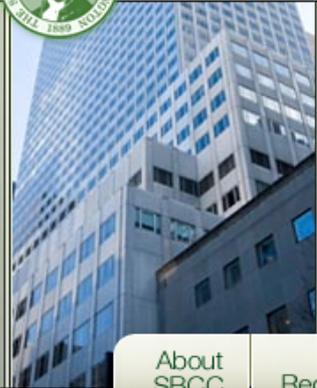




search



- About SBCC
- State Codes, Regulations & Guidelines
- Resources
- Answers & Interpretations
- Technical Advisory Groups
- Meeting Schedules & Agendas

### Code News

On November 12, 2009 the Council completed adoption of the 2009 International Building, Residential, Mechanical and Fire Codes and the 2009 Uniform Plumbing Code. These codes, with state

 [Ask us a question >](#)

### Upcoming Meetings

- 03/11/2010 | MVE Committee [\(agenda\)](#) | SeaTac City Hall 9 a.m.
- 03/12/2010 | Council Meeting [\(agenda\)](#) | SeaTac City Hall 10 a.m.

The State Building Code Council is a state agency created by the legislature to provide independent analysis and objective advice to the legislature and the Governor's Office on state building code issues. The Council establishes the minimum building, mechanical, fire, plumbing and energy code requirements necessary to promote the health, safety and welfare of the people of the state of Washington, by reviewing, developing and adopting the state building code.

# 2009 Washington State Non-Residential Energy Code

*Scott Rushing, PE, LEED® AP - Rushing Company*  
*Lisa Rosenow, CSBA, LEED® AP – NEEC*



# Mechanical Systems

## *Agenda*

- **Changes in NREC Chapter 11**
- **Changes in NREC Chapter 14**
- **Review of new RS-29 format**
- **Q&A**

# General Comments

- This presentation does not list or reflect all changes in the 2009 WSEC.
- Code sections as presented may have portions excluded for clarity during presentation.
- The code sections presented are intended to highlight select code revisions only.
- It is recommended to go to the State Building Code Council website to download the new code in order to reference the entire detail.
- [www.sbcc.wa.gov](http://www.sbcc.wa.gov)

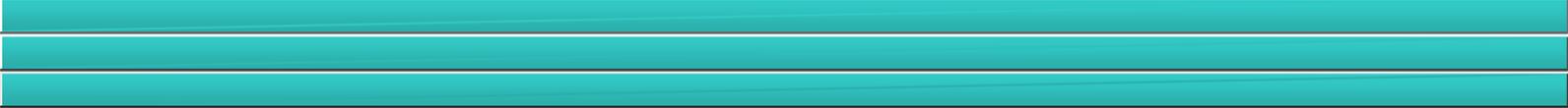
# General Comments

- “Official” interpretations of Energy Code content are made only by the SBCC in response to questions submitted by building officials.
- Interpretations are available at the SBCC website. Check it out.
- Please download the new code in order to reference all details of each particular section you are interested in.
- [www.sbcc.wa.gov](http://www.sbcc.wa.gov)

