

## TITLE 55 DEPARTMENT OF COMMERCE

### ARTICLE 1. NEIGHBORHOOD ASSISTANCE CREDIT PROGRAM

#### Rule 1. General Provisions (Repealed)

*(Repealed by Department of Commerce; filed Apr 29, 1982, 10:30 am: 5 IR 1172)*

#### Rule 1.1. General Provisions

##### 55 IAC 1-1.1-1 Project proposal defined

Authority: IC 6-3.1-9-2

Affected: IC 6-3.1-9

Sec. 1. DEFINITIONS. As used in this instruction, "Project Proposal" means a specified written program design, aimed at assisting an economically disadvantaged area, submitted to the Department of Commerce for approval, in a format specified by the Department of Commerce, setting forth at a minimum:

- (1) the program to be conducted
- (2) the area to be selected
- (3) the estimated amount to be invested in the program, and
- (4) plans for implementation of the program.

*(Department of Commerce; 55 IAC 1-1.1-1; filed Apr 29, 1982, 10:30 am: 5 IR 1171; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

##### 55 IAC 1-1.1-2 Program administration

Authority: IC 6-3.1-9-2

Affected: IC 6-3.1-9

Sec. 2. ADMINISTRATION. (a) The Director of the Department of Commerce, or his designee, after consultation with the Director of Community Services Administration and the Commissioner of the Department of Revenue, is authorized to set annual program priorities and to exercise administrative authority over all aspects of the Neighborhood Assistance Program not delegated by statute to any other agency.

(b) In administering the Neighborhood Assistance Program, the Director of the Department of Commerce, or his designee, is authorized to:

- (1) Develop annual program priorities, which can set the direction for the approval of programs and establish a focus for the Neighborhood Assistance Credit Program on an annual basis,
- (2) Develop application procedures, project proposal format and project proposal review criteria,
- (3) Receive and review project proposals,
- (4) Approve or disapprove project proposals,
- (5) Acknowledge the receipt of all project proposals and inform the proposer of the approval or disapproval of the proposal,
- (6) Notify the Department of Revenue of approved programs,
- (7) Monitor all approved projects,
- (8) Do all acts and things necessary or convenient to carry out the administration of the Neighborhood Assistance Program.

*(Department of Commerce; 55 IAC 1-1.1-2; filed Apr 29, 1982, 10:30 am: 5 IR 1171; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

##### 55 IAC 1-1.1-3 Computation of tax credit

Authority: IC 6-3.1-9-2

Affected: IC 6-3.1-9

Sec. 3. COMPUTATION OF TAX CREDIT. The computation of tax credits depends on the following factors: (a) Total amount invested: the tax credit shall be equal to fifty percent (50%) of the total amount invested in all approved programs by a business firm or individual; shall be computed on the basis of the total amounts invested in all qualifying projects during the tax year

rather than having a separate computation for each contribution or activity in each of the economically disadvantaged areas affected.

(b) Where the contribution consists of real or personal property, or loan thereof, the value thereof shall be determined in good faith by the qualified entity, considering the amount normally allowed by the Internal Revenue Service as a charitable deduction for Federal income tax purposes, and any other accepted business or accounting standards. Value determination is further subject to approval by the State Department of Revenue.

(c) Contributions to approved programs made by a business firm or individual shall be computed by the Department of Revenue only to the extent that such contributions are earmarked and used for a single specific approved program. Such contributions shall fall within Internal Revenue Service appropriate rulings.

(d) When business firms or individuals make an in-kind contribution to neighborhood programs in the nature of operating supplies or maintenance, tax credits will be granted equal to fifty percent (50%) of the costs of said items to the donor. Invoices or any other documents showing proof of costs to the donor must be submitted with the application for tax credits.

(e) The cost of personnel on loan from a business firm, or the costs of time of an individual donor, contributed to render expertise and assistance, is an acceptable program cost and eligible for a tax credit. Personnel time must be prorated, based on their normal hourly wage. The exact amount of time spent on the project must be indicated. The cost of said time may be claimed only by the donor.

(f) Employees of an organization with an approved program are not eligible for tax credits. (*Department of Commerce; 55 IAC 1-1.1-3; filed Apr 29, 1982, 10:30 am; 5 IR 1171; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 1-1.1-4 Tax credit program limitations**

Authority: IC 6-3.1-9-2

Affected: IC 6-3.1-9

Sec. 4. LIMITATIONS. (a) Any taxpayer who has been notified of an approved tax credit and required proof of payment, not filing said proof with the Department of Revenue, may have said tax credit disallowed.

(b) Relative to programs approved for tax credit, discrimination shown on the basis of race, age, sex, creed, color, or national origin toward employees and applicants for employment shall be prohibited. Violation of such may result in disallowance of the tax credit.

(c) All programs approved for a tax credit will be subject to evaluation by the Department of Commerce and all program records will remain available for a period of five (5) years, and will during normal business hours, be open to the inspection of the Department of Commerce, Department of Revenue, or their representatives. All approved programs shall be required to make a narrative annual report as prescribed to the Department of Commerce.

(d) Programs found to be in violation of these regulations [*this section*] by the Department of Commerce or the Department of Revenue, or programs found to have a serious deviation from their plans for implementation or a major change in goals, where such change has not been reported to and approved by the Department of Commerce, will be notified in writing by the Department of Commerce, in which it will be set out, the nature of the violation and the time period allowed for correction of such violation(s).

Failure to make corrections within the allotted time period may result in disallowance of all or part of the tax credit.

(e) In the event that a tax credit was improperly granted, the Department of Revenue will notify the taxpayer of the reason for adjustment and the procedures to be followed.

(f) Where possible, residents of the disadvantaged area will be employed by programs approved under these regulations [*this section*]. Programs designed to serve disadvantaged areas must seek the maximum feasible participation of residents of the areas, so as to make those programs widely utilized by their intended beneficiaries. (*Department of Commerce; 55 IAC 1-1.1-4; filed Apr 29, 1982, 10:30 am; 5 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

## **ARTICLE 2. ENERGY DEVELOPMENT BOARD**

### **Rule 1. General Provisions**

#### **55 IAC 2-1-1 Definitions**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5

Sec. 1. DEFINITIONS. As used in this instruction (55 IAC 2):

- (1) "board" means the Indiana Energy Development Board,
- (2) "department" means the Indiana Department of Commerce,
- (3) "board staff" means the administrative and clerical personnel necessary for the functioning of the Energy Development Board.

*(Department of Commerce; 55 IAC 2-1-1; filed Aug 28, 1980, 11:00 am: 3 IR 1592; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 2-1-2 Policy statement**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-6

Sec. 2. POLICY. It is the policy of the board to conduct an ongoing assessment of the opportunities of and constraints upon the use and development of all sources of energy whose use is applicable to Indiana's needs. The board shall encourage the balanced use of all sources of energy with primary emphasis on:

- (1) the utilization of Indiana's high sulfur coal including but not limited to programs promoting the development of Indiana's high sulfur coal so that it meets all pollution control requirements and is competitive with that of other states for export purposes; and
- (2) the utilization of Indiana's agricultural and forest resources and products for the production of alcohol fuel and other forms of biomass energy including but not limited to programs for research and development of the use of alcohol fuels, and establishment of distilleries in the state.

The board shall seek to avoid total reliance on a single energy source and shall encourage research, development and utilization of solar and all other forms of energy. *(Department of Commerce; 55 IAC 2-1-2; filed Aug 28, 1980, 11:00 am: 3 IR 1592; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 2-1-3 Applications for grants and loans**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-7; IC 4-23-5.5-9

Sec. 3. APPLICANT ELIGIBILITY. The board is authorized to accept applications for matching grants, direct grants, loans and loan guarantees from individuals, corporations, partnerships, educational institutions, other private sector groups, and state and local governmental agencies. The board may also make and accept applications for matching grants to be made in conjunction with federal agencies. *(Department of Commerce; 55 IAC 2-1-3; filed Aug 28, 1980, 11:00 am: 3 IR 1592; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 2-1-4 Filing and examination of applications; board meetings**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-9

Sec. 4. APPLICATION PROCESS. (a) Applications shall be submitted to: Energy Development Board, 440 N. Meridian Street, Indianapolis, Indiana 46204. All applications shall be accompanied by two (2) copies and shall be in an appropriate form as determined by the board.

