TC 1.5 Computer Applications
Research Subcommittee Meeting Minutes
ASHRAE Annual Meeting, Toronto, Ontario
Sunday, June 21, 1998

1. Call to Order/Introductions

The meeting was called to order at 8:10 p.m.

2. Discussion of 1017-TRP

Mick Schwedler presented a brief summary of events surrounding the status of 1017-TRP after a bidder was approved at the San Francisco meeting. This summary included proposed activities planned for the Toronto meeting designed to obtain a successful reconsideration by the ASHRAE Tech Council.

3. 966-RP PMS Report

Brian Kammers reported that the contractor's final report was satisfactory pending a few editorial changes. The contractor was asked to resubmit the final report by July 1. The TC will be asked to accept the project by letter ballot assuming the revised final report satisfies the PMSC

4. 1049-TRP PMS Report

Bob Potter reported that only one bid was received for the RFP. After review by the PMSC, it was unanimously agreed that the proposal failed to adequately address the work statement. The subcommittee's greatest concern involved the optimization portion of the project. After consideration, the PMSC will recommend to the Manager of Research that the project again be advertised, this time with a longer response date to facilitate additional bidders and a more complete response.

5. Proposed Research

No new research projects were presented for consideration by the subcommittee chairs. Jeff Haberl drafted a one-pager during the meeting for consideration during the full TC meeting on Monday.

6. Discussion/Review of Work Statements and One-Pagers

Dave Branson's work statement, WS-1032, "Identification and Computer-Based Preservation of Building Design and Commissioning Information" had been submitted for consideration by RAS following the Winter meeting in San Francisco. Once again the work statement was rejected. A copy of the work statement with the RAS's concerns was circulated. Dave was asked if he wanted to attempt yet another revision. While not declining, the status of a third submission was left unresolved.

The Chair reported that Walter Grondzik's work statement entitled "A Demonstration Multimedia Database for Examining and Comparing HVAC Design Alternatives" had not been revised since the last meeting. Since Walter was not present at the subcommittee meeting, the status of the work statement was left unresolved. (Walter Grondzik was present at the TC meeting on Monday and the work statement was discussed. As with WS-1032, the status of future revisions was unresolved.)

7. Research Topic Prioritization

The subcommittee recommended that the current research plan by submitted to the TC for approval. The subcommittee also agreed to support discussion of Jeff Haberl's new one-pager at the TC to determine if it should be included in the research plan. (At the TC meeting, Haberl's one-pager along with a one-pager submitted by TC 9.6 were discussed and considered for inclusion in the TC's research plan. The revised research plan is outlined below. The top five one-pagers will be submitted to ASHRAE as TC 1.5's research plan.)

Revised TC Research Plan (One-Pagers)

1. Identification and computer-based preservation of building design and commissioning information.

2. Development and implementation of an electronic method for interactive commenting of research, technical and symposium papers and peer approval of research project documents.
3. A demonstration multimedia database for examining and comparing HVAC design alternatives.
4. Development of a software data exchange platform for support of the development of compliance checking tools for SSPC 90.2, Energy Efficient Design of New Low-Rise Residential Buildings.
5. Software tool to aid the development of work statements that have software deliverables.
6. On-line development of standards.
7. Development of a demonstration toolkit for visualizing building energy and environmental data.

All one-pagers are attached to this document.

8. Discussion of Proposed Research Strategy

The proposed research strategy was discussed at some length and numerous comments received by the Chair for revision. The Chair indicated that the document would be revised and made available for review prior to the TC meeting at which time the revised version would be submitted for approval. (The revised research strategy, a copy of which is attached, was approved by the TC at Monday's meeting.)

9. New Business

No new business.

10. Adjournment

The meeting was adjourned at 9:00 p.m.

Research Strategy

TC 1.5, Computer Applications

The objective of TC 1.5's research program is to capture state-of-the-art advancements in computer-related technology that relate to HVAC&R research, design, manufacture, operation and maintenance and the dissemination of this information.

