

## McFarlane: Nuclear renaissance man

*The 52nd ANS president promises to be a strong proponent of the new strategic plan that will position ANS for a prominent role in the nuclear renaissance.*

BY RICK MICHAL

**T**HE TEXAS TWANG is still there, even though Harold McFarlane has been gone from the Lone Star State for decades. McFarlane, the 52nd president of the American Nuclear Society, has ranged far and wide during his nuclear career. He credits his success to being in the right place at the right time, but that seems more a case of sincere humility rather than truth. McFarlane, director of the Space Nuclear Systems and Technology Division at Idaho National Laboratory (INL), has had a steady climb up the nuclear ladder, from plasma physics researcher in Texas, to college professor in New York, to prominent roles with Argonne National Laboratory–West and INL in Idaho.

McFarlane has also been a significant contributor to ANS. An ANS Fellow, he has chaired numerous technical meetings, has served as the chair of two professional divisions and the Idaho Section, and is the author of a book published by the Society in 1992 titled *Controlled Nuclear Chain Reaction: The First 50 Years*.

During his term as president, McFarlane says, he will work to ensure that ANS continues to serve the needs of its members by being a viable provider of meetings, publications, and professional development resources. He will also promote ANS as a valuable and objective source of industry talent and knowledge to the world at large.

### Texas tale

McFarlane's story actually starts in Maryland, where he was born in April 1945. Soon thereafter, his family moved to the border town of Del Rio, Tex., where he was raised as the only child of Alvis and Lilla McFarlane. Alvis, a native Texan, met his future bride during World War II, when both were stationed in New Guinea. Alvis was a hospital administrator for the U.S. Army, and Lilla was a nurse.

McFarlane's earliest memory, he says, is of a stormy summer night in Del Rio, when he was four years old. As he lay sleeping,



Harold F. McFarlane, 2006–2007 ANS president

his mother roused him from his bed and led him into the hallway, away from the windows in his room. He remembers looking up in the dark at his mother, a silhouette illuminated briefly by lightning flashes. Moments later, hailstones shattered a window, sending shards of glass across his bed.

That memory is McFarlane's first vivid image of his mother. Less than a year after the hailstorm, Lilla entered a hospital from which she never came home. Lilla died of cancer when McFarlane was five years old.

With Lilla gone, McFarlane and his father moved out of the family home and into a new house that Alvis built behind the restaurant he and his brother owned and operated. "It was his only way of keeping track of both a young son and a demanding business," McFarlane says, adding that during this time, Alvis taught him to hunt and fish, fostered his curiosity, and fed him very well. After a few years, Alvis married a local woman, Evelyn Anderson, who, McFarlane says, brought a good balance to his upbringing. From the union of Alvis and Evelyn, McFarlane's only sibling, Gregg, was born in 1954.

Growing up in the 1950s in Del Rio proved to be a blessing for McFarlane, he says. The town, on the Rio Grande across from Mexico, had a population of less than 20 000 at the time. The closest neighboring community was a far stretch away, and the nearest city of considerable size was San Antonio, 150 miles to the east. The major industry was ranching. In Del Rio, McFarlane recounts wistfully, kids could go out and ride bikes and play all day without worry, and then go home at nightfall.

Although Del Rio was a ranching town, McFarlane wasn't much for riding horses. Instead, he engaged in several sports, including football, "the number one religion in Texas," he says. He played on the football team in junior high school and was a captain of the Del Rio High School team. And starting in late February, McFarlane and friends would haul the family boat to nearby Lake Walk to kick off the water-skiing season.

Sports, however, were secondary during McFarlane's time in Del Rio. More important was the bond he created with people who have remained his friends to this day. These are, he says, men and women who are very successful in everything from running businesses, to caring for their families, to saving lives as medical personnel. "We realize that we were molded in innocent times by caring families and a supportive community," he says, "something that few children are fortunate enough to experience."



Harold McFarlane plays with a deer at a friend's ranch near Del Rio, Tex., in the late 1940s.

