

**Energy Code Advisory Committee (ECAC)
Commercial Group
Meeting Report No. 19**

Meeting Date: January 7, 2004

Members Present:

Name	Present	Absent
Don Sivigny - Chair	X	
Steve Hernick - Alt. Vice Chair		X
Tim Manz		X
Joseph Ehrlich		X
Richard Hermans		X
Raj Maheshwari	X	
Tom McDougall		X
David Eijadi (alternate to Tom McDougall)		X
Bruce Nelson	X	
Eugene Scales	X	
Tim Sessions	X	
John Smith	X	
Marty Strub		X
Nirmal Jain		X

Others Present:

Name	Present	Absent
Gary Thaden		X
Katie Kolbeck		X
Lloyd West - Masonry Materials		X
Olene Bigelow - International Masonry Inst.		X
Phil Smith (for Bruce Nelson)		X
Rep. Mark Olson		X

Don Sivigny, chairman, called the meeting to order at 7:15 am.

Approval of December 17, 2003 meeting minutes

Don Sivigny asked if there were any corrections to the December 17, 2003 meeting minutes. There were no corrections noted. The meeting minutes were approved with the noted changes.

Old Business

- 02.08 The goal is to develop a simple, easy to use energy code compliance form. Rick Hermans will chair a subcommittee to work on this. Others on the group will include John Smith, Tom McDougall, and possibly representatives from the architects, building officials, and lighting design.

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- 02.09 Minnesota adopted a single Section 1300 Administrative section of code rather than the International Code's Administrative sections because each of the International codes has different Administrative sections. This was done for consistency sake. A part of the review of the energy code is to be sure that it fits with the Section 1300 Administrative Codes.
- 03.02 There was further discussion of system efficiency versus unit equipment efficiency. There may be some logic to allow the design engineer to perform an overall system energy efficiency comparison as opposed to only evaluating the efficiency of a particular piece of equipment in a system.
- 03.04 There should be differences in equipment efficiency allowed due to climatic conditions. An example would be a clear water chiller efficiency rating for warm climates and a glycol water solution chiller efficiency for northern climates.
- 03.07 There was discussion of the Administrative aspects of the energy code. Comments included:
- A. The ASHRAE Administrative provisions get more specific than Chapter 1300 of the State code. The ASHRAE provisions could be maintained as a part of the final document because their purpose and scope do not conflict with Chapter 1300.
 - B. Paragraph 4.33 of the State Building code allows for supplemental information to be requested by the building official, if necessary.
 - C. Chapter 1300 has no requirements for "U" values to be included with construction documents.
 - D. By adopting reference documents, the requirements of those documents become a part of the Code.
- 03.13 The residential code group is planning on developing a homeowner's maintenance list after the code has been reviewed. The commercial committee may want to consider similar.
- 04.03 The Administration portion of the Standard is in Section 4, and starts on page 15. Don Sivigny noted that Section 4.1.2.3 defines changes in space conditioning. Don will review the impact of this statement and how it relates to the IBC/IRC requirements. It may be a good idea to add a statement to the Code that integrates definitions of changes in space conditioning from other codes and standards. The most restrictive definition would apply. Minnesota Code chapter 7676.1400 subpart 4 already requires that buildings be brought up to the current code requirements if the usage changes.
- 04.04 The developed code is to be no less stringent than Standard 90.1 by Federal mandate.
- 04.05 There is a concern that Section 4.1.2, which deals with existing buildings, may require looking at ASHRAE 90.1, the Energy Code, IBC, and Minnesota Conservation Code (MCC) for Existing Buildings Chapter 1311. Additions are required to meet the new energy code, renovations have exceptions. The biggest conflict will probably be between ASHRAE 90.1 and IBC.

