

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

1791 Tullie Circle, NE | Atlanta, GA 30329
(404) 636-8400

TC MINUTES COVER SHEET

T.C. NO. 7.9

DATE OF MEETING: February 06, 2005

T.C. TITLE: Commissioning

LOCATION: Orlando, FL

| PRESENT | | | | |
|--------------------|--------------|-------------------|--------------|----------------------|
| VOTING | APPTD | NONVOTING | APPTD | NONMEMBERS |
| Gerald Kettler | 06 | J. R. Anderson | 04 | Tom Cappellin |
| Kristin Heinemeier | 04 | David Bevirt | 01 | Costas Balaras |
| Rodney Lewis | 03 | Rick Cassault | 03 | Mark Espel |
| John Castelvechi | 03 | Kenneth Fulk | 00 | Jean Gibbons |
| Timothy Corbett | 02 | Walter Grondzik | 03 | Mike Dolm |
| Charlie Culp | 01 | William McCartney | 02 | Joe Miller |
| Ken Peet | 03 | James Persaud | 04 | J. Patrick Carpenter |
| Andy Nolfo | 02 | Charles Kieffer | 00 | Raoul Webb |
| | | Carl Lawson | 02 | Randy Casteel |
| | | Wayne Dunn | 01 | Ben Crowley |
| | | Robert Towell | 99 | Ben Coe |
| | | David Bornside | 03 | Erv Bales |
| | | John Rieke | 99 | Wayne Webster |
| | | Dave Shipley | 03 | Henry Hays |
| | | Janice Peterson | 04 | Rick Hermans |
| | | Richard Rose | 04 | Verle Williams |
| | | James Harrison | 99 | Svein Mornes |
| | | Karl Stum | 03 | |
| | | Elia Sterling | 03 | |

| ABSENT | | | | | |
|---------------------|--------------|-------------------|--------------|---------------------|--------------|
| VOTING | APPTD | NONVOTING | APPTD | NONVOTING | APPTD |
| Barry Bridges | 03 | Thomas Logan | 03 | Eli Howard | 03 |
| J.C. Visier (Intl.) | 01 | Hollace Bailey | 99 | Edward Iczkowski | 02 |
| Brandt Williams | 03 | David Butler | 99 | Eric Jenison | 00 |
| Jeff Traylor | 02 | Natascha Castro | 02 | Michael Kuk | 00 |
| Larry Fisher | 02 | Daniel Frasier | 02 | Henry Manczyk | 03 |
| | | Ken Gillespie | 02 | Frederick Schroeder | 00 |
| | | Stephen Hanser | 98 | Cedric Trueman | 00 |
| | | Phil Haves | 98 | Dennis Tuttle | 94 |
| | | Charles Henck | 02 | Henry Vance | 01 |
| | | Christopher Smith | 99 | Chun Fai Wong | 03 |
| | | Michael King | 03 | Daniel Henon | 01 |
| | | Jay Enck | 01 | Harvey Brickman | 96 |

DISTRIBUTION

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

| | |
|--|-------------------|
| <i>Research</i> | Wayne Reedy |
| <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: Gerald (Jerry) Kettler
 VICE CHAIR: Kristin Heinemeier
 SECRETARY: J. R. Anderson

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 | Charlie Culp |
| Program | Richard Rose |
| Membership | Elia Sterling |
| Research | Dave Shipley / Ken Peet |
| 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 |

LONG RANGE RESEARCH PLAN

| Priority | Title | W.S. Written | Approved By R&T |
|----------|--|-----------------|--------------------|
| 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 The Commissioning Process BOD reviewed and approved for publication.

Guideline 1 under revision.

Two new guidelines have been approved for development by the Standards Committee, and are to be submitted for proper documentation.