So Del Rio, which sprouted up around San Felipe Springs in arid west Texas, was an isolated yet idyllic place to grow up. "It was small enough to need all the kids to participate in what was going on, yet large enough to have a few exceptional teachers and a strong nucleus of kids who were smart, ambitious, and talented," he says.

By the way, Alvis and Evelyn still live in Del Rio and are doing well. Evelyn is 84 and Alvis is 89, still keeping the most beautiful lawn in Del Rio and still "sharp as a tack," McFarlane says.

## Coast to coast

McFarlane's aptitude for science and math was evident throughout grammar and high school, but he credits much of his success to his ability to write and communicate, "especially in taking complicated, technical issues and translating them into something that can be understood at a level appropriate to a specific audience," he says.

After graduating from high school in 1963, the University of Texas (UT) was McFarlane's best option: Tuition was only \$50 per semester. During his sophomore year at UT, a graduate student named Richard Freeman invited him to participate in plasma physics experiments. What impressed Freeman was the candidness with which McFarlane talked about his laboratory work during freshman year. McFarlane explains: "In physics lab, my experiments often resulted in failures, according to the textbook. Nevertheless, I dutifully wrote them up, telling the truth and detailing as best as I could what happened and why."

McFarlane accepted Freeman's invitation to work in plasma physics because, he jokes, "it beat going back to Del Rio and working summers for the highway department." Although McFarlane had had some exposure to nuclear science in high school, working with Freeman was his first formal contact with the technology. His associa-

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Wedding day for Mary Ellen and Harold McFarlane in June 1968

tion with Freeman was the beginning of a lasting friendship and set a new direction for McFarlane's career goals. Eventually he was asked to help build a complicated experimental apparatus for a faculty member who had arrived at UT. That new faculty member was Ken Gentle, who, several months later, advised McFarlane to apply to the California Institute of Technology (Caltech) for graduate school.

UT was also the place where McFarlane met the love of his life, a fellow Texan and fiery redhead by the name of Mary Ellen Newberry. McFarlane knew she was the one for him, and the couple married in June 1968, just after Mary Ellen graduated from UT with a degree in speech pathology and audiology. McFarlane had graduated magna cum laude with a bachelor of science in physics a year earlier.

In 1968, the newlyweds loaded up their car and drove from Texas to California, where McFarlane pursued graduate work. McFarlane jokes that he seemed to be a curse to his Caltech advisors. "One dumped me, and the second one left for a career in industry." When that happened, no one remained to teach the nuclear engineering labs. So McFarlane took on that role, with some supervision, in his third year.

McFarlane's ultimate thesis advisor at Caltech was Noel Corngold, a scientist internationally renowned for his work in neutron physics. "Corngold was a sophisticated New Yorker; I was a hick kid with a thick Texas accent. We got along famously," McFarlane notes.

In 1970, during the Caltech years, the McFarlanes' son, Matt, was born. Matt now lives in Boise and works with United Vision for Idaho, an organization that provides support to nonprofit groups. According to McFarlane, Matt was shocked when he discovered that he was born a Californian and was not a native Texan.

In 1971, when McFarlane was ready to graduate from Caltech, a severe recession depressed the market for freshly minted technical Ph.D.s. He succeeded in getting an interview with the nuclear engineering department at New York University (NYU). The head of that department was an urbane Northeasterner named John Lamarsh, who liked the idea of bringing a Texan to a New York campus. "He thought that the people I'd be teaching had never experienced anything like me," McFarlane says of his twang and his comfortable Texas manner.

McFarlane accepted the offer, and he and Mary Ellen loaded up their car again and drove with Matt from California to New York. Six months after joining NYU, however, the university sold its science and en-



McFarlane's graduation day at Caltech in June 1971

gineering campus to avoid bankruptcy, and McFarlane's career prospects in New York were bleak. As for John Lamarsh, he turned out to be the "funniest, most caring friend a man could have," McFarlane says.

