

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND  
AIR CONDITIONING ENGINEERS, INC.**

1791 Tullie Circle, NE I Atlanta, GA 30329  
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**TC MINUTES COVER SHEET**

T.C. NO. **7.9**

DATE OF MEETING: **June 27, 2004**

T.C. TITLE: **Commissioning**

LOCATION: **Anaheim, CA**

<b>PRESENT</b>				
<b>VOTING</b>	<b>APPTD</b>	<b>NONVOTING</b>	<b>APPTD</b>	<b>NONMEMBERS</b>
Janice Peterson	02	David Bevirt	01	Richard Kelso
Kristin Heinemeier	02	Harvey Brickman	96	Ryan Stroupe
J.R. Anderson	00	Rick Cassault	03	David Claridge
Thomas Cappelin	00	Jay Enck	01	Joy Altwies
John Castelvechi	03	Kenneth Fulk	00	Bill Koran
Timothy Corbett	02	Walter Grondzik	03	Rodney Lewis
Charlie Culp	01	Charles Kieffer	00	Costas Balaras
Larry Fisher	02	Michael King	03	
Rodney Lewis	03	Carl Lawson	02	
Jeff Traylor	02	William McCartney	02	
Gerald Kettler	02	Andy Nolfo	02	
		Ken Peet	03	
		John Rieke	99	
		Christopher Smith	99	
		Robert Towell	99	

<b>ABSENT</b>					
<b>VOTING</b>	<b>APPTD</b>	<b>NONVOTING</b>	<b>APPTD</b>	<b>NONVOTING</b>	<b>APPTD</b>
David Bornside	03	Thomas Logan	03	Eli Howard	03
Barry Bridges	03	Karl Stum	03	Edward Iczkowski	02
J.C. Visier (Intl.)	01	Hollace Bailey	99	Eric Jenison	00
Brandt Williams	03	David Butler	99	Michael Kuk	00
		Natascha Castro	02	Henry Manczyk	03
		Wayne Dunn	01	Frederick Schroeder	00
		Daniel Frasier	02	Cedric Trueman	00
		Ken Gillespie	02	Dennis Tuttle	94
		Stephen Hanser	98	Henry Vance	01
		James Harrison	99	Chun Fai Wong	03
		Phil Haves	98	Richard Rose	02
		Charles Henck	02	Dave Shipley	03
		Elia Sterling	03	Daniel Henon	01

**DISTRIBUTION**

ALL VOTING MEMBERS (as of 5/04) AND LIAISONS (as of 1/05)

<i>Research</i>	Wayne Reedy
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<i>Research</i>	Patrick Hughes
<i>Staff Res/ Tech</i>	Michael Vaughn
<i>TAC Chairman</i>	William Bahnfleth
<i>Standards</i>	Rick Hermans
<i>Standards</i>	George Reeves
<i>Staff Standards</i>	Claire Ramspeck
<i>TAC Section Head</i>	Patricia Graef
<i>Handbook</i>	Harvey Brickman
<i>Special Pubs</i>	Kimball Ferguson
<i>Program</i>	Frank Schambach
<i>Professional Development</i>	Mark Hydeman
<i>Chapter Technology Transfer Liaison</i>	Kenneth Rhoden

## ASHRAE T.C. 7.9 ACTIVITIES SHEET

CHAIR: Janice Peterson

VICE CHAIR: Jerry Kettler

SECRETARY: Kristin Heinemeier

### TC MEETING SCHEDULE

<i>Location - Past 12 months</i>	<i>Date</i>	<i>Location - Next 12 months</i>	<i>Date</i>
Kansas City	6/03	Orlando	1/05
Anaheim	1/04	Denver	6/05

### TC SUBCOMMITTEES

<u>Function</u>	<u>Chairman</u>
Handbook	Karl Stum
Program	Richard Rose
Membership	Elia Sterling
Research	Dave Shipley
Long Range Planning	Jerry Kettler
Standards	Rodney Lewis
Commissioning Guideline(s)	Carl Lawson
Web Master	Dave Shipley
Journal/Insights	Larry Fisher

