

TC/TG/TRG MINUTES COVER SHEET

(Minutes of all TC/TG/TRG Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/TRG NO.: TC 4.1 DATE: September 8, 2012

TC/TG/TRG TITLE: LOAD CALCULATION DATA AND PROCEDURES

DATE OF MEETING: June 25, 2012 LOCATION: San Antonio, TX

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Voting Chris Wilkins Rolando Legarreta Chip Barnaby Steve Bruning Dan Fisher Glenn Friedman Doug Hittle Suzanne LeViseur Jim Pegues Larry Sun Non-Voting Bob Doeffinger Stephen Roth Jeff Spitler	2008 2008 2010 2008 2011 2009 2011 2011 2008 2008	Voting [none] Non Voting Lucy Armankwah David Ariyo Andrew Braum Jui-Chen Roger Chang Charlie Curcija Joe Ferdleman John Filler Nick Gmitter Martin Gough Robert Hopper Stephen Kavanaugh Ken-Ichi Kimura Larry Lisenbee James Norman Curt Pedersen Brian Rock Thomas Romine, Jr. Som Shrestha Branislav Todorovic Arun Veda Gary Wingfield		Visitors Steve Faulkner Keltion Friedrich Elyse Malherek Agami Reddy Harris Sheinman Rachel Spitler

DISTRIBUTION:

All Members of TC/TG/TRG

ADDITIONAL DISTRIBUTION:

TAC Chairman: Charles H. Culp, III
 TAC Section Head: Michael R. Bilderbeck
 Chapter Tech Transfer: Harris M. Sheinman
 Research Liaison: Dr. Srinivas Garimella
 ALI/PDC: John H. Nix, II
 Special Publications: William S. Fleming
 2013 HB Fundamentals: Peter Simmonds, PhD
 Standard Liaison: James R. Tauby, P.E.
 Manager of Standards: Stephanie C. Reinche
 Staff Liaison: Michael R. Vaughn

"These draft minutes have not been approved and are not the official, approved record until approved by this committee."

June 25, 2012
Committee Meeting Minutes (DRAFT)
TC4.1 Load Calculations Data and Procedures
San Antonio, TX

1. Meeting called to order by Chris Wilkins at 2:20pm
2. Roll Call
 - a. 10 of 10 voting members present. Quorum is present.
3. Introductions
4. Approval of January 2012 Chicago Meeting Minutes.
 - a. One correction needed: Item 9e change "Steve Bauman" to "Fred Bauman"
 - b. Motion to approve minutes as corrected: Chip Barnaby
 - c. Seconded: Larry Sun
 - d. Vote: 10-0-0-0.
5. Liaison Reports
 - a. Section Head – Mike Bilderbeck
 - Quorum without Quorum – ASHRAE is discussing a procedure to allow one or two electronically connected members to count toward quorum. This policy will be finalized in a couple weeks.
 - There is concern about attracting new members to join Technical Committees. Mike is asking TC members to attend local chapter meetings as outreach to encourage participation in TCs.
 - Programs – ASHRAE leadership has heard the complaints about the new approach to programs. Changes are underway.
 - Program speakers will be required to pay a reduced registration fee to attend the meeting. Previously registration was free.
 - b. Chapter Technology Transfer, Harris Sheinman
 - Working to develop grass roots activity to send members into technical committees.
 - Action for TC members: Attend local ASHRAE chapter meetings to explain the function of technical committees and encourage members to participate in TCs.
 - c. Research
 - A procedural change was made regarding cover sheets for RTARs. The new sheets are on the ASHRAE web site and should be used for submissions.
 - Currently there are very few RTARs and Work Statements in the pipeline for approval. Those submitting RTARs or WS now have a better chance for quick funding.
 - August 15 is the next deadline for RTAR and WS submission. The next deadline after that is December 15, 2012.