### Out to Idaho

When his NYU job was ending, McFarlane received a call from Michael Lineberry, an old Caltech friend, who had just been hired by Argonne National Laboratory-West in Idaho, which was managed by the University of Chicago. Lineberry told him

that Argonne-West needed someone who knew about experimental neutron physics to help start up a facility called the Zero Power Plutonium Reactor (ZPPR). McFarlane told Lineberry that he was the man for the job, and so the car was packed one more time for the trip back West.

It was the start of a career that has lasted more than 30 years in Idaho. But it wasn't supposed to be this way, according to McFarlane. "I was planning to stay there for about two years, or if things worked out well, perhaps five years," he says.

The McFarlanes arrived in Idaho Falls in August 1972, back when it was "the ugliest town that I had ever seen," he remembers. Although it was not far from the mountains on the banks of the Snake River, the town had uniformly square and plain houses and not much else. Things changed over the years, however, and today Idaho Falls is "one of those lovely Western micro-cities, bubbling with culture and charm," he says. The town is still home to the

McFarlanes.

McFarlane started working on fast reactor development at Argonne-West, where the ZPPR was in its third year of operation. As a researcher and section head, McFarlane compiled a significant part of the nation's fast reactor integral physics database, and he developed first-of-a-kind measurement and data application techniques. He also worked on developing the Clinch River Liquid-Metal Fast Breeder Reactor, a multi-billion-dollar project that was ultimately killed by Congress in 1983.



A day on top of Table Mountain in Idaho with son Matt in 1983

In the late 1980s, McFarlane was put in charge of the ZPPR critical experiment program. That program worked closely with industrial partners, such as Westinghouse and General Electric, and also had international agreements with the governments of the United Kingdom, France, and Japan, to support the design, safety, and licensing of fast spectrum reactors ranging from large breeders to small space reactors.

During the 1980s, McFarlane's introduction to space nuclear expanded. Working on the SP-100 program at Argonne–West, McFarlane and industrial partners GE and Westinghouse tested reactor designs for power experiments aboard spacecraft. "It was an exciting time," he says. "We were doing some very strange experiments, such as simulating a launch accident in which a reactor crashed on the beach. This was considered the most dangerous situation—a reactor core full of wet sand. So we simulated that scenario and determined that the core would be safe."

McFarlane's career has since accelerated like a rocket. In the early 1990s, he became



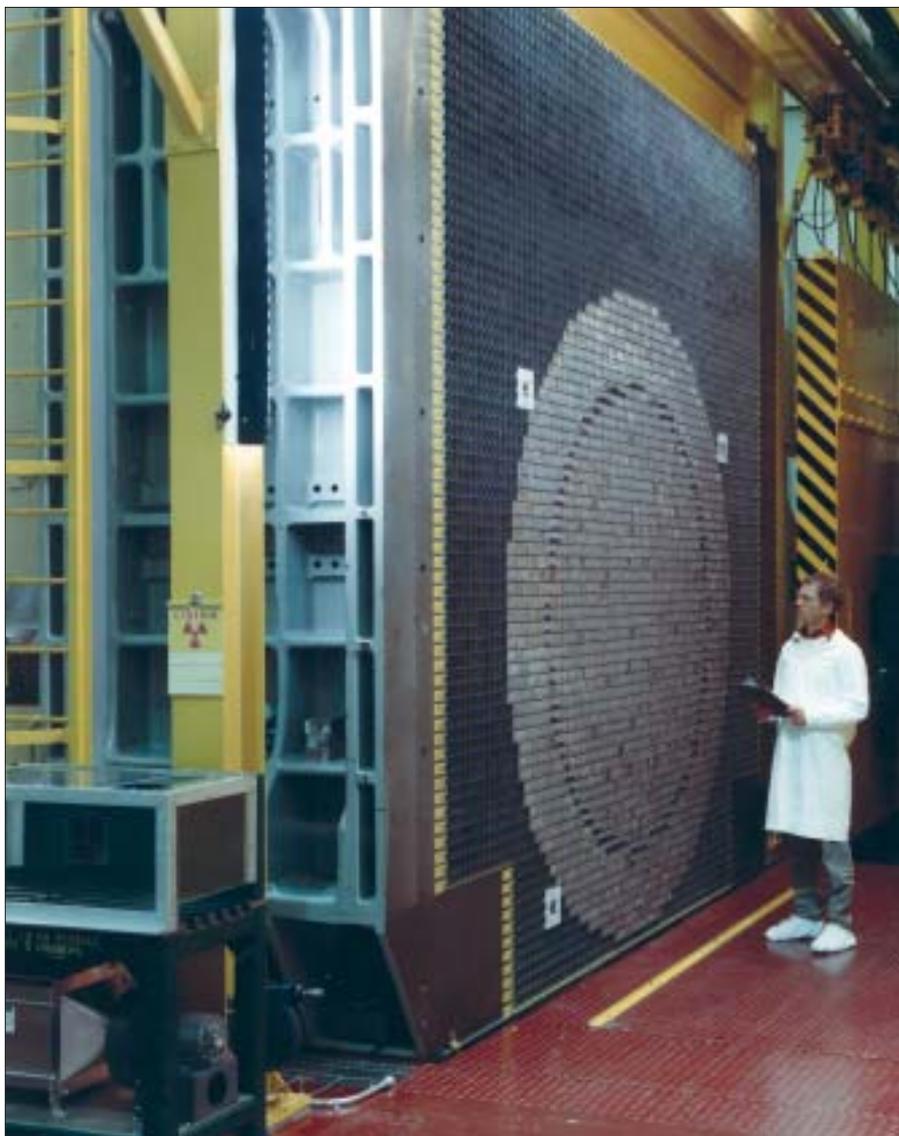
Mary Ellen and Harold at a golf course in Hawaii in 1985