### RESEARCH PROJECTS – Current

<u>Number</u>	<u>Title</u>
RP1137	Field performance Assessment of VAV Control Systems Before and After Commissioning (complete)
1247-TRP	Field Performance Assessment of Package Equipment to Quantify the Need for Monitoring, FDD, and Continuous Commissioning (contractor awarded)

### LONG RANGE RESEARCH PLAN

<b>Priority</b>	<b>Title</b>	<b>W.S. Written</b>	<b>Approved By R&amp;T</b>
1)	Impact of Commissioning HVAC Systems on Life Cycle Costs	WS-1241	?
2)	RTAR 2005-56: The Impact of Commissioning on Comfort	RTAR	No
3)	RTAR 2005:57: Utilization of Random Sampling Technology in Performing Building Commissioning	RTAR	No
4)	Field-Based Evaluation of Methods for Commissioning DDC Systems	No	No
5)	Methods of Improving Persistence of Commissioning Savings in Control Systems	No	No
6)	One Time vs Short-Term vs Seasonal Testing of Air-Handling Units	No	No

**STANDARDS ACTIVITIES**

Guideline 0 submitted for second public review, status will be reported on at next meeting.  
 Guideline 1 under revision.  
 Three new guidelines have been approved for development by the Standards Committee, though they were rejected by the Board of Directors.

**TECHNICAL PAPERS**

From sponsored research - none  
 From other sources - unknown

**PROGRAMS****TC SPONSORED SYMPOSIA** (Past 2 years, **present** and *planned*);

Cx Starts with Design Intent	Walt Grondzik	06/02
Cx Specialty Facilities	Carl Lawson	01/03
<i>Hi-Tech Facility Cx</i>	<i>Richard Rose</i>	<i>06/05</i>

**TC SPONSORED SEMINARS** (Past 2 years, **present** and *planned*)

Impact of Cx on Commercial Markets	Andy Nolfo	01/03
Cx Specialty Facilities	Carl Lawson	01/03
Cx Life Safety Systems	Carl Lawson	06/03
Impact of Total Building Cx	Carl Lawson	01/04
Cx is More than FPT	Rich Rose	01/04
<b>Retrocommissioning</b>	<b>Andy Nolfo</b>	<b>06/04</b>
<i>Training Cx Agents</i>	<i>Jerry Kettler</i>	<i>01/05</i>
<i>Cx of DDC</i>	<i>Rodney Lewis</i>	<i>01/05</i>
<i>How to Comply with ASHRAE 62.1-2004</i>	<i>Eli Howard</i>	<i>01/05</i>

**TC SPONSORED FORUMS** (Past 2 years, **present** and *planned*)

Persistence of Savings for Central Systems	Ken Peet	06/03
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**PROGRAM PLAN:** (See Above and attached)

**JOURNAL PUBLICATIONS** (Past 3 years, present and planned) - unknown

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**MEETING MINUTES – Sunday, June 27, 2004**

**ASHRAE T.C. 7.9 - Commissioning  
Nashville, TN**

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1. The meeting was called to order at 3:01 pm by Chairman Peterson
2. Self introductions were conducted.
3. Attendance sheets were distributed, and roll was taken: 11 out of 14 Voting members in attendance.
4. Vice Chairman Comments: none.
5. Agenda was reviewed and no additions were made. (Fisher/Anderson, 11/0/0).
6. Motion was made and seconded to approve minutes from Anaheim (Traylor/Castlevecchi, 11/0/0).
7. Administrative matters: Attendees were notified that seminars are being recorded (voice along with slides). They may be made available for a price depending on whether or not one has registered. It is not yet known whether TCs are still allowed to put the seminar presentations on their websites. Some reported that the system was slow, but others did not find this problem. TC 7.9 would like to continue posting seminars on the Website until we're told not to.

Chair Peterson announced that all draft documents coming from the committee (minutes, etc.) should have a copyright statement on them.

Forum 18 at the meeting on Tuesday will deal with strategic planning, particularly funding for research, and TC members were encouraged to attend.

