

# RAC SURVEY OF TECHNICAL COMMITTEES REGARDING SUBMISSION OF RTARs AND WORK STATEMENTS

## Executive Summary

ASHRAE MORTS Mike Vaughn noted a 24% decline in RTARs submitted and a 39% decline in Work Statements submitted from calendar year (CY) 2005 to CY 2006. RAC surveyed TC/TG Research Subcommittee Chairs (RSCs) at the Winter Meeting in Dallas to assess the reasons behind the decline. RSCs for 45 of the 99 TC/TGs responded. Almost two thirds of RSCs said their TC is submitting fewer RTARs than it did three or four years ago, and over half said their TC is submitting fewer Work Statements than it did three or four years ago.

Many factors are contributing to reduced RTAR submissions. Those that many respondents identified as contributing "a great deal" include:

- Members' lack of time to write RTARs (25.7%),
- Members' reluctance to write RTARs because authors are discouraged from bidding (25.7%),
- RTARs returned for arbitrary, unclear or conflicting reasons (20.0%),
- ASHRAE research project budgets too low to get a significant amount of work done (17.1%),
- Perception that projects will not get funded because the TC's priorities differ from those in the Society's Research Strategic Plan (17.1%),
- Lack of good research ideas (17.1%),
- Same RTARs returned multiple times (17.1%),
- Perception that projects will not get funded due to insufficient ASHRAE research funds (14.3%).

Many of the same factors were cited as contributing "a great deal" to submission of fewer Work Statements:

- Members' lack of time to write WSs (32.0%)
- Members' reluctance to write WSs because authors are discouraged from bidding (29.2%)
- Lack of approved RTARs to work from (26.9%)
- ASHRAE research project budgets too low to get a significant amount of work done (16%)
- Perception that projects will not get funded due to insufficient ASHRAE research funds (12%)
- Same WS returned multiple times (12%)

RSCs suggested a number of ways to increase the number of RTARs and WSs submitted. Some would require approval by entities other than RAC:

- Relax the conflict of interest policy that puts RTAR and work statement authors at a disadvantage in bidding on projects,
- Reduce the focus on the Society's Research Strategic Plan and on each new President's priorities, recognizing that the TCs usually have the best perspective on the priorities in their area of expertise,
- Provide stable research funding to encourage TCs to keep putting projects in the pipeline,
- Provide incentives to RTAR/WS authors, such as free meeting registration or waiver of one-year's membership fee.

RAC will discuss these suggestions and forward its recommendations to Tech Council.

Many suggestions related to RAC practices and performance and training of RSCs, and can be addressed primarily by RAC, particularly:

- Provide consistent review of each RTAR/WS and consistent direction to the TC as the RTAR/WS moves through the system, despite changing RAC membership,
- Approve more RTARs; rather than returning an RTAR, accept it and provide constructive criticism for WS preparation; make the RTAR process quicker; reduce the effort required; make clear what kind of RTARs are wanted;
- Improve communication between RAC and the TCs, increase liaisons' involvement, contact with the TCs, and encouragement of the TCs,
- Reduce levels of inefficiency and constant state of change,
- Keep saying there is money available,
- Provide a clear and concise user manual, make the procedure very clear with easy to follow steps and sample RTARs/WSs,
- Help TCs establish more realistic cost estimates to entice more bidders; set higher project funding levels to bring higher tier researchers,
- Provide an easy way to research prior work,
- Encourage TCs to submit more RTARs – even require each TC to submit two or three,
- Require RTARs to specify who will write the WS and by when,
- Promote better liaison between related TCs.

RAC will consider these suggestions fully and identify ways to improve our practices, performance and training. At the Winter Meeting, RAC began to expedite RTARs by accepting them while requiring items of concern to be addressed in the Work Statement. RAC also began the process of revising its Research Manual.

RSCs were also asked what ASHRAE could do to reduce the total time from the first submission of an RTAR to final approval of a Work Statement. A number responded that the multiple submission deadlines and more frequent RAC review meetings have already improved the situation considerably. Suggestions for improvement included:

- Review submissions quarterly, monthly or even in real time,
- Provide more frequent feedback and clear communication between RAC and the TCs,
- Revise the Research Manual and then leave the process alone for 10 years, make a clear process,
- Educate TC members about the research process and about how to write a good Work Statement,
- Provide a resource to help with some aspects of writing, for example a student intern to do a literature search would often help a lot
- Encourage TCs to conduct business electronically between meetings.

The survey of Research Subcommittee Chairs corroborated the fact that fewer RTARs and WSs are being submitted. RSCs offered many good suggestions to increase the number of submissions and to expedite the process, and RAC will consider these ideas in depth to identify ways to improve ASHRAE's research process.

