

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-  
CONDITIONING ENGINEERS, INC.**  
1791 Tullie Circle, N.E./Atlanta, GA 30329  
404-636-8400

TC/TG/TRG MINUTES COVER SHEET

**(Minutes of all TC/TG/TRG Meetings are to be distributed to all persons listed below  
within 30 days following the meeting.)**

**DRAFT #2**

Deleted: 1

**"These draft minutes have not been approved and are not the official, approved record  
until approved by this (council/committee)."**

TC/TG/TRG NO.: TC 1.11    DATE: April 23, 2017

TC/TG/TRG TITLE: Electric Motors and Motor Controls

DATE OF MEETING: January 31, 2017    LOCATION: Las Vegas, NV

Caesars Palace Las Vegas: Patrician

**Voting Members TC 1.11**

Name	Position	Affiliation
Rick Bunch	ALI Coordinator	R L Bunch Enterprises
Jerry Edwards	Membership	Bristol Compressors
Rick Heiden	Co-Research	Trane
Paul Lin	Vice Chair, NEMA Motor Liaison, Webmaster	Regal Beloit
Tom Lowery	Chair, Handbook	Schneider Electric

**Total Voting Members**

**5**

**Non Quorum Voting Members TC 1.11**

Name	Position	Affiliation
Rainer Grosse-Kracht		Bitzer

**Total NQ Voting Members**

**1**

**Corresponding Members TC 1.11**

Name	Position	Affiliation	Year
Florian Antretter		Fraunhofer Institute	2012
Kim Baker		NovaTorque	2015
Kenneth Bobick		Emerson	2012
Thomas Bourquin	Provisional	Nidec Motor Corp	2016
Casey Briscoe		Ingersoll Rand	2015
Robert Buckingham	Co-Programs	Baldor	2014
Kelly Chandler		Bristol Compressors	2014
Rudy Chervil		Johnson Controls	2008
Jim Chmielewski		Emerson	2004
Rupal Choksi		AHRI	2012
Robert Coleman		Trane	2008
Charles Culp		Texas A & M	2011
Terry Davies		Danfoss	2009
Ashish Desai	Provisional	Metal Industries	2014
Mark Doty		Price Mechanical	2010

James Duds		Karpinski Engineering	2012
Christian Ellwein	Provisional	KRIWAN	2016
Ken Fonstad		ABB	2012
Amr Adel Galal	Provisional	Siemens	2016
James Gu		Xylem	2013
Deep Gupta		Ingersoll Rand	2012
Shawn Hall	Provisional	ASHRAE	2015
Alex Harvey		Control Techniques	2012
Armin Hauer	Standards	<del>ebm-papst</del>	2008
Robert Helt		NEC Energy Solutions	2000
Benjamin House	Provisional	Energy Resources Integration	2016
Phillip Johnson		Daikin	2006
David Lee		Armstrong Fluid Technologies	2012
Alex Lifson		Carrier	2006
Timothy Mathson		Greenheck	2016
Paul McCabe		Rockwell	2006
Sally McInerney		University of Louisiana	1998
David Miller		Daikin	2012
Riyaz Papar		Hudson Tech	1999
Donald Perry		Ideal Electric	2006
Hermann Renz		Bitzer	2009
Brian Reynolds		Trane	2013
Billy Rhinehart	Co-Programs	Reliance	2003
Robert Richard		Honeywell	2006
Richard Robertson		Sybro Global	2014
Kezhen Shen		AHRI	2016
Daryl Showalter		FAFCO Thermal Storage	2002
Li Song		University of Oklahoma	2015
Colin Tait		SMS Engineering	2010
William Tinsley		TME	1999
Michael S. Todd	Secretary	Johnson Controls	2008
Kurt Vega		Emerson	2008
Derrick Vigil		Baldor	2006
Peter Walter		ABB	2006
Gang Wang	Provisional	University of Miami	2016
Thomas Watson		Daikin	2000
Michael Westlake	Provisional	UTC Climate	2016
David Williams	Provisional	Trane	2016
Adam Willwerth		Electro Static Technology ITW	2013
Mike Wolf		Greenheck Fan Corp	2014
Craig Wray	MTG Liaison	<del>retired</del>	2007
Huojun Yang	Provisional	North Dakota State University	2016

