Proposed Rules

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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

10 CFR Part 437

[Docket No. EE-RM–95–202]

RIN 1904–AA 74

Voluntary Home Energy Rating System Guidelines

AGENCY: Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy.

ACTION: Notice of proposed rulemaking and public hearings.

SUMMARY: Today, the U.S. Department of Energy (''Department'' or ''DOE'') is proposing statutorily required voluntary guidelines for home energy rating systems. The proposed voluntary guidelines are designed to encourage uniformity among systems for rating the annual energy efficiency of new and existing residential buildings. They provide for a uniform rating method; procedures for certification of the technical accuracy of the building energy analysis tools used to determine energy efficiency ratings; training of personnel conducting energy efficiency ratings; data collection and reporting; quality control; and monitoring and evaluation. The voluntary guidelines are intended for use by state and local governments, utilities, builders, real estate agents, lenders, agencies in mortgage markets, and others, to enable and encourage the assignment of energy efficiency ratings to residential buildings and the development of criteria for attractive financial instruments for energy efficient homes.

DATES: Written comments on the proposed rule (10 copies) must be received by the Department by October 23, 1995.

A public hearing will be held on October 2, 1995.

Requests to speak at the public hearing must be received by the Department by 4 pm on or before September 13, 1995. Ten copies of statement to be given at the public hearing must be received by the Department by 4 pm September 28, 1995.

ADDRESSES: All written comments (10 copies), requests to speak at the public hearing, and requests for the supporting documentation are to be submitted to: Voluntary Residential Energy Efficiency Rating Guidelines, Docket Number EE-RM–95–202, Buildings Division, EE–432, Office of Codes and Standards, U. S. Department of Energy, 1000 Independence Avenue, SW., Room 1J–018, Washington, DC. 20585

The public hearing will begin at 9:00 a.m., and will be held at the following location: Washington, D.C.: U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Room 1E–245 (1st Floor, E Corridor), Washington, D.C. 20585.

Copies of the transcripts of the public hearing, individual oral statements, and the written public comments received may be viewed and/or obtained from the DOE, Freedom of Information Reading Room, Room 1E–190, 1000 Independence Avenue S.W., Washington, D.C. 20585, (202) 586–6020, 9:00 a.m.-4:00 p.m.

FOR FURTHER INFORMATION CONTACT:
Robert Mackie, Buildings Division, EE–432, U.S. Department of Energy, Room 1J–018, 1000 Independence Avenue, SW., Washington, D.C. 20585, (202) 586–7892
Diana Dean, Office of General Counsel, GC–12, U.S. Department of Energy, Room 6B–231, 1000 Independence Avenue, SW., Washington, D.C. 20585, (202) 586–7440

SUPPLEMENTARY INFORMATION:

I. Background

A. Statutory Authority

Section 102 of the Energy Policy Act of 1992 (Pub L. 102–486), amended Title II of the National Energy Conservation Policy Act (Act) by adding sections 271–273 (42 U.S.C. 8236–8236b). Section 271 of the Act directs the Department to issue, by rule, voluntary guidelines that may be used by state and local governments, utilities, builders, real estate agents, lenders, agencies in mortgage markets, and others, to enable and encourage the assignment of energy efficiency ratings to residential buildings. Section 271 requires the Department to consult with the Secretary of Housing and Urban Development, the Secretary of Veterans Affairs, representatives of existing home energy rating programs, and other appropriate persons. In terms of specified content, section 271 provides that the voluntary guidelines shall:

(1) encourage uniformity with regard to systems for rating the annual energy efficiency of residential buildings;

(2) establish protocols and procedures for

(A) certification of the technical accuracy of building energy analysis tools used to determine energy efficiency ratings;

(B) training of personnel conducting energy efficiency ratings;

(C) data collection and reporting;

(D) quality control; and

(E) monitoring and evaluation;

(3) encourage consistency with, and support for, the uniform plan for Federal energy efficient mortgages, including that developed under section 946 of the Cranston-Gonzalez National Affordable Housing Act (42 U.S.C. 12712 note) and pursuant to sections 105 and 106 of the Energy Policy Act of 1992;

(4) provide that rating systems take into account local climate conditions and construction practices, solar energy collected on-site, and the benefits of peak load shifting construction practices, and not discriminate among fuel types; and

(5) establish procedures to ensure that residential buildings can receive an energy efficiency rating at the time of sale and that such rating is communicated to potential buyers.

Section 105 of the Energy Policy Act of 1992 amends section 104 of the Cranston-Gonzalez National Affordable Housing Act, 42 U.S.C. 12704, by defining an ''energy efficient mortgage'' as a mortgage that provides financing incentives for the purchase of energy efficient homes, or that provides financing incentives to make energy efficiency improvements in existing homes by incorporating the cost of such improvements in the mortgage.

The Department is developing the guidelines through notice and comment rulemaking because section 271 specifically requires that they be developed ''by rule.'' Nevertheless, compliance with the final guidelines is strictly voluntary.

B. General Purpose

The principal purpose of a home energy rating system is to calculate a descriptive rating of the energy performance of a residential building. An accurate home energy rating system will give the lending industry the confidence it needs to underwrite energy efficient mortgages, offer financing mechanisms, and provide the real estate and appraisal industries with a basis for valuing energy efficiency in the home sale and resale markets. It is anticipated that by providing an accurate technical basis for projecting energy savings from installations of energy efficiency measures, the guidelines, when finalized, will play a critical role in establishing a market-based system to encourage homeowners to improve the energy efficiency of new, reconstructed or existing housing.

Reliable and consistent energy analysis systems are prerequisites for financing residential energy efficiency through the mortgage process with energy efficient mortgages or energy efficient loans. Variation in current local and statewide home energy rating programs impedes the implementation of energy efficient mortgage programs because the Federal mortgage agencies and lenders are uncertain as to the reliability of the ratings.

As of 1993, a number of states had developed their own unique home energy rating programs. The National Association of State Energy Officials (NASEO) stated that 14 states have state-wide or city-wide, scaled home energy rating programs for new and existing homes. Thirty-three states had utility-run home energy rating certification programs for new homes in at least some areas of the state. In some areas both state and utility rating programs were in use.

Today's proposed rule responds to the need of mortgage lending institutions for a reliable technical basis upon which to underwrite energy efficient mortgages. Providing this solid footing for mortgage underwriting will encourage lenders to issue a variety of energy-related financial products which in turn will help stimulate the market for energy efficient housing measures.

Along with access to attractive financing, homeowners could be encouraged to make investments in energy efficiency if they are valued in the real estate market. Currently, appraisals are based on comparables that do not necessarily value energy efficiency measures. A reliable home energy rating gives appraisers a sound basis for recognizing energy efficient measures that have been installed.

Uniformity across different home energy rating systems could benefit consumers and the housing industry by making energy ratings a standard part of the real estate process. As ratings become widely utilized, consistency among systems will promote proper market valuation of improvements. Expanded use of home energy rating systems could stimulate increased use of energy efficiency and renewable energy technologies by making energy efficiency a quantitative, visible, and recognized attribute as homes are designed, built, bought, and remodeled.

C. Guideline Development

The Department's Office of Building Technologies contracted with the Home Energy Rating Systems Council (HERS Council) in 1993 for the development of a Technical Report to be used as a basis for the guidelines proposed today. The Department acted in response to the provisions set forth in the Act to develop voluntary guidelines in consultation with the Secretary of Housing and Urban Development, the Secretary of Veterans Affairs, representatives of existing home energy rating programs, and other appropriate persons.''

The HERS Council is a not-for-profit, corporation with a nineteen-member board representing various stakeholders in the matter of home energy ratings. The HERS Council's membership includes builders, mortgage lenders, HERS providers, consumer groups, State energy offices, utilities, real estate agents and appraisers, and product manufacturers.

The HERS Council formed a Technical Committee comprised of representatives from electric and gas utilities and utility trade associations, home energy rating providers, software developers, builders, state organizations, product manufacturers, and the heating, ventilation and air-conditioning industry. The Department also provided resources from the National Renewable Energy Laboratory to give technical support to the HERS Council during their work on the Technical Report.

The Department, working through the HERS Council, attempted to reach all possible stakeholders to obtain comments during the development of these proposed guidelines. Representatives from the U.S. Department of Housing and Urban Development (HUD) and the U.S. Department of Veterans Affairs (VA) attended HERS Council and Technical Committee meetings to remain apprised of the material being developed and the Department has consulted with both HUD and VA on the contents of these proposed guidelines.

Many of the larger and more active rating organizations participated in this effort, but the Department is aware that there are some home energy rating organizations not participating in the HERS Council. Therefore, the Technical Report created by the HERS Council, via a consensus process, may not reflect all opinions on the content of these guidelines. The proposed guidelines allow for delayed compliance as described below. The Department invites all interested parties to provide the Department with their views regarding the proposed guidelines in comments responding to this notice and at the public hearing.

D. Rating Method Development

The proposed guidelines provide for a single method of rating homes that is consistent with the statutory requirement in section 271 of the Act to encourage uniformity with regard to systems for rating the annual energy efficiency of residential buildings. The HERS Council and the Technical

Committee considered several existing rating methods. Many of the existing methods considered utilize a 100-point scale, and therefore, a large portion of consumers and financial institutions should find this type of scale an appropriate basis for ratings.

Many of the existing 100-point methods, however, lack consistency in the specification of the extremes of the scale (0 and 100 points). In some of the existing methods, the least efficient fuel and type of heating system is used to define the least efficient end of the scale. In other existing methods, the best available technology is used to define the most efficient end of the scale. The exact parameters that determine the ''least efficient'' and ''most efficient'' ends of the scale are selected individually by each HERS provider which can result in a lack of consistency among providers.

To promote consistency, the proposed scale utilizes a single fixed reference point from which energy efficiency is measured. The reference point is fixed at 80 points, and the proposed method assumes zero purchased energy at the top end of the 100-point scale. The top of the scale (100) represents a one hundred percent improvement over the reference point. Therefore, each point above 80 represents a five percent reduction in energy consumption from the reference point. Conversely, at a five percent increase in consumption per point, zero would represent purchased energy that is five (or more) times greater than the purchased energy consumed at the reference point. By selecting the energy efficiency of a hypothetical building (reference house) that remains constant as the reference point, the rating scale becomes both uniform and consistent over time. If no changes occur to the rated features of a home, then the rating also remains consistent over time.

1. Reference House

The approach used to create the specifications for the reference home was to base the proposed scale specifications on an already recognized standard for ''energy efficiency.'' Two recognized standards for energy efficiency that are national in scope are the Council of American Building Officials (CABO), Model Energy Code (CABO–MEC) and the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 90.2.

The HERS Council Technical Committee compared the specifications of these two documents. Using computer programs that met the preliminary requirements of the proposed tool certification process found in proposed section 437.200, a comparison was made of calculated energy consumption for two standard prototype homes located in seven cities in the United States. The predicted energy consumption was similar for either standard in most climates. In predominantly heating climates, CABO was slightly more stringent, whereas ASHRAE tended to be slightly more stringent in climates where cooling was the greater need. The difference was not considered to be substantial.

The HERS Technical Committee recommended the use of CABO–MEC as the basis for the reference home in the proposed rating method. CABO–MEC is the qualifying threshold for the energy efficient mortgage program of the Federal National Mortgage Association (Fannie Mae), and the Federal Housing Administration. Further, Section 101 of the Energy Policy Act of 1992 uses CABO–MEC as the benchmark for residential buildings in the Department's Building Energy Efficiency Standards Program.

