

Directs Federal Agencies (TVA) to meet minimum energy standards when constructing new buildings. 10 CFR Part 434 replaces the earlier 10 CFR Part 435 interim standard issued in 1989. This new standard specifies a minimum level of energy efficiency and is based on The ASHRAE 90.1-1989 energy code. The complete CFR can be found in the Federal Register, Part IV, Department of Energy, Office of Energy Efficiency and Renewable Energy (see: http://www.energycodes.gov/federal/pdfs/10_cfr_434.pdf).

There are 3 ways for a building design to comply with the standard:

- 1 Meet prescriptive requirements for individual building elements outlined in Subpart D - "Prescriptive Method"
- 2 Meet alternative requirements outlined in Subpart E - "Building Energy Cost compliance Method"
- 3 Meet alternative requirements outlined in Subpart F - "Building Energy Budget Compliance Method"

The last two methods (Subpart E & F) require an energy model of the proposed design be created using a building energy analysis program such as PowerDOE. To be in compliance the building design must be found to use less energy than a the same building design that meets the prescriptive requirements (Subpart D). Both Subpart E & F require certification by a registered architect or engineer.

Subpart D - "Prescriptive Method"

- 301.1 - "Exterior Design Conditions" - Lists exterior design conditions (Winter/Summer design Dry bulb temperatures etc.) that need to be used for all calculations required in subpart D.
- 401.1 - "Electrical Distribution Systems" - Defines requirements for check metering and schematic diagrams.
- 401.2 - "Electric Motors" - Lists minimum requirements and efficiencies (Table 401.2.1) that all electric motors must meet.
- 401.3 - "Lighting Power Allowance" - Indicates maximum exterior lighting energy (Table 401.3.1) and interior lighting energy (Table 401.3.2A-C) in watts/liner ft or watts/sf that must be met. "Lighting Power Control Credits" for programmable, occupancy sensors and daylight controls can be used to adjust and meet the maximum values.
- 402.1 - "Building Envelope Assemblies and Materials" - This Section indicates calculation methods that need to be used to determine the overall thermal performance of the building envelope.
- 402.2 - "Air Leakage and Moisture Mitigation" - Defines requirements that need to be met concerning moisture control and air infiltration such as window performance (Table 402.2.1), weather stripping, sealing penetrations and use of vapor barriers and vestibules plus compliance testing.
- 402.3 - "Thermal Performance Criteria" - Defines specific U-values for roofs, walls shared with unconditioned space and floors over unconditioned space (Table 402.3.1(A), maximum exempt skylight area (Table 402.3), minimum perimeter insulation R-values for slabs (Table 402.3.2).
- 402.4 - "Exterior Walls" - Lists maximum wall U-values (Table 402.4.1.1) and maximum window to wall ratios and U-values including adjustments for daylighting (Table 402.4.1.2). Tables are provided for 234 locations in the U.S. and can be found at http://www.energycodes.gov/federal/acp_ship.stm.
- 403.1 - "Mechanical Equipment Efficiency" - Lists minimum efficiency values for various types and sizes of HVAC equipment (Table 403.1A-F).
- 403.2 - "HVAC Systems" - Defines requirements for HVAC system load calculations, sizing, distribution, fans, ventilation, pumps and controls. Table 403.2.9.1 lists minimum pipe insulation thickness and Table 403.2.9.2 lists minimum duct insulation R-values. This section also lists requirements for record drawings and HVAC system balancing.
- 404.1 - "Service Water Heating Equipment Efficiency" - Defines requirements and minimum efficiency values (Table 404.1) for hot water heating.
- 404.2 - "Service Hot Water Piping Insulation" - Requires hot water piping to be insulated using values in Table 403.2.9.1.
- 404.3 - "Service Water Heating System Controls" - Requires controls to regulate water temperature depending on use.
- 404.4 - "Water Conservation" - Requires showerheads and faucets to meet requirements in 10 CFR 430.32 which limits water flow and requires the use of controls that limit water delivery to 0.25 gallons/cycle.
- 404.5 - "Swimming Pools" - Lists energy saving requirements for swimming pools.
- 404.6 - "Combined Service Water Heating and Space Heating Equipment" - Limits the use of water heater for dual space heating and water heating to a maximum size.

Subparts E & F - "Building Energy Cost Compliance Alternative"

- 501.1 - Subpart E permits the use of the "Building Energy Cost Compliance Alternative" for compliance. Sections 502.1-521.1 provide extensive details on how to obtain compliance through comparison to a prototype or reference building using computer modeling of the building design and comparing annual energy cost.
- 601.1 - Subpart F permits the use of the "Building Energy Budget Compliance Method" for compliance. Sections 601.2 - 607.1 provide extensive details on how to obtain compliance through comparison to a prototype or reference building using computer modeling of the building design and comparing annual energy use in Btus/sf/yr.

* This is provided only to give a brief overview of the subject CFR. Please review the CFR in its entirety for specific issues.

TVA 10 CFR Parts 434 & 435 Energy Code Compliance Form

Building Name ----->

Location (Address, City, State) -->

New Design> or Renovation> Owned> or Leased> Lease ends (year)>

Building Type>	Office	Training	Warehouse	Laboratory	Computer	Other
Gross Square Ft>	<input type="text"/>					

Total Building Square Footage> NOTE: Square footage number include outside walls
Use blanks to write in building types not listed.

Name	Address	Phone
Project Architect>	<input type="text"/>	<input type="text"/>
Mechanical Engineer>	<input type="text"/>	<input type="text"/>
Electrical Engineer>	<input type="text"/>	<input type="text"/>

Compliance Method Used (check one):

1

2

3

"Prescriptive Method"

Sections 301.1 - 404.6

Design must meet all of the following:

- 301.1 - Exterior Design Conditions
- 401.1 - Electrical Distribution System
- 401.3 - Electric Motors
- 402.1 - Building Envelope Assemblies and Materials
- 402.2 - Air Leakage and Moisture Mitigation
- 402.3 - Thermal Performance Criteria
- 402.4 - Exterior Walls
- 403.1 - Mechanical Equipment Efficiency
- 403.2 - HVAC Systems
- 404.1 - Service Water Heating Equipment Efficiency
- 404.2 - Service Hot Water Piping Insulation
- 404.3 - Service Water Heating System Controls
- 404.4 - Water Conservation
- 404.5 - Swimming Pools
- 404.6 - Combined Service Water Heating and Space Heating Equipment

"Building Energy Cost Compliance Alternative"

Sections 502.1-521.1

Compliance requires detailed energy analysis of the entire proposed design using a building energy analysis program such as PowerDOE.

-Annual energy cost (\$'s) of proposed design must be equal to or less than the annual energy cost of a prototype or reference building design that is configured to meet the requirements outlined in sections 301.1 - 404.6

Proposed design energy cost--> \$/yr

Prototype--> or

Reference-->

building energy cost--> \$/yr

"Building Energy Budget Compliance Method"

Sections 601.2 - 607.1

Compliance requires detailed energy analysis of the entire proposed design using a building energy analysis program such as PowerDOE.

-Annual energy cost (Btu/sf/yr) of proposed design must be equal to or less than the annual energy cost of a prototype or reference building design that is configured to meet the requirements outlined in sections 301.1 - 404.6

Proposed design energy cost--> Btu/sf/yr

Prototype--> or

Reference-->

building energy cost--> Btu/sf/yr

STATEMENT OF COMPLIANCE

(To be signed by professional accepting responsibility for compliance)

I _____
Date: _____

certify that this design meets the Code of Federal Regulations (CFR) 10 Parts 434 and 435.