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 | Walter 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 |
| Retrocommissioning | Andy Nolfo | 06/04 |
| Training of Commissioning Authorities | Gerald Kettler | 02/05 |
| How ASHRAE's Guideline on Commissioning is Changing | Walter Grondzik | 02/05 |
| How to Comply With ASHRAE 62.1-2004 | Eli Howard | 02/05 |
| <i>Commissioning DDC systems</i> | <i>Rodney Lewis</i> | <i>06/05</i> |
| <i>Preventing Train Wrecks in Underfloor Distribution Systems</i> | <i>Karl Stum</i> | <i>06/05</i> |

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

| | | |
|--|---------------------|--------------|
| Persistence of Savings for Central Systems | Ken Peet | 06/03 |
| <i>What changes are recommended for handbook chapter</i> | <i>Charles Culp</i> | <i>06/05</i> |

PROGRAM PLAN: (See Above and attached)

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

MEETING MINUTES – Sunday, February 6, 2005

**ASHRAE T.C. 7.9 - Commissioning
Orlando, FL**

1. The meeting was called to order at 3:01 pm by Chairman Ketler
2. Self introductions were conducted.
3. Attendance sheets were distributed, and roll was taken: 8 out of 13 Voting members in attendance.
4. Vice Chairman Comments: none.
5. Agenda was reviewed and no additions were made. (Peterson/Castelvecchi, 8/0/0)
6. **Motion** was made and seconded to approve minutes from Nashville. (Nolfo/Corbett, 8/0/0)
7. Administrative matters:
Webmaster training to be in Denver. To be done by individual by appointment
TC chair training to be done on 3 pm Sunday, unable to attend due to conflict.
Hightower award not done since no-one was submitted
An honors and awards chairman is recommend . No volunteers yet
Access on web site handbook chapters. Must log in TC web site as a member
Each Committee Chair and member of staff have an e-mail alias by function. The web site for the chair is tc0709@ashrae.org.
8. Correspondence: Visitor from Europe promoting Clima 9-12 Oct 2005

SUBCOMMITTEE REPORTS

9. **Membership committee:** Anyone interested in Corresponding Membership should contact Elia Sterling..
10. **Program Committee:** See attached report for more details.
Priority for future programs:
#1 Forum: What changes are recommended to be made for handbook chapter.
Charlie Culp to chair.
#2 Seminar for Denver for Commissioning DDC systems scheduled. Rodney is Chair. Four speakers are needed and he has three so far. J.R. said he would ask someone for the fourth.

- #3 Karl Stum will chair a new Seminar for Preventing Train Wrecks in Underfloor Distribution Systems.
11. **Research Committee:** See attached report.
1274 project being followed by Ken Peet. Current reports are on the project website. A link will be provided from the TC website.
#1 Impact of Commissioning on Life Cycle Costs. Kristin Heinemeier, the original author, plans a heavy rewrite. Will collaborate with TC 7.5.
#2 Impact of Commissioning on Comfort. Dave Shipley wrote the RTAR. The work statement would draw on information from an unsolicited research proposal if it is well-designed and if it goes forward. See following comments on following US project.
#1329 Unsolicited proposal “Building Performance Characterization, Energy Usage, Indoor Environmental Quality, and Occupant Perception And Health,” was sent to the Research Chairs of 10 TCs. Klas Haglid of TC 7.8 is heading the Project Evaluation Subcommittee.

Motion made that the TC request a seat on the PES.

Motion by Andy Nolfo made for Elia Sterling to be a voting member of the PES. Rich Rose Seconded. Passed unanimously.

Natasha Castro presented information to the Research Subcommittee on a proposed new International Energy Agency (IEA) Annex: Cost-Effective Commissioning for Low Energy Buildings. Workshop in Munich in March 16th and 17th of 2005. The information is provided to TC 7.9 primarily so that we are aware of international efforts, with a view to avoiding duplication and possibly seeking co-funding opportunities. Details are provided in the attached research report. See Natasha or Dave Bornside for more information.

Ken Gillespie discussed the Cx Assistant and a web link to be made available to obtain use of it. This is a new software program developed for the application of the initial work up of a commissioning plan for a project. It is viewed as a tool. Details are provided in the attached research report.