On the basis of the foregoing, the Department accepts the HERS Technical Committee's recommendations to use CABO–MEC. (See proposed section 437.102, ''Section Description of the Guidelines'', ''Configuration of the Reference Home.'')

As previously stated, several secondary mortgage programs, including HUD insured mortgages, recognize CABO–MEC as providing a level of energy efficiency that qualifies buyer for increases in their debt to income ratio limits. These programs currently reference the 1992 edition of CABO–MEC. The Department selected the 1993 edition to establish insulation levels for the reference home because it provides for more realistic (higher) levels of efficiency in multi-family homes than those provided in the 1992 edition. In addition, some elements to define a reference home and a standard set of operating conditions are not present in the 1992 or 1993 editions of CABO–MEC, so they are taken from the 1994 Amendments. Details are provided in Section II.B. ''Sections Descriptions'' under proposed section 437.103, ''Configuration of the reference home'' and proposed section 437.105, ''Operating condition assumptions.''

2. Star Rating Method

Many of the existing HERS systems provide ''star'' ratings as a way of summarily representing the point scores. Many of the providers support the concept that a ''four star'' rating should denote efficiency. The proposed guidelines include the use of a ''star'' system. Under this system, which uses a ''one star'' to ''five stars-plus'' scale, the reference home located at 80 points is awarded four stars.

The divisions of the ''star'' scale in the proposed rating method were created by the HERS Technical Committee based on a study of calculated energy consumption. The HERS Technical Committee used incremental levels of efficiency to look at the range of performance that might be found in the existing housing stock. (For example, a pre-1940 home with no modifications consumes approximately four times the energy used by a reference home.) The study also looked at logical incremental increases in levels of thermal performance above the levels found in the reference home. To attain those higher levels, the study looked at improved insulation equipment efficiency and the use of renewable energy sources such as passive and active solar. The ''star'' breakpoints presented in the proposed guidelines have their origins in this analysis by the HERS Technical Committee. Copies of the results of this study are available from the Department information contact listed in the ''Addresses'' paragraph of this proposed rulemaking. The Department has also placed a copy in its Freedom of Information Reading Room.

Thus, the guidelines proposed today are based on the principle of a reference house and logical incremental changes in energy consumption. The expression of the results is captured in the ''star'' categories of energy efficiency.

The Department invites comments regarding the potential acceptance of these guidelines by existing home energy rating providers and invites specific comments on the content of the guidelines. Commenters should bear in mind that these guidelines would not in themselves set any ''acceptable'' level of energy efficiency and that existing programs could use any point or points on the proposed scale for comparisons that encourage efficiency. Commenters are also encouraged to provide specific examples if comparisons to existing programs are offered.

II. Description of the Proposed Rule

A. Summary of the Proposed Voluntary Guidelines

The proposed voluntary guidelines would establish: (1) A uniform national rating method, and protocols and procedures for certification of the technical accuracy of building energy analysis tools used to determine energy efficiency ratings; (2) training of

personnel conducting energy efficiency ratings; (3) data collection and reporting; (4) quality control; (5) and monitoring and evaluation. They take into account local climate conditions and construction practices, solar energy collected on site, and the benefits of peak load shifting construction practices. They are designed not to discriminate among fuel types.

The Department proposes to incorporate by reference test procedures, U values and U_o values, and on site inspection procedures upon publication of this rule as final. These materials are listed below:

The ''Home Energy Rating Systems Building Simulation Test (HERS-BESTTEST)'', NREL/TP–472–7332, National Renewable Energy Laboratory. The U values and U_o values, of paragraph 502.2 of the Model Energy Code, 1993 Edition, Council of American Building Officials. ''On Site Inspection Procedures'', Guidelines No. 10, Home Energy Rating Systems Council.

Copies of these document may be reviewed at the Department of Energy, Freedom of Information Reading Room at the address stated above. Copies of these documents may also be obtained from the organizations and addresses listed below:

''Home Energy Rating Systems Building Simulation Test,'' NREL/TP–472–7332, National Renewable Energy Laboratory, 1617 Cole Boulevard, Golden, CO 80401–3393.

''Model Energy Code,'' 1993 Edition, Council of American Building Officials, 5203 Leesburg Pile, Falls Church, VA 22041.

''On Site Inspection Procedures,'' Guidelines No. 10, HERS Council, 1511 K Street, NW, Washington, DC 20005.

B. Section Descriptions

Subpart A—General Provisions

Proposed Section 437.1: Purpose

Proposed § 437.1 defines the purpose of part 437 as the establishment of voluntary guidelines to be used by Home Energy Rating System Providers to provide a consistent and uniform approach to rating homes for energy efficiency.

Proposed Section 437.2: Scope

Proposed § 437.2 specifies the types of homes that may be rated using the voluntary guidelines. Section 271 of the Act calls for the development of guidelines for ''residential buildings'' but does not define that term or otherwise dictate the types of homes to be covered by the guidelines. Consistent with the decision to base the proposed voluntary guidelines on CABO–MEC, the proposed scope is limited to residential buildings covered by CABO–MEC.

Included are: (a) one and two family dwellings; and (b) all other residential buildings, three stories or less in height. As required by section 271, both existing and proposed homes are included in the proposed scope of the voluntary guidelines.

Proposed Section 437.3: General Definitions and Acronyms

Proposed § 437.3 provides a listing of all the general definitions and acronyms used in section 437. ''Home'' is defined in this section as a residence or dwelling unit in detached or attached structures of three stories or less. The rating industry as it exists today favors the term ''home energy rating'' and the Department elects to follow that convention. ''HERS provider'' is defined as a person or organization that develops, manages and operates a home energy rating system or ''HERS''. The rating industry as it exists today tends to use the term ''HERS provider'' to describe a person or organization that provides HERS generated ratings.

Proposed Section 437.4 Availability of Ratings

To respond to the statutory requirement ''to ensure that residential buildings can receive an energy efficiency rating at the time of sale and that such rating is communicated to potential buyers,'' proposed § 437.4 recommends certain actions by people or organizations that are typically involved with the sale of a home or the creation of a mortgage.

The Department is of the view that informing home buyers of any available financing incentives related to energy efficiency will encourage consumers to take steps that will reduce energy use in this country. Consistent with that view, proposed § 437.4(b) provides for encouraging multiple listing services to include available home energy rating information. The Department understands that there is concern among stakeholders that buyers may need additional time to investigate available incentives and, if necessary, have a rating conducted. In doing so, the process of home selling might be delayed. However the Department believes that delays can be minimized by lenders with proper administrative procedures.

The Department also recognizes further concern that some existing homes may be viewed as less marketable as the result of a rating and therefore some homeowners may oppose the concept of rating homes. However the Department is not proposing that such a rating should be prerequisite to listing a home sale.

Proposed Section 437.100: Rating Procedure

Proposed § 437.100 sets forth a standard procedure to be used by each provider who voluntarily follows the proposed guidelines. A site visit would be required to collect data that is used in making a comparison of estimated yearly energy consumption between the home being rated and a standard reference home of the same size and shape. Only the energy consumed for heating, cooling and water heating would be used in this comparison. The reference home would be defined under proposed § 437.103.

Proposed Section 437.101: Rating Point Score and Star Rating

This proposed section describes the calculation procedure for determining a point score and star rating. The procedure would use the estimated energy consumption of the rated and reference houses to determine a rating score between 0 and 100 points. A score of 0 indicates that the rated home consumes five times or more energy than reference home and is considered profoundly inefficient; a score of 100 indicates that the rated home has zero annual purchased energy consumption for heating, cooling and water heating.

In addition to a numerical score, the rating is expressed by a ''star'' value of between one and five stars (five divisions) with a sixth division called ''Five Plus''. This section identifies the relationship of the numerical score to its corresponding ''star'' value.

Proposed Section 437.102: Rating Report

Proposed § 437.102 lists the minimum information that each rating provides. Proposed paragraphs (a)(5) and (a)(6) of this section would require each HERS provider to report the name of the agency certifying the accuracy of the energy analysis tool and the margin of error accepted by that agency. Section 271 of the Act requires that the guidelines establish procedures for certifying the technical accuracy of energy analysis tools, but gives no definition as to what constitutes ''technical accuracy.'' As proposed in section 437.200, these guidelines look to the accrediting agency to establish pass/fail criteria for energy analysis tools. The Department believes that the acceptable margin of error is an issue to be decided by the users of these ratings, such as consumers and lenders.

Therefore, the purpose of these two proposed reporting requirements is to provide information that allows users to decide for themselves if the accuracy of the energy analysis tool, as defined by the accrediting body, is acceptable. The Department expects and encourages comments from the financial community on this issue.

Proposed paragraph (a)(7) of this section requires each HERS provider to report the level of their accreditation as either ''basic compliance'' or ''full accreditation''. Existing HERS providers may have functioning systems that would comply, or could readily be made to comply with the majority of these guidelines, but would require lengthy periods of time to come into full compliance. In response to this situation, the Department proposes two levels of performance, basic compliance and full accreditation, with the opportunity for any existing HERS provider to meet certain guidelines with their present system for a period of up to two years, during which time they may represent themselves as being in basic, but not full compliance with the guidelines. The Department invites comments on the advisability of such a structure.

Paragraph (a)(9) provides for the reporting of previous energy consumption data if it is made available by the homeowner. Various factors such as prior home improvements or unusual weather conditions make it necessary for the rater to determine the usefulness of such information and to determine if it should be included in the report.

To facilitate energy efficient mortgages and loans as provided in section 271 of the Act, paragraph (b) of this proposed section provides for the report to include the estimated energy cost savings available with the rated home reconfigured with possible improvements to the minimum rated features. Paragraph (b)(2) also provides for reporting of ''The Present Worth Value'' of the energy cost savings and the discount rate used to calculate that value. The Department considers this information necessary because it is used in the qualification process for Federally backed energy efficient mortgage programs such as those provided by the Department of Housing and Urban Development (HUD). The Department is not proposing a specific discount rate.

Proposed Section 437.103: Reference House Configuration

Proposed § 437.103 establishes the level of energy efficiency of the reference home. The insulation levels are those that are required by the Council of American Building Officials Model Energy Code, 1993 edition (CABO-MEC), therefore, specific reference is made in this proposed section to have the enclosure elements configured to Paragraph 502.2 of CABO-MEC. This paragraph establishes the criteria for building envelope components according to the severity of the normal winter weather conditions for the geographic location of the home. The Department considers this procedure to be appropriate for the determination of insulation levels for the reference home.

To be responsive to the language in section 271 of the Act regarding the need to take into account ''solar energy collected on-site,'' this proposed section would create what the Department considers a ''solar neutral '' reference home by fixing the following components:

Fenestration Area—In proposed paragraph (a)(5)(i), the fenestration area is fixed at 18 percent of the conditioned floor area. The requirements for wall assemblies in CABO-MEC are based on the average U-values of those assemblies and therefore the total U-value of the wall assemblies including windows and doors is calculated, then divided by the gross wall area to determine the average. Since the area of glazing may vary depending on the thermal performance of the window itself and/or the opaque wall area, it is considered necessary to fix the amount of glazing to create consistency in the reference home. In the case of multi-family homes, where 18 percent of the conditioned floor area may exceed the actual exposed wall area, a formula is provided in proposed section 437.103 to establish the reference home fenestration on a ratio of exposed and common wall areas.