ASHRAE is setting up email aliases for committee positions, eg something like [secretary.tc0101@ashrae.net](mailto:secretary.tc0101@ashrae.net).

ASHRAE is migrating to a new website. Webmasters are being asked to download their files, and then upload them again when the new site is up.

8. Correspondence: None.
9. Society Liaisons:  
*Handbook*: Harvey Brickman indicated that T.C. 7.9 should have a handbook committee chair, list of revisers and reviewers for the 2007 revision of the Applications Handbook chapter on Building Commissioning. The "Authors' and Revisers' Guide" is on the website.

We need to vote to approve the chapter revision by summer 2005 or Winter 2006 meeting at the latest. If we're not already writing, we're behind! If we do not provide a revision on time, it will go in without revision. Charlie Culp volunteered to chair the committee, and Peet, Fisher, Bornside, Kettler, Traylor, McCartney, Enck, Castlevechi, Stum and Lawson volunteered or were volunteered to help.

*Standards:* Rick Hermans reported that the Standards Committee approved three new guideline project committees:

- Technical requirements for Commissioning Existing Buildings (Casault chair)
  - Preparation of Owners Project Requirements and BOD (Traylor chair)
  - Training for Building O&M (Grondzik chair)
- (They were subsequently rejected by the Board of Directors, however).

The second public review of GL0 has concluded, and they are responding to the few comments received. It is in good shape, but cannot be voted out at this time. A letter ballot will be conducted. The goal is to have it approved by 8/23 for Tech Weekend.

*BCA:* Rick Casault reported that the BCA certification program is in place, and the first exam will be on July 31 in five locations concurrently. A committee structure has been activated. BCA has endorsed the 2<sup>nd</sup> Public Review Version of GL0. Regions have been chartered, as well as some local chapters. BCA is becoming increasingly financially independent of NWEA, and looking for corporate funding. Several training sessions for practitioners have been scheduled.

## **SUBCOMMITTEE REPORTS**

10. Membership committee: Anyone interested in Corresponding Membership should contact Elia Sterling..
11. Program Committee: See attached report. .
12. Research Committee: See attached report. MSC (Traylor/Culp 11/0/0).
13. Handbook Committee: Volunteers are needed. Peet, Fisher, Bornside, Kettler, Traylor, McCartney, Enck, Castlevechi, Stum and Lawson volunteered. The chapter must be reviewed by summer 05. Copies will be distributed by July 31 to all revisers. Within a week, they will assign sections. The first rewrite is due September 15. Culp will assemble the document and send out again..The second revision y January 05. The first rewrite for the next meeting in Orlando. Consider: sections you would like to add, change the title to "Building Commissioning"? Perhaps we should get the chair of the RetroCx guideline (Casault) involved. The document should reference the NIBS Guideline for whole building commissioning, but focus on HVAC commissioning.
14. Long Range Planning Committee: See attached report. Jerry Kettler is encouraged about the progress with the guideline series. Three guidelines were approved for development. Guideline 1.5 (re: smoke exhaust systems) is controlled by TC 5.6, and they have agreed to update their current guideline, adding training and making it compatible with Guideline 0. .

They are asking for members.

RE training: There are five organizations that offer certifications and/or training (BCA, AABC, NEBB, AEE, and University of Wisconsin). How uniform should they be? What skillsets must a CxA have, and should ASHRAE provide guidance? We should include members of AABC, NEBB, AEE, and University of Wisconsin on our committee. We discussed how to get commissioning training into university engineering curriculum. Some schools do offer a degree in construction management. It was suggested that we contact those in ASHRAE who actually write the textbooks about including commissioning content.

It was proposed that we start another guideline within a few years, possibly on controls or systems manuals.