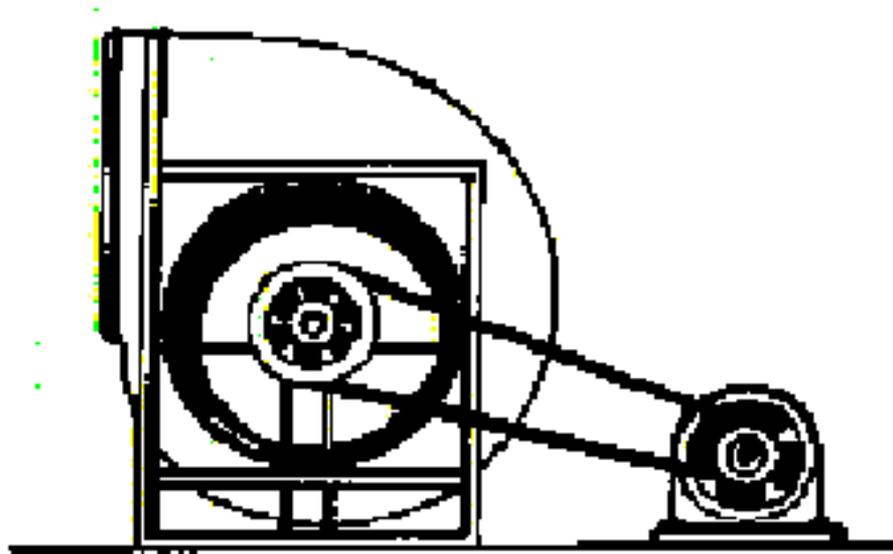
# Ch. 1 Administration & Enforcement

- One- and Two-Family Dwellings are to comply with Chapters 1 to 10.
- All other multifamily projects are to comply with Chapters 11 through 20.
- **101.3 Scope**
  - Spaces within the scope of Section R101.2 of the International Residential Code shall comply with Chapters 1 through 10 of this Code. All other spaces, including other Group R Occupancies, shall comply with Chapters 11 through 20 of this Code. Chapter 2, 7 and 10 are applicable to all building types.
- ***Refer to new definition of Multi-Family Residential under Section 201 General Definitions.***

# 2009 WSEC TAG Meetings



# *Mechanical Requirements*



# Ch. 11 Administration & Enforcement

- **1120 Scope (Revised)**

- This Code sets forth minimum requirements for the design **and commissioning** of new or altered buildings ...for public assembly, educational, business, mercantile, institutional, storage, factory, industrial, **and multifamily residential** occupancies ....

# Ch. 11 Administration & Enforcement

- **1135 Commissioning (New)**

- Commissioning in compliance with Sections 1416 and 1513.8 shall be required for new systems or modified portions of systems, with a heating capacity of 600,000 Btu/h or a cooling capacity of 40 tons or more.

*Comment: Commissioning requirements for existing systems are now specified.*

# Administration & Enforcement

- **1141.5 Commissioning Details/Specifications (New)**

- **When required by the building official**, include a list of the functional tests required to comply with commissioning in accordance with Sections 1416 and 1513.8 (mechanical and electrical commissioning requirements) as well as the name of the commissioning agent for buildings over 50,000 square feet.

*Comment: This applies only “when required by the building official.”*

# HVAC Equipment Performance

- **1411.1 General (Revised)**

- **For equipment not within the scope of Efficiency Tables 14-1A through 14-1G, this Code does not contain any minimum efficiency requirements.** However, for any claims of efficiency of this equipment, such as for RS-29 calculations, data shall be furnished by the equipment manufacturer consisting of a complete report from a test performed by an independent laboratory accredited by a nationally recognized accreditation organization.

# HVAC Equipment Performance

## ● 1411.1 General (Revised)

- Chilled water plants and buildings with **more than 500 tons** total capacity **shall not have more than 100 tons provided by air-cooled chillers.**
- EXCEPTIONS:
  1. Where the designer demonstrates that the water quality at the building site fails to meet manufacturer's specifications for the use of water-cooled equipment.
  2. Air-cooled chillers **with minimum efficiencies at least 10 percent higher** than those listed in Table 14-1C.
  3. Replacement of existing equipment.

***Comment: This essentially requires high efficiency air cooled chillers.***

# HVAC Equipment Performance

- **1411.2.1 Water-Cooled Centrifugal Water-Chilling Packages at Non-Standard Operating Conditions (NEW)**
  - Water-cooled centrifugal water-chilling packages **that are not designed for** operation at AHRI Standard 550/590 test conditions reflected in Table 14-1C (44°F leaving chilled-water temperature and 85°F entering condenser water temperature with 3 gpm/ton condenser water flow) shall have maximum full-load kW/ton and NPLV ratings adjusted using Equation 14-1.

***Comment: Water cooled centrifugals now have efficiency criteria for actual design operating conditions. This is appropriate since centrifugal chillers are typically customized / optimized for the design conditions.***

# Controls

- **1412.4 Setback and Shut-Off – Hotel/Motel (New)**
  - For hotel and motel guest rooms, a minimum of one of the following control technologies shall be required in hotels/motels with over 50 guest rooms such that the space temperature would automatically setback (winter) or set up (summer) by no less than 5° F when the occupant is not in the room:
    1. Controls that are activated by the room occupant via the primary room access method - key, card, deadbolt, etc.
    2. Occupancy sensor controls that are activated by the occupant's presence in the room.

