

# History of the Electric Process Heating Committee

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**T**HE Electric Process Heating Committee apparently evolved from what was later to be one of its own subcommittees namely the Induction and Dielectric Heating Subcommittee. There seems to have been more than one such subcommittee in the early 1940's. Two 1944 technical papers on induction heating, one by Herbert F. Storm and one by N. R. Stansel, were recommended by the American Institute of Electrical Engineers (AIEE) Committee on Electrochemistry and Electrometallurgy. A paper in May 1945 by J. T. Vaughan and J. W. Williamson was recommended by the AIEE Committee on Industrial Power Applications and the Subcommittee on Induction and Dielectric Heating. However, an article by W. C. Rudd in *Electrical Engineering* in June 1947 states that on December 5, 1945 the AIEE formed a subcommittee of the electronics group on electronic heating (i.e., induction and dielectric heating) which consisted of manufacturers, users, and a representative of the Federal Communications Commission (FCC). Mr. Jordon of General Electric was the first Chairman followed by W. C. Rudd of the Induction Heating Corporation and J. Eiselein of RCA.

By 1950 the Electric Heating Committee had been formed as evidenced by the fact that it was the committee which recommended that a paper by R. M. Baker published in that year. The writer has been unable to verify who were the chairmen during the 1950's, but a partial list of those who were particularly active in these early years includes C. W. Frick of General Electric; W. H. Hickok of Girdler; C. P. Bernhardt of Westinghouse; F. Chesnut of Ajax; Herman Garlan of the FCC; W. T. LaRose of W. T. LaRose Company; G. W. Scott of Armstrong Cork; J. T. Vaughan of Tocco; T. P. Kinn of Westinghouse; Mr. Gillespe of RCA; B. E. McArthur of Ajax Magnethermic; N. R. Stansel of General Electric; R. M. Baker of Westinghouse; M. Rossnick of Lepel; P. H. Goodell, Consultant; J. W. Hrovath of Alcoa; and M. Rothstein, Long Island City.

Some who came along later and contributed heavily were R. A. Sommer of Ajax Magnethermic; W. T. Thomas of Princeton University; W. F. Hall of Natco; D. Partridge of PPS Industries; K. L. Sorace of Lamson and Sessions; A. F. Leatherman of Battelle; and H. Bunte of Commonwealth Edison.

The Electric Heating Committee had four subcommittees: induction and dielectric heating; radiant heating; resistance heating; and technical data. They all participated in two day Electric Heating Conferences with emphasis, not only on technical papers, but also on user oriented papers. These were held biennially in a number of cities, including Cleveland, Philadelphia, Detroit, Chicago, Louisville, Toronto, Toledo, Milwaukee, Indianapolis, and Cincinnati.

The subcommittee on induction and dielectric heating con-

tinued to be especially active. In the 1940's it gave technical assistance to the FCC relative to establishing rules governing spurious radiation from industrial, scientific, and medical (ISM) equipment. Adopted in the late 1940's, these rules allow a radiation level of up to 10 microvolts per meter at a mile and assign a number of frequency allocations where dielectric heating equipment can operate without restriction. The FCC rules have proven successful. Compliance by industry is practicable and there have been very few interference cases from complying equipments. The subcommittee has continued its work with the FCC over the years and is partly responsible for the fact that the rules have survived a number of attempts at making them unnecessarily stringent. This work included responding to a number of FCC dockets, attending many meetings in Washington, and testifying at hearings. At this writing the rules are again in danger of being made drastically more stringent because of international pressure.

Another accomplishment of the induction and dielectric heating subcommittee was the preparation of AIEE Standard 54 covering induction and dielectric heating equipment. This was issued as a proposed standard in 1952 and adopted in 1955.

The Technical Data Subcommittee compiled a summary of physical properties of materials at various temperatures with special emphasis on materials which might be found in electrically heated loads and on those which are used in the heating equipment itself. This was issued in 1962. Heavily involved in this endeavor were Mrs. B. O. Buckland of General Electric; A. F. Leatherman of Battelle; E. S. Eyth of Weigand; L. A. Strobel of Detroit Edison; and W. A. Vinnedge of *Electrical World*.

In the late 1960's the name of the Electric Heating Committee was changed to Electric Process Heating Committee. One reason was to emphasize its industrial nature as opposed to space heating.

Today the Electric Process Heating Committee is in the Industrial Utilization Systems Department of the Industry Application Society (IAS). Its scope is to be responsible for all of the matters within the scope of the IAS in which the emphasis or dominant factor specifically relates to the conversion and/or utilization of electric energy in industrial process heating.

The present chairman is W. H. Killian of Tocco. There are subcommittees for the following.

Technical Papers Review: D. Lavers, Chairman;  
Standards: W. H. Killian, Chairman;  
Membership: J. Alexander, Chairman;  
Energy: C. Derr

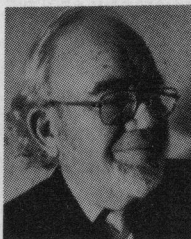
National Electric Code: R. M. Yurkanin, Chairman;  
FCC Liaison: D. Loveless, Chairman.

A partial list of those who preceded Mr. Killian as Chairman of the Electric Process Heating Committee are R. F. Miller of Modine; M. Feldman of Pillar; R. M. Yurkanin of Electran Process International; G. F. Bobart of Westinghouse; J. R. Wark of Indianapolis Power and Light; J. F. Cachat of Tocco; and C. A. Tudbury of Thermatool.

It is interesting to note how the nature of the papers has evolved. The early technical papers, some of which are mentioned above, were replete with Bessel function solutions of the basic differential equations and tedious slide rule calculations. More recent papers, such as those by Drs. Biringer and Lavers of the University of Toronto exploit the capabilities of computers. These have made possible such refinements as predicting end effects, stirring action in melting loads, load internal temperature distribution, dependency of physical, and magnetic properties on temperature.

Papers on specific applications and equipment have undergone an evolution from describing the design and operation of

motor-generator sets and sparkgap oscillators to solid state inverters, SCR power controllers, electronic switching, and microcomputer controls. But so far the relationship  $I^2R$  remains intact.



**Chester A. Tudbury** (M'35-SM'43-LS'79-LF'80) received the B.S. and M.S. degrees in electrical engineering from Massachusetts Institute of Technology, Cambridge in 1934.

He has taught electrical engineering at Fenn College, Cleveland, OH, and at Wayne University, Detroit, MI. He has been an engineer in the high-frequency heating field since 1940, including sixteen years with the Tocco Division of the then Ohio Crankshaft Company, two years with the Budd Induction Heating Division, Detroit, MI, and twenty-one years with the Thermatool Corporation, Stamford, CT, where his latest position was Technical Adviser to the President. He retired from Thermatool in early 1980 and still consults for them. He holds more than a dozen patents in the field of high-frequency heating, and authored the book, *Basics of Induction Heating*. He is a past Chairman of the Electric Process Heating Committee and the Induction and Dielectric Heating Subcommittee.