



Joseph K. Dillard

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1917–1988

By Edwin L. Harder

For Twenty-Five Years, from 1955 to 1980, Joseph K. Dillard and his talented group of associates were the virtual leaders in the tremendous advances in power system technology. His seventy-five papers published between 1952 and 1974 are an excellent chronology of these developments. They cover the solutions to all the problems encountered as the system transmission voltages were increased to 345 kilovolts (kV), then to 500 kV and 765 kV, and as the systems were interconnected, pooled, and operated as vast networks.

Notable are the Tidd 345-kV Project, joint with American Electric Power Company, Inc. (A.E.P.), and the Leadville 345-kV High-Altitude Project. These provided the fundamental basis for 345-kV transmission. Then came the Apple Grove Project, joint with A.E.P., which provided the fundamental basis for 500-kV and 765-kV transmission line design, and the 1100-kV Waltz Mill Project, which provided for testing cables up to these voltages.

All phases of lightning protection were studied: the phenomenon itself, the protection of lines and stations, switching transients, and the design of equipment to minimize and control these transients.

The most comprehensive economic study of power system operation and planning ever undertaken led to the Powercasting Program for long-range system design by computer, which,

for the first time, made possible the comparison of all reasonable alternatives of system design to provide for expected load growth over many years.

Along with these larger, interconnected systems came huge turbo-generators, high-voltage transformers, nuclear power, and the special problems of system stability and economic dispatching. As his papers attest, Joe provided the much-needed leadership in this period of rapid system growth.

Under Joe's leadership, Westinghouse took the lead in technical development of the first U.S. 500-kV commercial system at Virginia Electric & Power Company. This was followed by the Allegheny Power 500-kV system. These projects were the first in which switching surge design was determined to be a major consideration. This led to the development of circuit breakers with closing resistors to permit economies of equipment and transmission line design.

A very important part of electric utility engineering was the Westinghouse annual Electric Utilities School, which brought together promising young engineers from all over America and the world to learn the advanced technology involved in the design and operation of electric power systems. Joe and his group were personally acquainted with most of the key engineers in electric utilities throughout the world. Joe was always at the heart of these schools, never sparing himself (or his people) in making them a model of excellence. This contributed greatly to the respect and confidence with which electric utilities all over the world looked to Joe's Advanced System Technology Department for leadership and help in solving the highly complex problems of their growing systems.

All great engineering advances are the work of many engineering groups, all working in concert through the professional technical interchange afforded by the professional societies. Joe was a firm believer in professionalism, and the efficacy of this interchange. He was an outstanding leader in the Institute of Electrical and Electronics Engineers (IEEE), chairman of many of its committees, active on the board of directors for many years, and vice-president of technical activities and in 1976 became

president of the IEEE, the largest professional technical organization in the world.

He led also in other international organizations. In CIGRE, the International Conference on Large High Voltage Electric Systems, he was a member of the Executive Committee, and from 1972 to 1979, vice-president of the U.S. National Committee of CIGRE. For the World Energy Conference, he served on the board of directors of the U.S. National Committee (1972–1980) and as chairman of the Technical Program Committee in 1974.

Born on May 10, 1917, in Westminster, South Carolina, son of a plumber-general contractor, Joe became accustomed very early to hard work, a characteristic, along with his exceptionally clear analytical mind, that was to pay rich dividends throughout his strenuous career. After Westminster High School, Joe went on to the Georgia Institute of Technology, where he studied electrical engineering, in the Cooperative Program. After three years, however, he left for the U.S. Navy Yard in Charleston, South Carolina, to become a planner and estimator for the repair and conversion of naval vessels throughout World War II.

He married Elizabeth (Betty) Wash of Greenwood, South Carolina, on December 8, 1939. In 1946 he returned to Georgia Tech to complete his B.S. in electrical engineering, while teaching mathematics for support. Betty worked as secretary in the Electrical Engineering Department. In 1947 he went on to the Massachusetts Institute of Technology (MIT) for his MSEE, while teaching electrical engineering at the same time. Again at MIT, Betty became secretary in the Electrical Engineering Department. Betty's intimate knowledge of Joe's engineering education, and his subsequent superb use of it, was a boon not bestowed on many engineer's wives.

In 1950 Joe joined the Westinghouse Electric Company, and after assignments in the Electric Utility Engineering Department, the Switchgear Division, and the Analytical Department, he became manager of Electric Utility Engineering in 1956. With a reorganization, he became manager of Electric Utility Advanced Systems Technology in 1967, and then general manager of Advanced Systems Technology from 1975 until 1980. He

retired as a senior consultant in 1982 and died on February 13, 1988, survived by his wife, Betty, and his two sons, William King (Bill) and John Holcombe (Jack), and their families.

Joe gave generously of his time and talents in support of the engineering programs at Georgia Tech, MIT, and Carnegie Mellon University and received the highest commendations from these institutions. He served as chairman of the National Advisory Board for Georgia Tech and was a very strong supporter of many of the university's programs. He was a member of the Board of Visitors at MIT, representing industry. He served as chairman of the Steering Committee for the graduate program in power systems engineering at Carnegie Mellon University.

He was a professional engineer registered in Pennsylvania and a member of the Engineering Society of Western Pennsylvania and the National Society of Professional Engineers, and he encouraged all members of the team to follow suit.

Many honors came his way. He was elected a member of Sigma Xi and in 1963 a fellow of the IEEE "for contribution to electric power systems engineering in conversion and transmission research." He was awarded the Westinghouse Order of Merit, the company's highest recognition, in 1973 "for his work in the development of extra-high-voltage transmission systems technology." He was elected to the National Academy of Engineering in 1975, among the highest distinctions given to any American engineer. In this election he was honored "for his pioneering work in applying digital computers to the technical and economic analysis of power generation and transmission systems."

With all this, letters from many of his friends and associates, as well as the author's personal experience, it is revealed that Joe was a very warm and caring human being, demanding of himself and those who worked with him, but extremely supportive and proud of them all, with a charismatic style that endeared him to all his many friends and associates. He was recognized for his technical ability and his friendly and cooperative spirit. He enjoyed his work and the people he worked with. His associates and friends remember him as a "real guy." This had much to do with the success of the vast enterprise that he led and his election as president of the IEEE.

The superb electric power systems of today stand as a lasting memorial to the group of dedicated engineers who created them. Joe's name stands very high on the list of those who shepherded this fantastic development during its period of most dynamic growth.