Orientation—Also in proposed paragraph (a)(6)(i), glazing in the reference home would be distributed equally in each of four cardinal directions—north, south, east and west. As a result, the reference home is assumed to experience equally beneficial solar gains during heating season and equally detrimental solar gains during cooling. The rated home would reflect the benefits of favorable orientation and/or the negative impact of poor orientation. This principle is also utilized with regard to multi-family homes, which would assume hypothetical glazing in walls even though the actual wall in the rated home may be common with an adjoining unit and not have any windows.

Adjustment to Fenestration Area—Proposed paragraph (a)(7) specifies the percentage of the fenestration area that be assumed as frame or sash. This serves to further refine the actual glazed area for purposes of solar contribution for heating or solar load for cooling. The value of 27 percent is taken from the information in Chapter 27 of the 1993 ASHRAE Handbook of Fundamentals which specifies a 27 percent frame area for a 3 ft. by 4 ft. operable wood residential window. Frame and sash adjustments to fenestration area in the rated home are based on the actual windows in use or as proposed for retrofit or to be built homes.

Shading Coefficient—Proposed paragraph (a)(8) fixes the shading coefficient at 0.70 during the cooling season. This is consistent with the provisions for a reference house in section 8.8.3.2 of ASHRAE Standard 90.2, for energy efficient design of low rise residential buildings. It is also consistent with the provisions found in the 1994 amendments to CABO–MEC. The 1994 amendments were used as a source of information to define this feature of the reference home because the 1993 code lacks clarity on these necessary specifications. It should be noted that CABO states the use of draperies without providing a specific shading coefficient which still leaves some ambiguity that is avoided by following the ASHRAE approach. This part of the proposed guidelines also fixes the shading coefficient for the glazing area at 0.88 during heating. This value is as stated in Chapter 27 of the 1989 ASHRAE Handbook of Fundamentals for clear double ⅛ inch glass. Shading coefficients for glazing in the rated home are based on the actual windows in use or as proposed, but also assuming the use of non-white draperies on the same schedule as is specified for the reference home.

In response to the language in section 271 of the Act that requires that these proposed guidelines not discriminate among fuel types, proposed paragraph (a)(10) provides that the reference home utilize the same energy sources for the same purposes as in the rated home. In the case of ratings that include proposed upgrades, this eliminates the possibility of a better rating by fuel switching. Energy suppliers are free to promote their particular fuel type by providing comparative operating costs but should do so outside of the information provided in the rating of the home as it exists.

In proposed paragraph (a)(12), the equipment efficiencies specified for HVAC systems and domestic hot water equipment in the reference home, are the minimum efficiencies initially established by the National Appliance Energy Conservation Act of 1987 (NAECA)(Pub.L. 100–12). In proposed paragraph (a)(11), the reference home is

also assumed to have the same type of HVAC system, e.g., forced air or hot water, as the rated home, except that in the case of homes heated electrically, the reference home is assumed to be heated with an air source heat pump. The Department considers this to be consistent with the use of the minimum equipment efficiency established by NAECA, but acknowledges the fact that in some homes with an extremely efficient envelope, the use of resistance heat might very well represent the best value when life-cycle costing principals are applied. However, it is considered a greater risk to allow the combined inefficiency of a poor envelope using resistance heat to be mitigated if a heat pump system is not specified in the reference home.

Proposed paragraph (a)(13) provides for standard adjustments to HVAC systems for duct or piping losses when the rated home has all or part of its distribution system outside of the conditioned space. The adjustment factors are consistent with those found in the 1994 Amendments to CABO–MEC.

Proposed paragraph (a)(14) provides specifications for water heater efficiency expressed as an energy factor (EF). The values specified are those found in the NAECA requirements for domestic water heaters.

The seasonal average air leakage rate of 0.67 air changes per hour (ACH) established for the reference house in proposed paragraph (a)(15) is consistent with the 1994 amendments to CABO–MEC. Consideration was given to reducing that value to 0.50 air changes per hour as was done in the 1995 edition of CABO–MEC, but at 0.67 there can be a greater incentive to test with diagnostic equipment such as a blower door. With the reference home set at the lower level of 0.50, a tested home would receive minimal credit (0.15 ACH) in the rating before reaching the current ASHRAE minimum of 0.35 ACH assumed necessary for adequate ventilation. With an 0.67 rate as the basis for the reference home, a tested home has the opportunity to demonstrate a 0.32 ACH advantage in the rating. The minimum standard default value in proposed section 437.104, unless diagnostic testing is conducted, is 0.67 so in no case could a rated house claim any advantage over the reference home without testing.

Proposed paragraph (a)(16) sets standard assumptions for the building mass found in the reference building that would be considered when evaluating the benefits of mass for heat storage during both heating and cooling seasons. This approach allows designers of the rated home to incorporate passive solar strategies into the design and to receive full credit for mass provided for that purpose. The internal and structural mass values used are those found in the 1994 Amendments to CABO–MEC.

The reference home defined by proposed section 437.103 represents a fixed rating point that will not change over time. Homes which have been rated will never need to be re-rated unless modifications have been made to the home which affect its energy efficiency.

The Department invites comments on the configuration of the reference house but reminds comment writers that it is not the intention of these guidelines to use the reference house to set any specific level of efficiency. While the specifications happen to be consistent with some current energy efficient mortgage programs, anyone offering incentives for energy efficiency in financing or otherwise, is free to select any point on the rating scale as their ''threshold of energy efficiency'' or other basis for comparison. The objective in defining and using the reference home is consistency and the fact that it is fixed in time has no bearing on future definitions of ''energy efficiency'' or future qualifications for energy efficient financing programs.

Proposed Section 437.104: Minimum Rated Features

Proposed § 437.104 provides in Table 5, a list of building components and a corresponding list of features of those building components that must be considered when calculating the energy consumption for the rated home as required by § 437.100. The Department recognizes that there are numerous additional features or devices that might affect energy consumption in buildings. Examples are ceiling fans, whole house fans, moveable insulation, etc., most of which are occupant controlled. The Department believes that those listed in Table 5 represent all the major influences on energy consumption and that it is not necessary to require that each HERS provider be able to evaluate all options and to do so would place an undue burden on many existing systems. Paragraph (h) of this section states that any HERS provider may base a rating on additional features if the energy analysis tool being used is capable of doing so.

Proposed paragraph (c) provides methods, listed in the preferred order of use, to determine building envelope thermal characteristics.

Proposed paragraph (d) allows for the use of default values when data for the minimum rated features is not available without expensive and destructive disassembly of the home. The Department believes that these default values are best determined by a person or persons knowledgeable about typical construction practices used in any given time frame for homes in any given area. For this reason, this section places the responsibility for establishing or approving default values on the accrediting body and reflects the expectation that the required expertise is present in that body.

Paragraph (e) of this section deals specifically with air leakage. It states that if diagnostic testing equipment is not used to determine leakage, then based on observations of the general tightness of construction, a value of 0.67 air changes per hour or greater is to be used. This precludes the use of a lower, more efficient value in a rated home than is used for the reference home unless testing is done. It does not ensure that the energy consumption attributable to air leakage is accurately reported in the rating but neither do the models used to extrapolate annual average air leakage rates from a single diagnostic test. An experienced and well trained rater may make reasonable estimates of air leakage and doing so without the expense of diagnostic equipment reduces the cost of completing a rating. The Department invites comments on the sensitivity of the possible range of error which can occur with either estimated air leakage or in the models for diagnostic testing.

Proposed paragraph (f) of this section provides methods, listed in a preferred order of use, for determining efficiencies of primary types of mechanical equipment. Proposed paragraph (g) provides as the last in order of preference, an age-based table of default values for typical space conditioning and domestic water heating equipment. A non-aged based table of default values is provided for less common types of mechanical equipment.

These tables identified as Tables 6 and 7, were developed from the following references:

Department of Energy Residential Conservation Services Training Manual (1981)

California Home Energy Efficiency Rating System (CHEERS) equipment default table

Air Conditioning & Refrigeration Institute (ARI) historic equipment shipment data, weighted averages

Gas Appliance Manufacturers Association (GAMA) historic equipment shipment data, weighted averages

Oil equipment shipment data compiled by R. Krajewksi (Brookhaven National Laboratory), weighted averages

Proposed Section 437.105: Operating Condition Assumptions

These guidelines are to be used to rate homes and not the occupants of the home. Therefore occupant dependent factors e.g., thermostat set points, are to be disregarded when estimating the energy consumption of the rated and reference homes. Instead, the standard operating conditions provided in proposed § 437.105 are to be assumed.

Proposed paragraph (a) of this section provides standard temperature control setpoints of 68 °F for heating and 78 °F for cooling which are consistent with those found in the 1994 Amendments to CABO–MEC. When programmable offsets are available in the rated home, proposed paragraph (b) of this section specifies assumptions for the periods of offset and the amount of offset (5 °F). These values are based on information obtained from an industry survey conducted by Minneapolis Honeywell that reported typical use of programmable thermostats. The Department considers these schedules and offsets to be conservative and therefore suitable as an operating conditioning assumption when the rated home is so equipped.

Proposed paragraph (c) sets standard values for internal gains from lights, people and equipment to be used when calculating the space conditioning loads and energy consumption. These values are consistent with those found in the 1994 Amendments to CABO–MEC.

Proposed paragraph (d) provides a formula for the determination of domestic hot water usage. This formula for daily usage, (30 gallons + (10 gallons × number of bedrooms)), is consistent with the formulas found in the 1994 Amendments to CABO–MEC and in ASHRAE Standard 90.2 that establish domestic hot water usage.

Proposed paragraph (e) would require the HERS provider to make a determination as to what weather data is to be used when calculating energy usage. The normal source of weather information is to be found in the typical meteorological year (TMY) data published by the National Climatic Center, Asheville, NC. The term ''climatologically most representative'' is used regarding the choice of location of the TMY data to be used. This is because the Department recognizes the possibility that the closest TMY weather site geographically may not be truly representative of the weather conditions found at the site of the home being rated. This proposed paragraph also allows interpolation of weather data if the interpolated weather information is consistent among all HERS providers operating within a State and is approved by the accrediting body.

Proposed paragraph (f) provides that operating adjustments to equipment efficiencies are to be made to correct for climate and mis-sizing of equipment. These correction factors may be obtained from recognized sources. The most logical sources of this information are the Air Conditioning and Refrigeration Institute (ARI) or ASHRAE. The requirements of this proposed paragraph would be met if the adjustments are either provided by or approved by the accrediting body and are consistent among all HERS providers operating within a State.

Proposed paragraph (g) would require each HERS provider to use local utility or energy rates when calculating costs for reporting as required in proposed section 437.102. This paragraph also would provide for consistency among HERS providers on the updating of the rate information by requiring each HERS provider operating within a State to update information on the same schedule which is established by the accrediting body.

Proposed Section 437.106: Non-Rated Energy Consuming Devices

The energy consumed by appliances and lights is not included in consumption used to determine the rating. Proposed § 437.106 would establish standard consumption values for energy consuming devices such as appliances and lights since it is necessary to estimate the energy usage of these non-rated devices to comply with proposed § 437.102 (Rating Report). Proposed § 437.102 would require that, in addition to reporting the estimated energy use for heating, cooling and water heating, each HERS provider reports the estimated energy use and cost of all other energy used in the rated home.