To accomplish this objective, TC 1.5 plan has two goals:

- The first goal is to identify and promote projects designed to demonstrate the efficacy of emerging computer applications with potential impact on the practices of the heating, ventilating, refrigerating and air-conditioning industry. Potential application domains include (but are not limited to) controls, diagnosis and design.

- The second goal includes identifying and promoting projects designed to advance the Society's internal and external operations. Potential application domains include society, chapter and TC operations, standards development, and publication/software enhancement.

Examples of research of the first type might include development of advanced software applications such as knowledge-based systems designed to provide building owner/ operators with maintenance and diagnostic insights or neural networks designed to predict building energy consumption patterns. Examples of research of the second type include development or refinement of societal software standards and exploration of techniques for advanced computer-related communication with the membership.

In so far as practical, TC 1.5 research will be coordinated with other TC's or ASHRAE operating divisions to ensure that content and computing expertise are appropriately focused on the research issue and that the value of the research product is maximized.

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
PRIORITY 1

PROJECT TITLE

Identification and computer-based preservation of building design and commissioning information.

OBJECTIVES

a. Identify building design and commissioning information with potential value for use in building operations and monitoring processes and future modification projects.
b. Develop a computer-based methodology or procedure, based upon building classification, size and usage, to identify pertinent information collection domains.
c. Determine the appropriate level of data retention for these design and commissioning information domains.

BENEFITS

Vast amounts of building engineering design and commissioning information are generated during the design and commissioning processes. Typically, the majority of this information is not transferred or otherwise made available to the building owner. The ability to retrieve or reconstruct these data diminishes rapidly with time. Proper collection and computer-based preservation of this information would greatly facilitate maintenance of building operations at a high level of efficiency, future building operations and control upgrades, potential building monitoring efforts, and lastly, major renovation projects. Proper identification and preservation of this information holds great potential economic and operational benefit.

ESTIMATED COST

$50,000

ESTIMATED DURATION

1 year

METHOD OF PUBLISHING RESEARCH RESULTS

Technical Paper would be presented at ASHRAE meeting.

CONTRIBUTORS

David J. Branson, PE, (806) 748-0040
Bob Potter, PE, (914) 938-4093

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
PRIORITY 2

PROJECT TITLE

Development and implementation of an electronic method for interactive commenting of research, technical and symposium papers and peer approval of research project documents.

OBJECTIVES

a. Perform a survey of other societies and organizations to determine how they conduct interactive commenting and peer approval of research, technical and symposium papers and research projects.
b. Develop a process for online commenting and peer approval of papers and research project documents.
c. Recommend a technology solution for implementation of 'objective b' based on ASHRAE's current and proposed computer resources.
d. Prototype the recommended process on a sample of each category described in 'objective a' and evaluate the results.

BACKGROUND

Other societies are experimenting with online commenting and peer approval of papers and research project documents. ASHRAE has a need to improve on the present manual method of document review by use of online techniques. The present process is very time inefficient and expensive. This work statement authorizes a survey of other societies' and organizations' automated commenting and peer approval processes and intends to bring the best practices into ASHRAE as a coherent and formalized process.

BENEFITS

By providing a formal computer-based process in the conduct of interactive commenting and peer approval of research, technical and symposium papers and research projects, ASHRAE will reduce the time and cost resources necessary to manage and distribute those documents.

ESTIMATED COST

$75,000

ESTIMATED DURATION

8 months

DELIVERABLES

Identification of ASHRAE software and hardware required. Implementation of the developed prototype on the ASHRAE platform using a sample of each category of research, technical and symposium papers and research projects documents. Evaluation of the process and solution of the prototype on the samples.

CONTRIBUTORS

Henry Amistadi
Fred Buhl
David Bornside
David Branson
Art Hallstrom

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
PRIORITY 3

PROJECT TITLE

A demonstration multimedia database for examining and comparing HVAC design alternatives.