# Controls

## ● 1412.4.1 Dampers (Revised)

- Outside air intakes, exhaust outlets and relief outlets serving conditioned spaces shall be equipped with motorized dampers.....
- Exception 3: Gravity (nonmotorized) relief dampers are acceptable **in equipment with less than 5,000 cfm total supply flow** when in buildings less than 3 stories in height.

### *Previously in WSEC 2006:*

- *acceptable in buildings less than three stories in height.*
- *acceptable in exhaust and relief outlets in the first story and levels below the first story of buildings three or more stories in height.*

# Controls

- **1412.4.1.1 Damper Controls: (New)**

- Classrooms, gyms, auditoriums and conference rooms larger than 500 square feet of floor area **shall have occupancy sensor control** that will either close outside air dampers or turn off serving equipment when the space is unoccupied except where equipped with another means to automatically reduce outside air intake below design rates when spaces are partially occupied.

# Controls

- **1412.4.1.2 Optimum Start Controls (Revised)**

- Heating and cooling systems with design supply air capacities exceeding 2,000 cfm shall have optimum start controls. *(Threshold reduced from 10,000 cfm.)*

- **1412.5 Heat Pump Controls: (Revised)**

- Heat pumps equipped with supplementary heaters shall be installed with controls that prevent supplemental heater operation above 40°F.

# Controls

- **1412.8 Ventilation Controls for High-Occupancy Areas**

- Demand control ventilation (DCV) is required for spaces that are larger than 500 SF, have an occupant density for ventilation of greater than 25 people per 1000 SF of floor area (**reduced from 40 people**), (based on the Default Occupant Density column of Table 403.3 of the Washington State Mechanical Code) .....
- EXCEPTIONS:
  2. **Spaces** with a combined design outdoor airflow less than 1000 cfm.

***Comment: 2006 WSEC said “systems” as opposed to “spaces”.***

# Controls

- **1412.9 Enclosed Loading Dock and Parking Garage Exhaust Ventilation System Control: (New)**
  - Gas sensor controllers used to activate the exhaust ventilation system shall **stage or modulate** fan speed upon detection of specified gas levels.
  - Garages and loading docks used predominantly by gasoline-powered vehicles shall be equipped with a controller and **a full array of carbon monoxide (CO) sensors** set to maintain levels of carbon monoxide below 35 parts per million (ppm). Spacing and location of the sensors shall be installed in accordance with manufacturer recommendations.
  - A parking garage ventilation system having a total design capacity **under 8,000 cfm** may use a time clock or occupant sensors.

# Economizers

- **1413.1 Economizer Operation – Waterside (Revised)**
  - Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 50° F dry-bulb (*changed from 45° F*) and 45° F wet-bulb (*changed from 40° F*) and below.

***Comment: This should significantly increase equipment sizing for waterside economizer compliance.***

# Duct Sealing and Testing

- **1414.1.2 Low Pressure Duct Leak Test (Revised)**

- Applies to duct systems with ½ to 3 inches static pressure.
- Testing required if:
  1. Is connected to a constant volume, single zone, air conditioner, heat pump or furnace; and
  2. Serves less than 5,000 square feet of floor area; and
  3. Has more than 25 percent duct surface area located in any unconditioned space.

***Comment: Will not effect many systems. Most systems have more than 25% of surface area within conditioned space.***

# Duct Sealing and Testing

- **1414.1.3 High Pressure Duct Leak Test (New)**
  - Applies to duct systems **above 3 inches** static pressure.
  - High pressure duct systems shall be identified on the drawings.
  - Representative sections totaling no less than 25% of the total installed high pressure duct area shall be tested.
  - Both low and high pressure duct systems shall have leakage rate confirmed through field verification and diagnostic testing in accordance with SMACNA Duct Leakage Test Procedures (1985).

***Comment: Only systems classified for over 3" need testing (25% of the system surface area).***

# Commissioning and Completion

Entire section 1416 has been replaced with new Code language.

- **1416.1 General**

- Drawing notes or specifications shall require commissioning and completion requirements in accordance with this section.

*Comment: More detail and standard good practice criteria are spelled out.*

# Commissioning and Completion

- **1416.4 Commissioning Compliance Form (New):**
  - A commissioning compliance checklist shall be submitted to the building official upon substantial completion of the building.
  - The checklist shall be completed and signed by the building owner or owner's representative.

