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An energy resource standard

Section 12 of ASHRAE Standard 90-75 provides the analyst or building owner with a methodology for estimating the quantity and forms of energy resources required to support new building operation. This "crystal ball" also provides an awareness of the energy dependence and costs of operating a facility.

Proposed Section 12 of Standard 90-75, "Annual Fuel and Energy Resource Determination," has been subjected to its second open review in accordance with consensus standards procedures. Panel 12 of the Standard 90 Project Committee—responsible for drafting, managing reviews, and achieving consensus—has completed a revised draft following resolution of differences and completion of revisions mandated by the comments on the second open review. The Panel submitted a recommendation to the Coordinating Committee of the 90-75 Project Committee indicating that the consensus had been achieved, and that Section 12 should be added to the Standard.

Section 12 is in a rather unique situation insofar as Standard 90 or any other consensus standard adaptation procedure is concerned: It is one section that is being reviewed separately from the complementary text of the Standard as a whole.

To inform readers of its status, a brief overview of the genesis and purpose of Section 12 appears useful.

During the original open reviews of ASHRAE Standard 90-P (preceding adoption of 90-75), numerous comments regarding the energy resources issue were submitted. The original eleven sections of the standard did not address this issue, and a summary of those comments was that if the Standard did not recognize energy resources, it was not addressing the fundamental issue of energy conservation; i.e., conservation of depletable or nonrenewable energy resources.

The Society recognized the legitimacy of these comments, and further recognized that inclusion of resource consideration would delay adoption of a much needed energy conservation standard for new buildings while the issue was being subjected to the needed consensus procedures. It was decided that

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ASHRAE would adopt the Standard as originally conceived, omitting the energy resource, and issue a "Foreword" statement recognizing the need for considering energy resource and committing the Society to including this consideration as quickly as a text relating to this issue could be developed within the procedures established by ASHRAE and the American National Standards Institute (ANSI).

The original efforts in addressing the issue were made by an ASHRAE Presidential Committee which recommended that the original eleven sections of Standard 90 not be changed, except as required by other than resource issue comments; and that the entire resource issue be added as a separate Section "12." The Committee felt that this would enable the Standard to be adopted at the earliest possible date and would not create the need for significant changes to those sections.

As an outgrowth of this recommendation, Panel 12 was established for the purpose of drafting the resource section, conducting the open reviews, and obtaining the necessary consensus to add this Section to the Standard.

Shortly after adoption of Standard 90, the Panel drafted a text for Section 12 which was published in the July 1975 issue of *ASHRAE Journal*. The Project Committee felt that revisions mandated by the reviewers were significant enough to require a second review. The revisions required during the second review have been made and the Panel has recommended to the Standard 90-75 Project Committee that consensus has been achieved and that Section 12 be added to the Standard.

In the process of communicating with reviewers of Section 12, there appears to be one salient point of misunderstanding which might be addressed in some detail. If it can be said that there was any disagreement between the commentators and the Panel who drafted the text, it would be that the reviewers who perhaps remained "unresolved" in the consensus procedure did not recognize the value of resource consumption information to the systems analyst or building owner.

Section 12 provides the only available standard methodology for estimating the quantity and forms of energy resource(s) that will be required to support the building operation. Without the information developed in Section 12, the energy source and consumption information available to the analyst is left at monetary considerations and an arbitrary energy evaluation unit of British thermal units or kilowatt-hours. The latter has significance only if an arbitrary potential legislative limit is placed upon the building end use energy consumption, and the former has no relation to energy economics except for the obvious cost of the commodity.

Energy use can be calculated

Fundamentally, Section 12 provides a methodology whereby the systems designer can calculate the annual building energy consumption in the form consumed (MCF of natural gas, kW-hr of electricity, gallons of oil, etc.); then, by use of resource utilization factors (RUF), extend this information to the quantity and form of resource required to provide for the end use forms. The end result of the use of Section 12 is that the analyst or the building owner has complete knowledge of how much resource the proposed building (with its energy systems) will consume, and what form of resource will be required to support the building's energy system.

Section 12 does not mandate an optimization analysis to reduce the energy resource consumption to its minimum value. The logic behind this is that several resource options are available at most building sites, and the "reduction to minimum" approach may not necessarily be in the best financial interest of the building owner or in the best long-range interest of resource energy conservation. Buildings are not like vehicles, in that they have available to them alternative resource energy selections and are relative long-range investments. Thus, with lack of resource information, the building owner may elect to minimize the end use form and/or cost and later find his long-range dependence upon a relatively scarce source. In this regard, the use of Section 12 provides a "crystal ball" for the building owner and at the same time provides him with an awareness of the energy dependence and energy costs of operating the facility. Its exis-

tence serves as the only available nontrade source of knowledge for the building design profession regarding resource dependence.

Value of energy answered

Section 12 has achieved another significant milestone in the overall problem of energy economics: It recognizes the need for establishing a *value* of energy resources. This is addressed in Section 12.2, where the need for a resource impact factor (RIF) is implied. The output information developed in Section 12 is in the format that could be utilized in conjunction with the proposed RIF to optimize the energy source selection for a building project. The RIF concept encompasses such considerations as "availability, social, economic, environmental, and national interest issues." Until these are available, however, they remain the only judgment factor if the utilization factors of Section 12 are applied!

In conclusion, the singular question which welded the majority of the critical comments received in the Section 12 review was: "What will be the benefit of the use of Section 12?" The answer is that it will provide both analysts and owners with information currently unavailable to them. With this knowledge, decisions regarding energy resource and consumption will be founded on fact and will result in more effective use of energy resources. Additionally, Section 12 provides the basis for and recognition of RIF use and development—a concept that will ultimately facilitate intelligent national policy in building systems energy use.

ASHRAE is in a unique position in addressing these complex energy phenomena, in that it is neither a political body, nor a trade organization. To maintain this posture as a technical engineering society with the sole purpose of assimilation of technical information, it is imperative that they not yield to political or institutional pressures or submit to compromises to achieve their ends. They must, as a society maintain technical integrity in every undertaking including standards.

Standard 90 is perhaps the most ambitious standard that any technical society has undertaken, in that it is of significant interest as well to the public, institutional, and political sectors. As such, there has been significant pressure from these sectors to influence the technical content of the document. It is the Society's obligation to recognize and consider these inputs and to maintain the technical integrity of their efforts. In the adoption of Section 12, the Panel kept this goal in sight at all times and hopefully has preserved, on behalf of ASHRAE, this technical integrity.