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**Total Corresponding Members**

**57**

**Attendees at the TC 1.11 Meeting on January 31, 2017**

<b>Name</b>	<b>Position</b>	<b>Affiliation</b>	<b>E-Mail</b>	<b>VM*, CM*, Guest</b>
Tom Borquin	Guest	Nidec	tom.borquin@nidec-motor.com	Guest
Casey Briscoe	Member	Ingersoll Rand	casey.briscoe@irco.com	CM
John Cherney	Guest	MTE Corp	john.cherney@mtecorp.com	Guest
Jim Chmielewski	Member	Emerson	jim.chmielewski@emerson.com	CM
Bob Coleman	Member	Trane	rcoleman@trane.com	CM
Terry Davies	Member	Danfoss	tdavies@danfoss.com	CM
Mark Deroo	Guest	AMCA Int'l	mderoo@amca.org	Guest
Jerry Edwards	Member	Bristol Compressors	jerry.edwards@bristolcompressors.com	VM
Ken Fonstad	Member	ABB	ken.a.fonstad@us.abb.com	CM
Chandra Gollatudi	Guest	Regal Beloit	chandra.gollatudi@regalbeloit.com	Guest
Pete Hanson	Guest	Emerson	pete.hanson@emerson.com	Guest
Armin Hauer	Member	ebm-papst	armin.hauer@us.ebmpapst.com	CM
Rick Heiden	Member	Trane	rheiden@trane.com	VM
Robert Helt	Member	NEC Energy Solutions	rhelt@neces.com	CM
Mike Hulseher	Guest	Metal Industries	mhulseher@metalindustries.com	Guest
Sanae Iyama	Member	LBNL	ssiyama@lbl.gov	CM
Sam Jasinski	Guest	Navigant	samuel.jasinski@navigant.com	Guest
Amir Jokar	Section 1 Head	Exponent Inc	ajokar@exponent.com	Guest
Heinz Juergensen	Guest	Bitzer	heinz.juergensen@bitzer.de	Guest
Ronald Lent	Member	Metal Industries	rlent@metalindustries.com	CM
Alex Lifson	Member	Carrier	alex.lifson@carrier.utc.com	CM
Paul Lin	VC/Webmaster	Fridgewize, Inc	paul@fridgewize.com	VM
Tom Lowery	Chair/Handbook	Schneider Electric	tom.lowery@schneider-electric.com	VM
Tim Mathson	Member	Greenheck Fan	tim.mathson@greenheck.com	CM
Geoffrey Rozek	Guest	Hebei Electric Motors	geoffreyrozek@hebem.com	Guest
Kezhen Shen	Guest	AHRI	kshen@ahrinet.org	Guest
Michael Todd	Secretary	Johnson Controls	michael.s.todd@jci.com	CM
Gang Wang	Guest	University of Miami	g.wang2@miami.edu	Guest
Mary Weed	Guest	Siemens	mary.weed@siemens.com	Guest
Mike Westlake	Member	Carrier	michael.westlake@carrier.utc.com	CM
David Williams	Member	Trane	david.williams@irco.com	CM
Craig Wray	Member	Retired	pharmeng@pacbell.net	CM

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**Total Attendees**

**32**

VM = Voting Member

CM = Corresponding Member

**DISTRIBUTION:**

ALL MEMBERS OF THE TC/TG/TRG

TAC SECTION HEAD: Amir Jokar

CHAPTER TECHNOLOGY TRANSFER: Christopher Phelan

LIAISONS:

RAC RESEARCH LIAISON: Shinsuke Kato

ALI/PDC: James Bochat

SPECIAL PUBS: Mark Owen

STANDARDS: Dennis Stanke

MANAGER OF STANDARDS: Stephanie C. Reiniche

STAFF RESEARCH & TECHNICAL SERVICES: Michael R. Vaughn

ADDITIONAL DISTRIBUTION: All corresponding members

**ASHRAE TC/TG/TRG ACTIVITIES SHEET**

DATE: January 31, 2017

TC/TG/TRG NO.: TC 1.11 TC/TG/TRG TITLE: Electric Motors and Motor Controls

CHAIRMAN: Thomas F Lowery VICE CHAIRMAN: Paul Lin

SECRETARY: Michael Todd

TC/TG/TRG MEETING SCHEDULE			
Location-Past 12 Months	Date	Location-Planned Next 12 Months	Date
St. Louis	6/2016	Long Beach	6/24-6/28 2017
Las Vegas	1/2017	Chicago	1/20-1/24 2018
TC/TG/TRG SUBCOMMITTEES			
Function			Chairman
Standards Research Program Handbook Web-master Membership ALI coordinator (ASHRAE learning institute)			Armin Hauer Rick Heiden Rob Buckingham & Billy Rhinehart Tom Lowery Paul Lin Jerry Edwards Rick Bunch
RESEARCH PROJECTS-CURRENT			
Project Title	Contractor	Monitoring Comm. Chpt.	Report Made At Meeting
none			
LONG RANGE RESEARCH PLAN			
Rank Title	W/S Written	Approved	To RAC
1. RTAR 1768 – Standby Power	No – Heiden/Briscoe	No	No
2. RTAR 1793 – MOT for motor thermal properties	No – Heiden	No	No
STANDARDS ACTIVITIES-List and Describe Subjects			
AHRI Standard 1210 / 1211 Performance Rating of Variable Frequency Drives, MOT will become ASHRAE 222p, which is scheduled for public review 06/2019,			
TECHNICAL PAPERS from Sponsored Research-Title, when presented (past 3 yrs. present & planned)			
TC/TG Sponsored Transactions-Title, when presented (past 3 yrs. Present & planned)			
TC/TG Sponsored Seminars (past 3 yrs. Present & planned)			
1/15 Seminar 39 - Efficiency Prediction of Motors and Variable Speed Drives with Compressors and with Fans			
1/17 Seminar 12 - Variable Speed Drives and Chillers - Back to Basics			

**Deleted:** new

**Deleted:** standard once experience from the AHRI certification program has been developed,

TC/TG Sponsored Forums-Title, when presented (past 3 yrs. Present & planned)
TC/TG Sponsored Workshops-Title, when presented (past 3 yrs. Present & planned)
JOURNAL PUBLICATIONS, when published (past 3 yrs. present & planned)

**ASHRAE TC 1.11 Electric Motors and Motor Controls  
Minutes for the Meeting at  
Casasars Palace  
Las Vegas, Nevada  
Tuesday, January 31, 2017**

**1. CALL TO ORDER**

**Introduction of Members and Guests.**

Technical Committee 1.11 was called to order at 1:10 PM by Chair Tom Lowery. Technical Committee member and guest introductions were made and an attendance sheet was circulated. The membership list was reviewed and a quorum was established with 4 of 5 voting members present.

**2. APPROVAL OF MINUTES AND REVIEW OF ACTION ITEMS**

**MOTION:** Paul Lin made a motion to approve the January 2016 Orlando minutes with a second from Rick Heiden. There was no additional discussion and the motion passed 4-0-0.

**MOTION:** Paul Lin made a motion to approve the June 2016 St. Louis minutes with a second from Rick Heiden. There was no additional discussion and the motion passed 4-0-0.

**Report Action Items:**

None.

**3/4. TC MEMBERSHIP and COMMITTEE APPOINTMENTS**

Assigned committee positions for 2017-2018 term were discussed with the following results:

- Chair → Tom Lowery
- VC → Paul Lin
- Secretary → Michael Todd
- Research → Rick Heiden
- Standards → Armin Hauer
- Programs → Jim Chm
- Handbook → Tom Lowery
- Webmaster → Paul Lin
- Membership → Jerry Edwards
- ALI Coordinator → Rick Bunch

Time was spent going over the roster line by line. Jerry Edwards will send emails out to clean the roster for the next roster update in Chicago (Winter 2018).

## 5. CHAIR REPORT: Tom Lowery

The section one breakfast meeting notes are included in Appendix I (along with Publications & CEC notes). Publications reminded everyone not to post ASHRAE documents on Dropbox as it violates the copyright; however, it is OK to post to members side only of TC websites. A new Tech portal is now available, <http://technologyportal.ashrae.org>. The speaker source bias form has been in effect since the summer of 2016. The reduced speaker rate is good for ALL speakers. A new 3-strike rule for failure to upload presentations on time will begin at the Long Beach annual meeting. A new MTG was recently formed on the topic of Air Change Rate. There were a total of 21 remote participation meetings (RPM) at Las Vegas.