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- 04.06 The MCC does address tradeoffs in building envelope modifications when remodeling which would not require bringing the walls up to current code requirements.
- 04.10 Tom McDougall presented a comparison of lighting power densities by space type as required in Standard 90.1 - 1989, the current Minnesota Energy Code, and Standard 90.1 - 1999 (which is identical to 90.1 - 2001).
- A. Terms used in the Standards are UPD - unit power density, which can be applied by room area factors, and LPD - lighting power density.
 - B. Standard 90.1 - 1999 deletes the use of the area factor.
 - C. Some lighting levels have gone up from Standard 90.1 - 1989 to 90.1 - 1999. This is due to better research and information on lighting levels that should be provided based on space usage. It is also because the room area factor has been eliminated.
 - D. There are two methods that are acceptable for showing lighting compliance: the space by space method, and the building type method (which is more stringent).
 - E. Training will be needed for lighting designers when the new code is adopted.
 - F. There is no code requirement for daylighting.
 - G. There are credits provided in the Standard 90.1 - 1989 and Minnesota Energy Code for lighting controls. Standard 90.1 - 1999 does not have these credits.
 - H. There are less categories in the Standard 90.1 - 2001.
 - I. We may want to compare Standard 90.1 - 2001 with the California Title 24 requirements.
 - J. There are some spaces that will need to be tested for light levels based on a maximum watts per square foot.
 - K. How to handle high partitions in open offices needs to be reviewed.
 - L. BCAP - Building Code Assistance Program - we may want to check what research is being done to verify watt densities versus light levels.
 - M. Daylighting has a higher lumen per watt output per unit of heat to the space than does lights.
- 5.01 DOE is proposing changes to IECC 2003, but not ASHRAE Standard 90.1. Once we get through Standard 90.1, we will want to look at the DOE proposed amendments to IECC 2003 to be sure there is consistency with 90.1.

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- 7.02 When we review Sections 7 and 8, we will need to review DOE issues as well. When we get to Section 6, refer to the user's manual for a better understanding of the information.
- 9.04 In reviewing Tables B19 and B22, it was noted that there are inconsistencies in building envelope requirements depending upon construction type. The most obvious example of this is roof construction. If the insulation is entirely above the roof, the U value required is 0.063. If there is an attic, the required U value is 0.027. There are numerous other examples where the U value or SHGC are changed depending on zone or exposure. A subcommittee will further review the requirements and make recommendation of changed in the tables to bring more consistency to the requirements. This group will consist of John Smith, Raj Maheshwari, Tim Sessions, Joe Ehrlich and Tom McDougall. This will also require more research into what ASHRAE intended. Craig Conner will be a good resource for information.
- 9.05 Section 5.3.1f: "Rated R value of insulation": ASHRAE definition uses a mean temperature of 75° F. The Minnesota code also adds winter design conditions to cover the characteristic where insulation performance dramatically decreases with a decrease in temperature. This occurs with very low density fiberglass blown-in insulation, where the convective air flow within the insulation becomes a big factor for low ambient conditions. Insulation now has a coverage chart that identifies the thickness required in Minnesota in attics to allow for this. The deterioration in insulating factor starts to occur for outdoor air temperatures below about 20° F. We also need to refer to an ASTM standard on insulation performance. Bruce Nelson will work on this.
- 10.01 There was discussion of how to determine the requirements for common systems in multi-family dwellings. For example, the residential code does not require insulating plumbing piping, whereas the commercial code does. There is a need to more clearly define residential and commercial buildings. There also needs for consistency in the codes between 1 and 2 family buildings and multi-family buildings. The commercial committee needs to develop a better definition of a residential and commercial buildings for review.
- 10.02 There are two items to be concerned with when trying to define whether a building is residential or commercial. These are the building envelope requirements and the mechanical systems requirements. One possible method of clarifying the definition of a building is that it is residential if the mechanical systems serve only the individual unit, but commercial if the mechanical systems are centrally located.
- 10.03 If one abandons the overall building U value requirements and requires prescriptive compliance, then it is more easy to determine the building envelope requirements.
- 10.04 Where there is an assembly of common elements in a building that includes residential and commercial spaces, then those elements should be built to the most restrictive. This needs to be determines for the envelope requirements as well as mechanical systems efficiency requirements. Included would be the requirements for makeup air systems in "commercial" residential construction.

