

## SESSION 7C

### **PROGRAM EFFICIENCY, INSTALLATION QUALITY AND PEAK LOAD IMPACTS: NEW PERSPECTIVES IN RESIDENTIAL HVAC EVALUATION**

*Moderator: David Hungerford, California Energy Commission*

#### PAPERS:

##### **Savings Uncertainties in Residential Air Conditioning Rebate Programs**

Rachel Freeman, Summit Blue Consulting

##### **Do Quality Installation Verification Programs for Residential Air Conditioners Make Sense in New England?**

Robert M. Wirtshafter, Wirtshafter Associates

Greg Thomas, Performance Systems Development

Gail Azulay, NSTAR

William Blake, National Grid

Ralph Prahl, Prahl and Associates

##### **Measuring the Load Impact of an Air Conditioner Cycling Program**

Ed Lovelace, Southern California Edison

Corina Jump, Itron Inc.

Kris Bradley, Itron Inc.

#### SESSION SUMMARY:

This session focuses on the problem of evaluating peak impacts of residential AC programs. The papers represent three different evaluation approaches to estimating peak impacts from three different AC program types.

The first paper, “Savings Uncertainties in Residential Air Conditioning Rebate Programs” describes the development and application of a methodology for estimating the range of uncertainty on savings from residential AC efficiency programs. Results from this paper show that efficiency rating uncertainty and operating conditions outside of design specifications can increase demand saving estimate errors by a factor of 2.5. Key performance uncertainties identified include duct leakage, refrigerant charge, unit sizing, air flow over the coil, and extreme operating conditions. The model, Crystal Ball®, uses sensitivity analysis to identify and prioritize input uncertainties having the greatest contribution to kW and kWh savings, and thus provide program managers and evaluators with a tool for designing cost-effective programs and developing data collection plans.

The second paper, “Do Quality Installation Verification Programs for Residential Air Conditioners Make Sense in New England?”, examines the peak impacts of programs intended to encourage and provide tools to HVAC technicians to test and correct air flow and refrigerant charge conditions on existing systems. It finds that the investment in this type of program is only feasible for systems having extra capacity at system peaks.

The third paper, “Measuring the Load Impact of an Air Conditioner Cycling Program” reports the results of an analysis of end use data collected from a sample of Southern California Edison’s “Air Conditioner Cycling Summer Discount Program”. It estimates baseline usage and load reduction impacts for a variety of temperature conditions. Hourly impact estimates by temperature allow resource

planners to more precisely estimate the resource value of the AC cycling program and helps program staff more effectively manage the program.