The Department recognizes the fact that some appliances, especially refrigerators, may have a wide variance in energy use. There are also dramatic savings available with the use of alternative lighting fixtures. The primary reason behind the decision to neutralize the affect of appliances in the rating process is that the rating should not be based on items that are not a permanent part of the structure. Refrigerators and other appliances can be moved with the occupants or can be replaced with models that are more or less efficient. In the case of lighting, there are opportunities to include permanently wired fixtures in the rating but it is necessary to know the operating schedule of the lighting to properly identify savings. Therefore the rating would be based on the occupants and not on the house. In addition, the number of permanently wired fixtures in the typical home is limited and, in most cases, represent only a small part of the total energy use.

In proposed § 437.100(d), each HERS provider is encouraged to provide separate information on the cost of operating appliances.

The electric energy use values proposed in Table 8 of this section are taken from documents published by the Electric Power Research Institute (EPRI). Those documents include: EPRI Residential End-Use Energy Consumption: A Survey of Conditional Demand Estimates 1989 and EPRI Residential Energy Usage Comparison Project: An Overview 1990.

The gas energy use values proposed in this section are taken from documents published by the Gas Research Institute (GRI). Those documents are: GRI Baseline Projection Data Book, 1994 Edition; and GRI Interim Technical Input to NAECA Rulemaking for Gas-Fired Ranges, 1993.

Proposed Section 437.107 Projected Ratings for To-Be-Built Homes

This section recognizes that homebuilders may wish to offer standard models that may be built on sites that vary in orientation. This would prevent a rater from meeting a provision of section 437.104 which lists window and skylight orientation as a minimum rated feature. Therefore, a projected rating for to-be-built homes may be based on plans by estimating the energy consumption for each of the four cardinal orientations, (north, south, east and west), and basing the projected rating on the orientation that results in the greatest energy consumption.

Projected ratings for to-be-built homes must also use a default value for air leakage of no less than 0.67 air changes per hour. The rating may be revised upon completion of the home if diagnostic testing results in a lower air leakage rate (and/or on the basis of actual orientation). The Department recognizes that this may be unfair to builders who consistently deliver homes with tighter construction because the projected rating will not reflect the benefit of additional investment in tightening of the home and may cause the rating to fall short of a level required to obtain a particular incentive. The final rulemaking could address this issue by allowing an exception to the default value for demonstrated consistency of tightness by a builder

and the Department solicits comments on the appropriate basis on which that exception might be made (number of homes with demonstrated tightness, etc.).

Subpart C—How to Administer a Home Energy Rating System

Proposed Section 437.200: Energy Analysis Tool Requirements

Proposed § 437.200 establishes the minimum capabilities that an energy analysis tool must have in order to produce the information used in determining a rating. These include the ability to consider the effect of the following items when estimating energy use:

Building types. (Proposed § 437.2);

Reference home configuration. (Proposed § 437.103);

Minimum rated features. (Proposed § 437.104);

Operating condition assumptions. (Proposed § 437.105);

Non rated energy consuming devices. (Proposed § 437.106).

Proposed paragraph (a)(5) is provided in response to section 271(b)(2) of the Act which requires that the voluntary guidelines include protocols and procedures for certification of the technical accuracy of building energy analysis tools used to determine energy efficiency ratings.

The National Renewable Energy Laboratory (NREL) has developed a Home Energy Rating System Building Energy Simulation Test (HERS BESTEST) for this purpose. HERS–BESTEST is published as a technical report identified as NREL/TP–472–7332, and is available from the information contact identified at the beginning of this notice or from the National Technical Information Service, U. S. Department of Commerce, Springfield, Virginia 22161.

In developing HERS BESTEST, NREL used the results of three public domain dynamic analysis programs with time steps of one hour or less to establish reference energy consumption values as a basis for comparison of the energy consumption calculations generated by HERS tools. The programs used were DOE 2.1E, BLAST 3.0, and SERI–RES.

The NREL report establishes the procedures to administer HERS–BESTEST. The NREL report also provides suggested pass/fail criteria for certification of a rating tool based on the tools ability to correctly calculate, within an allowable deviation, building energy loads for a series of tests identified as Test Suite 1 of the HERS–BESTEST process.

A single story slab on grade house with typical glazing and insulation is used as a base case with the HERS–BESTEST Tier 1 test suite consisting of variations to the building in these elements:

- Air leakage.
- Wall and ceiling R-value.
- Glazing area.
- Glazing physical properties.
- Glazing orientation.
- South overhang.
- Uninsulated slab.
- Insulated slab.
- Uninsulated basement.
- Insulated basement.
- Internal loads.
- Crawl space.
- Exterior surface color.
- Combination of features using the least energy efficient specifications for each.

In each of the variations listed above, the energy loads calculated by the three public domain dynamic analysis programs differ by varying amounts. The variation can be up to fifteen percent of the mean of all three results. Thus a ''band width'' of results is created for each test case.

Proposed § 437.206 (Accreditation) provides that it is the responsibility of a State or any other organization established as an accrediting body, to establish the pass/fail criteria for certification of the tool. The suggested pass/fail criteria provided in the NREL report are based on the widest interval produced by either a deviation of four million BTU outside, on either side of the ''band width'' created in HERS–BESTEST or an interval produced by the 90% confidence interval for the population mean using a Students t distribution based on the reference results of HERS–BESTEST.

Proposed paragraph (b) of this section provides for future energy analysis tool requirements. The Department believes that the accuracy of ratings will be improved with tools that utilize hourly simulations to handle the variables provided for in this proposed paragraph. Proposed paragraph (b) of this section sets a period of four years from the date of final rulemaking for HERS providers to improve their tools to meet the requirements of this part.

The Department invites comments on the need for the degree of accuracy expected to result from the HERS–BESTEST procedure. Specific questions are: Can accuracy be best determined using empirical data that compares predictions to actual consumptions? Also, should HERS providers be able to self-certify the accuracy of the energy analysis tools?

Proposed Section 437.201: Site Data Collection Manual

Proposed § 437.100 states that data is to be collected at the site of the rated home. Proposed § 437.201 would require each HERS provider to supply each data collector with a manual containing approved data collection procedures. Proposed paragraph (a) of this section provides, as a reference source for such procedures, Guideline No. 10 of the Home Energy Rating Systems Council HERS Guidelines. The Department has placed a copy of this guideline in the public file for this notice.

The Department believes that a manual of this type can be most useful if it is directed to local building practice and history. Therefore, proposed paragraph (a) states that a HERS provider may use procedures established by the accrediting body or may create its own material as long as the procedures used are approved by the accrediting body.

Proposed Section 437.202: Training Home Energy Raters

Proposed § 437.202 would require each HERS provider to provide training to any employee who will be involved in the rating process. This section provides for the development of a syllabus to be used in this training.

Proposed paragraph (a) of this section identifies the subject matter for a classroom training segment of the training. Proposed paragraph (b) would require a written examination. Paragraph (c) would require field training. Paragraph (d) specifies a probationary period.

Proposed paragraph (e) provides for the use of a challenge test of competency for rater personnel with prior experience. The challenge test, if passed, would allow the HERS provider to waive the classroom training required by paragraph (a) of this proposed section.

The classroom training agenda in proposed paragraph (a) was developed from information provided to the Department by the HERS Council Technical Committee and is based on recommendations made by personnel representing the following organizations: California Home Energy Efficiency Rating System (CHEERS), Energy Rated Homes of America (ERHA), Oregon Department of Energy, Policy & Planning Division, Western Massachusetts Electric Co. Energy Crafted Home Program.

The Department considers these organizations to be among the most experienced HERS providers operating

today. The Department also believes that the proposed training requirements are based on sound principles.

Proposed Section 437.203: Quality Control

Proposed paragraph (a) requires each HERS provider to establish a Quality Assurance Plan and specifies the minimum elements of that plan. The first element listed as paragraph (a)(1) is the use of a peer review where other raters would be asked to critique the work of each rater as part of a continuing re-evaluation program. Proposed paragraph (b) would require HERS providers to establish a Quality Assurance File and specifies the minimum contents of that file. This paragraph further provides for a minimum updating cycle of two years for the information in this file, or sooner if changes are made to the HERS providers system.

Proposed paragraph (c) would require HERS providers to maintain an electronic database of specific information on each home rated and specifies the minimum content of that database. The main purpose of maintaining this data is to support the monitoring and evaluation activities provided in proposed section 437.204. It may also be possible in the future to link these databases with National or State databases that track default data on mortgages or loans. Only selected parts of the database such as the unique ID number would be needed for that purpose.

The specification of individual elements listed in proposed paragraphs (a), (b) and (c) is based on recommendations from the same organizations referenced in the discussion above on the development of proposed § 437.202 and the Department considers the requirements to represent the minimum effort expected for quality control. Specific recommendations or comments are invited on this subject.

Proposed Section 437.204: Monitoring and Evaluation

Proposed § 437.204 requires each HERS provider to semi-annually evaluate the accuracy of ratings being performed by a periodic comparison of predicted and actual energy use.

The Department believes that HERS providers should maintain certain information that would facilitate both their own monitoring and evaluation program and that of an accrediting body or other third-party reviewer. Proposed section 437.204 specifies that, in addition to the data specified in proposed § 437.203, each HERS provider shall maintain a database consisting of authorizations for the release of consumption information by utility companies. Optimally, the HERS provider could maintain actual consumption data for each rated home, but even if the information were readily available that would place a significant administrative burden on the provider. The Department also recognizes the fact that in many cases these authorizations may be difficult or impossible to obtain, but believes the need exists to make a reasonable effort to do so. This data must be retained for a minimum of 10 percent of the ratings performed or 500 homes, whichever is less, in order to allow the accrediting body or other monitoring entity to make random selections of ratings to review.

Proposed Section 437.205: Guideline Compliance

Proposed § 437.205 sets forth two levels of compliance for HERS providers and also sets future requirements for energy analysis tool capabilities. The Department considers this to be a phased-in approach to allow any existing HERS provider to represent themselves as operating in basic compliance with the requirements of this part while in the process of revising certain elements of their existing system to become fully accredited.

Proposed paragraph (a) of this section provides a list of what must be demonstrated to be deemed fully accredited. Proposed paragraph (a)(4) sets forth requirements for the energy analysis tool to pass both Tier 1 and Tier 2 sets of tests of HERS-BESTEST. The Tier 2 set of tests test for the ability to evaluate the following features related to high mass passive solar design:

- Variations in mass;
- Glazing orientation;
- Glazing area;
- South overhang;
- East and west shading.

Proposed paragraph (b) of this section provides for ''basic compliance'' by providing exceptions (with a maximum two year duration) to the full requirements provided in proposed paragraph (a) of this section.

The exception permitted in paragraph (b)(1)is the acceptance of simplified utility rate structures. Since the rating is based on consumption, the rating accuracy is not compromised and only minor inaccuracies are anticipated in operating cost estimates.

Paragraph (b)(2) allows an exception to the minimum rated features but it is unlikely that any key features would be excluded because the HERS provider would not pass the HERS-BESTEST procedure. The exception is most likely to be used because of the inability of existing systems to evaluate active solar water heating or passive solar systems.

The exception to the use of standard operating conditions allowed by paragraph (b)(3) is also considered to have minimal impact because of the need to pass HER-BESTEST. If a HERS provider does not use the exact prescribed standard operating conditions the results could be slightly less accurate but they must still be within HERS-BESTEST parameters.