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- 10.05 We may want to review how Wisconsin handles combination residential/commercial buildings.
- 12.01 The current energy code required a vapor retarder with a perm rating of 1 or less. If polyethylene film is used, it needs to be equivalent to 4 mil thickness. It was noted that 4 mil poly has a perm rating of 0.08, which is 12.5 times greater than the stated code requirement. It appears that this requirement has to do with the material strength requirements more than perm rating. This needs further clarification, and the code should be clear if this is the case. This also needs to be discussed in the future with the residential committee. A statistic stated was that 90% of wall moisture problems are from the outside, so the 1 perm rating may be sufficient for the intended purpose. It was recommended that the handout on insulation and vapor permeance that was prepared by the Building Science Corp. be reviewed (this was handed out in the first meeting, or is downloadable from the codes division web site). The definition of vapor retarder in the DOE proposal and IBC should also be reviewed (if there is one).
- 12.02 The question was raised if the codes should require bathroom exhaust fans regardless of whether or not the bathroom has exterior windows. This requirement would be because of durability issues. This may be a suggestion to the building code committee.
- 13.02 There was a general discussion about whether the mechanical code and energy code were being written from a “building as a system” perspective to work with other parts of the building code. Members of the mechanical code advisory committee indicated this was the case. The proposed new mechanical code rules will be published in the October 6 State Register (available online at: http://www.comm.media.state.mn.us/bookstore/state_register.asp), with adoption of the new code expected in early 2004.
- 14.01 5.5.3.1 and 5.5.3.2: These sections are tabled for now and will be discussed in the future.
- 15.07 Tim Manz will talk to Kelly about sending out information to help in writing SONARS. Things to keep in mind when writing them are: (11/19/2003: Information was sent)
- A. Identify why the change is needed.
 - B. Identify the reasonableness of the change
 - C. If the item is in a current code, identify this.
- 16.03 Colleen Chirhart joined the meeting to give an overview of writing SONARS.
- A. Each SONAR needs to be accompanied by a Rule Change Request Form. This form has been sent out by Kelly Denno.
 - B. When justifying cost impacts of a proposed rules change, you need to be reasonable as to how many people the change affects.

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- C. Any documents that you feel are relevant to the SONAR can be attached, but do not overwhelm the SONAR with information.
- D. Address what the impact of the SONAR is to the directly affected community, rather than the indirectly affected community.
- E. If we can address the cost benefit analysis of the SONAR, this should be acceptable.
- F. Redefining a term should have no cost implications, as it clarifies. (There may be cost savings in saved time by avoiding having to define terms for end users).
- G. If there are no cost implications, this should be identified in the SONAR.
- H. An incorporation by reference into the rules needs to have a SONAR, even if it is adding or deleting the reference.
- I. In writing SONARS, if the current rule is more stringent than the ASHRAE requirements, this needs to be addressed. An example would be more stringent insulation values.

17.01 Gene Scales handed out two reports – “Energy Conservation Strategies for Air Supported Structures” and “Energy Conservation Opportunities for Greenhouse Structures”. These reports helped to form the basis of proposed energy code changes for greenhouses and inflatable structures. The current energy code requires that energy saving features that have a simple payback of less than 10 years be implemented into these types of structures. The desire is to be more specific on required features that have been shown to have less than a 10 year payback.

17.02 Greenhouses use about 90% of their energy for space and infiltration heating. Inflatable structures use about 75% of their energy for the same purpose. Inflatable structures typically use oversized fans and heaters to quickly inflate the structure and heat them up. These structures can be reset to the outdoor air conditions when not in use, and brought up to temperature very quickly. The pressure in the structure can be adjusted between about 0.75 inches static pressure (calm wind conditions) to 1.25 inches static pressure (windy conditions) by using wind sensors. They constantly leak air, so must be provided with makeup air. If a hole develops, they are typically repaired with a piece of fabric glued in place.