12. **Handbook Committee:** Meeting held and reviewed current version and changes made. Asked for reviewers for the edit version. A Retro-Commissioning section to be added to the Handbook. Handbook changes to be made and final approval to be made in Denver. .BCA to be requested to make comments on the handbook.
At the Section 7 meeting the subject came up about improving the Handbook. Issue came up about “building performance”. This is the direction the section would like to go
13. **Long Range Planning Committee:** See attached report by Jerry Kettler. Two new guidelines were approved for entering the system: Guideline 1.2 Technical Requirements for Commissioning Existing Building HVAC&R Systems has been submitted to Standards. Rick Casault to be Chair.

Guideline 1.3 Training for Building Operation and Maintenance for the HVAC&R Commissioning Process. Chair to be finalized with T.C. 7.4. Details on how to document entering the system to be provided by Herman.

14. Journal/Insights: Larry Fisher had a conflict and was unable to attend the meeting.
15. Commissioning Guidelines Committee: Guideline 0 The Commissioning Process was approved by the Board at this meeting. (notice via e-mail on the 14th)

LIAISON REPORTS

16. *Handbook*: No comments
17. *Standards*: Rick Hermans reported that the Standards Committee approved two new guideline project committees: He is to forward instructions on how to proceed with the proper paperwork.
 - Technical requirements for Commisisoning Existing Buildings (Cassault chair)
 - Training for Building O&M (Grondzik chair)

 - (Preparation of Owners Project Requirements and BOD (Traylor chair)) discussed again.

Guideline 0 The Commissioning Process to be voted on by the Board at this meeting. Notice was received February 14 that it did get approval.

GPC-4 has gone through the public review stage and is ready for publication.

SSPC-62 Ventilation for Acceptable IAQ Rodney Lewis reported. The 62.1-2004 version is now in the bookstore. All addenda have been included. All code rated standards will be published every 3 years. All addenda to be published every 1.5 years. All public reviews will be done at the same time frame from starting to completion.

SPC 90.1 Energy Efficient Design of New Buildings. Rodney Lewis reported. The 90.1-2004 version is in the bookstore with a new user manual. A separate publication for small office buildings has also been made available in the bookstore.

SPC-111 Testing and Balancing for HVAC Kerry Kettler reported it is still in process.

GPC 11P MOT for Control components. Jerry Kettler reported it is ready for public review.

TC 1.8 Owning and Operating costs No report

TC 7.7 Testing and Balancing Rodney Lewis reported. There was a pump

seminar today and approximately 120 attended.

BCA: Rick Casault deferred to Kristin Heineimeier. The certification program is going well at this time. Region and Chapter structure is also going well. Committee structure is also going well. Work is going on to develop alliances with other organizations for training. The BCA will be active in an upcoming energy conference. ASHRAE Guideline 0 The Commissioning Process was formally endorsed and BCA is waiting for publication in order to be able to use it. There is work under way to develop a “best practices” for commissioning.

USBGC: Deferred to Janice Peterson. A **motion** was made to establish a liaison for this committee. Heinemeier/ Corbett 2nd Passed unanimous.8/0/0

BUSINESS

17. Old Business: None.
18. New Business: Proposed ASHRAE Standard on Evaluating Energy Efficient Buildings. A fourm at 10 AM Monday to discuss this item. Several other TC’s are invited and it is to be held at Westminster room.
19. The next TC7.9 Committee meeting will Sunday June 26, 2005, at 3 PM in Denver, CO.
20. **Motion** to adjourn was made at 4:53 pm and passed by acclamation.