**Up and coming meetings:** Long Beach, California – June 24 to 28, 2017

## 6. SUBCOMMITTEE REPORTS

### A. Standards: Armin Hauer

- Ashrae SPC 222 - Standard Method of Test for Electrical Power Drive Systems
  - Inaugural was today
  - Looking for user category member
- AMCA 207 - Fan System Efficiency and Fan System Input Power Calculation
  - Going through balloting
- Department of Energy NODA3
  - Spreadsheet for fans provides mathematical extension from shaft power to electrical input power through a default loss model for drive components.

### B. Research: Rick Heiden

- No formal interim or subcommittee meetings were held prior to meeting.

#### Action Items

- Heiden – submit WS on idle power consumption to TC Chair for letter ballot vote
- Davies, Shen, Heiden – solicit funding co-sponsorship for Motor Thermal research from NEMA, AHRI, UL and IEEE
- TC 1.11 – provide formal approval to cosponsor Motor Thermal research
- TC 1.11 – vote to progress Idle Power Consumption research

#### Active Research Projects

- None



#### Active Work Statements

- WS - Assessment of HVAC Equipment Idle Power Consumption as a Percentage of Built Environment Energy Load
  - First draft due NLT 15. May 2017 or it will be dropped.
  - Draft submitted to RL and TC.
  - Need PES, PMS and recommended bidders
- WS - Development of Method of Test for Motor Component Thermal Conductivity
  - 1<sup>st</sup> draft due NLT 15. December 2017. Will be dropped if not approved for bid by 1. February 2020
  - Need written record of TC 1.11 vote to co-sponsor

#### RTAR's

- RTAR 1768 - Assessment of HVAC Equipment Idle Power Consumption as a Percentage of Built Environment Energy Load (5 – 1500 kW)
  - Approved 29. July 2015 with comments. Comments have been resolved so work statement can proceed
    - The background statement states that there are no known methods of test for commercial or industrial HVAC equipment, but references CSA-393-12. CSA-393-12 is more general, for industrial and commercial equipment, but there's no explanation why this isn't a decent starting point.
    - The key hypothesis of this project is that the idle energy consumption of HVAC equipment is significant. Does this apply to all HVAC equipment or certain types only? Electrical water heaters deserve more attention, but I am not sure same for other large HVAC units. Need to cite or refer to existing evidences (even preliminary) to indicate that this is well needed research.
    - Looking for bidders
    - In order to complete work statement, need two names to review proposals of MOT's. Anyone interested after the meeting, see Rick – Armin, Paul, Casey interested
- RTAR 1793 - Development of Method of Test for Motor Component Thermal Conductivity
  - Approved 15. February 2016 with 2 mandatory comments, comments need to be addressed
    - **MOTION**: reaffirm co-sponsorship, PASSED 4-0-0
    - TC should seek co-funding for this project
      - Terry agreed to contact NEMA to help with funding
      - Rick agreed to contact UL to help with funding
      - Kezhen volunteered to bring this up to AHRI for potential funding

### Ideas

- Power quality trends by region and technology (surges, sags, etc)
- Data Center trends (i.e. 600 VDC ABB case) maybe a seminar
- Effects of motor type on VFD efficiency. How does the MOT for VFD need to be changed for motors other than asynchronous.
- Survey available literature and databases used for motor-VFD performance modeling in HVAC design
  - Motor-VFD performance rating updates for DOE MotorMaster Plus Database

### Completed Projects Sponsored by TC 1.11

RP-1078 -- Early Detection of Insulation Degradation in Low Voltage Motors  
RP-1076 -- Diagnostic Test and Analytical Methods for Resolving Fan/Motor Vibration Problems in Air-Conditioning Units  
RP-1095 -- Measurements of Electrical Power Inputs to Variable Speed Motors and Their Solid State Power Converters: Phase I  
RP-667 -- Measurements of Electrical Power Inputs to Variable Speed Motors and Their Solid State Converters  
RP-685 -- Test and Analysis Methods for Resolving Fan/Motor Vibration Problems in Air-Conditioning Units  
RP-770 -- Measurement of Electrical Power Inputs to Variable Speed Motors and Their Solid State Power Converters