17.03 Recommended energy code requirements for inflatable structures are:

- A. Temperature setback
- B. Pressure control
- C. Envelope insulation. Insulating to an R-11 is typical for these structures. The problem with the insulated structures is they are difficult to take down. An exception to the

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insulating requirements would be to not require it for structures that are taken down in the summer. There was much discussion about this, and a large percentage of the energy consumption of these structures is for heating them in the winter.

D. Maintain envelope structural seal integrity. This would help to minimize the air leakage, with the resultant reduction in makeup air volume required to maintain inflation in the structure.

17.04 Currently, not many of the inflatable structures are air conditioned in the summer. There appears to be a growing trend toward this, however.

17.05 A definition of a “permanent structure” may be required to be sure that the inflatable structures are covered by the energy code, and not excluded because some people may define them as temporary structures. Joe Ehrlich will do some research into the existing codes on this topic.

17.06 Greenhouses are commonly built out of poly wrapped around posts. Recommended energy code requirements for greenhouses are the following. It should be noted that the intent is not to modify the usage of temporary greenhouses that would typically be built in store parking lots, for example, during the spring season.

A. Heating systems having power vented or separated combustion.

B. Envelope with two ply coverings.

C. Temporary wall insulation on north and east sides.

D. Exterior coverings or interior thermal blankets that reduce nighttime heat radiation through the roof.

E. Temperature setback controls. Exception: Crops that require constant temperatures.

17.07 Rule Change Request C-1 was reviewed. The recommendation was to delete the wording “(see Appendix E)” completely from the ASHRAE document rather than modifying it. The reason for this revision is that Appendix E will be a part of the code, but is not to be construed as listing the only industry accepted practices.

17.10 Rule Change Request C-5 was reviewed. Recommendation is to rework to clarify when roof additional roof insulation required when repairs are made.

17.11 Rule Change Request C-6 was reviewed. Recommendation is to review definition of “interior wall finish.”

18.01 John Smith handed out a copy of ASTM Standard D4397-96, entitled “Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.” This standard is what the industry refers to in the manufacture of polyethylene sheeting. Currently,

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the Minnesota Energy Code calls for vapor retarders to have a maximum perm rating of 1.0, and also states “Polyethylene material which is used to meet the requirements of this subpart must either be designed to have a minimum thickness of four mills...” Four mill polyethylene performs 12.5 better than the required perm rating, so the impression is that the requirement for being equal to 4 mill polyethylene is for tear resistance. Bruce Nelson verified this. The ASTM standard deals with the tear resistance of polyethylene.

- 18.03 Rule Change Request C-5 revised 12/17/2003 was reviewed. There was much discussion on when the roof membrane repairs would require upgrading the roof. The current Minnesota Energy Code allows repair of up to 50% of the roof membrane without requiring upgrading. The “Statement of Need” and “Statement of Reasonableness” descriptions need to be reversed. The exceptions for R-16 and R-10 existing insulation need to become exception “h”. Add a statement if there is existing insulation below the deck.
- 18.04 Rule Change Request C-6 revised 12/17/2003 was reviewed. Rework the description of wall cavity. The “Statement of Need” and “Statement of Reasonableness” descriptions need to be reversed. Rework the two “Statements”.
- 18.07 6.2.5.2 Manuals: There was much discussion on the requirements of this section, and the discussion will be continued at the next meeting.

