

ASHRAE Summer Annual Meeting – January 22, 2006
Chicago, IL
TC 6.1 Research Sub-Committee Chair Minutes

Attendees:

Steve Tredinnick	Bill Coad	Dick Hegberg
Mike O'Rourke (partial)	Tom Cappellin	Gil Avery

Update on ASHRAE Research Plan

Research Advisory Panel (RAP) issued the Strategic Plan for Research in November 2005. The goal of the Strategic Plan is to guide the TC/TGs in selecting and conducting research that would be of greatest benefit to the society. The mission of ASHRAE is to advance the arts and sciences of HVAC&R and related human factors to serve the evolving needs of ASHRAE members and the public. Research is conducted to fulfill this mission by addressing:

- Comfort and productivity
- Quality of the indoor and outdoor environment
- Security, safety and health
- Cost effectiveness

The Plan has identified four broad, far reaching Research Opportunity Themes for ASHRAE:

- Energy & Sustainability
- Indoor Environmental Quality
- Tools and Applications
- Equipment, Components and Materials

The above issues must be addressed in all future RTARs since it represents 45% of the total scoring method. About \$200,000 to \$500,000 (depending on outcome of non-responsive project bids) available for research in 2006/2007. There is not a backlog of research projects this year so each TC was requested to prepare research topic acceptance requests (RTARs) and work statements (WS). RTARs are due August 15, 2006 and RAC will now review RTARs at all meetings (3 per year)

Tredinnick summarized the current research topic effort as follows:

- There are two projects that our TC has been asked to previously co-sponsor:
 - 1296-WS. Guidelines for Optimizing Centrifugal Chillers. Co-sponsored with TC 8.2. No update on this effort.
 - RTAR 1388. Re-evaluation of High Altitude Effects of Gas-Fired Boilers and Water Heaters. Joint with TC 6.10 and TC6.6. WS is being created. Time is running out for this WS and Tom Butcher will bring copies to TC meeting for review. Need volunteers.
 - TC 1.4 has a work statement they want our TC to co-sponsor. Control Valve Selection for Improved Controllability. WS was emailed to Tredinnick by Steve Taylor and copies were available for the meeting. Does the TC have any comments and will we co-sponsor? Need list of members to review. Mark and Dick Hegberg and Gil Avery.
- The following two *DRAFT* RTARs are prepared and not submitted (*all RTARs have to be rewritten using the new RTAR format and also address the new Strategic Plan to be forwarded to Larry Markel for preliminary review comments*):
 - M. Hegberg has completed and handed out an RTAR on "Applied Characteristics of Chilled and Hot Water Heat Transfer Coils". This project would computer analyze the part load performance characteristics of coils. Lab testing of coils at

- part load. Larry Markel performed a cursory review and had comments. Steve T. to forward comments to M. Hegberg. Need revisions.
- M. O'Rourke has completed preparing RTAR on Comparison of All Air Heating System to Finned Tube Radiation with and without VAV. Current version of RTAR uses older format and it should be reformatted to the new RTARs format.
- In a subsequent email on February 16, Dick Hegberg suggested a further RTAR on the topic on existing copper fittings and the new "crimped-on" (Northern Indiana Brass) to compare new K factors or equivalent drops with existing copper fittings. Current Chap.36 only shows (Table 11) Copper fittings very broadly in equivalent lengths for all sizes.
 - The following topics were carry over from Denver as potential candidates for RTARs:
 - Dick Hegberg to prepare RTAR on Evaluating Allowance for Sizing Piping Systems due to Aging. See attached June 26, 2005 memo from Dick. This stimulated considerable discussion regarding how to quantify aging. No effort to date, is still willing. Martha Hewett had some involvement. Dausin and Bowman 1933 UW research. HDR design guide. AWWA 1967 study. Had two papers about heat pump and military piping system pipe failures.
 - M. Hegberg to prepare RTAR on Field Applications of Variable Speed Circulators in Lieu of Control Valves. No update.
 - Bill Bahnfleth to prepare an RTAR for next meeting regarding Burt Rishel's suggested topic of Maximum Velocity in Piping Systems. No update.
 - We need to establish what we should add to our research activities for pipe and fittings.