(b) The procedure for evaluation of applications to the board is the following:

- (1) The board staff shall review the application to determine whether it contains the necessary information;
- (2) In addition, the board staff shall evaluate the application based on the criteria as stated in 55 IAC 2-1-7 and in accordance with established administrative policy;
- (3) After technical review by the board staff, a report, along with any other technical reports, shall be made to the board;
- (4) Public notice of board meetings shall be posted prior to the meetings;
- (5) During the course of evaluation by the board, the applicant shall be allowed to make any written or oral presentations to the board meeting as the applicant shall desire;
- (6) The board may return any application to the board staff for further research and analysis by the board staff;

(7) After consideration of the application for funding, the board will either accept, reject, modify, or table the application. The board may also return the application to the applicant for modification, and

(8) Whenever the board takes final action on an application it shall send a written notice thereof.

(c) All board meetings are open to the public and shall include time for public comment. If possible, a written request should be sent to the board so that the person requesting time for public comment can be placed on the agenda. Time permitting, unscheduled public comment shall be allowed at board meetings at the discretion of the board. The board reserves the right to limit the time allocated for each individual. (*Department of Commerce; 55 IAC 2-1-4; filed Aug 28, 1980, 11:00 am: 3 IR 1592; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-5 Re-examination of applications**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-9

Sec. 5. RE-EXAMINATIONS. (a) Any applicant who is aggrieved by the action of the board in granting or not granting applications shall have the right to request a re-examination of the application. Any applicant who wishes to request re-examination by the board must make a written request to the board. The applicant shall make the request for re-examination within thirty (30) days after the initial rejection by the board. In reviewing the request for re-examination, the board must vote by a two-thirds (2/3) majority in order for the re-examination to be held. No application which has been rejected by the board may be refiled with the board for a one (1) year period unless specifically approved by a two-thirds (2/3) majority of the board.

(b) Any applicant who is aggrieved by the action of the board staff may request a review by the board. (*Department of Commerce; 55 IAC 2-1-5; filed Aug 28, 1980, 11:00 am: 3 IR 1593; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-6 Confidential information**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5

Sec. 6. CONFIDENTIALITY OF APPLICATION INFORMATION. The board or board staff shall honor requests by applicants that identified data within the application be kept confidential (i.e., trade secrets or privileged or confidential commercial or financial information). All confidential data shall be specifically identified and marked by the applicant, and placed in an appendix to the application. The board or board staff shall only use such data for evaluation purposes. If the application does receive partial or full funding from the board, the board's or board staff's honoring of the confidentiality of identified data shall not limit its right to disclose the results of the project to the public. (*Department of Commerce; 55 IAC 2-1-6; filed Aug 28, 1980, 11:00 am: 3 IR 1593; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-7 Evaluation criteria**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-9

Sec. 7. CRITERIA FOR APPLICATION EVALUATION. In allocating funds to qualified applicants, the board shall use as guidelines the following criteria including but not limited to:

- (1) the technical feasibility of the project,
- (2) the economic feasibility of the project,
- (3) the environmental impacts of the project,
- (4) the level of Indiana resources utilized,
- (5) the amount of funds requested, including any other grants and matching funds,
- (6) the financial responsibility of the applicant to perform the proposed project,
- (7) the capability of the applicant to perform the proposed project,
- (8) the market attractiveness of the project,
- (9) the existence of similar projects, and
- (10) the compatibility of the application with the board's current year's programs.

(*Department of Commerce; 55 IAC 2-1-7; filed Aug 28, 1980, 11:00 am: 3 IR 1593; readopted filed Dec 2, 2001, 12:30 p.m.: 25*)

IR 1267)

**55 IAC 2-1-8 Eminent domain**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-8

Sec. 8. EMINENT DOMAIN. The board does not have the authority to exercise the power of eminent domain. (*Department of Commerce; 55 IAC 2-1-8; filed Aug 28, 1980, 11:00 am: 3 IR 1593; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-9 Waiver of patents, royalties and copyrights**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-9

Sec. 9. PATENT RIGHTS; ROYALTIES; COPYRIGHTS. Indiana waives title to any invention, patent, or copyright which may result from a project partially or fully funded by the board. However, in no event shall Indiana pay a royalty for its use of materials or processes developed from projects partially or fully funded by the board. (*Department of Commerce; 55 IAC 2-1-9; filed Aug 28, 1980, 11:00 am: 3 IR 1593; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-10 Acceptance of gifts and grants**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-10

Sec. 10. ACCEPTANCE OF GRANTS AND CONTRIBUTIONS BY THE BOARD. The board, on behalf of the state, may receive and accept grants, donation, or contributions from public agencies, including the federal government, and from private agencies and private sources. The board shall review the terms and stipulations of a grant, donation or contribution with a majority vote of the board being necessary before a grant, donation or contribution can be accepted by the board. (*Department of Commerce; 55 IAC 2-1-10; filed Aug 28, 1980, 11:00 am: 3 IR 1593; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-11 Officers of board; manager's powers and duties**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-4

Sec. 11. BOARD OFFICERS; MANAGER'S FUNCTION. (a) The Governor shall appoint one (1) of the appointed members as chairman, and the board shall elect a vice-chairman and treasurer. The Executive Director of the department shall be the manager and secretary of the board. The secretary and treasurer shall be bonded as the board may direct.

(b) The manager shall be the chief administrative officer for the board and shall direct and supervise the administrative affairs and technical activities of the board. The manager may perform the following:

- (1) appoint, discipline, and dismiss such employees as the board may require and such agents or consultants as may be necessary for implementing this chapter [55 IAC 2] subsequent to the board's approval;
- (2) purchase any office equipment and material necessary for the functioning of the board and board staff; and
- (3) call at least quarterly meetings of the board upon ten (10) days written notification.

(*Department of Commerce; 55 IAC 2-1-11; filed Aug 28, 1980, 11:00 am: 3 IR 1594; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-12 Quorum; representatives of members**

Authority: IC 4-23-5.5-6

Affected: IC 4-23-5.5-3

Sec. 12. QUORUM. Six (6) members of the board shall constitute a quorum and the affirmative vote of a majority of the membership shall be necessary for any action taken by the board. A vacancy in the membership of the board does not impair the right of the quorum to act. Board members may send representatives in their place to view board meetings and participate in

discussion; however, the representatives shall not be allowed to cast a proxy vote for that board member. (*Department of Commerce; 55 IAC 2-1-12; filed Aug 28, 1980, 11:00 am: 3 IR 1594; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-13 Conflict of interest**

Authority: IC 4-23-5.5-6  
Affected: IC 4-23-5.5-2

Sec. 13. CONFLICT OF INTEREST. A member of the board must disclose to the board any interest in a project the board may be considering for action. The board shall determine whether that member shall be allowed to participate in activities related to that project. (*Department of Commerce; 55 IAC 2-1-13; filed Aug 28, 1980, 11:00 am: 3 IR 1594; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 2-1-14 Performance and budget reports**

Authority: IC 4-23-5.5-6  
Affected: IC 4-23-5.5

Sec. 14. PERFORMANCE REPORTS. All projects which are partially or fully funded by the board are required to submit to the board performance and budget reports as specified in the provisions of the agreement. These reports shall be in an appropriate form as determined by the board. A final report shall be made to the board at the completion of the project. Absence of such reports may cause suspension or termination of the grant, loan or loan guarantee as determined by the board. (*Department of Commerce; 55 IAC 2-1-14; filed Aug 28, 1980, 11:00 am: 3 IR 1594; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**ARTICLE 3. INDIANA RESIDENTIAL CONSERVATION SERVICE PROGRAM (REPEALED)**

(*Repealed by Department of Commerce; filed Mar 28, 1984, 9:07 am: 7 IR 1211*)

**ARTICLE 3.1. INDIANA RESIDENTIAL CONSERVATION SERVICE PROGRAM**

**Rule 1. State Plan**

**55 IAC 3.1-1-1 Purpose and scope; federal regulations incorporated by reference**

Authority: IC 4-4-3-21  
Affected: IC 4-4-3-8

Sec. 1. The "Indiana Residential Conservation Service Program State Plan" contains the regulations specific to Indiana of the Residential Conservation Service (RCS) Program. This program is mandated by Part I of Title II of the National Energy Conservation Policy Act, Public Law 95-619 as amended by Subtitle B of Title V of the Energy Security Act (ESA), Public Law 96-294.

