

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.
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TC/TG/TRG MINUTES COVER SHEET

(Minutes of all meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/TRG No. TC 4.2 DATE: September 7, 1998

TC/TG/TRG TITLE: Weather Information

DATE OF MEETING: June 23, 1998 LOCATION: Toronto

MEMBERS PRESENT	MEMBERS ABSENT	EX/OFFICIO MEMBERS AND ADDITIONAL ATTENDEES
Dru Crawley (CH) Bob Morris (VCH) Joe Huang (SEC) Bill Bahnfleth (Program) Chip Barnaby Larry Degelman (arrived late) Marc Plantico Hilda Snelling (CM) Tom Stoffel	Oscar Richard Jack Roberts Henry Amistadi (CM) Raymond Bahm (CM) Don Hadley (CM) Mark Kramer (CM) David Menicucci (CM) Richard Perez (CM) Gideon Rozen (CM) Mike Squires (CM) David Wood (CM)	Jeff Biskup (Section Head) Carl Speich (RAC Liaison)

TAC CHAIR	Erv Bales
TAC SECTION HEAD	Jeff Biskup
RAC RESEARCH LIAISON	Carl Speich
STANDARDS LIAISON	Richard Beck
PROGRAM LIAISON	Larry Degelman
JOURNAL LIAISON	none
HANDBOOK LIAISON	David Claridge
ENV HEALTH COMMITTEE LIAISON	David Grimsrud
STAFF LIAISON (RESEARCH)	William Seaton
STAFF LIAISON (STANDARDS)	Claire Ramspeck
STAFF LIAISON (TECH SERVICES)	Martin Weiland

Abbreviations: CH = Chair
 VCH = Vice Chair
 SEC = Secretary
 CM = Corresponding Member

Minutes of ASHRAE TC 4.2 Meeting – June 23, 1998, Toronto Ontario

Minutes of Meeting

ASHRAE TC 4.2 - Weather Information

Tuesday June 23, 1998 Toronto, Ontario

Agenda is attachment A.

1. Call to Order and Roll Call

TC 4.2 Chair Dru Crawley called the meeting to order at 1:13 PM and roll call was taken. A quorum was established with 7 of 10 voting members present.

2. Approval of Minutes

The following corrections were noted in the minutes for the January 1998 meeting: (1) on page 3, the name Oscar Richards should be changed to Oscar Richard, (2) on page 2, Research should be shown as the third (3.), rather than the second (2.), item on the agenda. Bill Bahnfleth moved, and Chip Barnaby seconded, that the minutes from the TC 4.2 meeting on January 20, 1998 in San Francisco, California, be accepted as amended. Motion carried (6,0,0,1).

3. Announcements

Section 4 head Jeff Biskup and RAC Research Liaison Carl Speich came by to offer their support and compliment the Technical Committee's work. Dru Crawley said that the Technical Committee will be submitting one work statement to Carl.

Dru Crawley announced several Section 4 changes -

- 1) For symposia, the session chair cannot be a presenter.
- 2) Starting in Chicago, presenters will be given the equivalent of a one-day pass instead of the full conference registration.
- 3) The Committee's Program Plan is due at ASHRAE Headquarters on August 7th.
- 4) The Committee's Research Plan due at ASHRAE Headquarters on August 1st.
- 5) Changes from previous Research Plans are that it has to be preceded by a statement of the research strategy, and have 5 instead of 10 prioritized items.

4. Research

Research Chair Bob Morris reported that the Research Subcommittee met on Monday, June 22nd, and summarized the status of the ongoing TC 4.2 projects as follows. Minutes of the Research Subcommittee meeting are **attachment B**.