***Comment: This provides a reliable compliance deliverable and requires that the contractor / close out team goes on record as having completed all criteria.***

# 1416.4 Commissioning Compliance Form

<b>Project Information</b>	<p><b>Project Name:</b></p> <hr/> <p><b>Project Address:</b></p> <hr/> <p><b>Commissioning Authority:</b></p> <hr/>
<b>Commissioning Plan (Section 1416.3.1)</b>	<p><input type="checkbox"/> <b>Commissioning Plan was used during construction and included items below</b></p> <ul style="list-style-type: none"> <li>• A written schedule including Systems Testing and Balancing, Functional Testing, and Supporting Documentation</li> <li>• Roles and Responsibilities of the commissioning team</li> <li>• Functional Test procedures and forms</li> </ul>
<b>Systems Balancing (Section 1416.3.2)</b>	<p><input type="checkbox"/> <b>Systems Balancing has been completed</b></p> <ul style="list-style-type: none"> <li>• Air and Hydronic systems are proportionately balanced in a manner to first minimize throttling losses</li> <li>• Test ports are provided on each pump for measuring pressure across the pump.</li> </ul>
<b>Functional Testing (Section 1416.3.3)</b>	<p><input type="checkbox"/> <b>HVAC Systems Functional Testing has been completed (Section 1416.3.3)</b> HVAC systems have been tested to ensure that equipment, components, and sub-systems are installed, calibrated, adjusted and operate in accordance with approved plans and specifications</p> <p><input type="checkbox"/> <b>HVAC Controls Functional Testing has been completed (Section 1416.3.3)</b> HVAC controls have been tested to ensure that control devices are calibrated, adjusted and operate properly. Sequences of operation have been functionally tested to ensure they operate in accordance with approved plans and specifications</p> <p><input type="checkbox"/> <b>Lighting Controls Functional Testing has been completed (Section 1513.7)</b> Lighting controls have been tested to ensure that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications</p>
<b>Supporting Documents (Section 1416.3.4)</b>	<p><input type="checkbox"/> <b>Systems documentation, record documents and training have been completed or are scheduled</b></p> <ul style="list-style-type: none"> <li>• System documentation has been provided to the owner or scheduled date: _____</li> <li>• Record documents have been submitted to owner or scheduled date: _____</li> <li>• Training has been completed or scheduled date: _____</li> </ul>
<b>Commissioning Report (Section 1416.3.5)</b>	<p><input type="checkbox"/> <b>Commissioning Report submitted to Owner and includes items below</b></p> <ul style="list-style-type: none"> <li>• Completed Functional Tests documentation</li> <li>• Deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction</li> <li>• Deferred tests, which cannot be performed at the time of report preparation due to climatic conditions or other circumstances beyond control of Commissioning Authority.</li> </ul>
<b>Certification</b>	<p><input type="checkbox"/> I hereby certify that all requirements for Commissioning have been completed in accordance with Washington State Energy Codes, including all items above.</p> <p>_____</p> <p>Building Owner or Owner's Representative <span style="float: right;">Date</span></p>

# Simple Systems

\*per gross conditioned floor area

- **1421 / 1421.1 System Type & Sizing Limits (Revised)**

- Changes to the qualifying criteria include:
  - » Air cooled, constant volume packaged equipment with **cooling capacity of 135,000 Btu/h or less.**
  - » Heating only systems which have a capacity of less than **1,000 cfm (reduced from 5,000 cfm)** or which have a minimum outside air supply of less than **30% (reduced from 70%)** of the total air circulation.
  - » The combined airflow rate of all simple systems serving single rooms must be less than 10,000 cfm or they do not qualify as simple systems.
- System Sizing Limits (No additional safety factor allowed):
  - » Space heating output limit = 10 Btu/h per SF\*
  - » Space cooling limit = 15 Btu/h per SF\*

# Economizers

- **1424 Simple System Economizers (Revised)**

- Air economizers meeting the requirements of Section 1413 shall be provided on all new systems, including those serving computer server rooms, electronic equipment, radio equipment, and telephone switchgear.
- EXCEPTION: Equipment complying with one of the exceptions to Section 1433.