—END OF REPORT—

ATTACHMENTS

Program Committee Report .
Research Committee Report .
Long Range Planning Committee Report

TC 7.9 Research Subcommittee Meeting Agenda
 2005 Winter Meeting
 Saturday, February 5, 2005, 1:00-3:00pm
 Wyndham Hotel, Cambridge Room (Lobby Level)

1. Call to Order (Dave Shipley)

Present: Dave Shipley, Kristin, JR, Ken Peet, Ken Gillespie, Natascha Castro,

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 presented final report at full TC meeting. (June 2004) |
| | 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 | In progress | ADM Associates, Inc. | Sponsored by 7.5 (formerly 4.11); Prioritized RTAR. This project went out to bid and three bids were received. Project has been awarded to ADM Associates, Sacramento, CA. Ken Peet is TC 7.9 rep on the PMS. First meeting was in Nashville. (June 2004) <i>Feb report: Having meeting tomorrow night 6 to 7:30, will report on what's happened since. Contractor has set up a website. Will add that to the report. Two documents: field diagnostic on-site test procedure for RTU (still getting ready to do the field work). 20% level of document review document is on the site. Mainly deals with lit review.</i> |

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 | <p>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 status. (June 2004) As of Jan. 2005, this WS had been removed from the ASHRAE plan because of lack of action by the TC. We can have it restored if we respond to the earlier comments from RAC. The author is working on that. (Jan. 2005)</p> <p><i>Feb report: So much has gone on in the topic area that the work statement is now outdated. Emphasis is not quite right any more. It is encouraging that RAC is now more interested in the topic area. Not ready to resubmit as is, but may completely revise based on other things going on. PECCI put together a case study protocol for Cx information for California Commissioning Collaborative (about 10 bldgs in there – maybe 40 altogether at less complete point). Evan Mills of LBL has done a good study, taking advantage of some of that work. Nationwide, but most data are from TAMU and PECCI. 300 bldgs, with good analysis and a report. Expecting more to happen in near future. Need to take some time to digest this other work before we redraft our work statement. Dave will e-mail Mike Vaughn to let him know we don't need it to be prioritized. Ken Gillespie reports that TC 7.5 is interested in this topic. We would be interested in working together with 7.5 on a major rewrite of it, and then would co-sponsor what they come up with.</i></p> |
| 2 | RTAR 2005-56: The Impact of Commissioning on Comfort | RTAR | Dave Shipley | <p>RTAR drafted, submitted, and returned with comments. The author revised the RTAR and submitted the new version with the TC's research plan after Nashville. Work has not yet begun on a work statement. (Jan. 2005)</p> |

| <i>Priority</i> | <i>Title</i> | <i>Status</i> | <i>Author</i> | <i>Notes</i> |
|-----------------|--|---------------|---------------------------|---|
| | | | | <i>Feb report: Ideally, URP-1329 will go forward and will provide a control group for this proposed research. This RTAR would then change to be a second phase of URP-1329, focusing on commissioned buildings. It might not be limited to cx and comfort, but might add the IEQ elements as well.</i> |
| 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. (June 2004) <i>Feb report: ASHRAE considers this an existing technology, and no research is required. No plans to do anything. Forum was sparsely attended and negative. Few are using sampling. Idea of weighted random sampling might be interesting to pursue.</i> |
| 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. (June 2004) |
| 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. (Jan. 2004) <i>Feb report: Two times has submitted a forum and two times it has not fit.</i> |
| 6 | One Time vs Short-Term vs Seasonal Testing of Air-Handling Units | Title | Mingsheng Liu | Awaiting outcome of WS-1092. (June 2003) |
| 7 | M&V for Cx | Title | Kristin | New idea generated here. |

4. Other Items

Proposed new IEA Annex: “Cost Effective Commissioning of Low Energy Buildings” as part of ECBCS (Energy Conservation in Buildings and Community Systems). Discussion led by **Natascha Castro**.

Annex 40 is coming to an end (Cx of HVAC systems for improved energy performance.) Report from 40 is still being reviewed. Tools were developed, they looked at the process of cx, looked at manual cx and automation in cx. Mostly focused on existing buildings. Each country did a national project and applied their research in a building. There are case studies. There are several automated tools in prototype (or further) form.

Had workshop last October to define scope of next Annex. Need to build on the tools developed in Annex 40 and other work. Next meeting is in Munich. Now looking at low energy or advanced systems. Had a discussion to define that (because of all the countries involved). Second part is looking at methodologies and tools to optimize operation of buildings in use. Third part is quantifying costs and benefits. Plan is to present it to IEA Executive Committee in June.