890-RP - The Subcommittee discussed the project with the subcontractor, Don Colliver. The software is essentially complete and has been reviewed. Since the contractor no longer has a software programmer, there will be no more changes made to the program, which essentially meets the expectations of the Project Monitoring Committee. The Project Monitoring Committee has not received the final report, which was due at the end of June. The contractor

thought that he could submit the final report by end of July, but the Subcommittee felt that this would not leave enough time for review. Bob Morris proposed that the Subcommittee give a three-month no-cost extension to permit review and final closeout of the project. Marc Plantico suggested the extension be through the end of the year. Larry Degelman asked whether the project had not already received a previous extension. Chip Barnaby suggested the extension be through February of next year. Bob Morris moved that the Technical Committee ask for a no-cost extension to the end of February 1999, seconded by Chip Barnaby. The motion passed 7-0-0. After review of the final report, the Subcommittee will recommend acceptance of project to the Technical Committee for mail ballot. Bob Morris opined that the CD has a wealth of information, although the software is not very fancy.

926-RP *Snow Melt Load Design* (joint project with TC 8.1) - Bob Morris had agreed to provide data on Canadian locations to the contractors. However, it turned out that Canadian records do not record snow amounts. Bob Morris then used an algorithm to estimate the hourly amounts of snow from other data, but the results were found not to be realistic. Bob Morris will attempt other methods to derive snow amounts, and if successful, provide that information to the contractors for incorporation into their report. Bob Morris volunteered to provide information correlating snow amounts to inches of water for an interested visitor to the Project Monitoring Committee meeting. Bob Morris said the snow melt values was highly dependent on wind speed, so that it could vary substantially between nearby locations. Consequently, the contractor plotted the values for more than 50 locations, but did not attempt to draw contour lines.

962-RP - *Automatic Generation of Hourly Design Sequences* - Dru Crawley reported that the project is essentially complete, with the remaining task being the completion of the software, which should be done in the first part of July. The Project Monitoring Committee will review the Help File of the program. The contractor will complete the software by July 15, after which it will be reviewed by the Project Monitoring Committee. If it is approved, the software will be sent to ASHRAE Headquarters. The Project Monitoring Committee recommends that the project be approved. Dru Crawley moved that the Technical Committee approve the project, pending completion of the 11 outstanding items. The motion was seconded by many, and approved 8-0-0.

1015-RP *Typical Weather Years for International Locations* - Bob Morris reported that the Project Monitoring Committee met with the Contractor (Didier Thevenard of Numerical Logics in Waterloo, Ontario) and the prime subcontractor on Sunday, June 21. The project is slightly behind schedule. The first tasks are to identify available solar models, and obtain measured solar data from international sites that can be used to evaluate these models. Marc Plantico found that a lot of the solar data has both cloud type and cloud amount data needed for model evaluation. The contractor and the Project Monitoring Committee were both unclear about the objective of the *Metstat* solar model from NREL and need to find out more. Tom Stoffel said that the primary goal of the *Metstat* model was to provide monthly, rather than hourly, estimates of solar radiation. The other task is to identify sources of international solar data in format similar to DATSAV2 format. Tom Stoffel said that Ray George at NREL is also working on DATSAV2 format.

5. Research Plan for 1998-1999

Bob Morris circulated a proposed Research Plan developed by the Subcommittee (see minutes of

Subcommittee meeting). Most of the items are to support the data in the ASHRAE Handbook of Fundamentals, either in improving the data for sites, or expand the number of sites. Item 1 is to obtain stand-alone software to calculate the Handbook of Fundamentals statistics from detailed hourly weather data. This is something that either the Technical Committee or a contractor can use to recreate or expand the tables in the Handbook of Fundamentals. Item 2 is to purchase weather data as needed. Item 3 is to identify and quantify sources of uncertainty in the data from previous efforts. Item 4 is to develop mapping and interpolation methods. Item 5 to investigate the impact of global climate change on the design conditions. Bob Morris moved to approve the Research Plan. The motion was seconded by Larry Degelman, and passed 8-0-0.