Paragraph (b)(4) allows a HERS provider to be in basic compliance by passing only the Tier 1 set of HERS-BESTEST tests. The additional requirements found in the Tier 2 tests are all related to a high mass passive solar building and are not considered critical for basic compliance.

The exception to specific training requirements allowed under paragraph (b)(5)is provided to recognize the fact that many successful HERS providers may not have training programs that exactly match the syllabus set forth in these proposed guidelines, and therefore are given an opportunity to demonstrate that suitable training has been provided.

The Department believes that the exceptions listed will not significantly compromise the accuracy or the utility of ratings and provide for a reasonable period of time to become fully accredited.

Proposed Section 437.206: Accreditation

Proposed § 437.206 states a requirement that each HERS provider operating in voluntary compliance with these guidelines shall be accredited by an accrediting body such as a State or an independent entity meeting the criteria set forth in this section.

In it's consultation with various stakeholders in the development of these proposed guidelines, the Department has received conflicting commentary on the need for a system of accrediting HERS providers and certifying the energy analysis tools used by these providers. The leading proponent of accreditation is the HERS Council, supported by its financial community members. Opposition is primarily found in existing operating HERS systems where an accreditation process and/or changes to meet the proposed guidelines could be disruptive to their present systems. Many of the proposed guidelines state that when certain information needed for the rating process is not readily available without destructive disassembly of the home or without costly diagnostic procedures, then standard default values may be used. Such default values are best developed by local entities

based on local experience or historic data for building practice. The accreditation process would assure that the default values used were consistent among HERS providers operating within a defined area such as a State.

As the proposed guidelines are themselves voluntary, a voluntary system, probably a combination of states and national entities, could be developed for home energy rating providers seeking accreditation and tool certification.

The Department requests comments on the processes of accreditation and tool certification, and the establishment of appropriate entities for these purposes. Specific questions are:

Should a national entity be created for accreditation of HERS?

Should States accredit HERS and if so, who would accredit HERS in states where the State is unwilling or unable to do so?

Should guidelines be developed for the accreditation process itself and if so, who should develop them?

Is self-accreditation a viable approach and what process should be implemented to do so?

III. Procedural Requirements

A. Environmental Review

The proposed quidelines were reviewed under the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality regulations implementing the provisions of the National Environmental Policy Act (40 CFR parts 1500–1508), and the Department's regulations for compliance with the National Environmental Policy Act (10 CFR part 1021).

DOE concludes that, under Category A11 (Technical advice and assistance) of Appendix A to Subpart D, ''Categorical Exclusions Applicable to General Agency Actions'', of 10 CFR part 1021, the voluntary guidelines are categorically excluded from further environmental documentation.

B. Regulatory Planning and Review

The proposed guidelines do not constitutes a ''significant regulatory action'' as defined in section 3(f) of Executive Order 12866, ''Regulatory Planning and Review'' (58 FR 51735), and has not been reviewed by the Office of Information and Regulatory Affairs of the Office of Management and Budget.

C. Federalism

The proposed guidelines have been reviewed in accordance with Executive Order 12612, ''Federalism'' (52 FR 41685), which directs agencies to consider the impact of Federal actions on States, on the relationship between the Federal Government and the States, and on the distribution of power and responsibilities among the various levels of government.

The guidelines proposed by DOE are strictly voluntary. No requirements or inducements have been placed upon the States to adopt the guidelines. Consequently, the guidelines do not contain sufficient federalism implications to warrant the preparation of a federalism assessment.

D. Regulatory Flexibility Act

The proposed guidelines were analyzed under the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, which directs agencies to prepare a regulatory flexibility analysis for each proposed rule or certify that the rule will not have a ''significant economic impact on a substantial number of small entities.''

The proposed guidelines are expected to have a minimal effect on small entities. The guidelines described are voluntary and no requirements or burdens have been imposed on any entity. As permitted by section 605 of the Regulatory Flexibility Act, DOE certifies that the proposed guidelines will not have a significant economic impact on a substantial number of small entities. Consequently, no regulatory flexibility analysis will be produced.

E. Paperwork Reduction Act

These proposed guidelines were examined with respect to the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, which directs agencies to minimize Federal information collection and reporting burdens imposed on individuals, small businesses, and State and local governments.

These proposed guidelines establish voluntary guidelines for residential energy efficiency ratings and do not impose requirements for the collection or reporting of information to the Federal Government. Accordingly, clearance under the Paperwork Reduction Act of 1980 is not required by the Office of Information and Regulatory Affairs of the Office of Management and Budget.

IV. Public Comment Procedures

A. Public Participation

The Department encourages the maximum level of public participation in developing these guidelines. Individuals, Federal agencies, architects, engineers, utilities, States and local governments, building code organizations, builders, builder associations, building owners, building owner associations, consumers, mortgage lenders, and others are urged to submit written statements on the proposal. The Department also encourages interested persons to participate in the public hearing to be held in Washington, D.C., at the time and place indicated at the beginning of this Notice.

The Department has established a comment period of 90 days following publication of this notice, for interested persons to comment on this proposal. All comments will be available for review in the Department's Freedom of Information Reading Room.

B. Written Comment Procedures

Interested persons are invited to participate in this proceeding by submitting written data, views or arguments with respect to the subjects set forth in this notice. Instructions for submitting written comments are set forth in the beginning of this notice and below.

Comments (with 7 copies) should be labeled both on the envelope and on the documents, ''Residential Energy Efficiency Rating Guidelines'' (Docket No. EE–RM–95–202)'' and must be received by the date indicated in the beginning of this notice, in order to insure full consideration. Additionally, the Department would appreciate an electronic copy of the comments to the extent possible. The Department is currently using the WordPerfect 5.1 word processing program. All comments received by the date specified at the beginning of this notice and other relevant information will be considered by the Department before final action is taken on the proposed regulation.

All written comments received on the proposed voluntary guidelines will be available for public inspection at the Department's Freedom of Information Reading Room as provided at the beginning of this notice.

Pursuant to the provisions of 10 CFR 1004.11, any person submitting information or data which the submitting person believes to be confidential and exempt by law from public disclosure, should submit one complete copy of the document, and 7 copies, if possible, from which the information believed to be confidential has been deleted. The submitter is to include a statement specifying why the information is privileged or confidential. The Department will make its own determination with regard to the confidential status of the information or data and treat it according to its determination.

C. Public Hearing

1. Procedure for Submitting Requests To Speak

In order to have the benefit of a broad range of public viewpoints in, developing these guidelines the Department will hold a public hearing. Listed earlier in this notice is the date and address for the hearing. Any person who has an interest in these proceedings, or who is a representative of any group or class of persons having an interest, may make a request for an opportunity to make an oral presentation at the public hearing. Such requests should be labeled both on the letter and the envelope, ''Residential Energy Efficiency Rating Guidelines'' (Docket No. EE–RM–95–202)'' and should be sent to the address and must be received by the time specified at the beginning of this notice.

The person making the request should briefly describe the interest concerned and, if appropriate, state why he or she is a proper representative of the group or class of persons that has such an interest, and give a telephone number where he or she may be contacted. Each person selected to be heard will be so notified by the Department as to the approximate time they will be speaking.

Each person to be heard is requested to bring to the hearing seven copies of their statement. In the event any person wishing to testify cannot meet this requirement, alternative arrangements can be made with the Office of Hearings and Dockets in advance by so indicating in a letter requesting to make an oral presentation.

A list of the persons to be heard at the hearing will be available upon request from the Office of Hearings and Dockets. The list will also be available for inspection in the Department's Freedom of Information Reading Room.

2. Conduct of Hearing

The Department reserves the right to select the persons to be heard at the public hearing, to schedule the representative presentations, and to establish the procedures governing the conduct of the hearing. The length of each presentation is limited to 20 minutes.

A Department official will be designated to preside at the hearing. The hearing will not be judicial or evidentiary-type hearing, but will be conducted in accordance with 5 U.S.C. 553 and Section 501 of the Department of Energy Organization Act, 42 U.S.C. 7191. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity to make a rebuttal statement, subject to time limitations. The rebuttal statements will be given in the order in which the initial statements were made. The official conducting the hearing will accept additional comments or questions from those attending, as time permits. Any interested person may submit to the presiding official written questions to be asked of any person making a statement at the hearing. The presiding official will determine whether the question is relevant or whether time limitations permit it to be presented for a response.

Further questioning of speakers may be permitted by the Department. The presiding official will afford any interested person an opportunity to question the interested persons who made oral presentations, and employees of the United States who have made written or oral presentation with respect to disputed issues of material fact relating to the proposed rule. This opportunity will be afforded after any rebuttal statements, to the extent that the presiding official determines that such questioning is likely to result in a more timely and effective resolution of such issues. If the time provided is insufficient, the Department will consider affording an additional opportunity for questioning at a mutually convenient time. Persons interested in making use of this opportunity must submit their request to the presiding official no later than shortly after the completion of any rebuttal statements and be prepared to state specific justifications, including why the issue is one of disputed fact and how the proposed questions would expedite their resolution.

Any further procedural rules regarding proper conduct of the hearing will be announced by the presiding official.

Transcripts of the hearing will be made, and the entire record of this rulemaking, including the transcripts, will be retained by the Department and made available for inspection at the Department's Freedom of Information Reading Room as provided at the beginning of this notice. Any person may also purchase a copy of the transcript from the transcribing reporter.

The Department may cancel the public hearing if the Department does not receive sufficient interest concerning the hearing. The Department will include for the record a copy of the statement of any person who requested to speak at a hearing that was canceled by the Department.

List of Subjects in 10 CFR Part 437

Buildings, Energy conservation, Housing standards, Mortgages.

Issued in Washington, DC, on July 11, 1995.

Christine A. Ervin,

Assistant Secretary, Energy Efficiency and Renewable Energy.

For the reasons set forth in the preamble, it is proposed to amend 10 CFR Chapter II by adding part 437 to read as follows:

PART 437—VOLUNTARY HOME ENERGY RATING SYSTEM GUIDELINES

Subpart A—General Provisions

Subpart B—How To Rate a Home

Subpart C—How To Administer a Home Energy Rating System

Authority: 42 U.S.C. 8236–8236b

Subpart A—General Provisions

§ 437.1 Purpose.

The provisions of this part establish voluntary guidelines which any provider of home energy ratings may follow to produce uniform energy efficiency ratings for residential buildings. The energy efficiency ratings produced under this part may be used to enable and encourage the use of home mortgages or home improvement loans that include incentives for energy efficiency in homes.

§ 437.2 Scope.

These guidelines apply to existing or proposed site-constructed or manufactured residential buildings that are either one and two family dwellings, or other residential dwellings three stories or less in height excepting hotels and motels.

§ 437.3 General definitions and acronyms.

As used in this part—

Accrediting body means a State, local government, or other independent agency that meets the criteria provided in § 437.206 of these guidelines for the accreditation of HERS providers.

AGA means American Gas Association

Annual Fuel Utilization Efficiency or *AFUE* means the ratio of annual output energy to annual input energy that includes any non-heating season pilot input loss.

Conditioned space, directly means an enclosed space having heating equipment with a capacity of 10 BTU/(hr-ft^2), or cooling equipment with a capacity exceeding 10 BTU/(hr-ft^2). An exception is if the heating and cooling equipment is designed and thermostatically controlled to maintain a process environment temperature less than 65° Fahrenheit or greater than 85° Fahrenheit for the whole space the equipment serves.