NEW BUSINESS

- 19.01 The presentation by Rick Hermans on commissioning will be delayed until next meeting.
- 19.02 Bruce Nelson submitted a revised SONAR C-1, amendment 2. The revision strikes the reference to Appendix E. Motion to approve passed.
- 19.03 Section 6.2.5.2, subparagraph “e” was further reviewed. The consensus was that “A complete narrative of how each system is intended to operated, including suggested set points” would be addressed as a part of the temperature control shop drawings for the project. The only thing that may need to be clarified in those shop drawings to satisfy this requirement is the suggested setpoints. Based on this, the subparagraph was approved as is.
- 19.04 Section 6.2.5.3 System Balancing: This section, with subparagraphs 6.2.5.3.1, 6.2.5.3.2, 6.2.5.3.3, and the exception to 6.2.5.3.3 were accepted as written.
- 19.05 6.2.5.4 System Commissioning: There was much discussion of what “system commissioning” is. It is more comprehensive than just the “HVAC control systems”. It may be more appropriate to name this section “HVAC Controls acceptance testing”. This will be further reviewed at the next meeting.
- 19.06 Section 6.3 Prescriptive Path: This section will be reworked to require economizer cycles similar to what is required in existing Minnesota Energy Code. Bruce Nelson will work on. Each subparagraph was reviewed, with comments listed below.

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- A. 6.3.1(a):Table 6.3.1 does not require economizer cycles for air handling systems with the climatic conditions of Minnesota. This was a surprise to the committee members, and is contrary to the current Minnesota Energy Code, as well as current practice based on good economic value. This will be revised.
- B. 6.3.1(b):OK as is.
- C. 6.3.1(c):OK as is.
- D. 6.3.1(d):OK as is.
- E. 6.3.1(e):Refers to Table 6.3.1 - needs to be modified to be consistent with the revisions to 6.3.1(a).
- F. 6.3.1(f):OK as is.
- G. 6.3.1(g): OK as is.
- H. 6.3.1(h): OK as is.
- I. 6.3.1(i):Refers to Table 6.1.3 - eliminate this item as it does not apply to Minnesota climatic conditions.

19.07 Section 6.3.1.1 Air Economizers: Each subparagraph was reviewed, with comments listed below:

- A. 6.3.1.1.1: Design Capacity: ASHRAE requires 100% airside economizer systems where required on air handling systems, The current Minnesota Energy Code requires 50% minimum economizer capacity on systems between 3,000 and 5,000 cfm, and 85% capacity minimum on systems over 5,000 cfm. This will be further reviewed as a part of the revisions to 6.3. John Smith will research the availability of full economizer cycles on smaller air handling equipment.
- B. 6.3.1.1.2: Control Signal: OK as is including exception.
- C. 6.3.1.1.3 High Limit Shutoff: Will review high limit shutoff points for next meeting.
- D. 6.3.1.1.4: Dampers: OK as is.
- E. 6.3.1.1.5: Relief of Excess Outside Air: OK as is.

19.08 Section 6.3.1.2 Water Economizers: Each subparagraph was reviewed, with comments listed below:

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A. 6.3.1.2.1 Design Capacity: Will be further reviewed as a part of 6.3.

B. 6.3.1.2.2 Maximum Pressure Drop: OK as is.

19.09 Section 6.3.1.3 Integrated Economizer Control: Each subparagraph was reviewed, with comments listed below:

A. 6.3.1.3(a): OK as is.

B. 6.3.1.3(b): Possibly eliminate, based on review of system sizes that will require economizer cycles.

C. 6.3.1.3(c): Does not apply to Minnesota climate - eliminate.

19.10 Pick up at Section 6.3.1.4 next meeting. Also review 6.2.5.4.

Tentative Schedule of 90.1 Sections Review

Tentative schedule of Standard 90.1 - 2001 Sections review:

A. Continue reviewing new SONARS

Ongoing Information

Website to review ASHRAE Standard 90.1: <http://xp20.ashrae.org/frame.asp?standards/std90.html>

Website to review Building Code Assistance Project (BCAP) information: bcap-energy.org

Website for the Consortium for Energy Efficiency (CEE): www.cee1.org.

