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The Genesis of Standard 90

ASHRAE Takes on Energy Standard

By Roderick R. Kirkwood, P.E., Presidential/Fellow/Life Member ASHRAE

It is important to remember what it was like at the time Standard 90 was born because the public has forgotten about the need for saving energy. Standard 90 was a technical leap forward as the first such standard on energy use in buildings. It was quickly done to respond to a crisis, and was accomplished without any government funding.

The standard was produced by people who met every weekend for three months at their own or their employers' expense. The Society rented the meeting rooms and provided staff support, but did not have funds for travel and lodging. Committee members believed in the importance of this project. The standard reduced energy consumption by a significant amount, and reduced emissions that were impacting our planet.

The Energy Crisis

The story of ASHRAE's Standard 90 begins with the 1973 energy crisis. For those of you too young to remember, here is a short refresher. At that time, OPEC supplied most of the United States with fuel. OPEC member countries banded together and decided to raise the price per barrel for oil and reduce shipments. As a result, oil and its principal products,

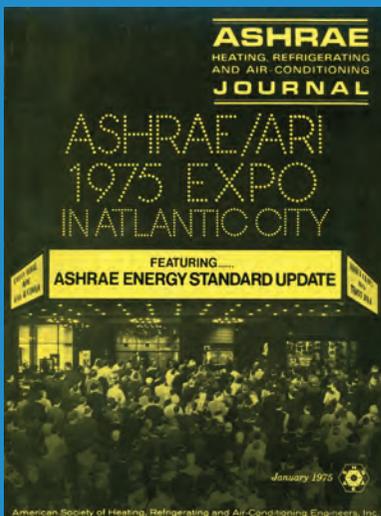
gasoline, diesel oil and aircraft fuel, were in short supply in the United States.

Americans had to wait in long lines at the service stations in hopes that they had fuel. If they were lucky, some could get a small ration of gas for their car at whatever price the station posted. This was a full fledged crisis, and fuel for generating electrical energy, heating buildings and homes, and running transportation systems were in short supply.

In the early 70s, the U.S. did not have a Department of Energy. However, plans were being developed in Washington, D.C., to spend billions of dollars developing new sources of fuel. Yet, it would be years before sustainable solutions were

About the Author

Roderick R. Kirkwood, P.E., was president of ASHRAE from 1973–74. He served as president for many years of the John Graham Company in Seattle. Kirkwood died May 6, 2010.



As agreed, I presented this proposal to the ASHRAE Board of Directors the next day for its consideration. The need for an energy conservation standard met a favorable response, but concerns about the funding ran into intense opposition. The only source for funds appeared to be a major dues increase, which was perceived as a potential for losing existing members and having a major reduction in new members. ASHRAE, as with most engineering societies, had been experiencing a decrease in membership. Many of the directors expressed concern that this would result in an even greater loss of members.

After almost two hours of discussion, the majority of the directors agreed that the alternative of not going ahead would allow another group to write a standard for energy conservation in buildings. Such a standard could be much less useable and effective than an ASHRAE standard written by our knowledgeable members who design energy systems for buildings every day.

Developing an energy standard was inevitable, and ASHRAE was the logical organization to write it. The loss of members that would come if another group wrote the standard and received credit and public visibility would be worse for the future of ASHRAE than raising dues. This analysis won the approval of the board of directors. With this approval, we authorized the standards committee to set up the necessary committee organization to handle this project under an crisis basis. It was to be ready to start as soon as we received confirmation that NCSBCS were accepting the recommendation of NBS to turn this standard over to ASHRAE for development.

Gathering the Standard Committee

When this decision was reported to the ASHRAE membership, there was a spontaneous standing ovation because the members understood the importance of this decision. The ASHRAE standards committee set up the team quickly; it was called the Standard 90 Committee with a panel set up for each section of the standard.

Each panel did detailed work on one or more phases of the proposed standard. The breadth of representation on these panels was important because this standard covers more than HVAC systems. Included were representatives of The American Institute of Architects (AIA), Illuminating Engineering Society (IES), Mechanical Contractors Association of America (MCAA), Air Conditioning and Refrigeration Institute (ARI), NBS, and Electrical Energy Association (EEA). The observ-

ers were Ken Henki from NCSBCS and Allen Trellis from the National Association of Home Builders.

The balance of the members was a cross section of the industry in ASHRAE: three consulting engineers, one manufacturer, two professors, and one testing laboratory. Andrew Boggs and I contacted IES to join with us to develop the chapter on lighting energy conservation, and they agreed. Frank Coda was the executive secretary of IES, located in the United Engineering Building in New York City, where the ASHRAE headquarters also was located. We contacted the AIA to join with us to develop the chapter on energy conservation for the building envelope. AIA agreed to join us in this high visibility effort. IES stayed with us, and completed its chapter on schedule. AIA set up its committee to develop the chapter and were well on the way to completion when it withdrew from the team.

The month between ASHRAE's Winter Meeting in 1974 and the NCSBCS meeting in Salt Lake City was a busy time for ASHRAE. We were organizing the team, selecting the members, determining how they would be able to do this in three or four months, and estimating our costs. This was critical to our ultimate success.