6. Research Chair Report

- a. Current Research - RP-1616 – Load Calculation Application Manual Update
 - Project objective is to update the Load Calculation Application Manual 1st Edition to incorporate research results from last 3-4 years.
 - Project work by Jeff Spitler has just begun.
 - Target for completion is September 2013.
 - Jeff will communicate a work schedule by mid summer.
 - Based on prior experience publication of 2nd Edition could occur by Winter 2014.
 - Larry Sun was appointed to replace Gary Wingfield on the Project Monitoring Subcommittee. Gary has retired from ASHRAE.
- b. Proposed Research – Heat Gains for Unhooded Kitchen Appliances
 - TC 4.1 co-sponsored a research project being proposed by TC 5.10 (Kitchen Ventilation) dealing with heat gains for unhooded kitchen appliances.
 - A Work Statement was submitted by TC 5.10. The WS was returned with comments and the committee is currently making changes.
- c. Future Research – LED Lighting Heat Gain
 - Objective – Determine heat gain, radiant/convective split, plenum loads for LED lighting fixtures.
 - Chris Wilkins and Dan Fisher will draft an RTAR.
 - Submission advice: Send draft for review to research liaison (Srinivas Garimella) and Manager of Research (MORTS) before August 15 deadline.
 - TC must vote approval of RTAR before it can be submitted.
- d. Future Research – Radiant Systems Impact on Load Calculations
 - Objective – Experimental research on how radiant cooling devices affect load calculations.
 - Chris Wilkins, Jeff Spitler, Fred Bauman to develop RTAR
- e. Future Research – Load Calculations for Stratified Spaces
 - Proposed by Steve Bilderbeck. Research load behavior in stratified spaces such as factories, assembly halls, auditoriums.
 - Proposed this could be a joint project with TC 4.10 (Indoor Environmental Modeling), TC5.8 (Industrial Ventilation Systems), TC 4.7 (Energy Calculations).
 - Field or experimental measurement should be included in the project to validate modeling.
 - Continue discussion on this research topic at Winter 2013 meeting.
- f. Research Subcommittee Organization
 - Bob Doeffinger will step down as research subcommittee chair July 1 to become TC secretary.
 - Chris Wilkins will become research subcommittee chair on July 1.

7. Program Chair Report (Glenn Friedman)

San Antonio Summer Meeting – June 2012

a. "Can I Determine My Loads with My Energy Modeling Program?"

- Monday, June 25, 8am
- Speakers are Jeff Spitler, Steve Bruning and Dan Fisher.

Dallas Winter Meeting - January 2013

b. "When is the Load Not What You Think"

- Topics: Effect of blinds on load (Chip Barnaby), radiant effects (Fred Bauman), effect of furnishings on load (Dan Fisher).
- Motion: Accept this as a seminar to submit for Dallas: By Glenn Friedman
- Second: Suzanne LeViseur
- Motion approved 10-0-0-0

Programs for Future Meetings

c. Ideas for future meetings

- BIM Load Calculations - Revisit this topic for Denver (Summer 2013) or New York City (Winter 2014) Stephen Roth, Steve Bruning, Chris Wilkins as speakers.
- Back to Basics: "Loads, Where Judgment Comes In" for New York City (Winter 2014). Cover zoning, using loads for equipment selection, things you don't control (Chris Wilkins)
- Conference Papers on atypical facades, phase change materials for New York City (Winter 2014).
- Load Calculation Application Manual, 2nd Edition – Many engineers are not aware of changes in load calculations. The completion of this research project could be a good opportunity to present seminars educating the membership about these advances.
- Stephen Roth proposed doing another seminar on mobile applications for HVAC calculations. The one in Chicago (Winter 2012) was well attended.
- Seminar dealing with ventilation and infiltration loads.
- Seminar on how load calculations interact with other ASHRAE TCs. Cover the involvement of weather, infiltration, building skin color, ventilation, fenestration and dynamic windows on load calculations.

8. Standards Chair Report (Glenn Friedman)

a. SPC 203 - MOT / Determining Heat Gain of Office Equipment Used in Buildings

- Committee is still lacking sufficient "producer" members.
- Cannot qualify for ANSI consensus status if producers are lacking.
- Moving forward with plan to release a draft for advisory public review. Hoping this will create interest among manufacturers and spur them to join the committee.
- Title, Purpose and Scope for the standard was changed to remove radiant/convective splits from the scope. Radiant/convective split testing procedures will be dealt with in an informative appendix. The standard will

now focus on the full load heat gain for equipment. There will also be less focus on standby mode, sleep mode, warmup and similar modes.

