

# Nuclear News

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## A Miller's Tale

**D**ON MILLER'S INTEREST in instrumentation and control probably started in 1953, when he received a crystal radio from his parents at Christmas. On the radio, the 11-year-old was able to tune in only a station or two, listening at night from his bedroom in Westerville, Ohio.

The radio, as he remembered, had few parts—a crystal, coil, battery, antenna, and headphones. Fiddle with the crystal and coil, and the results were the sounds of a radio station coming through the headphones. A simple process, but enough to spark an interest in its internal workings.

With a wire strung around his bedroom, at nighttime Miller could receive a station signal from the neighboring town of Columbus, home of Ohio State University, about 12 miles down the road from Westerville. Each night, at exactly the same time, a recording of "The Yellow Rose of Texas" was played; perhaps the station owner liked the song as much as the young Miller did.

Miller's parents, Don P. and Rachel, were strong influences on his life. His father, who was raised on a farm and later became a small business owner in Westerville, imparted the importance of taking risks and investing in oneself. His mother was an accomplished artist of oil paintings.

Prudent risk taking and internal investment will play an important role in American Nuclear Society activities in the coming year. As ANS president, Miller will recommend investment in ideas that will help the Society better accomplish its mission and grow with proper nurturing. Those ideas, coming from national and local Society members and headquarters staff, will involve the investment of thousands of dollars over a period of years. The result could be a rich and beneficial harvest for the Society.

*Don Miller takes office as ANS President this month. This NN profile provides a view of his professional and personal life, and his goals for the coming year.*

"Look at a farmer's business; look at a small business owner," he said. "For a farmer, a crop is planted each year, but there is no guarantee that the crop will be harvested. For a small business owner, there is no guarantee that customers will come through the door. No small business keeps a lot of money in the bank. It invests in itself."

### First he was "Bill"

Don Wilson Miller was born on March 16, 1942, in Westerville, a town of perhaps 5000, with another 3000 living in the surrounding countryside. Miller was known as "Bill" then, a name that stuck until his graduation from high school. "From the day I was born, my name was Bill," he said. It could have been because his mother's nickname in high school was Bill, or that his father's side of the family had some Williams, or because of his middle name. But whatever the reason, "I never got an answer on the origin of my name," he said.

His parents both had roots deep in that part of Ohio—his mother's side back to 1840, his father's, to 1833. His father was born and raised on a farm in Delaware County, north of Westerville, and it was there the senior Miller learned the traits of self-reliance. Following graduation from high school at age 16, the senior Miller left his family's farm in pursuit of a college education, a move that greatly upset his father (Miller's grandfather), who believed his son should stay to work the farm.

Eventually, the senior Miller went to college. He took work at an uncle's lumberyard, and by his late twenties, had become manag-

er for seven retail lumber stores. "He was very innovative in how he handled lumber," Miller said of his father. "He was always trying new ideas, and always looked to his own people for some of the new ideas."

An idea developed by Miller senior was the use of the forklift in the lumber industry. "The forklift is common stuff now, but in the early 1950s, lumber was moved piece by piece, hand by hand," Miller said. "My father started using the forklift to move lumber before anyone ever thought of using it. So he had to invest big money at the time in a forklift and specially modified trucks that dumped the lumber."

The senior Miller and Rachel also took time to start a family. Don Miller was the firstborn, followed in order by John, sister Jean, and Tom.

While the senior Miller worked to support his family, the young Don Miller was introduced to a neighbor, Harold Nafzger, a senior citizen who had been bitten years before by the "ham radio" bug. "He was my amateur radio mentor," Miller said. "I spent many hours over there in his ham radio shack talking about everything in the world, including his radio."

By the time he was 12, Miller had tested for and received his amateur radio license for novices, and a year later upgraded to a general class license. During those years, he also started a lifelong hobby of building radios from kits, so when he was not talking to other ham operators in the area, he was communicating by Morse code with hams around the world.