OBJECTIVES

a. Identify a broad range of existing HVAC systems that represent good design practice and successful implementation.
b. Obtain and/or generate descriptive information about each of the installations (e.g., schematics, photographs, simulations, performance statistics).
c. Create a prototype CD-ROM-based database that allows the rapid retrieval of HVAC system descriptions by key features.

BENEFITS

Design is frequently accomplished by modifying existing designs to fit the context of the current problem. This project will allow an engineer to easily gain access to an information-rich databases of existing designs that are relevant to a problem under consideration. These designs will be presented in a graphic, multimedia format, providing images and schematics that are of greatest interest and impact during design. HVAC engineers can quickly scan, search, retrieve, and compare a broad range of existing solutions that can be used as a basis for new design or as a starting point for generating new ideas. Ultimately the designs stored in the database should be directly accessible by commercial CAD systems for adaptation and modification.

ESTIMATED COST

$100,000

ESTIMATED DURATION

2 years

METHOD OF PUBLISHING RESEARCH RESULTS

A Final Report and a Technical Paper will be presented at an ASHRAE meeting. CD-ROM and databases access software to be distributed by ASHRAE for IBM PC-compatible machines.

POTENTIAL CO-SPONSORS

Manufacturers of equipment used in the examples in the database. CAD software developers.

CONTRIBUTOR

Walter Grondzik, (904) 599-3244

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
(CO-SPONSORED WITH TC 9.6)
PRIORITY 4

PROJECT TITLE

Development of a Software Data Exchange Platform for support of the Development of Compliance Checking tools for SSPC 90.2, energy Efficiency Design of New Low-Rise Residential Buildings.

OBJECTIVE

The objective of this research is to develop a Software Data Exchange Platform (SDEP) for support of the development of compliance checking tools for SSPC 90.2 Such a platform would be similar in function to the ASHRAE Neural Model Format Translator and AIA's layering protocol for CAD. It would contain algorithms and documented computer code that developers could use for developing compliance checking tools for SSPC 90.2. This public platform would accelerate the private development of compliance checking tools in support of SSPC 90.2 including web-based tools and connections to existing cost-estimating software and CAD systems. This research includes: (1) a thorough review of the functions and database structure that would be needed to create an effective public domain platform for supporting compliance checking tools; (2) the design and development of a freely distributable computer code and thoroughly defined documentation including the implementation of one (stand-alone) user interface for the prescriptive compliance alternative; (3) implementation of all modules for input, output, and exchange of data necessary to drive a compliance checker; and (5), assembling the code into an ASHRAE Toolkit including the appropriate documentation and source code.

BENEFITS

The project will benefit ASHRAE membership as well as the general public as follows:

1. ASHRAE to develop a standard platform for the development of compliance checking software for support of SSPC 90.2.
2. Software suppliers as an aid for accelerating the incorporation of effective and innovative input/output techniques into compliance checking software.
3. ASHRAE for accelerating the provate development of compliance checking software in suppport of SSPC 90.2.

ESTIMATED COST

$85,000

ESTIMATED DURATION

18 calendar months

METHOD OF PUBLISHING RESEARCH RESULTS

A Technical Paper will be presented at an ASHRAE meeting. An ASHRAE special publication may also result.

CO-SPONSORS

TC 9.6

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
PRIORITY 5

PROJECT TITLE

Software Tool To Aid The Development Of Work Statements That Have Software Deliverables

OBJECTIVES

a. Improve the quality of software delivered to ASHRAE through research projects.
b. Simplify the development of work statements that include software deliverables.
c. Utilize ASHRAE's investment in RP-966.
d. Test the process in RP-966 by using it to develop a work statement for software creation that aids in the development of work statements that include software.
e. Improve the level of consistency and compliance with the work statement process relative to software deliverables.

BENEFITS

This project only focuses on the part of the work statement development related to software. It is not intended to automate the entire work statement development process. This would have to be the subject of another project.

It turns out that the process required to assure that ASHRAE receives quality software deliverables is somewhat complex for the general membership. In addition it is not linear in nature. Both of these attributes indicates that an automated process would benefit the developers of work statements.