(b) The final regulations for the Residential Conservation Service Program (10 CFR Part 456) appeared in the June 25, 1982, "Federal Register," Vol. 47, No. 123. These regulations are hereby incorporated by reference into the State Plan as though set forth in full herein, pursuant to 5 U.S.C. and 552(a).

(c) Copies of the regulations incorporated by reference are available for inspection in the DOE Reading Room, Room GA-152, Forrestal Building, 1000 Independence Ave., SW, Washington, D.C. between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. (*Department of Commerce; Division of Energy; 55 IAC 3.1-1-1; filed Mar 28, 1984, 9:07 am: 7 IR 1153; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-1-2 Conflict with National Energy Conservation Policy Act**

Authority: IC 4-4-3-21  
Affected: IC 4-4-3-8

Sec. 2. (a) A covered utility shall petition the assistant secretary for Conservation and Renewable Energy should the utility

be prohibited by Indiana law or local ordinance from taking any action required to be taken under the National Energy Conservation Policy Act, or is required or permitted by Indiana or local law to take any action prohibited by NECPA.

(b) If the assistant secretary determines pursuant to such petition that a state or local law or regulation prohibits a utility from taking any action required to be taken under NECPA or permits or requires a utility to take any action prohibited by NECPA, the assistant secretary shall issue an order superseding such state or local laws or regulations to the extent the laws or regulations are inconsistent with NECPA. Such an order shall be effective with respect to all utilities otherwise subject to such state or local laws or regulations and shall moot any outstanding petitions under this section by such utilities. (*Department of Commerce; Division of Energy; 55 IAC 3.1-1-2; filed Mar 28, 1984, 9:07 am: 7 IR 1153; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **55 IAC 3.1-1-3 Definitions**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 3. The following definitions apply to 55 IAC 3.1:

“Arranging” means customer service actions taken by a participating utility enhance the efficiency, credibility, and acceptability of the Indiana RCSP. It includes tangible, visible, customer relations assistance [*sic.*] to eligible customers in such ways as answering program related inquiries; assisting in obtaining a Measures Loan; providing information from the Master List; post audit follow-up discussions; and related customer services that ultimately lead to residential energy savings. Any eligible customer may use a participating utility's arranging service.

“Assistant Secretary” means the Assistant Secretary for Conservation and Renewable Energy of the U.S. Department of Energy.

“Auditor Certification” refers to the Lead Agency prepared written tests administered to auditor candidates, employed, or under contract to a participating utility. An auditor must hold a valid and current state certified license to conduct audits under the purview of the IN RCSP.

“Class A RCSP Audit” refers to an on-site visit to a residence serviced by a participating utility, by a trained and state certified auditor who performs a detailed evaluation and counseling of the energy-related features of, or of possible application in, that residence.

“Conciliation” refers to a conference chaired by a Lead Agency member, or Lead Agency representative, to resolve bonafide complaints from eligible customers against persons who sell, install, or finance the sale or installation of program measures.

“Conditional Audit” refers to a [*sic.*] offer extended to an eligible customer to conduct a Class A audit, subject to such reasonable administrative considerations as batching responding customers by geographical area or type of energy source used to heat the residence.

“Conduction” means the movement of heat through a substance or between substances which are in contact with each other.

“Convection” means the movement of heat by the actual movement of the heated substance; e.g. hot air over a pan of water heated on the kitchen stove.

“Covered Utility” means in any calendar year a public utility which during the second preceding calendar year had either:

- (1) Sales of natural gas for purposes other than resale which exceeded ten billion cubic feet ( $10 \times 10^9$  cu.ft.) or;
- (2) Sales of electric energy for purposes other than resale which exceeded 750 million kilowatt hours ( $75 \times 10^7$  kilowatt hours).

“Degree Days” refers to the difference between a daily average temperature and 65°F. It is used to calculate heat loss over a period of time.

“Eligible Customer” refers to a person who both:

- (1) owns or occupies a residential building or dwelling unit therein; and
- (2) receives a fuel bill from a covered utility or participating home heating supplier for fuel used in such residential building or dwelling unit therein.

“Energy Conservation Measures” includes the following items:

- (1) “Caulking” means pliable materials used to reduce the passage of air and moisture by filling small gaps, located at fixed joints on a building, under baseboards inside a building, in exterior walls at electric outlets, around pipes and wires entering a building, and around dryer vents and exhaust fans in exterior walls. Caulking includes, but is not limited to, materials commonly known as “sealants”, “putty”, and “glazing compounds.”
- (2) “Weatherstripping” refers to narrow strips of material placed over or in movable joints of windows and doors to reduce

the passage of air and moisture.

(3) "Furnace Efficiency Modifications" refers to the following:

(A) Replacement furnaces or boilers, including a heat pump, which replaces an existing furnace or boiler of the same fuel type consumed due to an increase in combustion efficiency, improved heat generation, or reduced heat losses.

(B) Furnace replacement burner is a device which atomizes the fuel oil, mixes it with air, and ignites the fuel-air mixture, is an integral part of an oil-fired furnace or boiler including the combustion chamber, and which because of its design achieves a reduction in oil usage.

(C) Flue opening modification (vent damper) is an automatically operated damper installed in a gas-fired furnace that is installed downstream from the draft hood and conserves energy by substantially reducing the flow of heated air through the chimney when the furnace is not in operation.

(4) "Ceiling Insulation" refers to a material, primarily designed to resist heat flow, which is installed between the conditioned area of a building and an unconditioned attic. Where the conditioned area of a building extends to the roof, the term "ceiling insulation" also applies to such material used between the underside and upperside of the roof. The term "ceiling insulation" also includes such material installed on the exterior of the roof.

(5) "Wall Insulation" refers to a material primarily designed to resist heat flow which is installed within or on the walls between conditioned areas of a building and the unconditioned areas or the outside.

(6) "Floor Insulation" refers to material, primarily designed to resist heat flow, which is installed between the first level conditioned area of a building and an unconditioned basement, a crawl space, or the outside beneath it. Where the first level conditioned area of a building is on a ground level concrete slab, the term "floor insulation" also means such material installed around the perimeter of or on the slab. In the case of mobile homes, the term "floor insulation" also means skirting to enclose the space between the building and the ground.

(7) "Duct Insulation" refers to a material primarily designed to resist heat flow which is installed on a heating or cooling duct in an unconditioned area of a building.

(8) "Pipe Insulation" refers to a material primarily designed to resist heat flow which is installed on a heating or cooling pipe in an unconditioned area of a building.

(9) "Water Heater Insulation" refers to a material primarily designed to resist heat flow which is suitable for wrapping around the exterior surface of the water heater casing.

(10) "Storm Window" means a window or glazing material placed outside or inside an ordinary or prime window, creating an air space, to provide greater resistance to heat flow than the prime window alone.

(11) "Thermal Window" means a window unit with improved thermal performance through the use of two or more sheets of glazing material affixed to a window frame to create one or more insulated air spaces. It may also have an insulating frame and sash.

(12) "Heat Reflective and Heat Absorbing Window or Door Material" refers to a window or door glazing material with exceptional heat reflecting or heat absorbing properties; or reflective or absorptive films and coatings applied to an existing window or door which thereby results in exceptional heat reflecting or heat absorbing properties.

(13) "Clock Thermostat" means a device which is designed to reduce energy consumption by regulating the demand on the heating or cooling system in which it is installed and which uses a temperature control device for interior spaces incorporating more than one temperature control level, and a clock or other automatic mechanism for switching from one control level to another.

(14) "Passive Solar Measures" refers to systems that make efficient use of, or enhance the use of, natural forces, including solar insulation, winds, nighttime coolness, and the opportunity to lose heat by radiation to the sky—to heat or cool living space by the use of conductive, convective, or radiant energy transfer. Included are:

(A) Solaria/sunspace systems which refers to a structure of glass, fiberglass, or similar transparent or translucent materials which is attached to the south facing ( $\pm 45^\circ$  of true south) wall of a building which allows for air circulation to bring heat into the conditioned area of the residence and which is able to be closed-off from the residence at night and during periods of low solar radiation.

(B) Window heat gain retardants refers to those mechanisms which significantly reduce winter heat loss through windows by use of external or internal devices such as insulated rollup shades or movable rigid insulation, that cover the windows during the winter both at night and when no appreciable amount of sunlight is entering the window during the day.

(C) Window heat gain retardants refers to those mechanisms which significantly reduce summer heat gain through



windows in the summer by use of devices such a *[sic.]* awnings, solar screens or insulated rollup shades.