the site manager of Argonne–West and then assistant laboratory director for nuclear oversight. He soon tired of being at arms-length from research, however. In 1992, he was named associate director for the Fuel Cycle Division, his first foray into this field

of research. In 2002, he was named director of Argonne–West's Engineering Technology Division, where one of his responsibilities was to close down the Experimental Breeder Reactor (EBR) II. During this time, he also developed the proposal to move the radioisotope power systems assembly operations from Mound, Ohio, to Argonne–West, and he wrote up the business case for consolidating in Idaho all of the Department of Energy's Pu-238 space-nuclear activities. He was also involved at the beginning of the DOE's Advanced Fuel Cycle Initiative (AFCI), which started with processing EBR-II spent fuel for disposal. AFCI was recently rolled into the new Global Nuclear Energy Partnership (GNEP), the Bush administration's program to develop worldwide consensus on expanding the use of nuclear energy while resolving waste and nonproliferation issues.

McFarlane said that one highlight of working for the University of Chicago, which managed Argonne–West, was attending an executive MBA program in Chicago, from which he graduated with honors at age 55 in 2000. "The economics and management training were a powerful complement to my science and engineering background," he says.

After he had worked for the University of Chicago for 32 years, the DOE in February 2005 merged Argonne–West with the Idaho National Engineering and Environmental Laboratory, creating the INL. Under the Battelle Energy Alliance, which is the DOE's new manager for the lab, McFarlane became deputy associate laboratory director for nuclear programs. This was in addition to his position as director of the lab's Space Nuclear Systems and Technology Division. His career continues to look up: In January, INL's first radioisotope thermoelectric generator was launched for a one-way trip to Pluto and the edge of the solar system aboard NASA's *New Horizons* spacecraft.



McFarlane checks up on the Zero Power Plutonium Reactor at Argonne–West in 1986.

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McFarlane (left) and friends display the day's catch after fishing Lake Jackson in Grand Teton Park, Wyo., in 1993.



McFarlane (in orange Texas cap) and INL coworkers before the launch of the New Horizons spacecraft in Florida in January 2006.



A recent shot of Harold, Mary Ellen, and Matt.

## Links life

When the McFarlanes first moved to Idaho, they got involved in all the outdoor activities that were available: skiing, river floating, fly-fishing, hunting, hiking, and mountain climbing. In the late 1970s, they bought a home on the Snake River that came with a big garden and future home-improvement projects. Eventually, most of their activities fell away so that they could concentrate on one pursuit: golf.