If he was not visiting neighbor Nafzger during those days, it was likely that he was out delivering papers. For a stretch as a young teenager, he had one paper route in the morning, which meant getting out of bed at 4:30, and another route after school. In 1955, he was named the Ohio Newspaper Association's carrier of the year. "A newspaper route is a small business," he said. "I carried about 160 papers a day, rode my bike about seven miles a day, and made about \$20 a week. That's equivalent to about \$400 a month today. That's a lot of money for a 12-year-old."

In grammar school, Miller excelled in science, started playing the drums in 5th grade, and began running track as an 8th grader. In high school, he continued those efforts, with his eye always toward radio. "I used the radio equipment as the basis for two state science fairs," he said. "There were awards at two dif-



A teenaged Don Miller (bottom row, 2nd from the right) as a member of the Bi Phy Chem Club, a science club of more than 25 chemistry and physics students at Westerville High School



ferent levels, and I won the top award at both levels."

A favorite high school activity was band, in which Miller played the snare drum for four years. "That's another way to discipline yourself," he said. "You have to be there for practice, you have to march in lines, and when you're older you mentor the younger kids along."

High school was a time of fond memories for Miller. He learned to compose a proper sentence: "If you wait to learn the basics of writing until college, you're a dead pigeon," he said. He obtained a solid base for mathematics from Bob Short, a math teacher, and the basics of scientific research methods from Joe Ralston, a science instructor, both of whom taught him all four years of high school. He ran track for four years: "I wasn't fast enough to run the quarter mile, but I ran it." He was an honor student. And he dated the prom queen.

### In the army now

In the fall of his senior year, 1960, an army reserve officer from the town visited the high school and convinced 14 young men, including Miller, to enlist. Within 10 days of graduating from high school, Miller was off to basic training, which opened his eyes to a different world. "Basic training wasn't pleasant, but I learned important lessons," he said.

The first was that there was more to life than Westerville. "When you're raised in a small community of medium affluent people, almost all white Anglo-Saxon Protestants, you don't realize that there is a whole wide world outside your community, filled with people of various ethnic and religious groups," he said.

A second eye-opener was that it was the sergeants who ran the army, not the officers, a situation Miller now finds analogous to nuclear power plants. "The shift supervisors are the sergeants of nuclear plants," he said. "That was instrumental in my belief that we don't need degreed engineers in the control room. We just have to have excellence in training them."

Miller learned that view from being in the



Wedding day, June 25, 1966. Tommie (Mary) and Don Miller flanked by their parents, Paul and Mildred Thompson (left), and Rachel and Don P. Miller.

army motor pool, where he repaired tanks and track vehicles. "A motor pool is run by the sergeant," he said. "We had officers around, but they didn't know what was going on at the grass-roots level. You need officers to give the guidance, but you need the sergeant to make things happen. So you need both."

Following six months on active duty, Miller remained in the army reserves for seven years, attending meetings at Miami University in Ohio.

### College days

If Miller was never able to figure out why he was called Bill through high school, neither was he able to explain why he changed his name to Don upon entering college. "I went to college and things got confusing," he said.

Six months after receiving his high school diploma, and after his active duty in the army, Miller entered Miami University in January 1961. He is, even today, careful to explain that the college is the original Miami University, founded in 1809, and not the other school of the same name located in Florida.

His pride for his alma mater is equaled by his respect for the Ohio-based Indian tribe after which the school is named. An avid reader of history books, Miller can regale others with tales of the Miami Indians of southwest Ohio, of the Iroquois in upstate New York, the Seminoles, the various tribes of Plains Indians, and "one of the outstanding leaders of his time, Tecumseh, of the Shawnee tribe," he said.

At Miami of Ohio, Miller majored in physics and received his bachelor of science degree in 1964. During this time, he supported himself working at his father's lumberyard for two years, followed by two years at North American Aviation, in Columbus, designing antennas for missile system datalinks. While working toward his master's degree, he redesigned the electronics lab at Miami. "I had a teaching assistantship at the time," he said. "We were still in the old days of tube electronics, and I told them I could put in a totally transistor electronics course. They gave me the job of doing it, and I really liked that, which made me think I was going to be an electrical engineer."

In 1964 just prior to his first semester in grad school, Miller polished up for a blind date. At the last minute, the blind date backed out and a replacement stepped in. The replacement was Mary Thompson, who was known to everyone except her mother as "Tommie."