### **C. Programs: ~~Billy Rhinehart~~ now Jim Chmielewski**

#### Ideas and Discussion

- New motor technology advancement seminar – potential intermediate seminar for Chicago
  - Rick Heiden suggested Paul Lin to chair
  - Possible title: Advances in HVAC Motors and Controls
    - Motor types overview – Ken Fonstad volunteer
    - Fan or pump or compressor application – Rick & Terry to find two additional speakers
    - Test standards for different type of motors – Dan Delany (Regal)
- SPC 222 now taking over MOT for ASHRAE 1210 – potential for Kansas City if MOT ready
  - Looking to expand coverage in MOT
  - 1<sup>st</sup> draft target by Chicago
  - Potential chair – Ken Fonstad with potential speakers – Tom, Armin, public university customer (found by Paul), Bill to find another speaker
  - Rick proposed a Forum proposal as a method for collecting information to help with the standard.
  - Armin looking for an end user to be on the SPC 222 committee

Seminar and Forum proposals for Long Beach are due by **Monday, February 6th, 2017**

The following are the tracks for the next two meetings.

Long Beach – Summer 2017

- Track 1: Fundamentals and Applications
- Track 2: HVAC&R Systems and Equipment
- Track 3: Refrigeration
- Track 4: Building Life Safety Systems
- Track 5: Controls: Smart Building Systems and the Security Concerns as Technology Emerges
- Track 6: Commissioning: Optimizing New and Existing Buildings and their Operation
- Track 7: Net Zero Energy Buildings: The International Race to 2030
- Track 8: Residential Buildings: Standards and Guidelines and Codes
- Track 9: Research Summit

Chicago – Winter 2018

- Track 1: Fundamentals and Applications
- Track 2: HVAC&R Systems and Equipment
- Track 3: Standards, Guidelines and Codes
- Track 4: Earth, Wind & Fire
- Track 5: Beyond the "L": IAQ and Air Conditioning in Transportation Applications and Enclosed Vehicular Facilities
- Track 6: Tall Buildings
- Track 7: Modeling Throughout the building Life Cycle
- Track 8: Performance and Design of Heat Exchange Equipment under Real Field Type Conditions
- Track 9: Refrigerant Mini Track @ Expo

**D. Handbook *Chapter 45*: Tom Lowery & Deep Gupta**

The Handbook was recently published and there are no updates at this time.

**E. Membership: Jerry Edwards**

None.

**7. WEB SITE <http://tc111.ashraetcs.org>: Paul Lin**

None.

## 8. LIASION REPORTS

### Section Head: Amir Jokar

Amir reminded our webmaster to update our website since it is out of date. Paul will update.

From board of directors as they are looking for feedback for the following issue: no way for ASHRAE to track folks who only attend technical committees, also a way for everyone to have a badge. There is currently no money behind it, just an idea, looking for a solution. Ideas include to utilize self-service machines or maybe a small fee (against ASHRAE current rules). Another idea is to utilize the new electronic roster system to also track TC attendees. Tom to add a comment to TC activity form for the above issue.

### RAC: Shinsuke Kato

- None.

### NEMA/UL Motor Committee Liaison – ~~Paul Lin~~ now Chandra Gollatudi

- Chandra will be taking over.

### NEMA/UL Committee Liaison – Terry Davies

- Terry was unable to attend the last meeting. Next meeting coming up in March.

## 9. OLD BUSINESS

None.

## 10. NEW BUSINESS

None.

## 11. ANNOUNCEMENT OF NEXT MEETING

Chairman Tom Lowery announced that the next meeting would be held in Long Beach, California in June 2017 at the same time on Tuesday.

## 12. ADJOURNMENT

**MOTION:** Paul Lin made the motion to adjourn with a second by Rich Heiden, PASSED 4-0-0. The meeting was adjourned at 3:27PM.

Respectfully Submitted,

Michael Todd  
Secretary, TC 1.11

**Appendix I – Section 1 Breakfast Minutes, Publications & CEC Info**



LasVegas17\_SHBrkfst\_Handout.r1.pdf



Pub\_info\_W17.pdf



CEC\_info\_W17.pdf