We set other parts of our effort for the efficient use of energy in buildings in motion as well. Each ASHRAE chapter in the United States was requested to set up an energy conservation committee whose mission was to get coverage in the local news media that ASHRAE was an organization of engineers and other experts that knew how energy could be used efficiently in buildings. This could help solve the problems for owners in their efforts to reduce fuel requirements but maintain comfort for their occupants.

Part of our expense was for a public relations consultant to assist us in reviewing the articles that we wrote for the media and to help us in getting these into appropriate publications.

This was a relatively small cost but the results were amazing. We had articles in the *Engineering News Record*, the *Wall Street Journal*, and many other publications that had never heard of ASHRAE before. This changed the image of ASHRAE with the public and was apparently the basis for a growth in membership in ASHRAE of about 20,000 members.

NCSBCS had its scheduled meeting in March, and I was invited to meet with them to receive its formal request to develop a standard for energy conservation for buildings. I specifically repeated to them that ASHRAE would prepare such a standard as an ASHRAE standard, and use the docu-



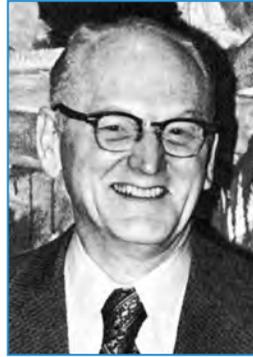
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ment prepared by NBS as reference material. NCSBCS appeared familiar with ASHRAE standards and did not ask for additional information from me. It did emphasize the urgent nature of this request, and I responded that ASHRAE was aware of the urgency of having such a standard. It was my goal to have a first draft complete in three months when my term of office ended (June 30, 1974). Most standards developed by voluntary groups have schedules in terms of years rather than months.

Writing and Reviewing the Standard

We immediately turned on ASHRAE Standard 90 Committee full blast. The effort was well spent in organizing the committee during the time that we were waiting for the final approval of NCSBCS. All of the effort was divided among a series of panels with a chairman responsible for each panel. More than 150 individuals are listed in this committee and that did not include the support staff and consultants. Changes of people occurred throughout the effort. Since all of the work was done by unpaid volunteers, except for staff, this was a contribution by individuals and their companies that could easily be worth \$1 million to \$1.5 million.

At that time e-mail did not exist and regular mail was too slow, so coordination was handled by phone calls and physical meetings of the members of each panel. Since this was on an expedited schedule, many meetings were held, and attendees or their companies paid for that as well. I believe that most of the panels met about twice a month with all of their members working on portions of their section between meetings and phone calls.



ASHRAE President Rod-erick R. Kirkwood in 1973.

The dedication and the resulting energy that you could feel in the air in these meetings were inspirational. It left all of us driving hard to do the impossible—write a standard in three or four months. This dedication was similar to troops heading off into the defense of their country. We had a battle to win, and we did it. With a group of 150 participants who came together in this direct effort and with the significant help that came from so many supporters, we made a lasting difference. The standard proved to be the right way to reduce global energy consumption without reducing energy needed for comfort.

In an ASHRAE Journal commentary, editor Fred Turner explains, "...Standard 90 is ASHRAE's most notable achieve-

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ment. It is a worthy legacy for the many people who have made it possible.”

Following the printing and mailing of the first draft, many hundreds of hours were spent in the consensus review process and in the resulting changes made to the original draft before ASHRAE Standard 90 was ready for distribution to the waiting public. ASHRAE and its members owe a debt of gratitude to NBS for what they had accomplished before ASHRAE was involved. The

first draft of proposed Standard 90P was issued on June 21, 1974. Some 5,000 copies were distributed throughout the industry, with comments requested to be returned by October 1974. The Standards Project Committee was reconvened and, in part, reconstituted to ensure that the panels had broad membership. This committee reviewed and digested more than 5,000 comments on individual items within proposed Standard 90P. The various panels reviewed all of these comments, and a new draft was issued on Jan. 14, 1975.

ASHRAE did not stop when Standard 90-75 was issued for the use of the public. It went on to provide manuals and taught classes through out the country to assist design engineers and building department reviewers how to use this Standard in their daily work. This has been further followed up with updated standards to continue to improve energy conservation in new building design.

Conclusion

In remembering the story of ASHRAE’s Standard 90 it is important to recognize that this standard would save 50% of all the energy being used in buildings in the country as it was implemented. This goal was surpassed some time ago. At the time of the prediction, the energy need for all of the country’s buildings was about 33% of all the energy used in the U.S. Therefore, the saving would offset the entire shortage when implemented. However, implementation takes time because of the energy used in existing buildings, which need to be brought up to the new standards or torn down and replaced by new buildings. In the last 33 years, this upgrade has been accomplished. ASHRAE Standard 90 and its updates have reduced the energy problem from what it would have been if we had not created this saving.

It is my hope that people understand why this standard was written and the dedication of the 150 volunteers who helped write it. The standard began as a basic idea about the right way to reduce energy use. Through the dedication of volunteers, the standard succeeded in achieving savings in energy much greater than we ever considered. This is a story that must be remembered. Many of these individuals have never received credit for their work. This is my way of providing a “thank you” to them for this intensive effort.●

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