mother was a secretary at the local community college.

Loewen tells a funny story about his father, who was born in Kansas into a Mennonite family, which meant that there was no dating, no drinking, no gambling. "He was one of eight kids, and when he reached adulthood, he left Kansas and went to Denver to work. He goes out to a bar there, and, not wanting to be a called a hick, he says to the bartender, 'I'll have a cocktail.' The bartender says, 'What kind of cocktail?' Not knowing one alcoholic drink from another, my father says, 'I'll have a fruit cocktail!'"

After graduating from high school in Leadville, Loewen enrolled at Western State College, in Gunnison, Colo., where he earned a cross-country skiing scholarship and majored in chemistry and math. "Western State was started in the early 1900s as a teachers college. Its science program was geared toward education majors, not science majors. I think there were two or three chemistry majors in my graduating class," he said.

As an undergraduate, Loewen worked during the summers for an oil shale company, and he realized that a job in chemistry, doing hydrations and environmental work,

held no interest for him. So when a Navy recruiter showed up on campus at the beginning of his junior year, Loewen took the opportunity to talk to him about becoming a fighter pilot. "The recruiter looked at my resumé and noticed that I was a science major. 'Everybody wants to be a pilot,' he said. 'You ought to be a nuke.' I said, a what?"

The recruiter ratcheted up his sales pitch, explaining that the Nuclear Propulsion Officer Candidate program would be a perfect fit. "Do the NUPOC program now and you can become a pilot later," he said. Loewen still wasn't convinced, so the recruiter went further. First, he said, you will have more technical fun in NUPOC than in the fighter pilot program. Second, you will make more money. And third, you will meet more women. "I was 20 years old, and I believed him," Loewen admitted. "That's how I got started in nuclear."

In the Navy

Loewen's recruitment papers were signed after Adm. Hyman Rickover had been dismissed as head of the nuclear Navy, and so Loewen never got a chance to meet the venerable old man before he was ushered into retirement. Loewen's mandatory NUPOC interview was scheduled instead with Adm. Kinnaird McKee, who succeeded Rickover as director of the Naval Nuclear Propulsion Program.

Interviewing with the head of the nuclear Navy did not mean an automatic commission, however. The recruit first had to pass a series of interviews with other Navy personnel—which Loewen did—and then decide whether or not to join. After making it through the interviews, Loewen knew that he wanted to be a Navy man. He turned in his scholarship at Western State in return for his commitment to NUPOC, and the Navy paid for him to finish school.

Loewen is disappointed that he never interviewed with the legendary Rickover. He relates a story about a prospective recruit who is brought in to meet Rickover. The admiral tells the recruit that dedication to NUPOC is all or nothing, and says, "We know you have a fiancé. We need you to be dedicated to the program. Here's the phone. Call your fiancé and tell her it's off." The recruit is thinking, "Sure, I'll call her up, cancel the engagement, get into the program, and then marry her later." So the recruit calls her up and breaks it off. And Rickover says, "I'm sorry. I can't trust you. If you're willing to break off an engagement just like that, I don't want you. Get the hell out of here."

Loewen would have welcomed a chance to be challenged like that. An interview with Rickover would have been a link to nuclear's legacy. He is lucky enough, however, to have had as a mentor Warren Nyer, a longtime ANS member and a friend of former ANS executive director Octave Du Temple. As a graduate student, Nyer worked on Chicago Pile-1. "So, I do have a link back to the very first controlled fission," Loewen said.

Surfing the waves off the Carolina coast in March 2011

Loewen finished college and went off to the Navy's Officer Candidate School (OCS), in Newport, R.I. It was 1983, the summer that the United States for the first time lost yachting's America's Cup to Australia and its fancy-hulled boat. "We used to go out during Navy training on patrols and see those boats going to race for the America's Cup," he said.