15. Standards Committee: SPC 166P (HVAC Terminology) should have someone from TC 7.9 participating, since there are a lot of terms related to commissioning that should be included.
16. Journal/Insights: Larry Fisher reported that the merger is going well between Journal/Insights and Special Publications. Special pubs has a full agenda. Fisher is the vice chair of the new committee. The Journal is seeking articles about “green” (without necessarily using the terms “green” or “LEED”). They are soliciting articles in 12 topics (published on the website).
17. Commissioning Guidelines Committee: Guideline 0 went out for second public review last month, and received 35 comments from a few people. All comments were responded to, and the commenters now have 30 days to review the responses. It is hoped that they will get all reviews back by the end of the year, and it should be published within 6 months

## LIAISON REPORTS

18. GPC-4 ‘O&M Documentation’ – Jerry Kettler – The guideline has not been sent out. There has been some confusion on the document, and they must make another attempt to make it compatible with Guideline 1 and 0 wording. It should be out for public review by Orlando. McCartney and King are also on the committee.
19. SP-91 ‘Guideline for Hospital and Healthcare’ – Carl Lawson – No report.
20. SSPC 62 ‘Ventilation for Acceptable IAQ’ – Elia Sterling – Standard 62-2004 will be published. They are voting about whether to change the title/purpose/scope. They will include all addenda as part of the standard. It will be on continuous maintenance.
21. SPC-90.1 ‘Energy Efficient Design of New Buildings’ – Cedric Trueman – No report.
22. SPC 111 ‘Test, Adjust and Balance’ – Jerry Kettler – They meet tomorrow to go over comments, especially on the water side.
23. GPC 11P ‘MOT for Control Components’ – Jerry Kettler. This will go out for public review by Orlando. It is no longer a Method Of Test but a Guideline for field testing of controls.

24. TC1.4 – ‘Control Theory and Application’—Larry Fisher—No report.
25. TC1.8 – ‘Owning and Operating Costs’– Barry Bridges – No report.
26. TC7.7 – ‘Test and Balance’ – Rodney Lewis – No report.
27. USGBC Liaison – J.R. Anderson – Jay Enck was recommended by the subcommittee for the USGBC Energy and Atmosphere Technical Advisory Group, and it looks like he will be accepted. Someone on the GBC board is pushing to cut back on the commissioning requirements, but it is felt that this will not happen. Jim Gartner of the Chapter Technology Transfer Committee is planning an issues update for Monday 10-12 in Orlando on “LEED in ASHRAE”.
28. Building Commissioning Association Liaison – Rick Casault – See Society Liaisons, above.

## **BUSINESS**

29. Old Business: None.
30. New Business: All are encouraged to attend Seminar 10 on Wednesday, on Retro-commissioning
31. The next TC7.9 Committee meeting will be on February 27, 2004 at 3 PM in Orlando, FL.
32. Motion to adjourn was made at 4:53 pm and passed by acclamation.

**—END OF REPORT—**

## **ATTACHMENTS**

- Program Committee Report p. 5
- Research Committee Report p. 7
- Long Range Planning Committee Report p. 9



**Program Committee Report – January 25, 2004 – Nashville**

**TC 7.9 PROGRAM SCHEDULE**

**Status**

City	Type	Title	Chairman	Speakers	Abstract Complete	Paper Complete	Paper Approved
Anaheim 1/24/04 to 1/28/04	Seminar	Impact of Total Building Cx	Carl Lawson	Charles Culp  Chad Dorgan			<b>Completed</b>
Anaheim 1/24/04 to 1/28/04	Seminar	CX is more than FPT	Rich Rose	Tim Corbett Jeff Traylor Bill McCartney Jerry Kettler			<b>Completed</b>
Orlando 6/26/04 to 6/30/04	Seminar	Training Cx Agents	Gerry Kettler	Jeff Traylor Charlie Culp Andy Nolfo Rick Casault	yes		
					yes		
					yes		
					yes		
Orlando 2/05/05 to 2/09/05	Seminar	How to Comply with ASHRAE 62.1-2004	Eli Howard	Andy Persily Ph.D Lynn Bellenger Dennis Stanke Hoy Bohanon	yes		
					yes		
					yes		
					yes		
Orlando 2/05/05 to 2/09/05	Seminar	Cx of DDC Systems	Rodney Lewis	Ken Gillespie Larry Fisher Jim Cogan Steve Doty	yes		
					yes		
					yes		
					yes		
Denver, CO 6/25/05 to 6/29/05	Symposium	High-Tech Facility Cx	Rich Rose	Charles Kieffer Bill McCartney Richard Greco Don Beaty Terry Rodgers	yes	yes	
					yes	yes	
					yes	yes	
					yes	yes	
Chicago 1/21/06 to 1/25/06	Seminar						