In time, Mary Ellen joined the amateur tournament circuit. This was no whim, since golf was in her bloodline. Her mother, Ruthe Newberry Hawkins, was a well-known Texas amateur golfer who won 10 championships over five decades at the Austin Country Club. At age 75, Ruthe set the women's scoring record at the Austin club, which has a Pete Dye-designed course. She also eventually had a chapter devoted to her in one of Harvey Penick's best-selling "little" golf books.

The McFarlanes' golf outings have included trips to courses in Scotland and Ireland. They have also won an Idaho state couples championship. In the late 1990s, Mary Ellen decided to turn it up a notch, and she went on to win a string of club championships. This year, as McFarlane proudly notes, Mary Ellen once again was the club and senior champion, winning by more than 10 strokes.

## ANS and McFarlane

McFarlane was introduced to ANS around 1970, when the Society held a summer meeting in Los Angeles. At the time, he was a Caltech graduate student, and he volunteered to help out at the meeting as a projectionist. A year later, when he had moved to NYU to teach nuclear engineering, one of his duties was to serve as the advisor to the ANS student section, and he remembers taking NYU students to the Brookhaven National Laboratory to learn about nuclear research ranging from gaseous reactor cores to radiation-strengthened concrete.

McFarlane is modest about his move up the ANS organization, just as he is with regard to his career. "I'm just a technical contributor like other people," he observes. His involvement started with contributing papers, then organizing sessions, and eventually putting together a special issue of the ANS journal, *Nuclear Science and Engineering*. In 1988, he ran his first big topical meeting, on reactor physics, in Jackson Hole, Wyo. In the early 1990s, he chaired ANS's Reactor Physics Division and ran the ANS Idaho Section.

When McFarlane's career began to focus on the fuel cycle, he got involved in ANS's Fuel Cycle and Waste Management Division (FCWMD). He started organizing FCWMD meetings and was asked to run

the first ANS national meeting held in Reno, in 1996. He served as the chair of the FCWMD and has been involved in international fuel cycle conferences. He combined his fuel-cycle knowledge with his writing skills to author the 14-page section on nuclear fuel reprocessing in the *Encyclopedia of Energy*, Volume 4, published in 2004 by Elsevier Inc.

McFarlane stresses that he will be a strong proponent of the ANS strategic plan that he helped develop as vice president. "There are a number of areas where I think I can be effective in helping to implement that plan," he says. One of his goals is to keep ANS at the forefront on emerging issues involving nuclear technology. For example, he says, "When you look at GNEP, it is completely consistent with the conclusions of our global series of fuel cycle meetings. The GNEP concept is the message that we've been trying to get across for awhile, with some success."

McFarlane also wants to reenergize ANS's local sections, which, he concedes, have gone through tough times. "We need to give them the tools to become effective in communicating on issues that are politically tinged," he says. In addition, he would like to see ANS's Outreach Program expand in order to be able to provide tools to members who are willing to go out and talk to Rotary clubs, civic organizations, and school groups.

McFarlane explains that ANS has a unique role to play in the nuclear renaissance. "I think we're the only industry organization that is a credible purveyor of information," he says. "We're not just trying to promote something, we're actually doing things like holding meetings and publishing papers that are important to the exchange of ideas."

He also gives much credit to ANS's immediate past president, Jim Reinsch, for his work in adding new organization members and young professionals to ANS's membership ranks. "We want to make ANS more nimble and responsive to members' needs and to articulate the value of ANS to employers."

McFarlane says he is ready for his whirlwind year as ANS president. At the same time, he notes that he has never lost contact with the strong foundation that the Texas town where he grew up provided him. Last year, when he turned 60, he got together with several former Del Rio classmates to reminisce about the good old days. His friends are now doctors, dentists, administrators, and business owners. During the reunion, the classmates claimed that they were individually responsible for molding McFarlane's character and, therefore, responsible for his eventual success. "Since my life has turned out pretty well without much of a plan," he says, "maybe they are right." **NW**