Conditioned space, indirectly means enclosed space that is not directly conditioned space:

(1) With area weighted heat transfer coefficient (U-value) to directly conditioned space exceeding that to the outdoors or to unconditioned spaces; or

(2) Through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour.

COP means Coefficient of Performance, which is the ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system under designated operating conditions.

Data analyst means a person trained to enter the information compiled by a data collector into the rating tool and to produce the energy efficiency rating of a home.

Data collector means a person trained to evaluate the minimum rated features of a home on site and collect all the information required to create a rating.

Detached one- and two-family dwelling means a building with one or two independent dwelling units with an individual or central HVAC system.

Energy analysis tool means a calculation procedure for determining a home's energy efficiency rating and estimating annual purchased energy consumption and cost.

EER means Energy Efficiency Ratio, which is the ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions.

Energy efficiency rating or *rating* means an unbiased indication of a home's relative energy efficiency based on consistent inspection procedures, operating assumptions, climate data and calculation methods.

Energy factor means a measure of water heater energy efficiency as determined under Department of Energy Regulations. 10 CFR 430.23(e)(2)(ii).

Estimated annual energy cost savings means positive dollar difference between estimated annual energy costs for a home with energy saving measures and estimated annual energy costs of the same home in its current condition.

Fenestration means a glazed opening in a building.

Full rater means the person trained to perform the functions of both a data collector and a data analyst.

HERS-BESTEST means the Home Energy Ratings System Building Simulation Test published in NREL Report No. NREL/TP–472–7332.

HERS provider means a person or organization that develops, manages and operates a home energy rating system.

Home means a one or two family dwelling, or multi-family dwelling of three stories or less.

Home energy rater or *rater* means the person trained to inspect a home to evaluate the minimum rated features and prepare an energy efficiency rating. (see also Data collector, Data analyst, Full rater)

Home Energy Rating System or *HERS* means the materials and procedures needed to operate a home energy rating program including but not limited to: marketing materials, training, publications, rating tool, quality control, data base collection and maintenance, agreements, data collection sheets, home owner reports, and other related materials and services.

HSPF means Heating Seasonal Performance Factor which is the total heating output of a heat pump during its normal annual usage period for heating, in Btu, divided by the total electric energy input during the same period, in watt-hours.

HVAC means Heating, Ventilating and Air Conditioning.

Internal gains means the heat gains within a home attributable to lights, people, and miscellaneous equipment including domestic hot water equipment losses.

NREL means National Renewable Energy Laboratory.

Purchased energy means the portion of the total energy requirement of a home that is purchased from a utility or other energy supplier.

Reference home means a hypothetical home configured to the specifications set forth in section 437.103 of these guidelines.

R-value means thermal resistance value.

SEER means seasonal energy efficiency ratio, which is the total cooling output of an air conditioner during its normal annual usage period for cooling, in Btu/h, divided by the total electric energy input during the same period, in watt-hours.

Thermal storage mass means materials or equipment incorporated into a home that will store heat, produced by renewable or non renewable energy, for release at a later time.

Trombe wall means a heavy mass wall, usually of masonry materials or containing water, constructed adjacent to a glazed area, for the purpose of collecting and storing solar energy.

Typical Meteorological Year or *TMY Data* means hourly data published by the National Climatic Center, Asheville, NC. based on historical weather data for 216 locations.

U-value means thermal transmittance value.

§ 437.4 Availability of ratings.

The purposes of this rating system are to permit:

(a) Each builder, real estate agent, lender, or organization in the mortgage business—

(1) When rating information is available, to communicate that information in writing to home buyers prior to sale; and

(2) To advise each applicant for financing of a home of incentives relating to qualification criteria, rate structure, or otherwise, available based on the energy efficiency of the home as measured by ratings conducted under these guidelines,

(b) Each multi-listing service (MLS) to include available home energy rating information on any applicable listing.

Subpart B—How To Rate a Home

§ 437.100 Rating procedure.

(a) To determine the energy efficiency rating of a home, each HERS provider shall—

(1) If the rating is being conducted for an existing home, visit the site of the home being rated to collect the data needed to conduct the rating;

(2) If the rating is being conducted for a to be built home, follow the procedures set forth in § 437.107 of these guidelines to collect the data needed to conduct the rating;

(3) Use the collected data to estimate the annual purchased energy consumption for heating, cooling and water heating for both the rated home and the reference home defined in § 437.103.

(4) If the energy efficiency rating is conducted to evaluate proposed energy

conserving improvements to the home, conduct additional estimates of annual purchased energy consumption with the home reconfigured to include those improvements sufficient to consider interactions among improvement options.

(b) Estimates completed by each HERS provider under paragraphs (a)(3) and (4) of this section must be—

(1) Based on the minimum rated features set forth in § 437.104 of these guidelines;

(2) Conducted using the standard operating assumptions established in § 437.105;

(3) Conducted using an energy analysis tool that has been certified for accuracy under § 437.200.

(c) Each HERS provider shall compare the estimates provided under paragraph (a) of this section to determine the energy efficiency rating of the home and if applicable, the energy efficiency rating of the home with proposed conservation measures installed.

(d) To encourage the use of energy efficient appliances, each HERS provider may provide additional information on estimated appliance energy consumption of the appliances in use in the rated home. This information will not change the rating procedure set forth in this section.

§ 437.101 Rating point score and star rating.

(a) Point score. The reference home has a score of 80 points on a 0 to 100 point scale. A rated home with the same annual purchased energy consumption as its associated reference home also has a score of 80 points. Every 0.05 decrease in the ratio (from 1:1) of the rated home's annual purchased energy consumption to the reference home's annual purchased energy consumption translates to an increase in the rated home's score of 1 point. An increase of 0.05 in the ratio translates to a decrease in the rated home's score of one point. Equation 1 is used to calculate the point score.

Equation 1

Point score = 100-((ER/EC)/.05)

Where—

ER=Estimated purchased energy consumption for heating, cooling and water heating of rated home (Btu).

EC=Estimated purchased energy consumption for heating, cooling and water heating of reference home (Btu).

(b) Star rating. The rated home will be given a star rating between one and five-plus stars, determined by the numerical score and the corresponding number of stars depicted in Table 1;

TABLE 1.—SCORE AND STAR SCALES FOR RATED HOMES

Score	Stars	Annual purchased energy consumption
0–39	One	> 3.0×Reference house.
40–59	Two	> 2.0 and < 3.0×Reference House.
60–79	Three	> 1.0 and <= 2.0×Reference House.
80–85	Four	> 0.70 and <= 1.0×Reference House.
86–91	Five	> 0.40 and <= 0.70×Reference House.
92–100	Five Plus	>= zero and <= 0.40×Reference House.

(c) Homes that utilize no purchased energy due to the use of technologies such as wind generation or photo voltaic power systems will require no calculations and will automatically be given a 100 point score and a five-plus star rating

§ 437.102 Rating report.

(a) For each rating conducted under this part, a report is to be prepared containing the following information:

(1) The numerical rating score determined in § 437.101;

(2) The star rating determined in § 437.101;

(3) The estimated annual purchased energy consumption by fuel type of space heating, space cooling, domestic hot water, and all other energy use, and the total of these four estimates;

(4) The estimated annual energy cost by fuel type of space heating, space cooling, domestic hot water, and all other energy use, and the total of these four estimates;

(5) The name of the accrediting body certifying the accuracy of the energy analysis tool under § 437.200.

(6) The margin of estimating error accepted by the accrediting body certifying the energy analysis tool;

(7) The level of accreditation, stated as either basic compliance or full accreditation determined under § 437.205 (a) and Guidelines compliance; and

(8) Whether infiltration was tested using diagnostic equipment or estimated by the HERS provider.

(9) Any available and pertinent prior energy consumption data.

(b) If ratings are conducted to evaluate energy saving improvements to the home, in addition to the information set forth under paragraph (a) this section, each rating report must include—

(1) The estimated annual energy cost savings available with the home reconfigured to include those improvements;

(2) The discount rate applied to, and present worth value of, the energy cost savings; and

(3) The financing interest rate and life of the measure used by the HERS provider to determine the present worth value.

(c) The rating report must also provide either:

(1) The estimated appliance energy consumption of the rated home: or

(2) Information that additional energy savings related to appliance use may be attainable and that the information available on Energy Guide labels and from other recognized sources may be used to consider the energy efficiency of appliances.

(d) If the rating is a projected rating for a to-be-built home, conducted under § 437.104(d) the rating shall be identified as a rating based on plans.

(e) For each rating conducted under these guidelines, the following items are to be prominently displayed on all reports and labels:

(1) Date of the rating;

(2) Annual estimated energy costs for heating, cooling, water heating and all other use:

(3) Rating point score: and

(4) Star rating.

§ 437.103 Reference home configuration.

(a) To conduct each rating under this part, each HERS provider shall establish a reference home that is used in an annual purchased energy consumption comparison with the rated home. The reference home is a hypothetical home configured using—

(1) The same shape and size as the rated home;

(2) The same area of surfaces bounding conditioned space as the rated home, but not including surfaces that neither gain nor lose heat;

(3) All enclosure elements that meet, but not exceed, the requirements, expressed as U and Uo values, of

paragraph 502.2 of the 1993 CABO Model Energy Code;

(4) An area of exterior doors of 40 square feet and with the door U-value at 0.20.

(5) Vertical fenestration area equal to—

(i) For detached homes, 18% of the floor area of directly conditioned space;

(ii) For attached homes, F×18% of the floor area of directly conditioned space where:

F=(exposed wall area)/(exposed wall area+common wall area)>=.56

(6) Vertical fenestration distributed—

(i) For detached homes, equally in each of the four cardinal directions, north, south, east and west; and

(ii) For attached homes, equally in each of the four cardinal directions, north, south, east and west, which if necessary may assume fenestration in common walls;

(7) A frame factor equal to 27% of the gross fenestration area calculated under paragraph (a)(5) of this section;

(8) The glazed area of the fenestration with a shading coefficient (SC) of 0.70 assumed during the cooling season, which represents the combined SC of the glazing and the use of nonwhite draperies and with a SC of 0.88 representing the SC of the glazing only assumed at all other times;

(9) No external shading assumed at any time;

(10) The same energy sources for heating, cooling and water heating used in the rated home;

(11) The same type of HVAC system(s) as the rated home except that if the rating is for any electrically heated home, the reference home HVAC system is an air source heat pump;

(12) The efficiencies of HVAC systems set forth in Table 2;

TABLE 2

Type	Units	Rating
Heating Equipment:		
Gas or Oil Warm Air Furnace.	AFUE	0.78
Gas Boiler (water)	AFUE	0.80
Gas Boiler (steam)	AFUE	0.75
Oil Boiler (water or steam).	AFUE	0.80
Air Source Heat Pump:		
(split system)	HSPF	6.80
(package system)	HSPF	6.60
Cooling Equipment:		
Central Air Conditioner:		
(split system)	SEER	10.00
(package system)	SEER	9.70
Heat Pump:		
(split system)	SEER	10.00
(package system)	SEER	9.70

(13) The heating and cooling system efficiencies proportionally adjusted for sections of ductwork located outside or inside conditioned space, with adjustment based on the configuration of the ductwork in the rated home and using the values set forth in Table 3 and Equation 2;

TABLE 3.—FORCED AIR AND HYDRONIC DISTRIBUTION SYSTEM LOSS FACTORS

Within conditioned space	Outside conditioned space	Unconditioned basement
Forced Air Systems—Duct Location		
Heating 1.00	0.72	0.80
Cooling 1.00	0.72	0.80
Hydronic Systems—Piping Location		
1.00	0.95	0.95

Equation 2

Adjusted Efficiency=Equipment Efficiency × Distribution Loss Factor

(14) The energy factor for the water heater set forth in Table 4 for the size used in the rated house;

TABLE 4

Water heating Type	Unit	Rated storage capacity (gallons) 30 gal	40 gal	50 gal	60 gal
Gas	EF	0.56	0.54	0.53	0.51
Oil	EF	0.53	0.53	0.50	0.48
Electric	EF	0.91	0.90	0.88	0.87

[1] EF=Energy Factor.