TC6.1 Research Plan June 2006

Recently completed projects

- RP-968 VALIDATION OF DESIGN DATA ON LOSS COEFFICIENTS OF CONSTANT DIAMETER PIPE FITTINGS AND PRESSURE LOSS OF PIPE FITTINGS AND DEVELOPMENT OF DESIGN DATA ON PRESSURE LOSS COEFFICIENTS OF REDUCING PIPE FITTINGS (TC8.10)
Dr. Rahmeyer, Utah State University
- RP-1034 DEVELOP DESIGN DATA ON THE PRESSURE LOSS OF LARGE PIPE FITTINGS
Dr. Rahmeyer, Utah State University
- RP-1035 DEVELOP DESIGN DATA ON THE PRESSURE LOSS OF CLOSELY SPACED MULTIPLE FITTINGS
Dr. Rahmeyer, Utah State University
- RP-1090 DEVELOPMENT OF A TWO-DIMENSIONAL TRANSIENT MODEL OF SNOW-MELTING SYSTEMS AND USE OF A MODEL FOR ANALYSIS OF DESIGN ALTERNATIVES.
Jeff Spitler, Oklahoma State University
- RP-1116 DEVELOP DESIGN DATA ON PRESSURE LOSS OF 6", 8" AND 10" PIPE FITTINGS (TC8.10)
Scott Morgan, University of Minnesota

Approved and voted in Nashville. UofMN will prepare the tech paper for Quebec City. Al Black will follow-up.

RP-1193 DEVELOP DESIGN DATA ON PVC PLASTIC PIPE FITTINGS, SIZES 6, 8 AND 10" DIAMETERS (TC8.10)

Dr. Rahmeyer, Utah State University

On January 2, 2006 the final report was pulled from the bookstore honoring a request from the Plastic Pipe & Fittings Association. See discussion below.

Research Projects Active Projects

RP-1196 DEVELOPMENT OF SOFTWARE TO CALCULATE THE APPLICATION SEASONAL EFFICIENCY OF COMMERCIAL SPACE HEATING BOILER SYSTEMS BASED ON ASHRAE STANDARD 155P

Ron Nelson, Iowa State University

RAC inquired to the status of this project. The project is still awaiting the completion of Standard 155P prior to finalizing. It will not be completed until Standard 155P is concluded which should be in about 1-½ to 2 years away. RAC also inquired regarding progress reports. The PI Ron Nelson must issue a progress report. Martha has contacted Ron Nelson and he will issue the reports to RAC.

1193-RP Final Report and Paper response to Plastic Pipe and Fitting Association (PPFA)

Research concluded February 2003 and the Final Report has been available in ASHRAE bookstore since then.

PPFA issued an objection on 11/18/05 to Mike Vaughn (Manager of Research and Technical Services) regarding two issues identified in the report. A series of emails occurred between PPFA, ASHRAE and Dr. Rahmeyer (principle investigator) attempting to address the issues.

On December 20 2005 PPFA issued a 12 page white paper specifically identifying their objections. They like the technical aspects contributing to the understanding of sizing and use of PVC piping, but took major exception to the wording of the report concerning glue beads and connection gaps (not representative of field conditions).

Dr. Rahmeyer concurred with the decision to pull the report on Dec. 28, 2005 so he could make modifications to the Final Report addressing the issues resulting in the temporary removal of the Final Report from the ASHRAE bookstore on January 2, 2006. Dr. Rahmeyer issued a draft addressing these issues. 12 copies were provided to the TC for review. Dr. Rahmeyer made some edits to the document that should address PPFA's white paper concerns.

Dr. Rahmeyer:

- Clarified that the inside and outside edges of the pipe ends were deburred and beveled.
- Deleted references to glue beads
- Addressed connection gaps as what happens if the fittings were installed incorrectly
 - Page 61 of final report - "Connection gaps can occur in all types of pipe and fittings that have a socket type of connection. Connection gaps can occur from repairs or occur intentionally to accommodate installation or to correct pipe lengths that were fabricated too short. There are also other types of fitting abnormalities that can effect loss coefficients such as protrusions from weld beads, flange gaskets, and beads of glue and sediment deposition."

On February 15th the project monitoring subcommittee teleconferenced and voted to accept Dr. Rahmeyer's amended report on RP-1193. The vote to accept the amended report is:

For 5
Against 0
Abstain 0

Members present: Dick Hegberg, Scott Fisher, Joe Thuman, Roy Ahlgren,
Members absent: Burt Rishel (unable to attend)
Guest: Steve Tredinnick (TC 6.1 research subcommittee chair)

The vote was also discussed with Burt Rishel after the conference call. The project monitoring subcommittee believes that the report will lead to a standard on the installation and assembly of plastic pipe if one does not exist. Dr Rahmeyer is encouraged to publish an ASHRAE technical paper on the cause of the unexpected loss in a PVC elbow and the tests done to show how it could be prevented.

Based on this information Michael Vaughn (Manager, Research and Technical Services) posted the revised report back on the ASHRAE website and bookstore shelves.