Website for Energy Star program: www.energystar.gov

Presentations from the DOE conference are posted for downloading at energycodes.gov-proposals.

ASHRAE 90.1 - 2001 Review categories and lead roles:

Building envelope: Tim Sessions and John Smith

Lighting: Tom McDougall and Katy Kolbeck

Equipment Efficiencies: Eugene Scales

Compliance Forms: Richard Hermans (chair), John Smith, Tom McDougall

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SONARs to develop

Meeting 3: Identifying the frost depth zoning as being the same as the climate zones for Minnesota.

Meeting 4: Adopt ASHRAE Table D1 design conditions for listed Minnesota cities, and adopt current Energy Code design conditions for cities not listed in ASHRAE Table D1. **6/18/2003: Bruce Nelson will work on.**

Meeting 5: Greenhouses and inflatable structures: Use current energy code requirements. **6/18/2003: Gene Scales will work on.**

Meeting 7: 7676.1400 Subparagraph 8-C deals with renovation work where the plaster is removed but not the lath, and required insulation be added. This requirement needs to be included in the new energy code. Add this requirement to ASHRAE Standard 90.1, Section 4.1.2.2.1(d). **12/3/2003: John Smith working on – Rule Change Request C-6. Reviewed, and need to modify.**

Meeting 7: 7676.1400 subparagraph 6 includes exceptions for alterations to membrane or built-up roofs. Similar language needs to be added to ASHRAE 90.1, 4.1.2.2.1 (e). **12/3/2003: John Smith working on – Rule Change Request C-5. Reviewed, and need to modify.**

Meeting 8: Amendment to allow the reuse of less energy efficient equipment when an economic analysis indicates that requiring replacement with more efficient equipment would not pay over the lifetime of measure.

Meeting 8: Amendment to include wording of 7676.1400 subparagraph 5 “Penetrations” in the 90.1 standard. **Bruce Nelson will work on.**

Meeting 8: There was much discussion of ASHRAE 90.1 4.1.2.2.1, subparagraph (d) in the difference between “framing” and “furring”. We may need to identify the difference between “framing” and “furring”.

Meeting 8: The recommendation is to change ASHRAE 90.1 4.1.2.2.1 Envelope Alterations, subparagraph (g) to require the replacement of existing fenestration with new code complying fenestration if the area of replacement fenestration exceeds 10% of the total fenestration. Rick Hermans will work on.

Meeting 8: ASHRAE 90.1 section 5.1.1: There is a need to add a vapor barrier requirements reference to the IBC. Vapor barriers are addressed in 1403.3, Vapor Barriers, of the IBC, and also under section 202, “definitions”. **Don Sivigny will work on.**

Meeting 8: ASHRAE 90.1 section 5.1.4 “Envelope Requirements are Specified by Space Conditioning Categories”, the question was raised as to how the code would address a 3 story building with a first floor commercial space and 2 stories of apartments (residential) on top. The feeling was that this building would fall under the commercial code for the commercial space, and the 90.1 residential requirements for the apartments. There is a need to clarify how to determine the requirements of a mixed use development.

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Meeting 9: Building envelope requirement tables: Delete the use of Table B21, place Brainerd under requirements of Table B22.

Meeting 9: Change values of Tables B19 and B22 to provide more consistency and uniformity. Reference which counties are to use which table. Define design conditions to use.

Meeting 9: Address change in attic insulation performance at lower outdoor air conditions. **Bruce Nelson will work on.**

Meeting 9: Table 5.3.1.1A is an exception to Table 5.3, which applies only for single rafter roofs. This table conflicts with Table 5.3. The recommendation is to delete Table 5.3.1.1A completely. 5.3.1.1c needs to be reprinted completely, with the deleted exception to 5.3.1.1 because it does not apply to Minnesota because Minnesota heating degree days exceeds 3600.

Meeting 9: Section 5.3.1.5 discusses slab on grade insulation. It needs to be clarified how to measure the required insulation depth.