### TC 7.9 Research Subcommittee Report

2004 Annual Meeting

Saturday, June 26, 2004, 1:00-3:00pm

Gaylord Opryland Resort & Convention Center, Nashville – Belmont A (Magnolia Mezzanine)

**1. Call to Order (Ken Peet) Present:** Janice Peterson, Natasha Castro, Kristin Heinemeier, J.R. Anderson, Ken Peet

### 2. Funded Projects

<i>Priority</i>	<i>Title</i>	<i>Status</i>	<i>Contractor</i>	<i>Notes</i>
	RP 1137 – Field Performance Assessment of VAV Control systems Before and After Commissioning	Complete	Patrick Fleming/ Stantech Consulting	Project is complete. Larry Fisher will make a final report at the full meeting.
	1274-TRP: Field Performance Assessment of Packaged Equipment to Quantify the Benefits of Proper Service and Assessing the Long Term Need for Monitoring, FDD, and Continuous Commissioning Technology	Bidder selected at Anaheim ; in progress	Todd Rossi	Sponsored by 4.11; Prioritized RTAR. This went out to bid and some bids were received. Project was awarded to ADM Associates, Sacramento, CA. Ken Peet is TC 7.9 rep on PMS. First meeting at 6:00pm today

### 3. Projects in the Pipeline

<i>Priority</i>	<i>Title</i>	<i>Status</i>	<i>Author</i>	<i>Notes</i>
1	Impact of Commissioning HVAC Systems on Life Cycle Costs	WS-1241	Kristin Heinemeier	To the best of our knowledge, this WS has been approved. It will remain the #1 priority due to its importance for promoting commissioning. We are still trying to determine its true status.
2	RTAR 2005-56: The Impact of Commissioning on Comfort	RTAR	Dave Shipley	RTAR drafted and submitted. RTAR returned by RAC with comments. Comments were not in hand by Anaheim, but are provided here. A forum on this topic will occur in Nashville. (June 2004) Dave Shipley will rewrite the

<i>Priority</i>	<i>Title</i>	<i>Status</i>	<i>Author</i>	<i>Notes</i>
				RTAR based on comments and the Forum.
3	RTAR 2005-57: Utilization of Random Sampling Technology in Performing Building Commissioning	RTAR	J.R. Anderson	RTAR received extensive comments. J.R. Anderson has pledged to work with those on both sides of the issue to rewrite the RTAR for submittal in August.
4	Field-Based Evaluation of Methods for Commissioning DDC Systems	Title	Larry Fisher	Larry Fisher has agreed to write the RTAR and seek TC 1.4 Control Theory and Application as a Co-Sponsor.
5	Methods of Improving Persistence of Commissioning Savings in Control Systems	Title	Ken Peet, David Underwood	Ken Peet submitted a Forum that seems to have been approved but didn't fit into the Anaheim schedule. He will try again.
6	One Time vs Short-Term vs Seasonal Testing of Air-Handling Units	Title	Mingsheng Liu	Awaiting outcome of WS-1092

## **T.C. 7.9 Long Range Planning Committee Report**

June 27, 2004

This Commissioning process is being adopted throughout the country. The Total Building Commissioning Process documents coordinated by National Institute of Building Sciences (NIBS) will expand the process into new trades and areas. The current efforts are targeted at new construction projects. The US Green Building Council LEED-NC program is accelerating this growth. The existing buildings that have not been commissioned, and are not operating properly, present additional opportunities to apply the process but with modified procedures.

