



U.S. Department of Energy
Energy Efficiency and Renewable Energy

weatherization and intergovernmental program

Standard 90.1-2001

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Outline of Presentation

- Summary of Addenda
- Energy Impact of Addenda
- DOE Guidance to states
- ASHRAE Support Materials
- What's coming in Standard 90.1-2004?



ANSI/ASHRAE/IESNA Standard 90.1-2001

- 34 Addenda to the 1999 edition
 - 5 Reductions in stringency
 - 5 Increases in stringency
 - Lots of clarifications, corrections and simplifications



Addenda Identification

- Changes to the 1999 edition are marked in the margin of the text of the 2001 edition
- All addenda are listed in Appendix F of the 2001 edition
- ASHRAE maintains a database of addenda on their web site at www.ashrae.org
 - In Shortcuts box (upper Right), select “Standards Addenda Index” in pop down box, and click “Go” button.



Addenda Details

- It is NOT the intent of this session that you become intimately familiar with each and every addendum.
- Complete copies of all addenda are available on ASHRAE's web site at www.ashrae.org
 - In Shortcuts box (upper Right), select “Standards Addenda Index” in pop down box, and click “Go” button.



Addenda Topics

- Administration and Enforcement (2)
- Envelope (9)
- HVAC and SWH (13)
- Lighting and Power (8)
- Energy Cost Budget (2)



Addenda Stringency

- DOE's Building Energy Codes Program (BECP) evaluates the impact of each addendum on the energy efficiency of commercial buildings.
- Details will be posted on DOE's web site at www.energycodes.gov



Addenda Overall Rating

- All addenda are rated with smiley faces.
 - Red frown for reduction in stringency ;
 - Yellow smile for neutral stringency (
 - Green smile for increase in stringency (



Special Note for State Adoption

- Addenda are rated on their impact to the US building stock as a whole.
- Addenda may be positive, neutral, or negative in their impact to specific states.
- Addenda may also have multiple parts that may be positive, neutral, or negative in their impact.



Administration and Enforcement

1. Clarifies treatment of alterations to existing buildings (
2. Clarifies separate treatment of additions and alterations to existing buildings (



Envelope

1. Clarifies “substantial contact” (
2. Clarifies roof insulation exceptions (
3. Clarifies use of slab F-factors (
4. Clarifies heat capacity calculation use (
5. Modifies residential slab requirements ;



Envelope

6. Modifies heated slab requirements ;
7. Modifies glazed wall system requirements (
8. Revises SI U-factors for consistency with IP (
9. Restructures envelope section (



HVAC and SWH

1. Modifies equipment efficiency requirements (
2. Modifies zone thermostat control requirements (
3. Modifies shutoff damper control requirements ;
4. Modifies shutoff damper control requirements ;
5. Modifies zone isolation requirements (



HVAC and SWH

6. Removes enclosed parking garage ventilation requirements (
7. Modifies economizer exceptions (
8. Modifies economizer requirements (
9. Modifies system balancing requirements ;
10. Modifies heat pump requirements (



HVAC and SWH

11. Modifies SWH sizing requirements (
12. Modifies a number of HVAC tables and adds new requirements (and ;
13. Modifies a number of HVAC related definitions and deleted certain requirements for system balancing (



Lighting and Power

1. Clarifies definition of “occupant intervention” (
2. Clarifies use of additional interior allowance (
3. Clarifies definition of “general low bay” and “general high bay” (
4. Clarifies intent of exterior lighting power requirements (



Lighting and Power

5. Clarifies that power “design load” is not necessarily “full connected load” (
6. Clarifies use of additional power allowances (
7. Allows use of building area method for all buildings (
8. Clarifies use of building area method (



Energy Cost Budget Method

1. Coordinates ECB with alteration and additions sections of Section 4 (
2. Clarifies rules for air and water economizers (



Focus on the “good”

- Addendum *d* allows for the use of combined horizontal and vertical insulation on slab edges
- Addendum *af* includes changes that are both good and bad for stringency of existing buildings, with the only “bad” item being a provision for tradeoffs between an existing building and addition to allow compliance of the addition.



Focus on the “good”

- Addendum *ad* adds requirements for buried duct insulation, restricts use of low leakage dampers for closed circuit cooling towers, adds performance requirements for gravity dampers, and makes a number of other changes impacting mechanical systems. (*ad* has both “good” and “bad” parts)