9. Handbook Chair Report (Steve Bruning)

- a. Submission deadlines are approaching:
 - July 12 – Chapter 17 Residential Loads
 - July 19 – Chapter 18 Non-Residential Loads.
- b. Chapter 17 – Residential Loads (Chip Barnaby)
 - Several comments on chapter received over last 4 years. Chip has reviewed all of them and believes these comments can be handled by editorial changes.
 - Work is also needed to update factors for the 2013 weather data update and to update references.
 - Chip will make the changes and circulate for a letter ballot approval in July.
- c. Chapter 18 – Non Residential Loads (Steve Bruning)
 - A copy of the revised Chapter was circulated.
 - Changes since the last draft include addition of an RTS equation summary table and minor editorial changes.
 - Two tasks remain: (1) addition of a discussion of load calculations for UFAD (Fred Bauman), and (2) revision of the example problem. Example problem is on a track separate from submission of the main chapter material.
 - Motion: "Approve draft of Chapter 18 for 2013 Handbook of Fundamentals pending addition of UFAD material.": By Steve Bruning
 - Second: Doug Hittle.
 - Motion approved 9-0-1-0
 - Example Problem: Bob Doeffinger's firm created an architectural Revit model for the ASHRAE Headquarters building. The Revit model will be available for users of the Handbook Online Plus.

10. Old Business

Committee Roster Update

- a. Voting members as of July 1, 2012
 - Rolando Legarreta (Chair)
 - Bob Doeffinger (Secretary)
 - Glenn Friedman (Programs/Standards Subcommittee Chair)
 - Chip Barnaby
 - Dan Fisher
 - Doug Hittle
 - Suzanne LeViseur
 - Som Shrestha
- b. New Non-Voting Members as of July 1, 2012
 - Chris Wilkins (Research Subcommittee Chair)
 - Steve Bruning (Handbook Subcommittee Chair)
 - Larry Sun
 - Jim Pegues (Vice Chair)

11. New Business

- a. ASHRAE BIM Online Education
 - ASHRAE is developing on-line education based on the ASHRAE Building Information Modeling (BIM) Guide. There is interest in incorporating the BIM Load Calculation seminar material TC 4.1 developed into an on-line education module. Chris is working with Steve Comstock on this.
- b. BIM Multidisciplinary Task Group (MTG)
 - The BIM MTG is comprised of liaison's to technical committees. The liaison must be reflected in the TC roster.
 - Motion to appoint Jim Pegues as TC 4.1 liaison to the BIM MTG: By Chris Wilkins.
 - Second: Doug Hittle.
 - Motion approved 9-0-0-0
- c. SPC 209 – Energy Simulation Aided Design
 - Doug Hittle is a member of this committee drafting a standard for energy simulation aided design.
 - The committee is concentrating on the modeling approach.
 - Doug will seek input and advice from committee members going forward.
- d. Use of Phase Change Materials in Building Envelopes
 - Doug Hittle would like the committee to consider what to do about Phase Change Material effects on load calculations.

12. Adjournment

- a. Meeting was adjourned at 4:00 PM

Attachments:

Meeting Agenda
Program Sub-Committee Report
Handbook Sub-Committee Report
Attendance Sign-in Sheet
New TC 4.1 Roster as of 7/1/2012.



ASHRAE Technical Committee 4.1

Agenda for - TC4.1 Load Calculation Data & Procedures

**San Antonio
June 25, 2012**

**TC4.1 Load Calculation Data and Procedures
Monday, 2:15 PM to 4:15 PM
Travis D, Grand Hyatt Hotel**

- | | |
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| 1. Call to Order | Chris Wilkins |
| 2. Roll Call | Jim Pegues |
| 3. Introduction of Visitors | Chris Wilkins |
| 4. Approval and/or Corrections to Montreal Meeting Minutes | Chris Wilkins |
| 5. Liaison Comments | |
| Section Head | Michael Bilderbeck |
| Chapter Technology Transfer | Harris Sheinman |
| Research | Srinivas Garimella |
| Handbook | Peter Simmonds |
| ALI/PDC | John Nix |
| Programs | - |
| Standards Liaison | James Tauby |
| Staff-Research/Tech Services | Michael R. Vaughn |
| Staff-Standards | Stephanie Reiniche |
| 6. Research Subcommittee Report | Robert Doeffinger |
| 7. Programs Subcommittee Report | Glenn Friedman |
| 8. Standards Subcommittee Report | Glenn Friedman |
| 9. Handbook Subcommittee Report | |
| Residential Chap 17 | Chip Barnaby |
| Non-Residential Chap 18 | Steve Bruning |
| 10. ASHRAE Website for TC 4.1 | Jim Pegues |
| 11. Old Business | Chris Wilkins |
| 12. New Business | Chris Wilkins |
| 13. Adjournment | Chris Wilkins |