After much discussion, there was consensus that Item 3 should become Item 1, since the new techniques developed could be utilized in the Item 1 software. Bob Morris mentioned that the Work Statement by Joe Huang on Identifying Sources of International Weather Data is not on the proposed research plan. This was followed by extended discussion on this Work Statement. Bob Morris said the Subcommittee thought the objective of the Work Statement is a moving target, and any result might be outdated by the time it's done, and be of limited value. Nevertheless, Tom Stoffel and Marc Plantico both thought that the information developed would be very useful. The consensus was then reached that the data could be put on the Web, and periodically updated, which would then address the primary objection raised at the Subcommittee meeting. Bob Morris will work with Joe Huang to modify the Work Statement, and submit it to Dru Crawley by the end of August for a letter ballot.

5. Handbook

Handbook Chair Bob Morris reported that the Committee needs to tell Dave Claridge, Handbook Liaison, whether the Committee plans any major changes to the Handbook chapter, and if so, provide an outline for the next ASHRAE meeting.

Bob Morris also reported on Forum 10, "Discussion and Feedback on the New Climatic Design Data in the 1997 Handbook of Fundamentals" that was held on Sunday, January 18, 11:15 – 12:05. There were two primary comments at the Forum: (1) the new conditions make design more complicated, so ASHRAE should provide guidance and recommendations on the use of these psychrometric conditions for design, and (2) what to do with locations appearing in the 1993 *Handbook* that were dropped in the new *Handbook* due to lack of data. Specifically, advice was sought whether it's okay to use 1993 weather data if the location no longer appears in the new *Handbook*. Oscar Richard moved, seconded by Dru Crawley, that TC 4.2 state those 1993 *Handbook* data are still applicable for locations that were dropped. Motion carried 9-0-0.

7. Program

Bill Bahnfleth reported there was a Symposium on New Weather data at this meeting, with an attendance of over 50. Bill Bahnfleth thought the papers were well received, and congratulated the authors for their work.

There are no new program planned at this time. There was discussion on a possible workshop on new weather tools. The consensus was that the idea is not well thought out yet. Larry Degelman moved, and Tom Stoffel seconded, that the Technical Committee approve a seminar for Chicago

on weather tools from 828-TRP, 890-TRP, 962-TRP and the WYEC toolkit, with the presenters being Chip Barnaby, Don Colliver, and Doug Kosar. The motion carried 8-0-0.

Bill Bahnfleth moved that the Technical Committee accept the seminar as the Program Plan. The motion carried 8-0-0.

8. Membership

Since Oscar Richard was absent, chair Dru Crawley briefly reviewed the membership of the Technical committee. Dru Crawley reports that Oscar will be back on the Committee for one year and Hilda Snelling will become a voting member again after this meeting.

9. Standards

Dru Crawley reported that a Standing Committee SSPC 169 on weather data in support of ASHRAE Standards has been formed, with Bob Morris as the chair. So far, the SSPC has held a second organizational meeting at this conference, with seven proposed members. The Standing Committee can only evaluate, but not develop weather data, which would still be referred to this Technical Committee.

10. Old Business

Marc Plantico reported that Mike Squires gave him an update on the AFM 88-29, *Engineering Weather Data*. It is very likely that there will be a representative from the Air force at the Chicago conference, but it's not clear whether Mike would be that representative. The revision of AFM 88-29 has been completed, and will be released as a CD, and also put on the Air Force's publication web site. Dru Crawley asked Marc Plantico to check whether ASHRAE or Dru Crawley can get the manual published as a separate CD. It may appear on Air Force web as early as this fall.

11. New Business -

Dru Crawley reported on the continued interest of the Indian chapter of ASHRAE, ISHRAE, to develop more weather data for the *ASHRAE Handbook of Fundamentals*. They now have a project in place and are obtaining weather data. When the Technical Committee receives this data, we will evaluate it, and if meets with our approval, we will add it to the *Handbook*.

Joe Huang mentioned the lack of public awareness of the new data in the *Handbook* and suggested that more be done to publicize it. Dru Crawley agreed to ask if Lew Harriman would be willing to write a paper for the *ASHRAE Journal* on the new weather data in the *ASHRAE Handbook of Fundamentals*.

Chip Barnaby and Tom Stoffel agree to look into how to add solar data into the *Handbook*.