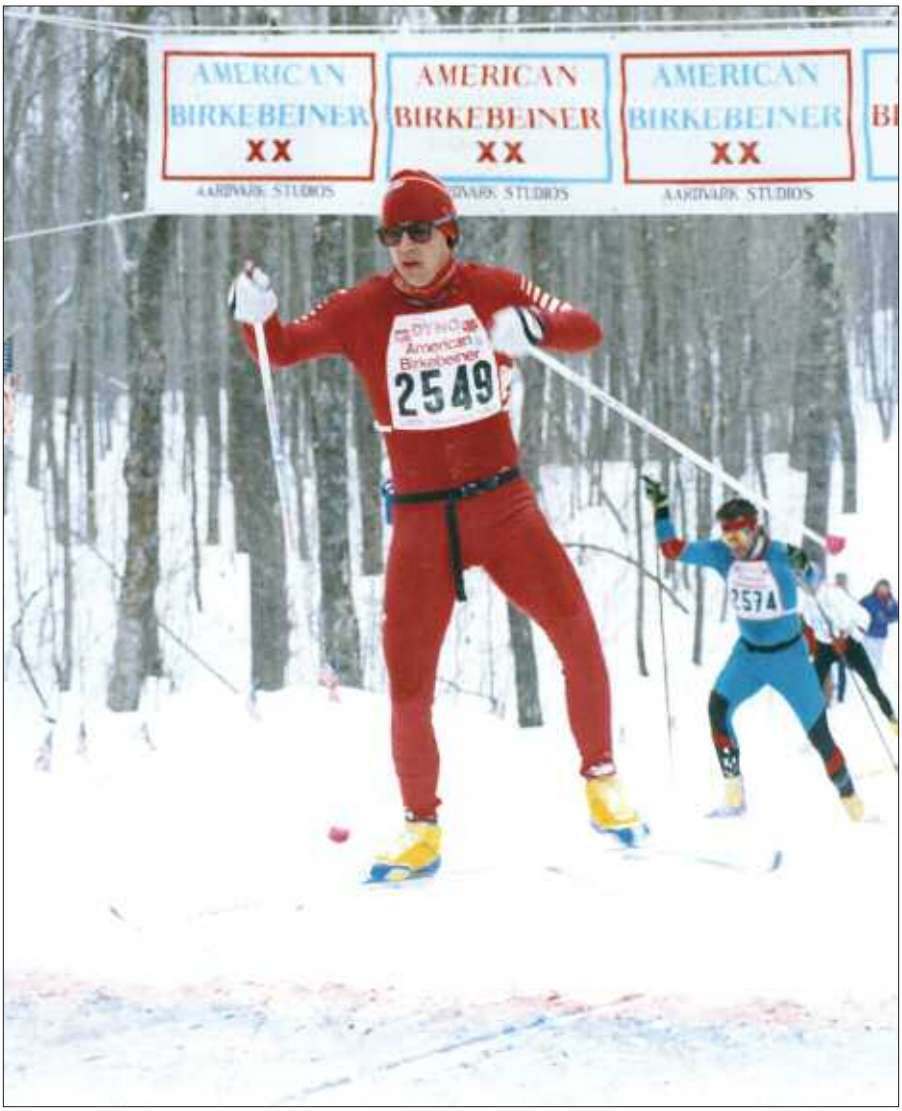
Following OCS, Loewen was commissioned as an officer in the Navy. Like many other ANS presidents—most recently, Don Hintz (2007–2008), Tom Sanders (2009–2010), and Joe Colvin (2010–2011)—he spent six months at the Naval Reactors Facility in Idaho, followed by another six months at a land-based reactor prototype, and then, because he had such a natural grasp of nuclear technology, he spent a year as a training instructor.

As a condition of his recruitment into the Navy, Loewen had committed to four years—one year in training and three at sea. "I owed the Navy three years after I got done with my prototype training," he said. "I thought that I would do one year in Idaho as a training instructor—so that I could keep skiing and racing the local circuit—and then I would have only two years out at sea before I could leave the Navy."

Orders came in, however, extending Loewen's sea time from two years to three years, which caught him by surprise. He called up a Navy administrative office to explain the error. "I told them they needed to fix it," he said, "but of course I was talking to some high-ranking officer and he said, 'No, we didn't make a mistake. Your contract said three years of sea duty and you were only doing two, so we extended it.' And I, not thinking clearly, said some choice words to him, and he replied, 'Ensign Loewen, I will have you on the worst ship on the West Coast in one week unless you agree to these orders. Do you accept them or not, yes or no?' 'Yes, sir!' I said. And that's how I served an extra year in the Navy."

His sea duty was spent on the very first nuclear-powered warship, the USS *Long Beach.* The ship, based in San Diego, had two reactors to power it across the Pacific Ocean and a new radar technology that, Loewen revealed, didn't work. Following the bombing that killed 122 servicemen aboard the USS *Stark,* a destroyer patrolling the Gulf of Oman and escorting Kuwaiti oil tankers, the *Long Beach* was ordered to support the Navy's mission in the gulf.