Two years younger than Miller, Tommie had been a nationally competitive swimmer. To say that Tommie and Miller became an immediate couple after their blind date would be inaccurate, but eventually they found their



Miller (center) accepts congratulations upon his PhD graduation from Ohio State University in 1971

ways to each other. "We were both dating other people until the spring of 1965," Miller said, "and then we both ended up going to Florida at the same time. We deliberately planned not to meet each other, but by total accident we did, and we spent the time together in Florida." By June 1966, the couple were married, two weeks after Miller received his master's degree.

While an undergrad at Miami, Miller came under the guidance of physics instructor Joe Priest, who imparted the strong influence of the philosophy of physics. "About the time I was finishing my thesis, he came to me and said, 'You could get a PhD in physics, but you'd be a mediocre physicist. You should consider engineering.' Best advice he ever gave me," Miller said.

At the same time, Don Glower from Ohio State University visited Miami University to talk about a new program he was starting in nuclear engineering. Miller listened, liked what he heard, and followed Glower back to OSU, in Columbus, Ohio. There, he pursued his PhD in nuclear engineering, where most of his work was done in radiation measurements. Tommie, who had majored in physical education at Miami University, found a job teaching school near Columbus.

That year, 1966, Miller was introduced to the American Nuclear Society, and he joined the local Southwest Ohio Section. "Glower told me that if I wanted to be a professional, I'd better join a professional society," he said. "That's the same speech I give my students today."

At OSU as a teaching assistant while pursuing his PhD, Miller taught classes in radiation measurement, instrumentation, noise analysis, mechanical engineering, and heat transfer. His last year in graduate school, 1971, he and two schoolmates developed a medical gamma-ray camera, which he said involved the first research in high-purity germanium detectors and led to the initial work in high-resolution imaging technology.

Miller's work at the university so impressed Glower that he was asked to stay on following his graduation in 1971 as an assistant professor.

## Life changes

Through the journey from graduate student to PhD to assistant professorship at OSU, children started arriving at the Miller household. Amy was born in 1969, Stacy arrived two years later, and Paul a year after that, in 1972, the same year Miller joined the national ANS at age 30.

By 1975, with the Miller family settled back in Miller's hometown of Westerville, which had grown to a population of more than 30 000, and with oldest child Amy ready to enter school, Miller made a successful run for election to the local school board. He remained on the school board, including terms as president, through 1991, when youngest child Paul graduated from high school.

Westerville's school system had grown to one of the largest school systems in Ohio (12th largest of 620 school systems) by that time, with more than 12 000 students and 900 employees. "I really learned about zero net



Preschool Don, circa mid-1940s

budgeting while on the school board, since it was the law," said Miller. "However, we always had a capital improvements budget for building upgrades and new equipment."

During his last stint as president, Miller oversaw a \$40 million building construction and renovation program in which three new buildings were erected and four other buildings were expanded and renovated.

Also in 1975, medical tests confirmed what Miller had self-diagnosed three years earlier: He had multiple sclerosis. "This was before the MRI test came along, so diagnosis was very difficult," he said. "They could never give me an absolute diagnosis, but they could eliminate what they were sure I didn't have."

An award given to Miller years later by an M.S. support group in Ohio recognized him for saying he had become a better person in the face of the disease. "It forces you to become better organized," he said. "It forces you to think that you're going to have to do something today, because tomorrow may not be there."

According to Miller, the disease attacks the body's neurons, making the body less able to follow the brain's instructions. "M.S. is a control systems problem," he said. "You lose your automatic ability to do certain things."

His regret is that he didn't do enough to compensate for the disease. "The first thing I lost was my ability to run," he said. "By the time my son Paul was five, I couldn't keep up with him. My regret is that I didn't do things I should have and could have done sooner, such as use a wheelchair or an electric scooter, instead of trying to continue to walk."

Miller said that through it all, it didn't often keep him from doing things he wanted to do. "My family has been supportive, but it was never overt, not to the point where everybody ran around helping me," he said.