# Appendix

## ASHRAE 2020: NZEB Research Topics

Following is a more detailed listing of possible research topics needs to provide net zero energy design guidance:

### **ASHRAE Research Topics—Priority 1**

Topics listed as Priority 1 fall within ASHRAE's core competency.

#### *Building Envelope*

The building envelope should be designed to match buildings loads and resources. For example, on a residential scale the U.S. Department of Energy Research Toward Zero Energy Homes demonstrates methods to get to 70% efficiency and recommends roof areas with a given efficiency of solar domestic hot water (SDHW) and photovoltaics (PV) to meet the remaining loads. This methodology can be applied to commercial typologies as well. For buildings with high lighting requirements, daylighting needs to be a primary façade element; similarly, cooling or ventilation loads should influence envelope design. Some areas to develop include:

- a. Dynamic "advanced" facades
- b. Glazing
- c. Frames
- d. Daylight devices
- e. Envelope airtightness

#### *Design Tools*

There is a need for more accurate geometry for architectural models imported to energy simulation programs. Actively pursue standardizing interoperability between software tools and developing software tools that can accurately model net zero energy buildings (NZEBs).

#### *Small Power/Plug Loads/Miscellaneous Loads*

Since these loads are not regulated in Standard 90.1 and also not under the control of the designer, they tend to be neglected. It is important that an evaluation of process, cooking, and refrigeration loads are factored in to the NZEB calculation.

### *Operating Issues*

There is a need to reduce constraints imposed by the structure of the current building industry. Maintainability, simplicity, ease of operation, and controllability are important considerations to ensure optimal operation of an NZEB.

### **ASHRAE Research Topics—Priority 2**

Some Priority 2 research topics do not fall under ASHRAE's core expertise. They should be addressed by working with the indicated organizations.

#### *Design Tools*

The following may be pursued with assistance from IESNA.

- a. Daylighting simulation and evaluation tools
- b. Ability to size HVAC systems accounting for daylighting technologies including thermal storage
- c. Renewable energy integration tools

#### *Electrical Power*

ASHRAE should work with IEEE and others to address these issues.

- a. Demand control and load shedding
- b. Electrical equipment efficiency
- c. Integrating renewable generation (DC current) in building electrical systems
- d. Small scale cogeneration integration
- e. Electrical storage
- f. Net metering standards

#### *Service Water Heating*

These items are not addressed by the Research Strategic Plan (RSP) but will impact NZEBs.

- a. Research project/new standards
- b. Domestic Hot Water (DHW) conserving fixtures
- c. Instantaneous DHW systems

### **ASHRAE Research Topics—Priority 3**

Some Priority 3 research topics do not fall under ASHRAE's core expertise. They should be addressed by working with the indicated organizations.

### *Climate Typology*

Copublish solar and wind data with NREL solar databases. There is a need for better index of clear/cloudy skies and to understand the implications to design.

### **Topics Addressed Outside of ASHRAE Research**

The following topics are important to the ASHRAE 2020 initiative and are being pursued, or should be pursued, by other committees within ASHRAE, such as the Research Advisory Panel impaneled to development the next generation Research Strategic Plan (RSP) and the Advanced Energy Design Guide Steering Committee. Continued attention should be given to these topics to enhance net zero energy design guidance.

### *Climate Typology*

- a. Develop basic recommendations for each of the ASHRAE climate zones to simplify "packages" of recommendations for designers (currently being addressed by AEDG).
- b. "Advanced Energy Design Guide" approach for larger facilities to hit efficiency improvements of 70% relative to baseline (currently being addressed by AEDG).
- c. Better envelope standards guidance per location and orientation (currently being addressed by SSPC 90.1).
- d. Consider the extension of the comfort zone (should be addressed by SSPC 55).

### *Design Tools*

- a. Provide building balance point tools for use in the schematic design stage to match building envelope to climate conditions (currently addressed in RSP).
- b. Energy simulation for Standard 90.1 evaluation.

### *HVAC*

HVAC is currently addressed in the ASHRAE Research Strategic Plan.

- a. Natural ventilation design standards and guidance
- b. Alternative HVAC distribution
- c. Boiler efficiency
- d. Chiller efficiency
- e. Increase the delivered efficiency of heating, cooling, and ventilation perhaps with a shift from air to water as the medium for energy
- f. Consider total combined energy efficiency: fan energy, electrical distribution, and gas distribution

## *Lighting*

Lighting is currently addressed by IESNA.

- a. Lighting system design with emphasis on lighting quality, task lighting, and sample packages of lighting system designs that reduce the required lighting power density
- b. Lighting controls
- c. Lamp technology
- d. New lamp materials (photonic crystals)