***Comment: Economizer requirements are now the same as those for complex systems. There are now far fewer benefits to being classified as “simple systems” than before.***

# Complex Systems

- **1431.2 System Sizing Limits (New)**

- Heating and cooling design loads for the purpose of sizing systems shall be determined in accordance with one of the procedures described in Chapter 29 of Standard RS-1 listed in Chapter 7 or an equivalent computation procedure.
- Interior temperatures criteria:
  - » 70°F for heating and 75°F for cooling, or
  - » Values as specified in the Washington Administrative Code (WAC).
- Building mechanical systems for all buildings which provide space heating and/or space cooling shall be sized **no greater than 150 percent** of the design load as calculated above

# Complex Systems

- **1431.2 System Sizing Limits (New)**

- » For buildings with a total equipment cooling capacity of 300 tons and above, the equipment shall comply with one of the following:
  1. No one unit shall have a cooling capacity of more than  $\frac{2}{3}$  of the total installed cooling equipment capacity;
  2. The equipment shall have a variable speed drive; or
  3. The equipment shall have multiple compressors.
- » EXCEPTIONS: The following limited exemptions from the sizing limit shall be allowed, **however, in all cases heating and/or cooling design load calculations shall be submitted.**

# Controls

- **1432.2.1 Air Systems – Temperature Reset (Revised)**
  - ...Interior zones without an exterior wall load impact and high occupancy areas (per Section 1412.8) shall have maximum airflow sized to meet typical cooling loads with the higher reset air temperature.

***Comment: This is so interior zones with constant loads will not “defeat” reset strategy.***

***There are additional new exceptions.***

# Controls

- **1432.2.2 Hydronic Systems – Temperature Reset**
  - Exception to this criteria is no longer allowed for hydronic systems that use variable flow devices.

# Hydronic Systems

## ● 1432.3.1 Hydronic (Variable) Flow Criteria (New)

- HVAC chilled water, condenser water, and hot water pumping shall be designed for variable fluid flow and shall be capable of reducing pump flow rates to no more than the larger of 50 percent or less of the design flow rate, or the minimum flow required by the equipment manufacturer for proper operation of equipment served by the system....
- Exceptions include:
  1. Heating, chilled, and heat pump water systems that include three or fewer control valves and have a total pump system power less than or equal to 3 hp (2.2 kW).
  2. Systems having a total pump system power less than or equal to 1-1/2 hp (1.1 kW).
  3. Condenser water systems for chillers.

# Hydronic Systems

- **1432.3.1.1 Variable Flow Controls (New)**

- Pump speed control for combined pump motor HP less than or equal to 20 HP and without DDC control of individual coils:
  - » Differential pressure; or
  - » Reset based on zone hydronic demand or other zone indicators; or
  - » Reset based on pump power and differential pressure
- For systems having combined pump motor HP that exceeds 20 HP, or smaller systems with DDC:
  - » Static pressure set point as reset based on the valve requiring the most pressure; or
  - » Directly controlled based on zone hydronic demand.

# Hydronic Systems

- **1432.3.4-5 Equipment Isolation (New)**

- 1432.3.4 Chiller Isolation: When a chilled water plant includes more than one chiller, provisions shall be made so that flow through any chiller is automatically shut off when that chiller is shut off while still maintaining flow through other operating chiller(s).
- 1432.3.5 Boiler Isolation: When a hot water plant includes more than one boiler, provisions shall be made so that flow through any boiler is automatically shut off when that boiler is shut off while still maintaining flow through other operating boiler(s).

# Controls

- **1432.4 Direct Digital Control System Capabilities (New)**
  - Provisions have been added to support energy metering.
  - All complex systems equipped with direct digital control systems and all buildings with total cooling capacity exceeding 780,000 Btu/hr shall have the following capability:
    - » Trending
    - » Demand response setpoint adjustment

# Economizers

- **1433 Economizers (Revised)**

- Exception 1: Qualifying small equipment:

- » For other units with a total less than 33,000 Btu/h (**2006 WSEC: no size limit**)
- » SEER and EER values more than **15%** (**2006 WSEC: 10%**) higher than minimum efficiencies listed in Tables 14-1A, 14-1B and
- » The total capacity of all qualifying small equipment without economizers shall not exceed **72,000 Btu/h** per building, or **5%** of its air economizer capacity, whichever is greater (**2006 WSEC: 480,000 or 20%**).