By 1975, Miller had been promoted to associate professor at OSU and three years later he became chair of nuclear engineering and director of the OSU nuclear laboratory. Through 1979, when he chaired his local ANS section, all his research to that point had been toward medical applications.

In 1980, he was promoted to full professor at the university and, that year, he also changed his research focus to the power side of nuclear technology. "I felt that medicine was too narrow to keep as my area," he said. "At the time, gamma camera funding died and I had to look for other areas. So I switched to the power area, because power was the place to be."

He made a step toward the power end in 1983 when he, along with several graduate students and a faculty member in computer science, began developing an operator advisor based on artificial intelligence. Later, Miller, Brian Hajek, and several graduate students obtained a grant from the Department of Energy to interface and test the system at the Perry nuclear power plant in Ohio. Research using the simulator program at Perry, although substantially changed, continues today. This—and research sponsored by the NRC in sensor diagnostics—has led to work in reactor protection systems and system fault diagnostics.

Of one of the collaborators on the Perry project, Miller said, "I would say there is no other faculty member in the U.S. who has more knowledge about the details of nuclear power plant operations than Brian Hajek."

Hajek works part-time as a research scientist in the nuclear engineering department at OSU and also provides a consulting service to nuclear plant operators. For years, he was a Nuclear Regulatory Commission license examiner, when the NRC used consultants as examiners.

Hajek will be Miller's right-hand man for ANS activities. "He's a good administrator, he can keep things organized, and he's got a lot of good ideas," Miller said. "He's a key person for my presidential year at ANS."

During his early days as an associate professor at OSU, Miller was influenced by Bob Redmond, then chair of nuclear engineering. "Later when I became director of the reactor lab, I reported to him in his position as associate dean," Miller said. "He was kind of my mentor, leader, and confidant for many years until his retirement in 1992. He was always such an unflappable guy."

The early 1980s saw Miller make a conscious effort to become more involved in the national ANS. Tom Williamson, then chair of the ANS Education and Training Division, advised him to attend more meetings and ask questions, and by 1983, Miller had been elected to the division's executive committee.

"Education was a natural because I was a professor," he said. "My wife says that I have a drive to make a difference, and I suppose that's ultimately what it was. I just can't stand around and watch other people do all the work. You have to be involved to make things happen. If you have a belief in nuclear technology, you need to promote it."

## A full plate

Along the way, Miller has been very active in ANS. He was made a Fellow in 1991 and received a Certificate of Appreciation that same year. He has been involved in the Student Activities Committee since 1989, and the Industry Relations Committee for 13 years. He was chair of the Human Factors Division, chair of the Education and Training Division,



and is now a member of the Power Division. From 1991–93, he was president of Alpha Nu Sigma, following a two-year term on its board of directors.

Since 1991, Miller has been on the special ANS committee on new construction, and he has been a session organizer for three topical and six national meetings. He was technical program chair at the recent ANS Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies conference in May 1996 (see p. 24, this issue).

He spent four months on a sabbatical at the Electric Power Research Institute doing research on instrumentation and control upgrades. An outcome of his time spent at EPRI has been a collaborative program with AEA Technologies and EPRI to introduce dynamic safety systems (a unique reactor protection system developed in the United Kingdom for gas reactors) into U.S. lightwater reactors. He has also been listed in *Who's Who in Engineering* and *Who's Who in America*, and he is a member of IEEE, ISA, and ASEE.

By the summer of 1994, Miller was contacted by then-president Ed Fuller, who was chairing the nominating committee seeking out candidates for ANS vice president and president. "He asked me if I knew any educators I could recommend, and I figured if he was thinking about me, why not give it a shot? Ed Fuller gave me a lot of insight and direction on what it is to be president and vice president."

A month before becoming ANS vice president in May 1995, Miller was selected to a four-year term on the Advisory Committee on Reactor Safeguards (ACRS). That committee of 11 members from different fields makes recommendations to the Nuclear Regulatory Commission regarding nuclear reactor safety. Members are picked for the committee because of their expertise in varying areas, such as operations, materials, electrical systems, risk assessment, I&C, and severe accident management. Miller was elected to the committee along with two other new committee members—Miller as the I&C expert.