(15) "Replacement Solar Swimming Pool Heater" refers to devices which are used solely for the purpose of using the sun's energy to heat pool water and replaces an existing pool heater that uses electricity, gas, or fossil fuels.

"Energy Conserving Practices" refers to low or no cost practices which save energy, do not require the installation of energy conservation or renewable resource measures, and do not adversely impact the RCS program. Such practices may include, but are not limited to:

(1) "Furnace Efficiency Maintenance and Adjustments" which includes the cleaning and combustion efficiency adjustment of gas or oil furnaces, periodic cleaning or replacement of air filters on forced-air heating or cooling systems, lowering the bonnet or plenum thermostats to 80°F on gas or oil forced-air furnaces, and turning off the pilot light on a gas furnace during the summer.

(2) "Nighttime Temperature Setback" which refers to manually lowering the thermostat control setting for the furnace during the heating season to a maximum of 55°F during sleeping hours.

(3) "Reducing Thermostat Settings in Winter" which refers to limiting the maximum thermostat control setting for the furnace to 68°F during the heating season.

(4) "Raising Thermostat Setting in Summer" which refers to setting the thermostat control for an air conditioner to 78°F or higher during the cooling season.

(5) "Water Flow Reduction in Showers and Faucets" which refers to pacing *[sic.]* a device in a shower head or faucet to limit the maximum flow to three gallons per minute, or replacing existing shower heads or faucets with those having built-in provisions for limiting the maximum flow to three gallons per minute.

(6) "Reducing Hot Water Temperatures" which refers to manually setting back the water heater thermostat setting to 120°F and reducing the use of heated water for clothes washing.

(7) "Reducing Energy Use When a Home is Unoccupied" which refers to reducing the thermostat setting to 55°F when a home is empty for four hours or longer in the heating season, turning an air conditioner off in the cooling season when no one is home, and turning a water heater off when a home is vacant for two days or longer.

(8) "Plugging Leaks in Attics, Basements, and Fireplaces" which includes installing scrap insulation or other pliable materials in gaps around pipes, ducts, fans, or other items which enter the attic or basement from a heating space, installing fireproof material to plug any holes around any damper in a fireplace and adding insulation to any attic or basement door.

(9) "Sealing Leaks in Pipes and Ducts" which includes installing caulking in any leak in a heating or cooling duct, tightening or plugging any leaking joints in hot water or steam pipes, and replacing washers in leaking water valves.

(10) "Efficient Use of Shading" which includes shades or drapes to block sunlight from entering a building in the cooling season, to allow sunlight to enter during the heating season, and to cover windows tightly at night during the heating season.

"ESA" means Subtitle B of Title V of the Energy Security Act, Pub. L. 96-294, which amended Part 1 of Title II of the National Energy Conservation Policy Act (NECPA).

"Home Heating Supplier" means a person or firm that sells or supplies home heating fuel including No. 2 heating oil, kerosene, butane, and propane to an eligible customer for consumption in a residential building.

"Infiltration" means the movement of air or moisture into or out of the conditioned area of a residence through openings in the residence shell.

"Lead Agency" refers to the Indiana Department of Commerce, Division of Energy, 440 N. Meridian Street, Indianapolis, IN, 46204-2248 *[sic., 1 North Capitol Avenue, Suite 700, Indianapolis, IN 46204]*.

"Master Record" refers to a Lead Agency prepared and maintained list of participating state-wide suppliers, installers, and lenders who sell, install or finance program measures.

"Material Standards" refers to minimum safety and effectiveness standards for products and measures covered under the RCS program.

"Measures Warranties" refers to a written warranty by the manufacturer of an energy conservation or renewable resource measure that the eligible customer for whom the measure is installed, the installation contractor who installs the measure, and the seller of the measure shall be entitled to obtain, within a reasonable period of time and at no charge, appropriate replacement parts of materials for those measures found within one year from the date of installation to be defective due to materials, manufacturer, or design. A written warranty equivalent to that referred will be provided by the supplier of an energy conservation or renewable resource measure to persons who purchase the measure from the supplier. A written warranty will be provided by a contractor installing an energy conservation or renewable resource measure stating that any defect in materials, manufacture, design, or installation found within one year from the date of installation shall be remedied without charge and within a reasonable period of

time.

“Model Audit” means a Lead Agency prepared audit which established the procedures, techniques, requirements, forms, calculation bases, data, and related factors to be used in conducting an audit under the purview of the IN RCSP.

“NECPA” means Part 1 of the Title II of the National Energy Conservation Policy Act. Pub. L. 95-619, as amended by Subtitle B of Title V of the Energy Security Act (ESA).

“Participating Home Heating Supplier” means a home heating supplier that had elected to participate in a state plan which includes home heating suppliers.

“Program Announcement” refers to the RCS program information and offer of services required to be provided by a covered utility or participating home heating supplier to each eligible customer.

“Program Audit” means an audit in which the estimates of costs and energy savings are based on an adequate assessment, including actual measurements or inspections, as appropriate, performed on-site by the auditor, of the building shell and of the space heating, space cooling, and water heating equipment of the residence of an eligible customer. In the case of residential building containing more than four dwelling units, the program audit may mean an audit in which the estimate of costs and energy savings are based on a sampling of the types of units in the building.

“Public Utility” refers to any person, state agency, or federal agency which is engaged in the business of selling natural gas or electric energy, or both, to residential customers for use in residential buildings.

“Radiation” refers to the movement of heat from an object by means of electro-magnetic waves or infra-red rays and does not involve any molecules other than the substance radiating the heat.

“Rate” means any price, rate, charge, or classification made, demanded, observed, or received with respect to sales of electric energy or natural gas, any rule, regulation, or practice respecting any such rate, charge or classification, and any contract pertaining to the sales of electric energy or natural gas.

“Residential Conservation Service Program” refers to the program required to be implemented by covered utilities pursuant to an approved state plan, an approved non-regulated utility plan, or a federal standby plan.

“RCSP” means residential conservation service program.

“Regulated Utility” means a public utility with respect to whose rates a state regulatory authority has rate making authority.

“Residential Building” means any building used for residential occupancy which is not a new building to which voluntary performance standards under Section 304(a) of the Energy Conservation and Production Act, as amended apply; has a system for heating or cooling or both; and contains at least one, but not more than four, dwelling units. After January 21, 1983, the term “residential building” also includes any building which contains more than four dwelling units unless such building contains a heating or cooling system, or both, which is a central system.

“Secretary” means the Secretary of Energy.

“State” means a state, the District of Columbia and Puerto Rico.

“State Plan” means a plan developed pursuant to the Federal Guidelines.

“State Regulatory Authority” refers to any state agency which has rate making authority with respect to the sales of electric energy or natural gas by any public utility.

“Unconditional Audit” refers to an offer extended to an eligible customer by a participating utility to conduct a Class A audit without pre-conditions. (*Department of Commerce; Division of Energy; 55 IAC 3.1-1-3; filed Mar 28, 1984, 9:07 am: 7 IR 1153; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 3.1-1-4 Liability of project manager**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 4. A covered utility or participating home heating supplier that arranges for a lender to make a loan to, or a contractor to perform work for, an eligible customer should not be held liable, by virtue of its role as project manager for the RCS program, in any cause of action between such customer and such lender or contractor. (*Department of Commerce; Division of Energy; 55 IAC 3.1-1-4; filed Mar 28, 1984, 9:07 am: 7 IR 1157; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **Rule 2. Program Guidelines**

**55 IAC 3.1-2-1 Plan coverage**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 1. (a) In Indiana there are nine utilities which presently meet the definition of a covered utility and consequently must participate in the Residential Conservation Service Program. These utilities include the following:

(1) Citizens Gas and Coke Utility

2020 N. Meridian Street

Indianapolis, IN 46202

(2) Indiana Gas Company, Inc.

1630 N. Meridian Street

Indianapolis, IN 46202

(3) Indiana and Michigan Electric Company

125 E. Washington Street

P.O. Box 60

Fort Wayne, IN 46802

(4) Indianapolis Power & Light Company

P.O. Box 1595B

25 Monument Circle

Indianapolis, IN 46206

(5) Kokomo Gas and Fuel Company

900 East Boulevard

Kokomo, IN 46901

(6) Northern Indiana Public Service Company

5265 Hohman Avenue

Hammond, IN 46325

(7) Public Service Company of Indiana, Inc.