(15) A seasonal average air leakage rate of 0.67 air changes per hour;

(16) An internal mass of 8 pounds per square foot of floor area and a structural mass of 3.5 pounds per square foot of floor area; and

(17) No heat capacitance associated with solar storage mass within the thermal envelope of the rated home.

(b) For walls of attached homes, the U-value calculation set forth under paragraph (a)(3) of this section is completed using the fenestration area calculated as F in paragraph (a)(5)(ii) of this section and the actual area of walls that experience heat loss or gain. Common walls that separate homes are not included in this calculation.

§ 437.104 Minimum rated features.

(a) Each HERS provider shall complete the annual purchased energy consumption estimates for heating, cooling and water heating set forth in § 437.100 of these guidelines using the energy loss and gain associated with the minimum features set forth in Table 5.

(b) For existing homes, the envelope thermal characteristics of building elements 1 through 7 set forth in Table 5 are determined by site observation.

(c) If data for the minimum rated features set forth in paragraph (b) of this section can not be obtained by observation or without destructive disassembly of the home, each HERS provider shall use default values. The default values are determined from the following sources listed in the preferential order of use—

(1) for manufactured homes, available manufacturer's data;

(2) current and historical local building practices; or

(3) current and historical local building codes.

(d) Default values set forth in paragraph (c) of this section will be established or approved by the accrediting body and consistent for each HERS provider operating within a state.

(e) For existing homes, the determination of air leakage and duct leakage values set forth as building elements 10 and 11 in Table 5 are determined by data collected on site using the following procedures listed in preferential order of use:

(1) current on-site diagnostic test data; or

(2) observations of the condition of the building and duct system made by the HERS provider. Based on these observations values used will be;

(i) for air leakage, 0.67 air changes per hour or greater with the minimum value

of 0.67 to be used only when the rater observes features that denote tight construction; and

(ii) for duct leakage, default values approved or established by the accrediting body.

(f) For existing homes, the energy efficiency of the mechanical equipment set forth as building elements 12 through 14 in Table 5 is determined by data collected on site using the following sources listed in preferential order of use:

(1) current on-site diagnostic test data;
(2) name plate data;
(3) manufacturer's data sheet; or
(4) equipment directories.

(g) If information on the energy efficiency of mechanical equipment cannot be determined from the sources listed in paragraph (f) of this section, the values set forth in Tables 6 and 7 shall be used.

(h) Any HERS provider may base annual purchased energy consumption estimates for the rated home on additional features if the HERS provider's energy analysis tool is capable of doing so.

TABLE 5.—MINIMUM RATED FEATURES

Building element	Minimum rated features
1. Floor/Foundation Assembly.	Construction type (slab-on-grade, crawl space, basement), insulation (edge, under slab, cavity, sheathing), vented or unvented (crawl space), capacitance (if slab or basement receives appreciable solar gain).
2. Walls	Construction type, insulation value (cavity, sheathing), capacitance, color (light, medium, or dark).
3. Roof/Ceiling Assembly	Construction type, insulation value (cavity, sheathing), roof color (light, medium, or dark).
4. Rim Joist	Insulation value (cavity, sheathing).
5. Doors	Construction type, insulation value.
6. Windows	Construction type, orientation, U-value (of complete assembly), solar heat gain coefficient, shading.
7. Skylights	Construction type, orientation, tilt, U-value (of complete assembly), heat gain coefficient, shading.
8. Passive Solar System (Direct Gain System).	Solar aperture area and orientation, thermal storage mass.
9. Solar Domestic Hot Water Equipment.	System type, collector type and area, orientation, tilt, efficiency, storage tank size, pipe insulation value.
10. Air Leakage	Air leakage measurement type (estimate, blower door test, tracer gas test), volume of conditioned space.
11. Distribution System	System type, location, insulation value (duct and pipe), air leakage (ducted systems only).
12. Heating Equipment	Equipment type, location, efficiency (AFUE, HSPF).
13. Cooling Equipment	Equipment type, location, efficiency (SEER, COP).
14. Domestic Hot Water Equipment.	Equipment type, location, energy factor or seasonal efficiency, extra tank insulation value, pipe insulation value.
15. Control Systems	Thermostat type.

TABLE 6.—MECHANICAL

Mechanical Systems	Units	Pre-1960	1960–69	1970–74	1975–83	1984–87	1988–91	1992 to present
Heating:								
Gas Furnace	AFUE	0.60	0.60	0.65	0.65	0.68	0.76	0.78
Gas Boiler	AFUE	0.60	0.60	0.65	0.65	0.70	0.77	0.80
Oil Furnace or Boiler	AFUE	0.60	0.65	0.72	0.75	0.80	0.80	0.80
Air-Source Heat Pump	HSPF	4.50	4.50	4.70	5.50	6.30	6.80	6.80
Ground-Water Geothermal Heat Pump.	COP	2.70	2.70	2.70	3.00	3.10	3.20	3.50
Ground-Coupled Geothermal Heat Pump.	COP	2.30	2.30	2.30	2.50	2.60	2.70	3.00
Cooling:								
Air-Source Heat Pump	SEER	5.00	6.10	6.50	7.40	8.70	9.40	10.00
Ground-Water Geothermal Heat Pump.	EER	10.00	10.00	10.00	13.00	13.00	14.00	16.00
Ground-Coupled Geothermal Heat Pump.	EER	8.00	8.00	8.00	11.00	11.00	12.00	14.00
Central Air Conditioner	SEER	5.00	6.10	6.50	7.40	8.70	9.40	10.00
Room Air Conditioner	EER	5.00	6.10	6.10	6.70	7.70	8.10	8.50
Water Heating:								
Storage Gas	EF	0.47	0.47	0.47	0.49	0.55	0.56	0.56
Storage Oil	EF	0.47	0.47	0.47	0.48	0.49	0.54	0.56
Storage Electric	EF	0.79	0.80	0.80	0.81	0.83	0.87	0.88

TABLE 7.—MECHANICAL EQUIPMENT EFFICIENCY VALUES(Not Age-Based)

	Units	Rating
Heating:		
Gas Wall Furnace (Fan).	SE	0.70
Gas Wall Heater (Gravity).	SE	0.65
Gas Floor Furnace	SE	0.60

TABLE 7.—MECHANICAL EQUIPMENT EFFICIENCY VALUES(Not Age-Based)—Continued

	Units	Rating
Gas Water Heater (Space Heating).	AFUE	0.75
Electric Furnace	HSPF	3.413
Electric Radiant	HSPF	3.413

TABLE 7.—MECHANICAL EQUIPMENT EFFICIENCY VALUES(Not Age-Based)—Continued

	Units	Rating
Heat Pump Water Heater (Space).	HSPF	5.11
Electric Water Heater (Space).	HSPF	2.73

TABLE 7.—MECHANICAL EQUIPMENT EFFICIENCY VALUES(Not Age-Based)—Continued

	Units	Rating
Cooling:		
Electric Evaporative Cooling.	EER_{rc}	30
Gas Absorption Cooler	COP	0.40
Water Heating:		
Heat Pump	COP	2.00
Instantaneous Electric	EF	0.87
Instantaneous Gas	EF	0.75
Solar (Use SRCC Adjustment Procedures).	EF	2.00

§ 437.105 Operating condition assumptions.

To conduct each rating under these guidelines, each HERS provider shall estimate the annual purchased energy consumption for heating, cooling and water heating for both the rated home and the reference home using the following assumptions—

(a) Temperature control set points for heating and cooling of 68° F and 78° F;

.

(b) Where programmable offsets are available in the rated home, 5° F temperature control point offsets with an 11 PM to 7 AM schedule for heating and a 9 AM to 3 PM schedule for cooling, and with no offsets assumed for the reference home;

(c) Internal heat gains from lights, people and equipment of 3000 Btu/hr for detached homes and 1500 Btu/hr for attached homes;

(d) Estimated hot water usage based on Equation 3.

Equation 3

Gallons/day=30 gallons+(10 gallons * number of bedrooms).

(e) the climatologically most representative TMY or equivalent weather data, which may be interpolated between weather sites if interpolation is established or approved by the accrediting body and consistent for each HERS provider operating within a state.

(f) Corrections for climate conditions and mis-sizing of equipment, using correction factors to HSPF, SEER and AFUE that are established or approved by the accrediting body and consistent for each HERS provider operating within a state.

(g) Local residential energy or utility rates that—

(1) Include fuel/energy unit rates;

(2) Include fuel/energy unit demand rates;

(3) Include fuel/energy block rates;

(4) Include customer service and fuel charges;

(5) Are updated at least annually; and

(6) Are confirmed by the accrediting body

§ 437.106 Non-rated energy consuming devices.

Consistent with § 437.102(a) (3) and (4) of these guidelines each HERS provider shall calculate and report the annual purchased energy consumption and energy cost for the operation of all non-rated energy consuming devices in the rated and reference homes. Actual efficiency of these devices is not considered and usage estimates are based on Table 8. The data in table 8 may be modified if they are established or approved by the accrediting body and consistent for each HERS provider operating within the state.

TABLE 8.—ANNUAL ENERGY USE FOR NON-RATED FEATURES

End use	Units/year	Energy estimate	Applicability
Ceiling Fan	kWh	220/ea	If present.
Dishwasher	kWh	299/per cooking area	If present, or if space is dedicated for DW.
Dryer, electric	kWh	875/ea	If present, or if 220V wiring is present @ dryer location.
Dryer, gas	Therms	60/ea	If present, or if gas piping is present @ dryer location.
	kWh	100/ea	
Lights	kWh	940	All homes.
Microwave Oven-built-in	kWh	191/per cooking area	If permanently installed.
Miscellaneous Plug Loads	kWh	500	All homes.
Pool Pump	kWh	1700/ea	If present.
Range/Oven Combo-electric	kWh	450/per cooking area	If present, or if 220V wiring is present @ range location.
Range/Oven Combo-gas w/pilot	Therms	44/per cooking area	If present, or if gas piping is present @ range location.
Range/Oven Combo-gas w/o pilot	Therms	22/per cooking area	If present.
Refrigerator	kWh	1150	Each one present.
Television	kWh	720	All homes.
Washer, clothes	kWh	99/ea	If present, or facilities present for washer.
Well pump	kWh	288/ea	If present.

§ 437.107 Projected ratings for to-be-built homes.

(a) A HERS provider may calculate the projected rating of a to-be-built home based on architectural drawings with material, mechanical and electrical specifications; and by—

(1) Using a default value for air leakage of 0.67 air changes per hour; and

(2) Using the planned location and orientation of the proposed home, or if the proposed orientation is unknown, calculating ratings for the home facing each of the four cardinal directions, north, south, east and west, and using the lowest rating score as the projected rating.