12. Adjournment

Chip Barnaby moved, and Tom Stoffel seconded, that the meeting be adjourned. Dru Crawley adjourned the meeting at 3:28 pm.

**1998 Annual Meeting
Schedule of TC 4.2 Weather Information Activities
Toronto, Ontario**

Time/Date	Committee	Room, Floor, Hotel
Sunday, 21st June 1998		
8:00 to 10:00 AM	ASHRAE's New Weather Data for Energy Calculations , Symposium TO-98-02 sponsored by TC 4.2	Dominion Ballroom Sheraton
1:00 to 3:00 PM	◆ PMS RP-962 Automated Generation of Design Sequences	Adelaide (3 rd floor) Hilton
3:00 to 4:30 PM	TC 4.2 Handbook Subcommittee	Adelaide (3 rd floor) Hilton
4:30 to 6:00 PM	PMS RP-1015 Typical Weather Years for International Locations	Adelaide (3 rd floor) Hilton
Monday, 22nd June 1998		
8:00 AM to 12:00 PM	SSPC 169P Weather Data for Building Design Standards	Executive (4 th floor) Sheraton
4:15 to 6:30 PM	TC 4.2 Research Subcommittee	Osgood West (3 rd floor) Hilton
Tuesday, 23rd June 1998		
1:00 to 3:30 PM	TC 4.2 Weather Information	Carleton (Mezz.) Sheraton

◆ Project now complete—meeting probably will be canceled.

**ASHRAE TC 4.2 Weather Information
Agenda for the 1998 Annual Meeting
Toronto, Ontario
Sheraton Centre Toronto Hotel, Mezzanine, Carleton Room
Tuesday, 23rd June
1:00 – 3:30 PM**

1:00 pm **Call to order and Roll Call** (Crawley/Huang)

(Please update addresses, phone numbers, membership status, and subcommittee membership on attendance sheet)

1:10 pm **Introduction of liaison representatives from standing committees**

1:15 pm **Approval of minutes from San Francisco meeting**

Subcommittee Reports:

1:20 pm **Research** (Morris)

- **RP-890** Update the Climate Design Information (Chapter 24) in the ASHRAE Handbook of Fundamentals
- **RP-926** Snow Melt Load Design
- **RP-962** Automated Generation of Hourly Design Sequences
- **RP-1015** Typical Weather Years for International Locations
- **Research Plans for 1999-2000**
- **Work Statements in Progress**
 - Update Weather Data for ASHRAE Research
 - Identify and Quantify Sources of Uncertainty in the Calculation of ASHRAE Design Weather Information
 - Update Information for 2001 Handbook of Fundamentals
 - Identify and Characterize International Weather Data Sets and Sources
 - Regional Mapping and Gridding of Climatic Parameters
 - Extrapolating from Max/Min Data to Hourly Data

2:10 pm **Handbook** (Roberts)

2:30 pm **Program** (Bahnfleth)

- ASHRAE's New Weather Data for Energy Calculations, Symposium (Bahnfleth)

2:40 pm **Membership** (Richard)

2:50 pm **Standards** (Crawley)

- SSPC 169P Weather Data for Building Design Standards (Morris)

3:00 pm **Old Business**

- Update of AFM 88-29, Engineering Weather Data (Squires)

3:15 pm **New Business**

- Weather Data for Pakistan, India

3:25 pm **Announcements**

3:30 pm **Adjourn**

Next meeting: Chicago, 26th January 1999

**Minutes
Research Subcommittee
ASHRAE TC 4.2 Weather Information
Monday, June 22 1998
4:15PM - 6:30PM
Toronto**

Participants

Don Colliver, University of Kentucky
Joe Huang, Lawrence Berkeley National Laboratory
Dru Crawley, US Department of Energy
Hilda Snelling
Marc Plantico, US National Climatic Data Center
Tom Stoffel, National Renewable Energy Laboratory
Jack Roberts, Fanning, Fanning, and Associates
Robert Morris, Environment Canada, Chair

The meeting agenda is appended to the end of these minutes.