1000 E. Main Street

Plainfield, IN 46168

(8) Southern Indiana Gas and Electric Company

P.O. Box 569

Evansville, IN 47741

(9) Terre Haute Gas Corporation

632 Cherry Street

Terre Haute, IN 47808

(b) Prior to the beginning of each calendar year, the Department of Energy shall identify in the "Federal Register" a list of all utilities required to participate in the RCS program for that calendar year. Failure to include a utility meeting the qualifying sales guidelines on this list does not affect the requirements upon such covered utility under the RCSP rules.

(c) There are no non-regulated utilities in Indiana which meet the "covered utility" definition and have chosen to participate in the state plan. The home heating suppliers have to date chosen not to participate in this audit program. The Lead Agency continually encourages the involvement of the home heating suppliers, the non-regulated utilities and non-covered utilities. These industries have been informed that they may enter the program at anytime. Plan amendments will be submitted in accordance with the appropriate subparts should the home heating suppliers or non-covered utilities voluntarily or through executive order become subject to the plan. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-1; filed Mar 28, 1984, 9:07 am: 7 IR 1157; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-2-2 Enforcement considerations**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8; IC 8-1-1

Sec. 2. (a) The Public Service Commission of Indiana (PSC) is responsible for the monitoring, investigation and enforcement

of program accounting and payment of costs considerations. The PSC authority to perform this role is the PSC Act of 1941, IC 8-1-1 through IC 8-1-1-13. The PSC oriented monitoring will be conducted by designated members of the commission staff.

(b) Enforcement responsibilities other than RCSP accounting and cost payment considerations will be performed by the Lead Agency. This enforcement authority is granted per Indiana Code which appeared in the Indiana Register, February 1982. Compliance violations will be resolved with the appropriate utility and, if necessary, reported to the State Attorney General's Office and the United States Department of Energy.

(c) Participants other than utilities are subject to the provisions of 55 IAC 3.1-2-9(b) through 55 IAC 3.1-2-9(d) as appropriate. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-2; filed Mar 28, 1984, 9:07 am: 7 IR 1158; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-2-3 Monitoring supply, installation, and financing programs**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 3. (a) The National Energy Conservation Policy Act prohibits utilities from supplying, installing or financing any energy conservation or renewable resource. This prohibition however shall not apply to furnace efficiency modifications, clock thermostats and load management devices; or to any energy conservation measure or renewable resource measure supplied or installed by a public utility through contracts between the utility and independent suppliers or contractors where the customer requests such supply and installation and each contractor meets the following requirements:

(1) Is on the master list of suppliers and contractors.

(2) Is not subject to the control of the public utility except as to the performance of the contract and is not an affiliate or a subsidiary of the utility.

(3) Is selected by a utility in a manner consistent with subsection (b) below.

(b) The contractor selection activities [*sic.*] of a utility:

(1) may not involve unfair methods of competition;

(2) may not have a substantial adverse effect on competition in the area in which such activities are undertaken nor result in providing to any supplier or contractor an unreasonable large share of contracts for the supply or installation of energy conservation or renewable resource measures;

(3) shall be undertaken in a manner that provides, subject to reasonable conditions the utility may establish to ensure the quality of supply and installation of energy conservation or renewable resource measures, that any financing by the utility of such measures shall be available to finance the supply or installation by any contractor on the list or to finance the purchase of such measures to be installed by the customer;

(4) shall be undertaken, to the extent practicable in a manner that minimizes the cost of energy conservation and renewable resource measures to such customers; and

(5) shall include making available upon request a current estimate of the average price of supply and installation of energy conservation and renewable resource measures subject to the contracts entered into by the public utility under subsection (a) of this section.

(c) In the event that a covered utility would engage in the supplying, installing, or financing of any energy conservation or renewable resource measures that utility shall charge fair and reasonable prices and interest rates. The Lead Agency on a quarterly basis will review the utility's prices and interest rates, comparing them to industry acceptable figures. If adjustments in the prices and interest rates charged by a utility are necessary the Lead Agency will instruct the utility as to what is considered a fair and reasonable cost.

(d) The utility supplying, installing and financing activities will be conducted in a manner which does not have a substantial adverse affect upon competition or involve the use of unfair, deceptive or anticompetitive acts or practices.

(e) The covered utility will seek funds for the financing of measures from financial institutions located throughout the area covered by the lending program. Utilities are obligated to only select those institutions which operate in accordance with good business practices.

(f) The covered utility must notify the Indiana Department of Commerce, Division of Energy Policy and the Assistant Secretary of the Federal Department of Energy when a financing, supplying or installation program becomes effective. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-3; filed Mar 28, 1984, 9:07 am: 7 IR 1158; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-2-4 Program announcement**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 4. (a) Participating utilities are required to send to each eligible customer no later than six months after the initial approval of the state plan in December 1980 and every two years thereafter until January 1, 1985, an RCSP program announcement. Customers who have requested and received an RCSP audit, or who have used the utility arranging service since the initial program announcement distribution do not have to be sent a subsequent announcement. Customers which have requested an audit but at the time of the program announcement mailing have yet received the audit should not be sent a subsequent announcement.

(b) As a minimum the program announcement will contain the following information:

(1) A general overview of the RCSP program and the importance of every individual doing their share to conserve residential energy.

(2) A list of program measures for the category of residential buildings owned or occupied by the eligible customer.

(3) A state-provided estimate of the savings in energy costs, or a range of savings, for a one year period, which could occur from the installation of each measure. The estimates of the savings in energy costs which are likely to result from the installation of each program measure will be determined based on the following:

(A) Accepted heat loss values derived from the formula contained in the Indiana model audit.

(B) A 1,176 square foot single unit house with at least 13 entrances and exits per day; single story frame/ranch style construction; outside dimensions of 28 feet wide × 42 feet in length. All walls in the conditioned space are 8 feet high; total window area is 127 square feet with 21 square feet for the door area. The attic is 1,176 square feet; floor is standard construction with some minor cracks in floor joints.

(C) Exterior shell walls contain no insulation, the attic is insulated to R-7 while the floor is uninsulated windows are single pane; storm door is not present; three air changes per hour. All space heating ducts are uninsulated.

(D) The type furnace typically found in the service area and its average seasonal efficiency and a single electric 18,000 BTU window air conditioner with an energy efficiency ratio of 6.5.

(E) Fuel price and climatic considerations will be representative of the applicable HUD region in which the customer resides.

(4) A list of energy conserving practices as defined by the Lead Agency and approved by the Governor. These practices will consist of inexpensive or cost free actions that can be taken by the customer to conserve energy and fuel costs.

A disclosure statement, similar to the following, should be included regarding the estimated savings for practices and measures: "Home energy savings depend on many factors. The estimates reflected in this example are based on an uninsulated 1,440 square foot ranch-type house that is 25 years old; heated with \_\_\_\_\_; and located in the \_\_\_\_\_ part of the state (e.g. central Indiana). Your savings will be different according to the size, location, age, number of occupants, your energy habits, and other factors. The total annual savings from the installation of more than one measure may well be less than the sum of savings of each measure installed individually. A cumulative total savings of about 50% is attainable and economically possible. The audit which we offer will provide specific estimates for your home."

(5) A state-provided estimate of the savings in energy costs, or a range of estimates, for a one year period which are likely to result from the adoption of the practices. Calculations can be provided for each practice individually or as a group.

(6) An offer to provide a class A audit and a description of the audit contents. Customers will be informed that they can receive only one subsidized audit of their homes in which they are presently residing. In the event that a customer receives more than one program announcement, the state encourages, but does not require, that the customer request the audit from the utility which provides the furnace fuel. The customer using LP gas, coal, or oil will be audited by their covered electric utility.

(7) A brief description of the benefits an eligible customer may receive by participating in the RCS program include the following:

(A) Assistance by the auditing utility in obtaining for the supplying, installing or financing of approved measures by a master record listee.

(B) Access to the customer complaint proceedings.

(C) Special billing of audit related costs and repayment of loans through the utility when approved by the lending institution.

(D) A one year manufacturer's, supplier's, and installer's warranty when using the services of a master record listee.

(E) Products which when purchased or installed by a master record listee meet the Department of Energy material and installation standards as outlined in 55 IAC 3.1-3-1 and 55 IAC 3.1-4-1.

(8) An explanation of the master record and an offer to provide to every eligible customer upon request, this listing of suppliers, contractors and lenders who sell, install or finance program measures in his county or adjacent service areas. An audit does not have to be performed or requested to obtain the list.