# Economizers

- **1433 Economizers (Revised exceptions)**

- Exception 2: Chilled Water Terminal Units:
  - » Chilled water terminal units connected to systems with chilled water generation equipment with IPLV values more than 25% (**2006 WSEC: was 10%**) higher than minimum part load efficiencies listed in Table 14-1C,...
- Exception 3: Water-cooled refrigeration equipment
  - » Water-cooled refrigeration equipment serving **chilled beams and chilled ceiling space** cooling systems only which are provided with a water economizer meeting the requirements of Section 1413. Water economizer capacity per building shall not exceed 500 tons...

# Economizers

- **1433 Economizers (New Exceptions)**

- Exception 8: Group R:

- » Cooling units with a total cooling capacity less than 54,000 Btu/h provided that these are high-efficiency cooling equipment with SEER and EER values more than 15% higher than minimum efficiencies listed in Tables 14-1A, 14-1B and 14-1D.

- Exception 9: Server Rooms:

- » Equipment used to cool any dedicated server room, electronic equipment room.... The total capacity of all systems without economizers shall not exceed 240,000 Btu/h per building or 10% of its air economizer capacity, whichever is greater.

# Economizers

- **1433 Economizers (New Exception)**

- Exception 10: (VRF) Variable Refrigerant Flow Systems:

- » Variable refrigerant flow (VRF) systems, These systems shall also be capable of providing simultaneous heating and cooling operation, where recovered energy from the indoor units operating in one mode can be transferred to one or more indoor units operating in the other mode, and shall serve at least 20% internal and 20% perimeter zones and the outdoor unit shall be at least 65,000 Btu/h in total capacity. Systems utilizing this exception shall have 50% heat recovery effectiveness on the outside air. **This exception shall be limited to buildings of 60,000 square feet and less.**

# Economizers

- **Comment:**

- » **The 2009 WSEC was completed before the performance standard for variable refrigerant flow systems (AHRI 1230) was in place. So there is no efficiency table for VRF systems in the 2009 WSEC.**
- » **Therefore, VRF systems do not qualify for 1433 Economizers exception 1.**
- » **VRF does qualify for exception 10.**
- » **Side note: The Seattle energy code process occurs after the WSEC process and, so, the VRF efficiency table did make it into the Seattle Energy Code.**

# Heat Recovery

## ● 1436.1 Fan Systems

- Fan systems that have a minimum outdoor air capacity of 5,000 cfm or greater shall have a heat recovery system with at least 50% recovery effectiveness.

Note: The “***and minimum outdoor air supply of 70% or greater of the total air circulation***” requirement has been removed.

- Where a single room or space is supplied by multiple units, the aggregate ventilation (cfm) of those units shall be used in applying this requirement.

# Heat Recovery

- **1436.1 Fan Systems**

- New Exceptions:

- 6. Systems that only provide cooling.

- 7. Cooling only air handling units or air conditioning units where the minimum outdoor air is less than 70% of total supply air.

***Comment: As written, units 15 tons or greater with both cooling and heating will require heat recovery regardless of outdoor air percentage.***

***But VAV lab systems will not...***

# Heat Recovery

- **1436.1 (Laboratory) Fan Systems**

- Laboratory VAV air systems and fume hoods are exempt from the heat recovery requirements of Sections 1439.2 and 1436.1 provided that an instruction label is placed on the face of the hood that explains the Code required VAV operational requirements. (Exhibit 14-1.)

- **1439.2 Laboratory Exhaust Systems**

- Buildings with laboratory exhaust systems having a total exhaust rate greater than 5,000 cfm (**reduced from 15,000 cfm**) shall include heat recovery systems to precondition makeup air from laboratory exhaust. Exceptions include:
  - » Direct make-up (auxiliary) air supply equal to at least 75% of the exhaust rate.
  - » Combined Energy Reduction Method (calculation).

# Electric Motors

- **1437 Motor Efficiency – Series Terminal Units**

- Fan motors less than 1 HP in series terminal units shall be:
  - » Electronically commutated motors (ECM), or
  - » Shall have a minimum motor efficiency of 65% when rated in accordance with NEMA Standard MG-1 at full load rating conditions.