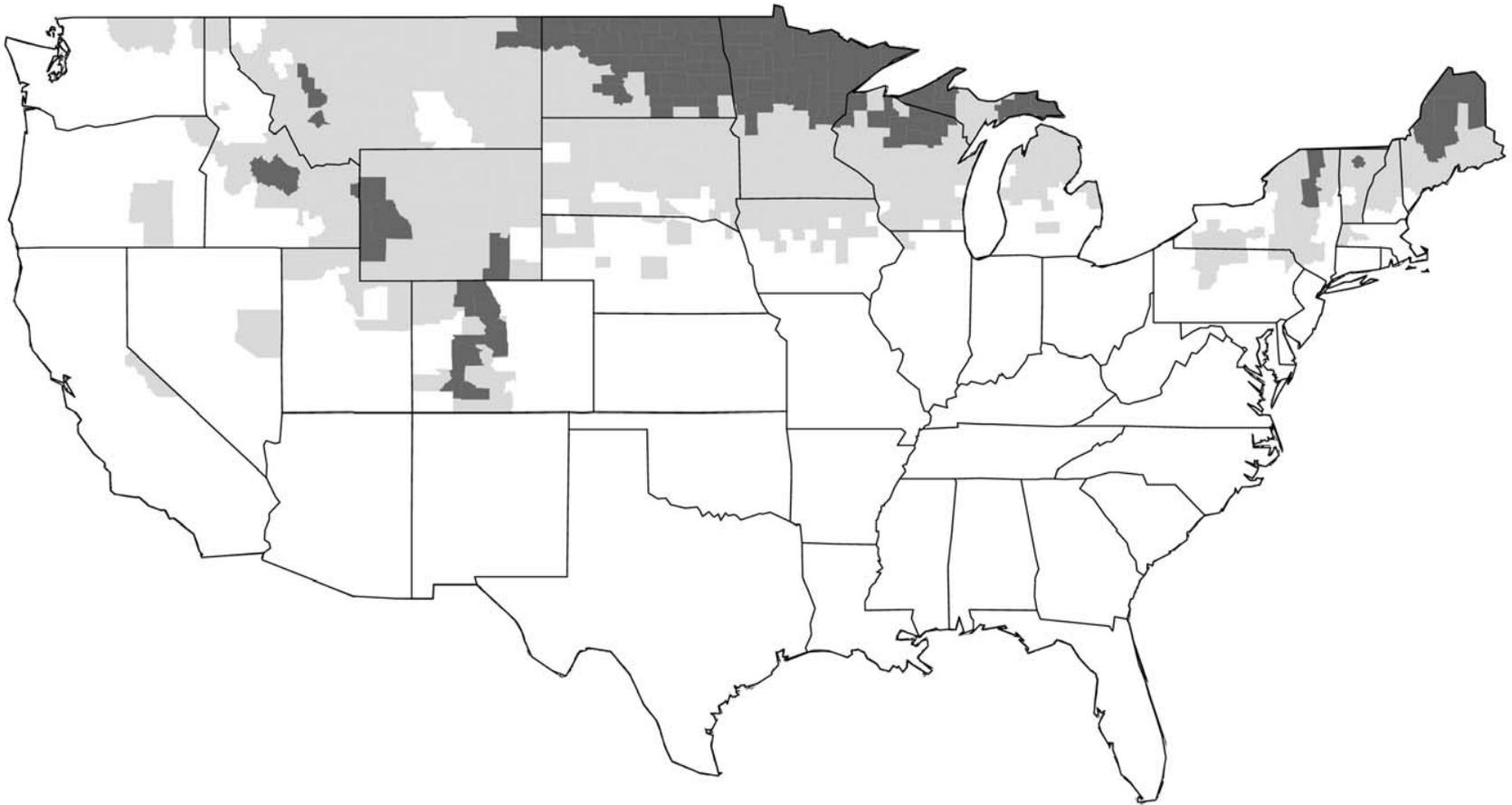


Focus on the “bad”

- Addendum *f* removes slab insulation requirements for high-rise residential in ASHRAE zones 19-20
- Addendum *g* removes slab insulation requirements for heated slabs in zones 19-26 (northern US)



Areas impacted by Addendas f and g





Focus on the “bad”

- Addendum *m* (part of addenda *ad*) relaxes damper leakage requirements in very cold, very hot, and very mild climates



Focus on the “bad”

- Addendum *n* slightly relaxes requirements for use of motorized dampers
- Addendum *t* eliminates the performance requirements for air and water system balancing (but maintains that these systems must still be balanced)



DOE Determinations

- DOE issued a positive determination on Standard 90.1-1999, July 15, 2002.
- States are required to update their commercial code to meet or exceed this standard by July 15, 2004.
- Details
 - Federal Register at www.gpoaccess.gov/fr
 - DOE's web site at www.energycodes.gov
- DOE is still in the process of drafting its determination on the 2001 edition.



States Should Consider

- Improvements, enhancements, and clarifications made in Standard 90.1-2001 when adopting Standard 90.1-1999.
 - To reach consensus on the 1999 edition, committee agreed to address subcommittee resolved issues as addendum in new continuous maintenance process.
 - After dust settled in 1999, need for clarifications and intent changes addressed in addendum.



States Should Consider

- Adoption of the 2001 edition
- Amending the standard in those specific areas that decreased stringency from Standard 90.1-1999, in your state.
 - Some requirements in the 1999 edition changed in the 2001 edition have become widely accepted
- Referencing recently updated standards



ASHRAE Support

- Electronic standard
- Online compliance forms
- Online addenda
- Interpretations (formal and informal)
- Technical Services Engineer (Steve Hammerling)



Resources for Implementation

- Users Manual includes compliance forms, examples, and ENVSTD software for Windows
- Online standard, compliance forms, and addenda
- Professional Development Seminar:
“Complying with Standard 90.1”



Resources for Implementation (continued)

- Continuous Maintenance
 - Proposed addenda may be submitted at any time
 - SSPC must take documented, consensus action within one year and must notify proposer of action
- Interpretation Requests handled by 90.1 Committee
 - Informal (unofficial) – chair or staff respond
 - Formal (official) – SSPC approves response



CODE INTERACTION SUBCOMMITTEE

- Work closely with model code organizations to incorporate features of 90.1
 - Adoption by reference
 - By insertion of key 90.1 elements
- Synchronize with model code cycles
 - Republish standards on 3-year cycle coordinated with model code organizations



Contact ASHRAE

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What's coming in Standard 90.1-2004?

- Revised lighting power densities
- Additional guidance for LEED users



Addendum to the 1999 Edition (more)

- The following slides have additional information about the addendum.



Additional Slides and Information

- Additional slides and information related to Standard 90.1-2001 will be available from the DOE web site after the workshop.

www.energycodes.gov



Questions?