(9) A general description as to when the customer will receive the audit based upon such factors as serving one geographic area at a time or serving certain types of energy users first. If the audit is not conditioned on such factors, a statement outlining that the audit will be provided within a reasonable period convenient to the customer and the utility should be included.

(10) The following paragraph includes the required information for federal tax credits: "The Federal Government permits most homeowners or tenants to claim tax credits of up to 15 percent of the cost of conservation investments (such as insulation or storm windows) and up to 40 percent of the cost of solar energy systems (such as solar water heaters). For more information on your eligibility for these tax credits, contact your local Internal Revenue Service Office."

(11) Statement on Indiana tax credits such as the following: "Indiana residents who installed, or have installed in their principal Indiana residence, insulation, weatherstripping, caulking, storm windows and storm doors may be entitled to a deduction against their Indiana Adjusted Gross Income. The deduction is limited to the lesser amount of \$1,000, or the cost of the qualifying items plus installation. In the case of qualifying solar and wind energy systems, a special Indiana income tax credit has also been established. For details, contact the Indiana Department of Revenue at (317) 232-2240 or call toll free: 1-800-382-4631."

(12) An explanation that an individual on becoming an eligible customer may obtain, provided that an audit had been previously conducted on the residence, a copy of the audit results without charge.

(13) A notation informing the customer that financial assistance under the Solar Energy and Energy Conservation Bank may be available from certain lenders, neighborhood development associations, or historic preservation agencies.

(c) Participating utilities will provide each new customer, within 60 days of becoming such a customer, with a program announcement consisting of the information presented in 55 IAC 3.1-2-4(b)(1)-(12) [(b)(1) through (b)(12) of this section].

(d) Each participating utility is required to forward to the Lead Agency 60 days prior to the date of intended use, a draft version of each program announcement. The Lead Agency is responsible for suggesting changes and approving in writing the program announcements prior to any release. The utilities must informally coordinate their initial announcement and all subsequent versions with any covered utilities that also provide service to the same customer base. In the event that participating utilities which share the same customer area select to jointly develop an announcement, the following items must be included:

(1) Identification of each utility.

(2) Language which states that the audit is available from any of the jointly listed utilities. The customer however is encouraged to request the audit from the utility providing his furnace fuel.

(3) Any differences in the RCSP services provided by the utilities.

(e) A program announcement may not include the following:

(1) Advertising for the sale, installation or financing by any supplier, contractor, or lender including [sic.] the covered utility of any program measure. However, a utility may state in general terms the existence of any financing program for the sale or installation of measures.

(2) Information regarding any product which is not a measure of practice as defined in the state plan.

(3) Brand names of any conservation or renewable measures.

(f) Utilities are prohibited from unfairly discriminating among measures, eligible customers, suppliers, contractors and lenders in the content of, and in the providing of, information concerning the program announcement and its distribution. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-4; filed Mar 28, 1984, 9:07 am: 7 IR 1159; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **55 IAC 3.1-2-5 Program audits**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 5. (a) The covered utility shall provide a program audit to each eligible customer within a reasonable time after the request for an audit. Allowances will be made for special circumstances such as difficulty in contacting a customer or determining a convenient audit time. The covered utilities may [sic.] condition their audits based upon such factors as geographic areas, fuel type

or servicing high consumption customers first. Utilities which decide to condition their audits must provide the Lead Agency with a description of the basis for conditioning and the anticipated or actual annual audit schedule. The percentage of the utility customer base and the actual number of customers in each conditioning zone should be included in the report.

- (b) The audits performed by the participating utilities shall include, or be conducted in accordance with, the following:
- (1) A discussion of the approved practices, emphasizing their importance individually and collectively and that they should be adopted before considering the installation of measures. The approved practices for Indiana are:
    - (A) Furnace efficiency maintenance and adjustments.
    - (B) Nighttime temperature setback during the heating season.
    - (C) Reducing thermostat setting during the winter.
    - (D) Raising thermostat settings during the summer.
    - (E) Water flow reduction devices.
    - (F) Reducing hot water temperature setting.
    - (G) Reducing energy use when the home is unoccupied.
    - (H) Sealing pipe and duct leaks.
    - (I) Plugging leaks in the house shell.
    - (J) Making efficient use of shading.
  - (2) An energy analysis of the residence which encompasses the consideration of the following approved measures:
    - (A) Caulking both inside and outside.
    - (B) Weatherstripping.
    - (C) Furnace efficiency modifications.
      - (i) Replacement heating system.
      - (ii) Replacement oil burner.
      - (iii) Flue opening modifications (vent damper).
    - (D) Ceiling insulation.
    - (E) Wall insulation.
    - (F) Floor insulation.
    - (G) Duct insulation.
    - (H) Pipe insulation.
    - (I) Water heater insulation.
    - (J) Storm or thermal window.
    - (K) Heat reflective and absorbing window and door materials.
    - (L) Clock thermostat.
    - (M) Passive solar space heating and cooling system.
      - (i) Solaria/sunspace system.
      - (ii) Window heat loss retardants.
      - (iii) Window heat gain retardants.
    - (N) Replacement solar swimming pool heater.
  - (3) The auditor shall determine the applicability of each program measure in the residence based upon the applicability factors established in the "Indiana RCS model audit" or the "Indiana multi-family RCS model audit". If a given applicability factor is not met, the auditor is not required to provide estimates of the cost and savings of installation of such measure in the residence. Auditors are precluded from recommending or estimating costs and savings for any product or practice which is not approved per listing in the state plan. Figure I denotes which conservation measures are applicable in the four HUD regions. Figure II indicates the four HUD regions.
  - (4) All program measure auditing procedures will be developed and validated by the state Lead Agency. Only these procedures, as reflected in the RCS model audits, may be utilized *[sic.]* by the participating utilities.
  - (5) A thorough in-person explanation of the completed audit results and measures calculations. Under extenuating circumstances the results may be provided other than on-site. "Extenuating circumstances" are limited to such reasons as: requested by the customer, computer/calculator problems, and telephone difficulties. Exceptions, for situations such as an influx of audit requests, will be considered by the Lead Agency if prior approval is requested by the utility.
- In the event that the results are not presented at the conclusion of the audit, the auditor will show the customer a typical audit format and discuss how to interpret the actual measures calculations when received. If the auditor performs the measures

calculations other than on-site, the results must be returned to the customer within 10 utility working days following the date of the audit. The Lead Agency contends that for the audit to achieve the expectations of the customer, a thorough explanation of the audit components and findings is essential. This discussion is best conducted on-site at the conclusion of the audit.

(6) An explanation of the master record, including its customer protection features and responsibilities of the listees. An auditor is prohibited from recommending any supplier, installer or lender which provides RCSP services. If the auditor's utility supplies, installs or finances any approved measures, the auditor may disclose this fact in his presentation. A copy of the master record for the county in which the customer resides shall be given to the residents.

(7) Auditors are allowed to perform a program audit only for those measures approved by the Governor as listed in the state plan.

(c) The audit results will be presented in writing to each audit recipient and contain the following information:

(1) An estimate of the total cost, expressed in dollars or a range of dollars, for the installation, including labor and materials, by a contractor of each applicable program measure.

(2) An estimate of the total cost, expressed in dollars or a range of dollars, for the purchase by a customer of each applicable program measure. Customer installed estimates for wall insulation do not have to be provided. Customer installed estimates for any furnace efficiency modifications will not be provided.

(3) A written estimate of the energy savings expressed in dollars or a range of dollars which could accrue during the first year after installation of each applicable program measure. Current energy rates will be used in determining these saving estimates. However, the customer will be advised that the cumulative effect of installing multiple measures may be less than the sum of each measure installed individually. The following disclosure statement shall be contained in this section of the written audit presentation:

“The procedures used to make these estimates have been evaluated by the state of Indiana, Indiana Department of Commerce, Division of Energy Policy for accuracy. However, the actual installation costs incurred, and possible energy savings resulting from the installation of any measure, may be different from the estimates provided by your auditor. Although the estimates are based on measurements from your home, they are also based on certain assumptions which may not apply in your situation. Further, the total energy cost savings from the installation of several measures will be less than the total savings estimated for each measure installed individually.”

(4) As applicable, a written estimate of the normal annual maintenance costs for any applicable measure.