# System Criteria

- **1438 System Criteria (Revised)**

- The criteria in this section applies to:
  - » Custom and packaged air handlers serving variable air volume fan systems
  - » **Constant volume fans**
  - » Heating and cooling hydronic pumping systems
  - » Pool and service water pumping systems
  - » Domestic water pressure boosting systems
  - » Cooling tower fan
  - » Other pumps or fans where variable flows are required
- Fans and pumps 7.5 HP and greater shall have:
  - » **Variable speed drives**, or.....equivalent

# System Criteria

- **1438.1.2 Limitation on Centrifugal Fan Cooling Towers (New)**
  - Open cooling towers with a combined rated capacity of 1,100 gpm and greater at 95°F condenser water return, 85°F condenser water supply and 75°F outdoor wet-bulb temperature shall meet the energy efficiency requirement for axial fan open circuit cooling towers.
  - EXCEPTION: Open circuit cooling towers that are ducted (inlet or discharge) or have external sound attenuation that requires external static pressure capability.

# System Criteria

- **1438.2 Hot Gas Bypass Limitation (New)**

- Cooling equipment with direct expansion coils rated at greater than 95,000 Btu/h total cooling capacity shall have a minimum of 2 stages of cooling capacity or capacity modulation other than hot gas bypass that is capable of reducing input and output by at least 50%.

- **1438.3 Large Volume Fan System (New)**

- Single or multiple fan systems serving a zone or adjacent zones without separating walls with total air flow over 10,000 cfm (3,540 L/s) are required to reduce airflow based on space thermostat heating and cooling demand. A variable speed drive shall reduce airflow....

# Domestic Water

- **1445 Heat Recovery for Domestic Water Systems (New)**
  - Condenser water heat recovery systems shall be installed for heating or preheating of service hot water provided all of the following are true:
    - a. The total installed heat rejection capacity of the water cooled systems exceeds 1,500,000 Btu/h of heat rejection.
    - b. The capacity of service water heating equipment exceeds 250,000 Btu/h.

# Domestic Water

- **1446 Domestic Hot Water Meters (New)**

- Each individual dwelling unit in a Group R-2 Multi-Family residential occupancy with central service shall be provided with a domestic hot water meter to allow for domestic hot water billing based on actual domestic hot water usage.

# Equipment Efficiencies

- **Tables 14-1A through 14-1F (Revised)**

- In general, most of the efficiencies are straight out of ASHRAE 90.1-2007.
- Some tables have some values that are more stringent than ASHRAE 90.1-2007.
- In general, all manufacturers have standard equipment selections compliant with the current 90.1 tables.
- Several code sections have exceptions that can be used if better than code efficiencies are provided (i.e. economizer exceptions).
- Those sections may or may not prove difficult to utilize. Talk to your vendors. Do the footwork.

# RS-29 Summary (Overhauled)

- **Goal:** As energy code stringency increases, most agree that it is important to improve “performance based” compliance tools.
- **So....the 2006 WSEC RS-29 standard has been abandoned.**

# RS-29 Summary

- ASHRAE 90.1 2007 Appendix G was used as a starting point for the new RS-29.
- This is the same protocol used for LEED 2009 modeling.
- There are obvious advantages for teams running energy studies for LEED EA points.
- The Baseline building in RS-29 is a 2009 WSEC compliant building in terms of u-values, controls, lighting, etc.
- Check out the bldg-sim and various other forums for relevant modeling discussions:
  - <http://lists.onebuilding.org/listinfo.cgi/bldgsim-onebuilding.org>

# 2009 Washington State Nonresidential Energy Code Compliance Forms

- **Mechanical Summary (MECH-SUM)**
- **Mechanical Complex Systems Checklist (MECH-COMP)**
- **Electric Motors (MECH-MOT)**
- **Mechanical Permit Plans Checklist (MECH-CHK)**
- **Economizer Flowchart**

# Question & Answer

- NREC compliance forms will be available for free download from [www.neec.net](http://www.neec.net) in June 2010.
- Technical Assistance
  - Stan Price & Lisa Rosenow at NEEC
    - » [Stan@putnamprice.com](mailto:Stan@putnamprice.com)
    - » [Lisa@putnamprice.com](mailto:Lisa@putnamprice.com)