ASHRAE Technical Committee 4.1

Meetings

TC 4.1 Load Calculation Data and Procedures
Monday 2:15-4:15p (Travis D, Grand Hyatt)

Sponsoring:

Seminar 21: Can I Determine My Loads with My Energy Modeling Program?
Monday 8:00-9:30am (Convention Center Room 103B)

TC 4.1 Handbook
Sunday 3:00-4:00p (San Jacinto - Grand Hyatt)

TC 4.1 Research
Sunday 4:00-5:00p (San Jacinto - Grand Hyatt)

TC 4.1 Programs & Standards
Sunday 5:00-7:00p (San Jacinto - Grand Hyatt)

TC 4.1 RP-1616 PMS
Day, Time (Room) TBD

Introduction of officers and voting members for 2012:

Chris Wilkins	Chair	Voting
Rolando Legarreta	Vice Chair	Voting
James Pegues	Secretary	Voting
Steven Bruning	Handbook Subc Chair	Voting
Robert Doeffinger,Jr	Research Subc Chair	Non-Voting
Glenn Friedman	Stds/Prog Subc.Chair	Voting
Chip Barnaby		Voting
Dan Fisher		Voting
Doug Hittle		Voting
Suzanne LeViseur		Voting
Larry Sun		Voting

TC 4.1 Meeting, Programs
San Antonio, June 25, 2012

Glenn Friedman, Program Chair

1. Current Programs

- a. San Antonio Seminar 21: Seminar Session Title: *Can I Determine My loads with My Energy Modeling Program?, Monday at 8:00 am*
 - i. SEMINAR
 - Speaker #1: Jeff Spittler
 - Speaker #2: Steve Bruning
 - Speaker #3: Dan Fisher

2. Future Programs

- a. Dallas, January 26-30, 2013

3. Dallas

- a. "When is the load not what you think?" Blinds-Chip. Radiant effect-Fred. Furniture-Dan
- b. Track 1: HVAC&R Systems & Equipment

Track Chair: Yunho Hwang / Keith Newcomer

Email: yhhwang@umd.edu / keith.newcomer@piedmontng.com

An HVAC&R system is a combination of equipment engineered and duct and/or pipe distribution to operate in concert to provide the desired results for the space or process. Whether simple, standard, or unconventional – the equipment and system distribution must be designed, installed, operated, and maintained to achieve those results. The series of programs and papers in this track will highlight the basic to advanced options for the designers, contractors and operators to deliver effective, efficient, sustainable systems.

- c. Track 2: HVAC Fundamentals and Applications

Track Chair: Mike McDermott

Email: mxm@grummanbutkus.com

Fundamentals are the building blocks for understanding their applications. Thermodynamics, fluid flow and psychrometrics are key components to evaluating the basic to advanced applications. In addition, topics that cover the standard "value engineering" items like resized duct or pipe could be addressed. The intent of this track is to provide papers and programs that cover varying levels of fundamentals for the designer in a wide array of topics.

- d. Track 3: Standards, Guidelines and Codes

Track Chair: Jon J. Cohen

Email: jcohen@hohwatertechnology.com

ASHRAE is known for its standards – and they are constantly evolving with the intent on improving the built environment and its systems. Designers, Contractors and Owners must be able to keep up with the changes in the current cycle but to also be aware of what is to come; existing and future standards. In addition, there is a large interaction of ASHRAE with the code authorities and government to incorporate these standards and guidelines. The series of sessions in this track will illustrate the changes to the standards and guidelines, their projected path and good design techniques to meet or exceed the standards.

- e. Track 4: Energy Conservation

Track Chair: Charles E. Henck

Email: chenck@wrallp.com

TC 4.1 Meeting, Programs
San Antonio, June 25, 2012

approach as other system designed but usually have special technical requirements that mandate close velocity capture/control, air quality control, etc. that can be overlooked but the more traditional building system design engineer. This track will seek case studies and trouble-shooting projects highlighting the opportunities and pitfalls associated with these unique applications.