(5) A written statement outlining the following information when recommending a passive solar space heating system (solaria/sunspace systems):

(A) A pictorial description of the system, including the approximate dimensions.

(B) The estimated percent of the heating load to be provided by the system.

(C) Collection storage characteristics including the recommended heat capacity of storage.

(D) A disclosure statement similar to the following:

“The energy cost savings estimates for installation of a solar domestic hot water system you have received was based on a system possibly different from one you may wish to purchase. The estimates provided used simulated measurements. As such, the savings estimate provided may be more or less than the savings you will experience.”

(6) A written statement outlining the federal and Indiana tax credits as well as a sample calculation noting the tax benefits of installing an applicable measure. The following paragraphs include the required information:

(A) “The Federal Government permits most homeowners or tenants to claim tax credits of up to 15 percent of the cost of conservation investments such as insulation or storm windows and up to 40 percent of the cost of solar energy systems such as solar water heaters. For more information on your eligibility for these tax credits, contact your local Internal Revenue Service Office.”

(B) “Indiana residents who install, or have installed in their principal Indiana residence, insulation, weatherstripping, caulking, storm windows and storm doors may be entitled to a deduction against their Indiana Adjusted Gross Income. The deduction is limited to the lesser amount of \$1,000, or the cost of the qualifying items plus installation. In the case of qualifying solar and wind energy systems, a special Indiana income tax credit has also been established. For details, contact the Indiana Department of Revenue at (317) 232-2240 or call toll-free: 1-800-382-4631.”

(d) Utilities which do not provide in-person results of the audit are required to provide customers with the opportunity to discuss the results of the audit with a qualified utility employee or utility contractee.

(e) Covered utilities are prohibited from discriminating unfairly among eligible customers in providing audits.

(f) Unfair discrimination among program measures is prohibited.



(g) Eligible customers can receive only one RCSP subsidized audit during the program's duration. The participating utilities sharing an eligible customer will coordinate the performance of the audit based on the following concept:

(1) In order to minimize potential coordination problems, such utilities will freely exchange applicable audit records, past customer and residence billing records, profile costs for similar residences where past billing information is not established or inadequate, and other pertinent information.

(2) If the requesting customer uses natural gas as his furnace energy source, the customer's participating natural gas utility will perform the audit.

(3) If the requesting customer uses any furnace energy source other than natural gas, the customer's participating electric utility will perform the audit.

(4) If an eligible customer requests that the audit be performed by the participating utility that does not provide his furnace fuel, subsection (g)(2) and (3) of this section are waived. However, such customers will still only receive one subsidized RCSP audit.

(5) Should an eligible customer receive a subsidized RCSP audit, and subsequently move to a different qualifying residential building serviced by any participating utility, that customer is considered a new customer, and is eligible to receive another subsidized audit.

(h) In order for an auditor to provide cost and savings estimates for furnace efficiency modifications on furnaces using an energy source other than the energy source provided by the auditor's utility, the customer must request a furnace evaluation in writing. Such customers will be presented the following statement to sign:

“One of the features of the Residential Conservation Service Program audit presently being conducted in your home is an evaluation of your primary furnace. This evaluation can provide an estimate of the cost and potential savings for several furnace efficiency modifications you may wish to have installed.

A provision in the Federal law specified that only the supplier of your furnace fuel may audit the furnace unless you waive this provision in writing. Your furnace fuel source is \_\_\_\_\_ and in your area, my company sells furnace fuel limited to \_\_\_\_\_.

If you do not want my company to evaluate your furnace, applicable cost and savings estimates for possible furnace modifications will simply not be included in the overall audit summary. If you do want us to evaluate your furnace, knowing that we do not supply your furnace fuel, please sign and date below.

\_\_\_\_\_  
(NAME)

(i) Each person who performs a program audit will be qualified to perform the necessary measurements and inspections to determine the estimated cost of purchasing and installing the recommended program measures and the savings in energy costs that are likely to result from the installation of such measures.

A determination as to whether an individual is qualified will be based on the results of a state-administered test. The Lead Agency auditor certification test shall be designed to evaluate an applicant's knowledge of the following:

(1) A general knowledge of energy issues as they relate to the reasons, purposes, and customer benefits of the Indiana RCSP.

(2) Detailed knowledge of the master record concept, listing considerations, how the record complements the program, and consumer protection features.

(3) Knowledge of residential building codes that apply to the installation, use, or maintenance of program measures.

(4) An understanding of the three types of heat transfer, and the effect of ambient temperature and humidity on heat transfer.

(5) A general appreciation of residential construction terminology, shell considerations, internal systems, and the inter-relationship of the human dimension on the building.

(6) A general knowledge of the operation and maintenance of typical residential heating and cooling systems. The auditor must be able to calculate furnace/boiler steady state efficiency. If required by local ordinance, the auditor must hold a valid license or certification instrument attesting to proficiency in furnace systems.

(7) Detailed knowledge of the program measures; advantages and disadvantages of each measure; and the general measures material and installation standards.

(8) A general knowledge of solar energy, to include insulation, shading, and heat capture and transfer as they apply to program measures.

(9) Utilities may also consider instituting additional eligibility requirements such as demonstrating desirable interpersonal skills, possessing a vehicle operator's license and participating in training seminars.

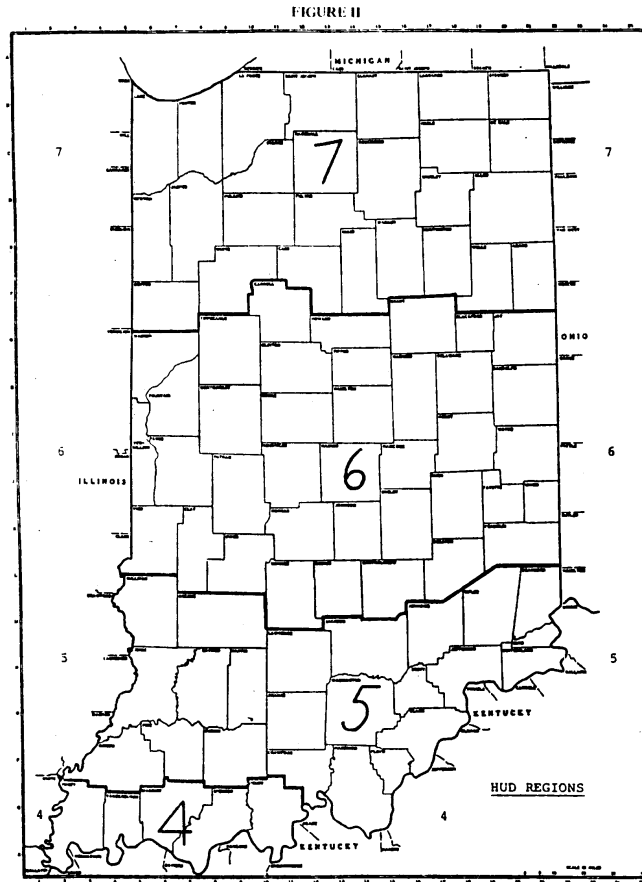
(j) The auditor's test will be conducted in the office of the Lead Agency each Thursday at 9:00 AM, Indianapolis time.

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Candidates for testing must bring a 1” x 1” black and white facial photo to be used in preparing the identification card. An auditor candidate may take the exam three times in a consecutive 30 day period. Further testing iterations must be approved by the Lead Agency. The auditor's test is available to all persons in a nondiscriminatory manner. However, individuals who are not employed by, or are not under an RCSP contractual employment relationship with a participating utility, will receive a restricted license. Such an individual cannot perform RCSP sanctioned audits. An unrestricted license will be issued if the auditor becomes employed by a utility or a utility's subgrantee within one year of the original test date.