RP-890

The first order of business concerned the progress of RP-890. The Project Monitoring Subcommittee discussed the project with the contractor, University of Kentucky, represented by Don Colliver.

Generally, database on CD containing the various joint frequency distributions including dry-bulb temperature with wet-bulb, and others, and software to access the data was acceptable. In preparing the CD for publication by ASHRAE the contractor agreed to provide wording for the CD jacket explaining that long file names do not work with the application software, since it was written in 16-bit code.

R Morris asked the contractor whether better documentation explaining the relative frequency units (PPM) could be provided.

The number of US stations in the SAMSON data set was 239 not 236 as reported in the software.

D Crawley agreed to help in producing a PDF copy of the final report to include on the CD as part of the documentation.

A copy of the final report for RP-890 was the only outstanding issue awaiting resolution. The contractor indicated that the report was nearly complete and agreed to distribute a draft shortly. The PMS agreed to request that TC 4.2 approves a request for a 3-month no-cost extension.

RP-926

R Morris indicated that Larry Chenault of TC 6.1 (Snow Melting Systems) had approached TC 4.2 with a request for more information on the density of freshly fallen snow, than the assumption of 10:1 ratio of depth to water equivalent commonly. R Morris agreed to investigate and look for more complete information and provide it.

RP-962

D Crawley reported that the final report is recommended for approval, pending minor editorial changes.

RP-1015

R Morris reported that the project was proceeding, although slightly behind schedule. One of the issues was finding correct and complete documentation about the cloud observations (height, amount, and type) in the DATSAV2 files from NCDC. Tom Stoffel mentioned that Ray George at NREL had some experience in using the DATSAV2 cloud information for solar modeling and suggested that the contractor contact him for advice.

Work Statements in Progress

J Huang presented a draft work statement "Identify and Characterize International Weather Data Sets and Sources". It was tabled until members could read and evaluate it.

No other progress was reported on developing work statements.

Research Plan for 1999-2000

After considerable discussion, the following projects, listed by priority were agreed to, for TC 4.2's approval:

1. Operational system for the calculation of psychrometric design conditions for the ASHRAE HOF (\$60K).
2. Acquire weather data for research and for updating psychrometric design conditions for the ASHRAE HOF (\$50K).
3. Identify and quantify sources of uncertainty in the calculation of psychrometric design conditions (\$80K).
4. Development of mapping and interpolation methods to estimate psychrometric design conditions at locations where observations are unavailable (\$150K).
5. Investigate the impact of global climate change on the ASHRAE design conditions (\$150K).

The meeting was adjourned at 6:30.

AGENDA
Research Subcommittee
ASHRAE TC 4.2 Weather Information
Monday, June 22 1998
4:15PM - 6:30PM
Toronto, Ontario

4:15	Call to Order/Changes to Agenda	Morris
4:20	890-TRP Update the Climatic Design Information (Chapter 24) in the ASHRAE <i>Handbook of Fundamentals</i>	Morris
4:50	926-TRP Snow Melt Load Design (TC 6.1)	Morris
5:00	962-TRP Automatic Generation of Hourly Design Sequences	Crawley
5:10	1015-TRP Typical Weather Years for International Locations	Morris
5:20	Work Statements in Progress (1998-1999 Research Plan) — Updated Weather Data for ASHRAE Research	Morris
	—Identify and Quantify Sources of Uncertainty in the Calculation of ASHRAE Design Weather Information	Squires
	— Update Information for 2001 Handbook of Fundamentals	Plantico
	—Identify and Characterize International Weather Data Sets and Sources	Barnaby
	—Selection of Semi-Extreme Hourly Weather Data Sequences for Simulation-Based Design	Levermore
	—Create Typical Year Weather Data Sets for U.S. and Canadian Locations	Morris
	—Regional Mapping and Gridding of Climatic Parameters	Morris
5:35	Research Plan for 1999-2000	Morris
6:20	SSPC 169P, Weather Data for Building Design Standards	Morris
6:25	Other Business	
6:30	Adjourn	