"What I wanted to do was to build nuclear power plants. My thinking was that I would leave the Navy and go to graduate school."



An avid and accomplished cross-country skier, Loewen competed twice in the famous American Birkebeiner ski race. He's shown here in the 1991 competition.

For Loewen and the rest of the crew on the *Long Beach,* that meant the job of escorting tankers, which came with risk. In another incident involving a U.S. naval vessel, an Iranian missile had hit a Kuwaiti tanker under U.S. flags, and people on board were killed in the explosion. While Loewen was aboard the *Long Beach,* in October 1986, a pair of Iranian fighter jets zoomed toward his ship. Loewen was officer of the deck at the time and was thinking about the *Stark* and the earlier tanker that had been hit by missiles. Would this be his ultimate end? He was understandably on edge, as were others on the bridge, but the ship's captain seemed confidently at ease.

"We were following our rules of engagement, warning the jet pilots that they were approaching a U.S. warship," Loewen recalled, "except that we were doing it in English and hoping they could understand it." The ship put its own missiles in position to fire at the approaching aircraft. "Everything was ready," he said, "and then they apparently realized the gravity of the situation and turned around. The next thing I hear is 'Contact turned outbound, we're standing down.'" On the bridge we gave a huge sigh of relief. The captain put his feet up and said, 'Lieutenant Loewen, take it back to 5 knots,' just as calmly as could be."

The incident proved to be "my epiphany for nuclear science and technology," said Loewen, remarking on the irony of being aboard a nuclear-powered vessel as a protective escort for an oil tanker. "I liked the technology, but I didn't know if I wanted to be in the Navy. I didn't like escorting oil tankers. What I wanted to do was to build nuclear power plants. My thinking was that I would leave the Navy and go to graduate school. That started me on the pursuit of my career—that was the day."

On dry land

Although Loewen left active duty, he was in the Naval reserves for years. He started graduate school in 1987 at the University of Wisconsin, which he chose, he said, because of its location. The state of Wisconsin hosts the biggest cross-country ski race in North America—the American Birkebeiner, or the Birkie, named after a Norwegian legend in which a group of cross-country skiers, members of a political faction called the Birkebeiners, carried the prince of Norway on their backs for 50 kilometers in the year 1206, when the country was involved in a civil war. Loewen wanted to ski the Birkie. He had offers to attend other universities, but, he said, he decided to pick his first love and go where he could do a lot of skiing. It was in Wisconsin that Loewen and Jennifer, whom he had met when he was stationed in San Diego with the Navy, were married in 1989.

Loewen had initially planned to get a master's degree in nuclear engineering, but his class advisor urged him to reach for a Ph.D. "I'm ex-Navy, where you have to go through signatures of qualifications," he said. "So, I read what the requirements were to get a Ph.D., wrote down a plan, and came back and said I would get it done in four years." The advisor wisely imparted that it would probably take five to seven years. "He told me to keep my four-year plan as a souvenir," Loewen said.

The Loewens' first child, a daughter named Zatha, was born in 1992, about the time Loewen was completing his master's degree in plasma processing. His advisor, however, was having personal problems, so Loewen's Ph.D. thesis plan sat untouched for a year. Frustrated, Loewen left the university without his Ph.D. to work for a start-up company in Massachusetts as a nuclear engineer processing radioactive waste. His second child, a son named Hans, was born in 1994.

The job eventually moved the Loewen family from Massachusetts to Tennessee, but financial issues caused the company to go into bankruptcy. "When it imploded, I decided to go back to finish my Ph.D.," he said. He called Michael Corradini (who is the current ANS vice president/president-

Lieutenant Loewen and baby Zatha in 1992

Loewen's son, Hans, and daughter, Zatha, at the U.S. Naval Academy in August 2010

elect) at the University of Wisconsin and secured him as a new advisor, and he started school again in January 1998. At Wisconsin, Loewen joined the university's student section of ANS, soon becoming its publicity chair and later its president.

It was during this time that he and Jennifer decided to become foster parents. He recalls their first foster child, a boy named Ricky, who was 18 months old and had been abandoned by his teenage alcoholic mother. "I was in a lab at the university, pouring liquid lead into water and watching it explode, when the social worker brought Ricky to our home," he said.