DOE will be the participating organization for the US. NIST also putting forward money. LBL also main contractor, subcontract to TAMU and PECCI. NRCAN is the participating organization for Canada.

Shadow groups also set up in each country. ASHRAE could join that shadow group or could be one. Could do research in parallel with the protocols being developed. Would be good to have ASHRAE review the draft to make sure it takes into account recent developments. Progress of the Guidelines (0 and 1) will be useful to the Annex. The Subcommittee asked Natascha to act as liaison between our group and the new Annex. She will report to the Research Subcommittee and we will in turn provide information to the rest of the TC.

Discussion of 1329-URP: Building Performance Characterization, Energy Usage, Indoor Environmental Quality, and Occupant Perception And Health. Discussion to be led by **Dave Shipley** (unless someone else shows up and is passionate about doing so).

MOTION: Kristin moves, JR second, that we recommend to the TC that we request a seat on the PES and that the TC select the representative from among the following names: Elia Sterling, J.R. Anderson, Barry Bridges. We further request that the representative comes to our subcommittee regularly to report on the project if it goes forward. Unanimously approved.

New Topic Ideas:

M&V for Commissioning – how to do it cost-effectively. M&V in a formal sense is not really appropriate for Cx. You do have to measure, but it is probably too expensive to follow one of the formal IPMVP protocols for the purposes of Cx.

Work has been going on to do verification of simulations that forecast new building performance, including checking the simulations at the system level.

Ken also has a QA plan for retrofits. Could take that idea and overlay an M&V plan. Will require some model development, some diagnostics, some monitoring. Data gathering for FPT would drive the M&V requirement. Suggest this be proposed to 7.6, Cedric Trueman chair of standards for 7.6, to be added as an addendum to 14P.

Recommend a TC liaison to California Commissioning Collaborative to address this and other topics.

Cx Assistant

Energy Design Resources, of Savings by Design, has put this web-based tool out there - was proposed by CGT Energetics from Irvine CA in 2002. Had a cost estimating tool, specification generator, etc., added a design intent tool, sequence of operation tool for several different systems, new tools will generate cx plan, training plan, systems manual. Some of it has been provided to GL1 for their help. Another proposal is to include a design review tool.

Tool is available at Energydesignresources.com, create a login and password, and the tool resides on a server at CGT. Focused on projects – create a name for the project, enter the information, and it all gets passed from one of the tools to the next. Test protocol level has not been integrated into it; may be too detailed for this type of tool.

The tool also offers (tool formerly had three levels: abbreviated, standard, and comprehensive), but the tool looks at what pieces of the project do you do and who does them. Abbreviated approach is a way to get the contractor to do a specific set of things. Tool recommends a specific level. LEED requires standard plus some other aspects, so now you have five levels: abbreviated, standard, LEED-standard, comprehensive, LEED-comprehensive. It has 10 different building types at the moment.

Potentially very useful to California High Performance Building. CCC is going to mirror it. Likely to be a superset of what most people need, but may miss certain things (like high humidity situations). Not currently building up a database. Each project is protected from other people. Could provide information into the national database of cx projects. Produces RTF documents (as a draft), which you can then take and modify. Need to convince CCC that we need the same thing for existing buildings.

T.C.7.9 - COMMISSIONING

Long Range Planning Committee Report

February 05, 2005

This Commissioning Process is being adopted throughout the country as a value added process. The Total Building Commissioning Process documents coordinated by National Institute of Building Sciences (NIBS) will expand the process into new trades and areas. These efforts are targeted at new construction projects. The US Green Building Council LEED-NC program that requires commissioning 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
2. A defined skill set for trained commissioning providers and training program requirements for these commissioning providers.
3. 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.
4. Application tools and “boilerplate” for providers to uniformly apply the processes.
5. 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. Research is being conducted on by several organizations outside of ASHRAE on cost/ benefit relationship and specific results of commissioning. The result of these efforts should be reviewed and analyzed to provide a simple explanation of the need for and results of commissioning.
3. Develop or assist in the development of educational programs for owners, architects, consultants, and contractors to facilitate their participation in the

process. The Building Commissioning Association and PECEI have several committees working in this subject area

4. Develop a series of commissioning related Guidelines and User Manuals. Initial efforts to provide added guidelines were rejected by the ASHRAE Board of Directors. These efforts should be redefined and new publications developed.