Meeting 10: 5.5.1.2: Substantial contact: There is a need to change “inside surface” to “air barrier surface”. This is in the current energy code. An air barrier surface is different for different types of insulation. For example, for fiberglass batts, the air barrier surface would be the inside surface of the indoor wall. However, for foamed in place foam insulation, the air barrier is the surface of the insulation located on the indoor side, even if the insulation is not in full contact with the inside surface of the indoor wall material. Once this is clarified, the exception becomes “a”.

Meeting 10: 5.5.1.3: There was discussion of pipes and ducts located in walls and ceilings, which may be interpreted as unconditioned spaces. Uninsulated pipes in outside walls can sweat if the pipes are carrying cold water. Waste and vent pipes in outside walls probably would not be a problem. A clarification of exceptions for pipes and ducts located in outside walls needs to be written.

Meeting 11: 5.5.3.2: Exception (c): This exception has expired. **Raj Maheswari will write SONAR to delete.**

Meeting 13: 6.6.2 Load Calculations: The paragraph will be modified to specifically reference the ASHRAE Handbook of Fundamentals, with no specific edition identified. **Tim Manz will do.**

Meeting 13: 6.2.3.2.2 Setback Controls: Both the heating system and cooling system paragraphs will be simplified to remove the conditional statements (thereby applying the cooling system requirement to Minnesota) as well as removing the unnecessary references to Appendix D. **Bruce Nelson will do.**

Meeting 14: 6.2.2 Load Calculations: Delete “acceptable to the adopting authority.” Delete “(for example, ASHRAE Handbook - Fundamentals).”

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Meeting 14: 6.2.3.2.3 Optimum Start Controls: There were concerns expressed that this paragraph is not clear if it is dealing with the total systems capacity for multiple individual systems serving a single space, or the capacity of the individual systems. It needs to be clarified what is meant by the word “system” and Multiple fans. Two fans supplying into a single duct would be a “system”. Two air handling units serving a large space is two systems if the supply ducts are not joined together. **John Smith will write a SONAR to clarify this.**

Meeting 14: 6.2.3.2.4 Zone Isolation: Zones should also meet the requirements of 6.2.3.2.1 Automatic Shutdown and 6.2.3.2.2. Setback Controls. **Eugene Scales will write SONAR.**

Meeting 14: Meeting 14: 6.2.3.8: Ventilation Controls for High Occupancy Areas: Need to amend reference to ASHRAE Standard 62 to include Addenda N, which has now been approved. Do a similar appendix as Appendix F on page 167 for Standard 62. After “100 people per 1000 ft2 shall include” insert “demand control or other means”.

Meeting 15:Section 6.2.4.1.1b Insulation - General: Strike the words “located outside the conditioned space”. A vapor retarder is important in or outside of the conditioned space. **Bruce Nelson will write this SONAR. 12/3/2003: Part of Rule Change Request C-1. Reviewed, and revisions need to be made.**

Meeting 15:Section 6.2.4.1.2 Duct and Plenum Insulation:

- B. The code needs to clearly state that the duct insulation must be independent of the building envelope insulation. This is identified in the notes for the Mechanical Code requirements.

Meeting 15:Section 6.2.4.1.3 Piping Insulation:

- A. Review of Table 6.2.4.1.3, Minimum Pipe Insulation Thickness: The proposed Mechanical Code reflects the pipe insulation thicknesses required in the current Minnesota Energy Code. The ASHRAE 90.1 requirements are slightly less stringent in some cases than the proposed mechanical code. To avoid confusion, the recommendation was that the ASHRAE table should be amended to reflect what is being proposed for the Minnesota Mechanical Code 1204.2 (and currently in the existing energy code.) Bruce Nelson will work on this. 12/3/2003: This may become Rules Change Request C-3. **12/17/2003: Part of Change C-3. Reviewed revised proposal and approved.**
- B. Because the proposed Minnesota Mechanical Code does not address plumbing piping insulation, Table 6.2.4.1.3 for domestic and service hot water systems should be used. This will be addressed under Section 7.2.3. We also need to check with the Minnesota Health Department plumbing code to see if it addresses domestic water piping insulation. **12/3/2003: No longer an issue based on using the ASHRAE Tables for pipe insulation thicknesses.**