He and Jennifer never knew until the last minute when a child would be brought to them. Ricky's delivery came out of the blue. Loewen left work early to take Ricky and his daughter, Zatha, who was scheduled for a routine appointment, to the doctor's office. "The only abnormality they could find with my daughter was that she didn't have a favorite TV show, because we have never had a TV in the house," he said. "But with Ricky, they had me place him on the table—double pneumonia, double ear infection, and a horrible diaper rash—things that Jennifer and I were not used to seeing." Loewen said that the job of being a foster parent through the years has been "enlightening and enriching, to say the least."

In career

Once Loewen received his Ph.D. in engineering physics in 1999, he took a job at Idaho National Laboratory performing nuclear research. In 2005, with support from INL's Jim Lake (a former ANS president [2000–2001], under whom Loewen served as chair of the ANS Membership Committee), he became the ANS Glenn T. Seaborg Congressional Fellow, which was "a great and unique opportunity for me," he said.

As a Fellow, Loewen spent a year in Washington, D.C., working on Capitol Hill for Sen. Chuck Hagel (R., Neb.). "The legislation I was working on—the Energy Policy Act of 2005—got passed into law," he said. "I also learned about what politics really is. It was just a wonderful year."

At the end of that year, he returned to his position at INL, and because of his work with Senator Hagel, *Esquire* magazine selected him to be the voice of nuclear power in a 2005 article featuring the "best and brightest" professionals from various walks of life. The article attracted the attention of someone at General Electric, who called Loewen and said he "should talk with some people." Loewen decided then to interview with General Electric. "I left the Navy because I wanted to build reactors, and so now I had the chance to fulfill my goal," he said. "I wanted to build something, and GE has never stopped building reactors," he added, noting the two new ABWRs that are nearing completion in Taiwan.

Loewen started working for GE in 2006 and was assigned to the PRISM (Power Reactor Innovative Small Module) project. The PRISM is a sodium-cooled reactor designed by GE and reviewed by the Nuclear Regulatory Commission. According to Loewen, PRISM reactors could help meet a nation's electricity needs and could become part of the solution for nuclear waste management and nonproliferation issues. The reason, he said, is that the PRISM would be fueled by materials recovered from light-water reactor used fuel.

Recovering these elements—uranium, neptunium, and plutonium—and using it as new fuel would reduce by 99 percent what is now considered nuclear waste, he said. "That's like going from one mile per gallon to 99 miles per gallon," he said. The resulting waste from the PRISM's spent fuel would be fission products only, which, when stored safely for 300–500 years, would be less radioactive at the end than what would be found in a natural uranium mine.

As ANS president, Loewen's focus will cover a spectrum much broader than just recycling, he said. He firmly believes that the United States will continue to build com-

In one of Loewen's favorite shots, Hans and Zatha at a high school cross-country meet in 2009

Eric and Jennifer Loewen in August 2010

mercial reactors for electric power purposes, and he recently has given talks to ANS student sections and at universities, at town meetings, and at other venues on nuclear fuel and the goal of zero leakers, on ALARA (as low as reasonably achievable), and on uranium enrichment levels, among other things. He also knows that as the new ANS president, he will be given plenty of opportunities to discuss the accident at Fukushima Daiichi, in Japan, and the effects it will have on the nuclear industry.

"What happened in Japan is a tragedy," he said of the earthquake and tsunami that resulted in the great loss of lives. He is quick to note that no one in Japan has died as a result of nuclear energy, just as there have been no fatalities in more than 60 years from nuclear power in the United States.

He added that ANS has established the Special Committee on Fukushima, co-chaired by Corradini and Dale Klein, former NRC chairman, with results from the committee expected within the year. Many opposed to nuclear power, Loewen said, will try to use the Fukushima accident to call for changes in nuclear power before the technical issues are fully understood. But Japan faced a "beyond worst case" disaster—twice—first from the earthquake and then the tsunami. "We, the technical community, did not hypothesize events of this magnitude occurring back-to-back," he said.

The sharing of lessons learned from Fukushima, he explained, will be facilitated by ANS so that the information receives wide distribution and will be archived for the future stewards of nuclear technology. "As industry professionals, our philosophy of learning, teaching, defense-in-depth, excellence in designs, standards, and conduct of operations, and operators' following emergency preparedness planning will continue," he said.

What bothered Loewen the most as events transpired in Japan was how the media seemed to barely mention the many other horrors experienced by survivors of the earthquake and tsunami. The Japanese Police Agency confirmed 15 031 people dead, mostly from drowning, and 9487 missing, as the tsunami had swept away entire villages. Yet early on, TV, radio, and newspaper coverage focused on Fukushima, with reports espousing the ills of nuclear power while, in many instances, showing a massive oil refinery fire in the background. "Where was the media blitz regarding the pollution from those refinery fires that contained products with no half-lives?" Loewen wondered.