A. The following existing guidelines should be completed or revised to complement Guideline 0:

Guideline 1. HVAC&R Technical Requirements for The Commissioning Process

Guideline 4 Preparation of Building Systems Manuals and O&M Documentation for HVAC&R Building Systems Commissioning (Revision of present guideline 4)

Guideline 5 Technical Requirements for Commissioning Smoke Exhaust Systems (Revision of present guideline 5) Technical Committee 5.6 has agreed to facilitate this upgrade.

B. The following new guidelines should be developed:

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

Guideline 1.3 Training for Building Operation and Maintenance for the HVAC&R Commissioning Process

C. A user manual for Guideline 0 should be requested immediately .

D. User manuals should be developed for: Commissioning Building HVAC&R Controls Systems, Commissioning of Medical and Laboratory Facility HVAC&R Systems, Commissioning for the LEED[™] Program, Commissioning of Kitchen and Laboratory Exhaust Systems

5. Develop a composite basic skill set needed to provide the commissioning process, and develop a related set of training requirements to facilitate the training of commissioning process 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. These programs should be analyzed and supplemented. This should also include quality and integrity issues and interrelationships with other professionals.
6. Assist in the development of college level training in commissioning for

architectural, engineering and technician programs.

7. Work with the engineering and architectural licensing boards to include commissioning knowledge in the license exam.

| TC 7.9 PROGRAM SCHEDULE (3/02/05) | | | | | Status | | |
|-----------------------------------|----------|---|-------------------------------|--|--------------------------|--------------------------|--------------------------|
| City | Type | Title | Chairman | Speakers | Abstract Complete | Paper Complete | Paper Approved |
| Orlando 2/05/05 to 2/09/05 | Seminar | Proper application of building component factors of table #2 for 62.1 design | Rich Rose | Dan Int-hout Eli Howard Jerry Kettler Larry Fisher | | | Complete |
| Orlando 2/05/05 to 2/09/05 | Seminar | Training Cx Agents | Gerry Kettler | Jeff Traylor Charlie Culp Andy Hoiro Rick Casault | | | Complete |
| Denver, CO 6/25/05 to 6/29/05 | Seminar | Cx of DDC Systems | Rodney Lewis | Ken Gillespie Larry Fisher Ken Peet Jerry Kettler / J. Santos | | | |
| Denver, CO 6/25/05 to 6/29/05 | Forum | Member input for TC 7.9 Cx Handbook | Charlie Culp Session #4288 | | | | |
| Denver, CO 6/25/05 to 6/29/05 | Symposia | High-Tech Facility Cx | Rich Rose Session #4155 | Charles Kieffer Bill McCartney Don Beaty Terry Rodgers | Yes Yes Yes Yes | Yes Yes Yes Yes | Yes Yes Yes Yes |
| Denver, CO 6/25/05 to 6/29/05 | Forum | Guideline #2 | Jerry Kettler | | | | |
| Denver, CO 6/25/05 to 6/29/05 | Seminar | Preventing train wrecks in under floor air distribution systems through Commissioning | Karl Stum Session #4287 | Carl Lawson Scott Nelson Gaylon Richardson Larry Luskay | | | |
| Chicago 1/21/06 to 1/25/06 | Symposia | Cx Quality and Benefits | Rich Rose | Tudi Haasl Dr Wang Shengwei Hiroo Izumiyama Harry Enck | | Yes Yes | |
| Quebec City 6/24/06 to 6/28/06 | Forum | Guideline #3 | Jerry Kettler | | | | |