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- C. Minnesota Mechanical Code 1204.2 needs to have the following paragraph added to the insulation thickness table, which is a statement from the current Minnesota Energy Code, subparagraph 17 D:

“E. For applications with fluid temperatures at 32 degrees Fahrenheit and below, the designer shall consider additional insulation with vapor retarder to prevent condensation.” There was discussion of how this would affect wicking styles of pipe insulation that are being marketed for chilled water systems. This should be addressed. 12/3/2003: Request from Tim Manz to change 32 to 40 to match the proposed Mechanical Code. **12/17/2003: Temperature was changed back to 32 F.**

Meeting 15: The footnote of the proposed Mechanical Code 603.8 should be changed to the following revised paragraph from ASHRAE 90.1 6.2.4.2.2: “Representative sections totaling no less than 25% of the total installed duct area for the designated pressure class shall be tested. Duct systems with pressure ratings in excess of 3 in. w.c. shall be identified in the construction documents.”

Meeting 16: There was much discussion of where the insulating values for piping belong - in the energy code or mechanical code. The final recommendation was that the Mechanical Code tables would be adjusted to match the ASHRAE 90.1 tables in 6.2.4.1.3. While this relaxes some insulation requirements, it helps to avoid confusion between the two codes. At a later date, the requirements can be increased. It was also noted that this addresses the domestic water piping insulation requirements, which is not covered in the Mechanical Code but is covered in ASHRAE. There is nothing in the Plumbing Code requiring domestic water piping insulation, except for freeze protection. Additional recommendations for table 6.2.4.1.3:

- A. Delete footnote “b” from the table.
- B. Delete footnote “d” from the table and use current language in the Mechanical Code.
- C. Allow footnote “c”.

12/3/2003: Need to check with Tim Manz to verify that revisions have been made to the proposed Mechanical Code. **12/17/2003: Changed have been incorporated into Change C-3 which was reviewed and approved.**

Meeting 19: Section 6.3 Prescriptive Path: This section will be reworked to require economizer cycles similar to what is required in existing Minnesota Energy Code. Bruce Nelson will work on.

Meeting 19: Section 6.3.1.1 Air Economizers: Each subparagraph was reviewed, with comments listed below:

- A. 6.3.1.1.1: Design Capacity: ASHRAE requires 100% airside economizer systems where required on air handling systems, The current Minnesota Energy Code requires 50% minimum economizer capacity on systems between 3,000 and 5,000 cfm, and 85% capacity minimum on systems over 5,000 cfm. This will be further reviewed as a part of the revisions to 6.3. John

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Smith will research the availability of full economizer cycles on smaller air handling equipment.

Code change tracking form

Don Sivigny will keep form up to date. The form will have information presented in three colors:

Blue: original proposal of rule change

Red: Changes to proposal

Green: Go with changes

Modified format:

Track 1: Original SONAR submittal. Only one track 1.

Track 2: Proposed changes to original SONAR submittal. There can be multiple Track 2's, as the SONAR is modified.

Track 3: The final version of the SONAR. There is only one Track 3.

Adjourn. The meeting adjourned at 10:00 a.m.

If you cannot make a future meeting and know it, please notify either Don Sivigny or Steve Hernick so that they can take this into account when developing the meeting agenda.

The next regular Commercial meeting is Wednesday, January 21, 2004, from 7:00 a.m. to 10:00 a.m. in the Building Codes and Standards Division Conference Room, 408 Metro Square Building, 121 7th Place East, St. Paul, MN.

Provider of donuts and rolls for next meeting: Gene Scales