This would be a follow up project to previous research. The research project RP-966 was intended to create a process that aided the Society in the area of software quality. The purpose was to create a procedure for ASHRAE members to develop work statements that required software as a deliverable.
The most unique part of the research would be the development of a complete work statement. It is the intent of this one page work statement proposal to use the results of RP-966 to create a work statement for the automation of the RP-966 process. This would be the first use of the process created in RP-966. It will provide experience that should help determine if the process it suitable to the Society.

An automated process would be simpler to use and therefore the membership would be more likely to follow the procedure.

ESTIMATED COST: $45,000

ESTIMATED DURATION: 9 months

METHOD OF PUBLISHING RESEARCH RESULTS

Software diskette available to Technical Committees. The program would walk a member through the process of developing a work statement. The output from the process and software program would be the documentation related to software that would be include in a work statement.

CONTRIBUTOR

Brian Kammers, PE, (414) 274 - 5985

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
PRIORITY 6

PROJECT TITLE

On-line development of standards.

OBJECTIVES

a. Perform a survey of other societies and organizations to determine how they develop online standards.
b. Develop a process for online circulation, review, comments and approval of standards in accordance with ANSI specifications.
c. Recommend a technology solution for implementation of 'objective b' based on ASHRAE's current and proposed computer resources.
d. Prototype the recommended process on two (2) sample standards and evaluate the results.

BACKGROUND

Other societies are experimenting with online standards development. ASHRAE has a need to improve on the present manual method of developing standards by use of online techniques. The present process is very inefficient and expensive, as illustrated by the problems associated with development of Standard 90.1. This work statement authorizes a survey of other societies' and organizations' automated standards development processes and intends to bring the best practices into ASHRAE as a coherent and formalized standards development process.

BENEFITS

By providing a formal computer-based process in the development of standards, ASHRAE will reduce the time and cost resources necessary to manage and develop those standards.

ESTIMATED COST

$75,000

ESTIMATED DURATION

8 months

DELIVERABLES

Identification of ASHRAE software and hardware required. Implementation of the developed prototype on ASHRAE's hardware and software on two (2) sample standards. Evaluation of the process and solution of the prototype on the sample standards.

CONTRIBUTORS

Henry Amistadi
Fred Buhl
David Bornside
David Branson
Art Hallstrom

RESEARCH PLAN
TECHNICAL COMMITTEE 1.5
PRIORITY 7

PROJECT TITLE

Development of a Demonstration Toolkit for Visualizing Building Energy and Environmental Data

OBJECTIVE

The objective of this research is to develop a toolkit for visualizing building energy and environmental data. Such a toolkit that would be similar to the ASHRAE Primary and Secondary HVAC Toolkits in format and would contain algorithms and documented computer code for visualizing building energy and environmental data. These procedures would be applicable to hourly, daily and monthly datasets of time series building energy and environmental data. This research includes: (1) thorough literature review of the current methods used to graphically display building energy and environmental data, (2) development of a freely distributable computer code that displays building energy and environmental data, and (3) assembling such code into an ASHRAE Toolkit including the appropriate documentation and source code.

BENEFITS

The project will benefit ASHRAE membership as well as the general public as follows:

1. ASHRAE to develop a standard toolkit for displaying building energy and environmental data using effective graphical display techniques.
2. Software suppliers as an aid for incorporating effective and innovative graphical display techniques into building energy and environmental analysis programs.
3. Text book publishers for effectively displaying building energy and environmental data.
4. ASHRAE for developing more effective data display and visualization techniques for teaching engineers how to effectively display and analyze building and environmetal data.

ESTIMATED COST

$85,000

ESTIMATED DURATION

18 calendar months

METHOD OF PUBLISHING RESEARCH RESULTS

Technical Paper would be presented at ASHRAE meeting. An ASHRAE special publication may also result.

CONTRIBUTORS

Jeff Haberl

POTENTIAL CO-SPONSORS

None yet identified.