In spite of the growth of commissioning, there are several issues challenging the growth momentum and quality in the process. These issues are:

1. Lack of documented benefits and results of commissioning. A simple understandable marketing program for commissioning to owners, architects, engineers, contractors and other users of commissioning could be developed from this data.
2. A defined skill set for trained commissioning providers.
3. Training program requirements for commissioning providers.
4. Coordination of other guidelines that are included in or support commissioning, such as: program and design phase activities, O&M data (Guideline 4), smoke control (Guideline 5), and building operations training.
5. Application tools and “boilerplate” for providers to uniformly apply the processes.
6. Interface and cooperation with other organizations in the above efforts.

To address these problems ASHRAE has the opportunity to provide needed guidance.

1. Continue the development of Guideline 0 and update revision of the 1996 issue of Guideline One and supporting user information. This effort is being coordinated with the efforts of NIBS to create a total building commissioning process.
2. The use of commissioning is often limited by the lack of marketing and knowledge of the process and its many success stories. ASHRAE should sponsor research on cost/ benefit relationship and specific results of commissioning. The result of these efforts should be a simple explanation of the need for and results of commissioning.

3. Develop or assist in the development of an educational program for owners, architects, consultants, and contractors to facilitate their participation in the process including: (Note: The Building Commissioning Association has several committees working in this subject area)
  - A. Commissioning Results and Benefits.
  - B. Developing Commissioning Programs.
  - C. Commissioning Verification and Testing Methodologies.
  - D. Commissioning Documentation Requirements.
  - E. Operations Training.
3. Develop a series of commissioning related guidelines. The revision process for Guideline 0 and One is expanding the amount of information and examples included. There is a need to supplement Guideline 0 and One with additional documents to build a coordinated set of guidelines from design through building operation. See the following attachments for new guidelines being submitted.
4. Develop a listing of the basic skill sets need to provide commissioning. ASHRAE or other organization can then provide training and certifications. This should also include quality and integrity issues and interrelationships with other professionals.
5. Develop a set of training requirements to facilitate the training if commissioning providers. Many organizations including; The Building Commissioning Association, The Associated Air Balance Council, The National Environmental Balance Bureau, The Association of Energy Engineers and the University of Wisconsin offer commissioning training and certification.
6. Assist in the development of college level training in commissioning for engineering and technician programs.
7. Work with the engineering licensing boards to include commissioning knowledge in the PE exam.

## PROPOSED COMMISSIONING GUIDELINES SYSTEM

Commissioning is a new process to many in the design and construction industries. It can be a very complicated process. This leads to the need for guidelines for the industry to assimilate the commissioning process.

Guidelines to support Guidelines 0 and 1 are needed. The new guidelines should be related by organization and numbering to the existing Commissioning Guidelines. This grouping allows the coordination of the guidelines and ASHRAE then has a larger number of documents for targeted audiences. This would result in the renumbering and revision to some existing guidelines.

The following group of guidelines is proposed: The ones listed in **bold** are being developed or have been requested.

### **Guideline 0 The Commissioning Process (Guideline 0)**

### **Guideline 1.1 HVAC&R Technical Requirements for The Commissioning Process (Presently guideline 1)**

### **Guideline 1.2 Technical Requirements for Commissioning Existing Building HVAC&R Systems**

### **Guideline 1.3 Preparation of Owners Project Requirements and Basis of Design Documents for HVAC&R Systems Commissioning**

Guideline 1.4 Preparation of Building Systems Manuals and OEM Documentation for HVAC&R Building Systems Commissioning (Presently guideline 4)

### **Guideline 1.5 Technical Requirements for Commissioning Smoke Exhaust Systems (Presently guideline 5)**

Guideline 1.6 Technical Requirements for Commissioning Building HVAC&R Controls Systems

### **Guideline 1.7 Training for Building Operation and Maintenance for the HVAC&R Commissioning Process**

Guideline 1.8 Technical Requirements for Commissioning of Medical and Laboratory Facility HVAC&R Systems

Guideline 1.9 Commissioning for the LEED<sup>tm</sup> Program

Guideline 1.10 Training for the Commissioning Process

Guideline 1.11 Commissioning of Kitchen Exhaust Systems