Conference Program Chair: Wade Conlan

Email: wade.conlan@exp.com

Staff Support

For information on the technical program, special events, special sessions and general conference inquiries

Tiffany D. Cox

Conference Program Administrator

Email: tc Cox@ashrae.org

Technical Support

For technical problems or for help in submitting an abstract online, [email Tech Support](#)

j. **Submission Schedule**

June 1	Web Site Opens for Seminar and Forum Proposals
July 9	Final Conference Papers Submitted for Review
Aug. 13	Seminar and Forum Program Proposals Due
Sept. 14	Conference Papers Accept/Reject Notifications and Notifications of Seminar and Forum Accept/Reject Distributed
Dec. 7	Upload of PPTs Begin
January 7, 2013	All PPTs Due Online
Jan. 26	Speaker's Lounge Opens

a. Denver, June 22-26, 2013

- i. BIM and Load Calculations Seminar Update for Denver or New York, Roth, Bruning, Wilkins

b. New York, January 18-22, 2014

- i. Back to Basics: "Loads: Where Judgment Comes In" for next trades show in New York; zoning, loads to selection, things you don't control (Wilkins)
- ii. Conference Paper Session Proposal New title and new topic, A-typical facades. Phase change materials. Coatings. Branko to advise.

c. Seattle, June 28-July 2, 2014

d. Chicago, January 24-28, 2015

e. Atlanta, June 27-July 1, 2015

4. **Future Ideas**

a. **Seminar Session Proposals**

i. **Ventilation and infiltration**

ii. **How Load Calculations Interact with Other ASHRAE Chapters**

- Weather
- Infiltration
- Building skin color
- Ventilation
- Fenestration, dynamic windows



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TC4.1 Load Calculation Data & Procedures

San Antonio, TX

June 24, 2012

Handbook Subcommittee Report

Sunday, June 24, 3:00 PM to 4:00 PM

Hyatt San Jacinto (2)

1. **Handbook Committee Liaison Comments:** Peter Simmonds, Liaison to TC4.1.

2. **Schedule for 2013 HoF Chapters:**
2012 June – Final chapters approved by full TC
2012 July 12 – Chapter 17 submitted to Simmonds/ASHRAE
2012 July 19 – Chapter 18 submitted to Simmonds/ASHRAE
2013 June – HoF Published

4. **Chapter 17 Residential Loads:**
 - Chip Barnaby has compiled reviews and user comments received. He also has received revised weather data from TC4.2.
 - Chip reviewed the Chapter and marked up revisions based on various comments.
 - He will add clarifying comments regarding applicability of the simplified method.
 - Chapter mark-up will be distributed in the next two weeks with a letter ballot.

5. **Chapter 18 Non-Residential Loads:**
 - Steve Bruning distributed a revised chapter mark-up with attachments for inserts and replacement of selected text and tables. Jim Pegues provided a summary of equations now included with the draft.
 - The revision of equations to use more unique and consistent nomenclature will not make it into this revision.
 - References have been checked and older Bibliography entries have been deleted.
 - Fred Bauman will draft a paragraph summarizing UFAD cooling load calculation information from the upcoming update of the UFAD design manual. He will coordinate with Gary Wingfield.
 - The draft chapter mark-up will be approved separately from the master Example, which is still in progress due to input from other TCs. The example will be sent out for review and approval by email ballot mid-July. The added UFAD paragraph will be included with that.

