



R. J. F. —

# RICHARD G. FARMER

1928–2012

Elected in 2006

*“For the solution of problems in the dynamic operation of electric power systems, including subsynchronous resonance and system stabilization.”*

BY VIJAY VITTAL AND GERALD T. HEYDT

**R**ICHARD G. (DICK) FARMER died peacefully at his home in Phoenix, Arizona, on March 26, 2012, after a courageous battle with cancer.

He was born November 5, 1928, in Laramie, Wyoming. He graduated from Eaton (CO) High School in 1946 and immediately joined the United States Navy. His math aptitude was fostered in Fire Control School after boot camp. It was this naval training that headed Richard toward electrical engineering. After discharge he attended Colorado State University, Fort Collins, earning his degree in electrical engineering in 1952 and later his master’s degree from Arizona State University (ASU) in 1964.

Richard’s work experience spanned the globe. His first job was in the Digital Computer Laboratory at the Massachusetts Institute of Technology. Then in 1957, while employed by Miner and Miner of Greeley, Colorado, he moved his family to Beirut, Lebanon, where he worked on rural electrification in that country.

In 1965 he began work at Arizona Public Service Company (APS) in Phoenix, where he became the principal engineer until his retirement in 1994. While working at APS, he was asked by ASU to teach an evening class in electric power engineering. After retirement from APS, he increased his class load at ASU, where he attained full professorship and worked until his final day.

Dick brought real engineering cases to his ASU teaching. He loved to tell students the story of the Mohave Generating Station, which had a catastrophic generator shaft failure, due to subsynchronous resonance—twice. It was not unusual for students to be in Dick's office at all hours to seek practical advice on a homework assignment, a thesis, or a job offer. Perhaps the most touching note attesting to his devotion to his students accompanied a bouquet of flowers that appeared anonymously at his office upon his death: "Thank you, Professor Farmer, for showing me what kind of man I really want to be."

The two incidents of shaft failure at the Mohave Generating Station in the early 1970s alerted the electric utility industry to a technical problem with far-reaching economic consequences. The total cost of the two outages was estimated at about \$66 million. Through his individual technical expertise and his leadership in the IEEE Power Engineering Society Working Group on Subsynchronous Oscillations, Richard Farmer developed and implemented innovative, state-of-the-art techniques that provided (a) a means of understanding the origin of the problem, (b) measurement approaches and monitoring equipment, and (c) guidelines for subsynchronous resonance (SSR) countermeasures. As a testimony to the effectiveness of the solutions developed, it is important to note that an event of such magnitude has not occurred since.

This seminal work on SSR mitigation provided a new lease on life for series-compensated transmission lines. Due to the geographical expanse of the Western United States and the long distances between generating units and load centers, it is imperative to use series compensation on these lines for enhanced performance and efficiency. However, the threat of SSR-related equipment failure would have been a serious limiting factor to the level to which these lines could be compensated. The techniques developed by Mr. Farmer and the group under his leadership provided efficient approaches to increase series compensation and mitigate the possibility of SSR. This has significantly enhanced the transmission capability of the lines and their efficiency in transporting bulk power to energy-hungry urban areas.

The Western system, with its long lines and heavy power transfers, is also susceptible to low-frequency interarea oscillations. The work done by Mr. Farmer in the area of power system stabilizer tuning has had a significant impact on the mitigation of the low-frequency oscillations problem in the Western United States. As a planning engineer for APS, he developed innovative techniques for the tuning of power system stabilizers that have become industry standards. He was also the principal architect of the first automatic islanding scheme in the Western Interconnection.

Richard was elected to the National Academy of Engineering (NAE) in 2006. In 2007 he was awarded the IEEE Power and Energy Society's Charles Concordia Award and in 2010 IEEE named him Outstanding Power Engineering Educator. He was also the author or coauthor of multiple power system engineering books and publications and a speaker at power system conferences. Through his work, he inspired and educated many students and colleagues with his rich knowledge and willingness to share his expertise.

Perhaps Dick's most important accomplishment was his family. He married Jo-Anne Overman in 1949 and together they raised four children. He was the tutor, the Little League and Pop Warner coach, the biggest fan, and the rock of the family. Jo-Anne passed away in 1995. Dick was blessed with additional love in his life. He married Gloria Sue Roberts on June 9, 2009. Dick and Sue could be seen dancing two or three nights a week at the Scottsdale American Legion up until the final month of his life. Dick lived a full, rich, and happy life to the end.

Richard was preceded in death by his first wife, Jo-Anne, his parents, William Farmer and Mary Roy, and his stepfather, Jack Roy. He is survived by his wife Gloria Sue Farmer; his children Kristine Farmer (partner Carole Dietzel) of Phoenix, Gregg Farmer (Valerie) of Estes Park, Colorado, and John and Lee Farmer, both of Phoenix; and his grandchildren Taylor Farmer, Mikayla Farmer, Marcella Farmer, Meredith Donner, Ann Lambiase-Mitchell, and Virginia Lambiase-Mitchell.