Conf-920828--17

PNL-SA--20379

DE93 001313

A KNOWLEDGE-BASED SYSTEM FOR AUTOMATED EVALUATION OF ENERGY STANDARDS COMPLIANCE

Richard W. Quadrel
Micheal R. Brambley
Rex C. Stratton

August/September 1992

Presented at the
ACEEE 1992 Study on Energy
Efficient Technology
August 30 - September 5, 1992
Pacific Grove, California

Work supported by
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

DISCLAIMER

A Knowledge-Based System for Automated Evaluation of Energy Standards Compliance

Refereed Paper

Panel 6: Government, Nonprofit and Private Programs

It has been estimated that as much as 60% of the energy used to heat, cool, and illuminate buildings could be saved through better design. Consequently, many states have incorporated an energy standard (such as ASHRAE Standard 90.1-1989) into their building codes, compelling architects and engineers to consider building energy use during the design process. Although energy standards provide a benchmark against which designers may measure their designs, compliance evaluation often requires tedious calculation. In addition, energy standards fail to provide project-specific recommendations for improving energy-*inefficient* designs.

We are building a computer program, the *Energy Standards Intelligent Design Tool* (ES-IDT), that addresses both of these issues. The ES-IDT is one component of the Advanced Energy Design and Operation Technologies (AEDOT) system, a computer-based environment for integrating building energy software. The ES-IDT automatically and continually evaluates a building design as it is being developed on a CAD system. If the emerging design begins to deviate from compliance with ASHRAE Standard 90.1-1989, the ES-IDT notifies the architect, indicating which section of the standard was violated and what design decision(s) caused the violation. The ES-IDT also will suggest some design options to improve the energy efficiency of the building. Based on these suggestions, the architect can either modify the design manually or ask the computer to implement one of the options automatically.

This paper discusses the issues surrounding energy standards compliance, the technical development of the ES-IDT software and its role within the AEDOT system, as well as potential future applications of this technology.

END

DATE FILMED

2 / 22 / 93