TC 4.1 Sign-In Sheet - San Antonio - June 2012

	2012 June	Name	Status	Affiliation	E-mail
1	✓	Chris Wilkins	Voting	Hallam-ICS	cwilkins@hallam-ics.com
2	✓	Rolando Legarreta	Voting	Alegro Engineering	riegarreta@alegro-engineering.com
3	✓	Jim Pegues	Voting	Carrier	james.f.pegues@carrier.utc.com
4	✓	Steve Bruning	Voting	Newcomb & Boyd	sbruning@newcomb-boyd.com
5	✓	Bob Doeffinger	Non-Voting	ZMM Inc	rcd@zmm.com
6	✓	Glenn Friedman	Voting	Taylor Engineering	gfriedman@taylor-engineering.com
7	✓	Doug Hittle	Voting	Hittle LLC	hittle@colostate.edu
8	✓	Chip Barnaby	Voting	Wrightsoft	cbarnaby@wrightsoft.com
9		Curt Pedersen	Non-Voting	University of Illinois	cpederse@uiuc.edu
10	✓	Jeff Spittler	Non-Voting	Oklahoma State Univ	spittler@okstate.edu
11	✓	Larry Sun	Voting	Tsuehiyama Kaino Sun & Carter	lsun@tkscengineering.com
12	✓	Suzanne LeViseur	Voting	Haddad Engineering	sleviseur@haddadeng.com
13	✓	Dan Fisher	Voting	Oklahoma State University	dfisher@okstate.edu
14	✓	Som Shrestha	Non-Voting	Oak Ridge National Laboratory	shresthas@ornl.gov
15	✓	Stephen Roth	Non-Voting	Carmel Software Corp.	sroth@carmelsoft.com
16		Branislav Todorovic	Non-Voting	University of Belgrade	
17		John Wright	Guest	University of Waterloo	
18		Mo Hosni	Guest	Kansas State University	
19		Wendell Humpres	Guest	Moses Engineers	
20		Rachel Spittler	Guest	Oklahoma State University	rachel.spittler@okstate.edu
21		Harris Sheinman	CTF Liaison	Heety International	hsheinma@heety.com
22	✓	AGAMI REDDY	Guest	Arizona State University	vedolyta@asu.edu
23	✓	Kelton Friedrich	Guest	McMaster University	Friedrick@mcmaster.ca
24		Steven Faulkner	Guest	Georgia Power	sfaulkn@southernco.com

	2012 June	Name	Status	Affiliation	E-mail
25	X	Elyse Malverek	Guest please add as corresponding member	The Weight Group	elysem@trigi.com
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**LOAD CALCULATION DATA AND
PROCEDURES
T-TAC-TC04.01
As of Any Date**

Chair
2045660 072 Voting

Term in Position: 07/01/2012 to 06/30/2014

Term on Committee: 07/01/2002 to 06/30/2014

Mr Rolando Legarreta, PE

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VICE CH/WEBMASTER/LIA. MTG.BIM-VM

5011825 010 Non-voting

Term in Position: 07/01/2012 to

Term on Committee: 07/01/2006 to 06/30/2012

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Secretary

187002 128 Voting

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Term on Committee: 07/01/1995 to 06/30/2016

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Handbook Subcommittee Chair

96120 032 Non-voting

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Term on Committee: 07/01/1995 to 06/30/2012

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Research Subcommittee Chair

3030489 111 Non-voting

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Term on Committee: 07/01/1992 to 06/30/2012

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STANDARDS/PROGRAM SUBC. CHAIR

2000944 082 Voting

Term in Position: 07/01/2009 to 06/30/2013

Term on Committee: 07/01/2004 to 06/30/2013

Mr Glenn Friedman

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Member

2012220 999 Voting

Term in Position: 07/01/2010 to 06/30/2014

Term on Committee: 07/01/1997 to 06/30/2014

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Term in Position: 07/01/2011 to 06/30/2015

Term on Committee: 07/01/2005 to 06/30/2015

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**LOAD CALCULATION DATA AND
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As of Any Date**

CORRESPONDING MEMBER

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Term on Committee: to

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8140623 082 Non-voting

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2051726 041 Non-voting

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CORRESPONDING MEMBER

2026715 053 Non-voting

Term in Position: 07/01/2003 to

Term on Committee: to

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2020067 057 Non-voting

Term in Position: 07/01/2003 to

Term on Committee: to

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CORRESPONDING MEMBER

629100 070 Non-voting

Term in Position: 07/01/2003 to

Term on Committee: 07/01/2001 to 06/30/2003

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CORRESPONDING MEMBER

391122 506 Non-voting

Term in Position: 07/01/2005 to

Term on Committee: 07/01/2001 to 06/30/2005

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Term on Committee: to

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**LOAD CALCULATION DATA AND
PROCEDURES
T-TAC-TC04.01
As of Any Date**

Corresponding Member
8098137 030 Non-voting
Term in Position: 07/01/2012 to
Term on Committee: to
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