Turning to the topic of the Yucca Mountain repository, Loewen said that he'd like to see it be put back on the nation's agenda as a storage and disposal site for nuclear waste. He agrees completely with ANS's position statement on Yucca Mountain, which supports the development and use of geological repositories for the disposal of high-level radioactive waste and the expeditious processing of Yucca Mountain's license application in an open, technically sound manner.

Loewen pointed out that the Nuclear Waste Policy Act, as amended in 1987, established the law for allowing the Department of Energy to submit a license application for Yucca Mountain to become the nation's proposed geological repository, subject to demonstrating that the site is suitable and safe. "Regulatory standards have been developed, reviewed by the courts, are in effect, and should be used by the Nuclear Regulatory Commission to determine whether the repository can be operated in a safe manner," he said.

He also thinks that ANS membership will increase over the next two decades because of extended participation by younger members. He mentioned the recent ANS student conference, which was attended by more than 600 young nuclear advocates. "We need to tell them they are getting their edu-

The Loewen family in 2002. Hans and Zatha are on the right, and two foster children, on the left, are unnamed in this photo to protect their privacy. (Photo: Evelyn Hymas/Hymas Image, Rigby, Idaho, reprinted with permission.)

cation for a career, not a job," he said. One difference between the two, he said, is that in a career, "you're part of a professional community. It's important that they become members of ANS."

Being an ANS member, he said, is about staying on top of issues and being able to impart knowledge to people outside the industry, such as neighbors and those encountered in the checkout line at the grocery store, who want to know the real story about what happened, for example, at Three Mile Island or Fukushima. "The best part of being a professional is being part of that," he said, noting that he recently gave a commencement speech at Western State, his alma mater, where he talked about nuclear technology and the value of joining a professional society, and he got a rousing standing ovation.

There is great value, too, in attending ANS meetings, he said. "ANS is important because it brings together competitors, regulatory people, and academia all in one room," he said. "That's a tremendous thing. That's how we professionals share that knowledge. That's the good thing about our industry—we share and we want to get better."

Loewen related that ANS was formed in 1954 to serve as the technical steward of nuclear science and technology (NS&T) information and to develop, collect, organize, document, and share this information for energy, medicine, industry, food, and space applications. "Sometimes we get too focused on power generation and forget the many other technical disciplines within ANS that are pushing the boundaries of NS&T," he said.

ANS accomplishes its mission, he said, by providing membership value through 19 active professional divisions, three technical groups, three technical journals, the monthly member publication *Nuclear News* and the bimonthly *Radwaste Solutions,* the society tabloid *ANS News,* the new ANS blog site *ANS Nuclear Cafe* (<www.ansnuclearcafe.org>) and other social media efforts, and other related professional activities.

Loewen said that now more than ever, nuclear professionals must continue to promote nuclear technology. ANS must facilitate this objective by accomplishing such goals as electronically archiving all issues of ANS publications. "This is stewardship," he explained. "We must make this NS&T information more accessible in the digital age. To go forward, any organized body of information must not lose the past achievements and failures." ANS must also maintain and further enhance the scope and efforts of its nuclear standards development, Loewen said. "That's what we do best. Our ANS/ANSI standards are recognized worldwide."

In addition, he said, ANS needs to work cooperatively with related organizations—such as ANS international local sections, the International Atomic Energy Agency, the ANS Agreement Societies (which includes many national nuclear societies and the OECD Nuclear Energy Agency), the International Nuclear Societies Council, and the Pacific Nuclear Council—for the mutual benefit of all partners.

He has passed on his general enthusiasm and passion to his children, whom he counsels on striving to succeed in life and in the athletic arena. Both of his children are active and competitive athletes. His daughter, Zatha, who was named after a great-grandmother, attends the U.S. Naval Academy. His son, Hans, a junior in high school, has his sights set on the same goal.

The *Esquire* story that called Loewen the man who would save the world was published in December 2009, several years after the "Best and Brightest" article. The story noted that Loewen firmly believes that there is a solution to global warming, mass starvation, resource wars, and a long-term energy crisis, and that the solution is nuclear energy. He now brings that belief system to his year as president of ANS. It's not likely that he will literally save the world, but it is assured that he will keep advocating for nuclear energy, and that his term with ANS will be all systems go.