(b) Upon completion of construction and verification of the proposed specifications, the rating may be revised using the air leakage rate based on on-site testing and the actual orientation of the home.

Subpart C—How To Administer a Home Energy Rating System

§ 437.200 Energy analysis tool requirements.

(a) In order to be certified for the purpose of providing home energy ratings under these guidelines, an energy analysis tool must—

(1) Demonstrate the ability to calculate annual purchased energy consumption for each building type for which ratings are provided;

(2) Estimate the total annual purchased energy consumption associated with the minimum rated features set forth in § 437.104;

(3) Calculate energy use of non-rated energy consuming devices set forth in § 437.105 of these guidelines;

(4) Reflect the operating conditions assumptions described in § 437.105 of these guidelines; and

(5) Pass all tests in Tier 1 and Tier 2 of the Home Energy Ratings System Building Energy Simulation Test (HERS-

BESTEST)—NREL Report no. NREL/TP–472–7332 which is administered by, and has pass-fail criteria set by the accrediting body.

(b) Future tool requirements. On or before [insert date four years from the date of the final rule], each HERS provider accredited under these guidelines, shall have updated their energy analysis tool to be capable of rating the following additional features—

(1) Thermostat set-back and set-up;

(2) Effects of part load and weather conditions on HVAC systems;

(3) Demand and time of use utility rates;

(4) Solar water heating;

(5) Trombe walls;

(6) Sunspaces; and

(7) Whole house fans.

(c) Energy analysis tools that are certified under paragraph (a)(5) of this section must be retested and recertified if a new version of the tool is released that includes changes to the engineering algorithms.

§ 437.201 Site data collection manual.

Each HERS provider shall provide each data collector with a manual containing procedures for the on site collection of data that are:

(a) Consistent with those provided in Guideline No. 10 of the Home Energy Rating Systems Council HERS Guidelines, titled ''On Site Inspection Procedures''; or

(b) Established or approved by the accrediting body and updated as supplemental or revised information becomes available.

§ 437.202 Training home energy raters.

Each person seeking a position as a full rater, data collector, or data analyst for any HERS provider shall receive training prior to performing rating tasks without supervision. The training will be conducted in accordance with a syllabus developed by each HERS provider. The syllabus must specify subjects that are applicable to each position (i.e. full rater, data collector or data analyst) and must include—

(a) Classroom training. Each rater shall receive classroom training on—

(1) Basic principles of heat transfer (i.e., viewing the home as a system);

(2) The minimum rated features of buildings;

(3) Variations in construction types and their ramifications;

(4) Types and efficiencies of windows;

(5) Types and efficiencies of heating, cooling, water heating, and lighting systems;

(6) Types and characteristics of space conditioning and domestic hot water distribution systems;

(7) Types of thermostatic controls;

(8) Determination of azimuth;

(9) Determination of air leakage;

(10) Determination of fuels used by major appliances;

(11) Utility rate structures;

(12) On-site inspection procedures;

(13) Producing a scale and dimension drawing of a home;

(14) Calculating the area of rectangles, triangles, circles, ovals and combinations of these shapes;

(15) Calculating the volume of boxes, pyramids, spheres, and other geometric shapes;

(16) Communicating the benefits of energy saving measures and practices to the consumer; and

(17) Quality assurance.

(b) Written examination. Each rater shall be given a written examination that evaluates the rater's understanding of the subjects in paragraph (a) of this section.

(c) Field training. Each rater shall perform two ratings (or portions of ratings for those seeking to be data collectors or data analysts), including software operations, in the presence of trainers.

(d) Probationary period. Each rater shall complete a probationary period where close supervision is provided. This period covers a minimum of five ratings, after which the supervisor shall determine if additional training is needed.

(e) Challenge test. A challenge test may be taken, which, if passed in all competencies, will waive the classroom training requirement. The requirements of paragraphs (c) and (d) of this section may not be waived.

§ 437.203 Quality control.

(a) Each HERS provider shall establish a quality assurance plan that includes—

(1) Periodic peer review and re-evaluation of raters;

(2) Random auditing of each rater's work;

(3) Evaluation of the training program by raters after field experience;

(4) Customer evaluation of rating services;

(5) Random review of the inputs into the rating tool to ensure that they are consistent with the data collected in the field; and

(6) Verification of the accuracy and completion of the input forms and output of the first five ratings performed by each rater.

(b) Each HERS provider shall maintain a permanent quality assurance file that is updated at least every two years or when changes to the system are made, and contains—

(1) A description of local rate structures for electricity, gas and other locally used fuels;

(2) A description of climatological data (including interpolation methods) used;

(3) A description of the data storage and maintenance systems including—

(i) Software for database;

(ii) Training for data entry personnel; and

(iii) Data quality assurance procedures that will be exercised;

(4) A description of each rating tool that the HERS provider uses including a list of which home types the tool supports;

(5) The results and date of the certified accuracy test conducted for the rating tool;

(6) An example of the rating outputs that are produced;

(7) The materials and tests used to provide training for home energy raters;

(8) The materials used to document the site data collection procedures; and

(9) A description of the individual elements of the quality assurance plan set forth in paragraph (a) of this section.

(c) Each HERS provider shall maintain an electronic database of information for each home rated. The minimum content of the database is—

(1) A unique file reference or ID number;

(2) Date of on-site inspection;

(3) Raters name;

(4) Tool name and version;

(5) Identification of weather data used for the rating;

(6) Type of rating, either complete or projected;

(7) Use of rating, either—

(i) Time of sale rating;

(ii) Pre-home improvement rating;

(iii) Post home improvement rating; or

(iv) Information only rating;

(8) Address of rated home;

(9) Home type;

(10) Floor area of conditioned space;

(11) Fuel types used by building HVAC and water heating systems;

(12) Minimum rated feature energy efficiency data used to determine the rating;

(13) In the four categories of heating, cooling, water heating and all other uses, the—

(i) Estimated annual purchased energy consumption in total;

(ii) Estimated annual purchased energy consumption by fuel;

(iii) Estimated annual energy cost in total; and

(iv) Estimated annual energy cost by fuel.

(14) Estimated total annual energy cost for all uses; and

(15) Rating score of the rated home on 0–100 points scale and 1–5+ stars category.

§ 437.204 Monitoring and evaluation.

(a) Each HERS provider shall at least semi-annually evaluate the accuracy of consumption and cost estimates by comparing predicted energy usage and costs to actual billing records.

(b) To allow the accrediting body to monitor the accuracy of ratings, each HERS provider shall for 10% or for 500 of the homes rated annually, whichever is less, maintain a database of the following—

(1) Homeowners authorization for the release of consumption information by utility company(s);

(2) Weather data site selected for energy estimation;

(3) Any energy efficiency improvements made to the home, date of completion, and whether the improvement plans were evaluated in the rating report.

§ 437.205 Guideline compliance.

(a) Full accreditation. Any HERS provider may be accredited as being in full compliance with these guidelines if it demonstrates that it can—

(1) Conducts ratings in accordance with the provisions of § 437.100;

(2) Reports the results of ratings in accordance with the provisions of § 437.102 of these guidelines;

(3) Produces documentation of a correctly configured reference home in accordance with the provisions of § 437.103;

(4) Provides documentation that their energy analysis tool is certified under § 437.200 as having passed all HERS–BESTEST tests designated as Tier 1 and Tier 2 tests;

(5) Provides training in accordance with the provisions of § 437.202;

(6) Provides documentation of a quality control plan and a permanent quality assurance file in accordance with the provisions of § 437.203; and

(7) Provides documentation of a monitoring and evaluation program in accordance with the provisions of § 437.204.

(b) Basic compliance. Any existing HERS provider may be accredited for a period of up to two years from [insert date of issuing final rule], as being in basic compliance with these guidelines, by demonstrating that it meets all the provisions of paragraph (a) of this section except that it may—

(1) Use a simplification of utility rate structures;

(2) Rate only the features set forth by § 437.104, that may be rated with its existing system capabilities;

(3) Use only those standard operating conditions set forth in § 437.105 that can be handled by their existing energy analysis tool;

(4) Pass only the Tier 1 set of HERS–BESTEST tests;

(5) Meet the training requirements of § 437.202 by—

(i) Verification that each person with responsibilities in the conduction of ratings has completed classroom training on all items set forth in § 437.202 (a) of these guidelines;

(ii) Verification that each person with responsibilities for the conduction of ratings has received field training;

(iii) Verification that all personnel have successfully passed a written objective examination in all areas applicable to their designated job descriptions; and

(iv) Verification of a probationary period set forth in § 437.202 (d); and

(6) Use an existing program to monitoring and evaluate the accuracy of ratings;

§ 437.206 Accreditation.

(a) Each HERS provider operating in voluntary compliance with these guidelines shall be accredited only by a State or other independent accrediting body having a person or persons—

(1) Qualified to establish and coordinate standard default values within a State, for—

(i) Default values for minimum rated features set forth in section 437.104;

(ii) Operating condition assumptions and local climatic data interpolation set forth in section 437.105 of these guidelines;

(2) Qualified to administer the procedures for certification of energy analysis tools established by HERS–BESTEST set forth in the NREL Report no. NREL/TP–472–7332 referenced in § 437.200;

(3) Qualified to evaluate the training syllabus and procedures set forth in § 437.202;

(4) Qualified to review and evaluate the quality control procedures set forth in § 437.203.

(b) Any Lender or agency in a mortgage business who offers mortgage or loan incentives for energy efficiency on the basis of a home energy rating should require that any HERS provider conducting those ratings be accredited under these guidelines.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 95–CE–27–AD]

Airworthiness Directives; Jetstream Aircraft Limited HP137 Mk1, Jetstream Series 200, and Jetstream Models 3101 and 3201 Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes to adopt a new airworthiness directive (AD) that would apply to Jetstream Aircraft Limited (JAL) HP137 Mk1, Jetstream series 200, and Jetstream Models 3101 and 3201 airplanes. The proposed action would require inspecting (one-time) the threaded portion of the aileron mounting spigots for cracks, replacing any cracked spigots, and replacing the securing nut assemblies with newly designed special nut assemblies and new split pins. The proposed action is prompted by reports of cracked mounting spigots caused by stress corrosion. The actions specified by the proposed AD are intended to prevent damage to the aileron control systems, which if not detected and corrected, could cause loss of lateral control and eventual loss of control of the airplane.

DATES: Comments must be received on or before September 29, 1995.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Central Region, Office of the Assistant Chief Counsel, Attention: Rules Docket No. 95–CE–27–AD, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106. Comments may be inspected at this location between 8 a.m. and 4 p.m., Monday through Friday, holidays excepted.

Service information that applies to the proposed AD may be obtained from Jetstream Aircraft Limited, Prestwick International Airport, Ayrshire, KA9 2RW, Scotland, telephone (44–292) 79888; facsimile (44–292) 79703; or Jetstream Aircraft Inc., Librarian, P.O. Box 16029, Dulles International Airport, Washington, D.C. 20041–6029; telephone (703) 406–1161; facsimile (703) 406–1469. This information also may be examined at the Rules Docket at the address above.

FOR FURTHER INFORMATION CONTACT: Mr. Raymond A. Stoer, Program Officer, Brussels Aircraft Certification Office, FAA, Europe, Africa, and Middle East