Because Miller spends about seven to eight days a month working on ACRS matters, he has voluntarily reduced his activities and salary at OSU.

In action, the ACRS committee reviews recommendations presented by NRC staff. One of the issues the NRC and the ACRS committee have on their agenda for the next several years is digital I&C in nuclear power plants: Miller has found himself particularly busy writing reports on regulatory guides and regulations. "We're codifying the total regulatory guidance in the I&C area," he said. "This will be the first comprehensive update in that area since 1983, and as we are all aware, computer-based technology has made dramatic change in the past decade."

On the family end of things, the Miller children are now all grown and out of the house. Oldest daughter Amy, 26, studying to be an elementary school teacher, is being married this August and will settle with her husband Robb Shannon in Westerville. Stacy, 25, graduated with a psychology degree from the University of Virginia in 1993 and has traveled



The Miller family in the early 1980s: Stacy, Don, Paul, Tommie, and Amy

extensively since then. She is returning to school at the University of Colorado in Denver this fall to pursue her master's degree in elementary education. Son Paul, 23, graduated from Virginia Tech University in May this year as a civil engineer and has begun a job in construction management in Columbia, S.C.

Tommie, who first taught high school physical education, now teaches physical education at a community preschool. She has also become a successful antique dealer, and travels as much as Miller does, going to antique shows buying and selling.

Miller unwinds by turning back to amateur radio, tapping out Morse code to operators around the world, the same as he did as a teenager. "Morse code is the easiest way for long distance communication," he said. "You need the least sophisticated equipment."

Over his ham radio, Miller also communicates with three Ohioans every Saturday morning to talk about events of the previous week. "Two of them are professors in physics, one is an electrical engineer for an aviation development company, and I'm the nuclear engineer," he said. "We just talk about different things. We're all about the same age."

Together, Miller and Tommie belong to the local yacht club, although he admits it should more appropriately be called a dinghy club. "Yacht club connotes big boats," he said. "In this club, the biggest boat is 20 feet long. So really it's just little boats sailing around a man-made lake. It's more of a social event."

### The coming year

The best defense is often a good offense. That's a philosophy advocated by Miller for his year as ANS president. He said that he will push for an expanded Eagle Alliance (for more on the Eagle Alliance, see *NN*, Jan. 1996, p. 13, and this issue, p. 44) and the benefits that it can bring, will seek to develop stronger ties with other societies, and will especially support internal investment.

"We must learn from the past but not dwell on it, and look to the future," he said. "By that I mean we've gotten to the point where we have a zero net operating budget and we've even increased our net assets over the last five

years. We'll continue to be hard-nosed about keeping the zero net operating budget, but at the same time we must take some of the gains on our reserve fund and apply it in the form of long-term investments in ourselves."

It goes back to his small business point of view, an obvious perspective when you consider that for years he has been on the board of directors of his family's lumber business, which has a number of branches in central Ohio. The business is similar to ANS in that it has 45 to 50 employees and net revenues of \$6 million to \$7 million a year. Loans are taken from the bank and invested in inventory and new capital equipment to help the business grow, a situation Miller would like to see duplicated by ANS. "For example, we could fund five programs a year and invest \$50 000 a year for five years in each program," he said. "If two programs do nothing, we throw the \$50 000 a year away with no return. But if the other programs strike it big, monetarily or by being able to serve the Society better, then we're a winner."

New programs, of course, will have to be approved by the ANS Board of Directors. According to Miller, each should meet the following requirements: provide a clear understanding and projection of its impact on ANS financial and human resources; involve multiple segments of the Society, such as divisions, local sections, and headquarters staff; and have a clearly but broadly defined management plan.

"We have to be hands-off a bit with this. People are not going to be willing to take risks if they fear their hand will be slapped or the rug will be pulled out from under them at the slightest hint of failure," he said.

In the end, the man who long ago took interest in the inner controls of a crystal radio will now take control of the inner workings of the Society. With his belief in small business philosophies, he remains undaunted by the task. "A friend of mine gave me a good one-liner: The object of a business is to stay in business," he said. "I believe in that. And I believe that with the assets that the Society has—the staff, the volunteers, and our reserve funds—we will succeed."—Rick Michal