FIGURE 1

Indiana HUD Regions Based on Approximate Heating Degree Days: (By County)	Residential Building Categories by Source of Heating Fuel	Energy Conserving Practices	General Measures Applicable To All Residences Provided Certain Conditions Are Present	Specific Conservation Measures					Specific Renewable Resource Measures				
				Ceiling Insulation (R-Value)	Wall Insulation (R-Value)	Floor Insulation (R-Value)	Storm or Thermal Windows	Vent Damper	Window Heat Loss Reductions	Window Heat Gain Reductions	Solar/Sunspace	Shading/Screening	Pool Heating
Region 4 (3401-4100 Days) Perry, Posey, Spencer, Vanderburgh, & Warrick	Electricity	x	x	30	x	19	x	x	x	x	x	x	x
	Electric Heat Pump	x	x	30	x	11	x	x	x	x	x	x	x
	Gas	x	x	30	x	11	x	x	x	x	x	x	x
	Oil	x	x	30	x	11	x	x	x	x	x	x	x
	Other Fuels	x	x	30	x	11	x	x	x	x	x	x	x
Region 5 (4501-5000 Days) Clark, Crawford, Davess, Dearborn, Dubois, Floyd, Gibson, Greene, Harrison, Jackson, Jefferson, Jennings, Knox, Lawrence, Martin, Ohio, Orange, Pike, Ripley, Scott, Sullivan, Switzerland, & Washington	Electricity	x	x	30	x	19	x	x	x	x	x	x	x
	Electric Heat Pump	x	x	30	x	11	x	x	x	x	x	x	x
	Gas	x	x	30	x	11	x	x	x	x	x	x	x
	Oil	x	x	30	x	11	x	x	x	x	x	x	x
	Other Fuels	x	x	30	x	11	x	x	x	x	x	x	x
Region 6 (5001-6000 Days) Bartholomew, Blackford, Boone, Brown, Carroll, Clay, Clinton, Decatur, Delaware, Fayette, Fountain, Franklin, Grant, Hamilton, Hancock, Hendricks, Henry, Howard, Jay, Johnson, Madison, Marion, Monroe, Montgomery, Morgan, Owen, Parke, Putnam, Randolph, Rush, Shelby, Tippecanoe, Tipton, Union, Vermillion, Vigo, Warren, Wayne	Electricity	x	x	30	x	19	x	x	x	x	x	x	x
	Electric Heat Pump	x	x	30	x	19	x	x	x	x	x	x	x
	Gas	x	x	30	x	11	x	x	x	x	x	x	x
	Oil	x	x	30	x	11	x	x	x	x	x	x	x
	Other Fuels	x	x	30	x	11	x	x	x	x	x	x	x
Region 7 (6001-7000 Days) Adams, Allen, Benton, Cass, DeKalb, Elkhart, Fulton, Huntington, Jasper, Kosciusko, Lagrange, Lake, LaPorte, Marshall, Miami, Newton, Noble, Porter, Pulaski, St. Joseph, Starke, Steuben, Wabash, Wells, White, & Whitley	Electricity	x	x	38	x	19	x	x	x	x	x	x	x
	Electric Heat Pump	x	x	38	x	19	x	x	x	x	x	x	x
	Gas	x	x	30	x	11	x	x	x	x	x	x	x
	Oil	x	x	30	x	11	x	x	x	x	x	x	x
	Other Fuels	x	x	30	x	11	x	x	x	x	x	x	x



*(Department of Commerce; Division of Energy; 55 IAC 3.1-2-3; filed Mar 28, 1984, 9:07 am: 7 IR 1161; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 3.1-2-6 Arrangements for installation and financing**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 6. (a) Each covered utility is required to arrange for the installation, and to arrange for the financing for the supply and installation, of any applicable program measure upon request by any eligible customer. Utilities are prohibited from arranging for the installation or financing of an item which is not a certified RCSP measure. This customer relations feature will be conducted in the following manner:

(1) Arranging installations. The covered utilities shall:

- (A) Provide personalized assistance in obtaining three bids from a master record listee for a given measure installation. The utility clerk will review and evaluate the contractor's specifications to assure the accuracy and completeness of the bids.
- (B) Assist in answering any questions from customers concerning the bids.
- (C) Answer questions the selected installer may have on measures material and installation standards and specifications.
- (D) Expedite the bidding and installation process.
- (E) Provide to customers who do not want any information other than master record listings, an extract from the master record of installers that should bid within the range suggested by the auditor.
- (F) Provide the customer with an extract of the master record listing all local RCSP contractors in the event that the three utility arranged bids are unacceptable. This action completes the utility's installation arranging responsibility to

the customer for the measure in question.

(2) Arranging financing. Assistance will include, but is not limited to, providing the customer with the following:

(A) An extract from the local master record of lenders.

(B) A minimum of three loan company or credit agency applications from local master record listees.

(C) A liaison service between the lender and customer to expedite the loan process. This service will include answering questions, providing information on current interest rates and outlining contract terms available from the lenders.

(D) An extract of the master record listing all local RCSP lenders in the event that the three utility arranged loan offers are rejected by the customer. This action completes the utility's financing arranging responsibility to the customer for the measure in question.

(b) Covered utilities are prohibited, when arranging for the installation, or when arranging financing for the purchase or installation of any program measure from recommending, selecting, or providing information regarding any supplier, contractor, or lender, if such recommendation, selection or information would unfairly discriminate among the listees.

(c) When involved in the arranging process, the covered utilities are prohibited from discriminating unfairly among eligible customers, among suppliers, among contractors, among lenders or among program measures. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-6; filed Mar 28, 1984, 9:07 am; 7 IR 1166; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **55 IAC 3.1-2-7 Accounting and payment of costs**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 7. (a) On October 24, 1980, the public service commission of Indiana held a rehearing on the proposed rules and regulations concerning accounting and record keeping practices in conduct of the residential conservation service program. The commission, after having given full consideration to all relevant facts, arguments, statements and exhibits presented at the hearing and rehearing, adopted several provisions in regard to accounting and payment of cost. The findings which are pertinent to Section 456.309(a) and (b), Part I of Title II of the National Energy Conservation Policy Act are as follows:

(1) "Rule 2. Costs of circulating lists of suppliers, installers and lenders for conservation measures enumerated in the state plan shall be borne as a current operating expense of the utility providing such lists.

(2) Rule 3. Costs of services provided by the utility to the customer that directly assist the customer in arranging for finance or installation of conservation measures shall be borne as a current operating expense of the utility providing such arranging services.

(3) Rule 4. Costs of a program audit shall be charged to the individual customer requesting the audit at a standard amount of fifteen dollars (\$15.00) per dwelling unit or at such greater amount as prescribed by the National Energy Conservation Policy Act or amendments thereto and rules and regulations promulgated thereunder.

(4) Rule 5. Administrative costs associated with the functions of the utility as an intermediary for collection of loans made by lenders on the master record for the purchase and installation of a conservation measure which are incurred by the utility providing for repayment of the loan as part of the utility bill shall be recovered by the utility from the lender.

(5) Rule 6. All amounts expended by a utility for labor and materials in connection with the purchase or installation of any conservation measures shall be charged to the customer for whom such activity is performed.

(6) Rule 7. The actual cost of executing program measures, to the extent they are in excess of customer or lender assessment, shall be borne as a current operating expense of the utility.

(7) Rule 8. The rules prescribed herein are subject to the National Energy Conservation Policy Act 42 USC 8211 et seq., as amended from time to time, and any final rules and regulations implementing such Act. Based upon the record developed in Cause No. 36060 and such other information available to the commission, it shall be presumed that the actual cost of "program audit" to an eligible customer will exceed fifteen dollars (\$15.00).

(8) Rule 9. Utilities participating in the state plan shall keep a record of services performed, fees and revenues received, and costs borne in connection with the residential conservation service program as described at 10 CFR 456 and embodied in the state plan and shall make such information available to the Lead Agency."

(b) In those areas where a residential customer is an eligible customer of more than one covered utility, the customer may receive an RCSP audit from only one of the utilities. No utility is required to make more than one audit of a residential building or dwelling therein unless a new owner requests an audit. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-7; filed Mar 28, 1984, 9:07 am; 7 IR 1166; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-2-8 Customer billing; repayment of loans; termination of service**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 8. (a) Customer billing will be conducted in the following manner:

(1) Every charge by a covered utility to a customer for carrying out any activities pursuant to the state plan which are performed for the benefit of the customer, including the repayment of loans, will be stated separately on the billing from the cost of providing utility or fuel service. At the option of the utility, RCSP charges can be reflected on the monthly fuel statement, or on an entirely separate billing.

(2) The customer's payment of any RCSP charges may be included with the payment for service and fuel. Utilities which receive a payment which includes payment for both utility service and RCSP costs will first credit repayment for utility service, with the balance credited to the RCSP charges. Exceptions will be made if the customer requests in writing an alternate distribution of payment.

(b) Repayment of loans will be conducted in the following manner:

(1) In the case where a customer has an arranged loan from a master record lender, and provided that the lender agrees, the utilities shall permit the repayment of the loan as part of the periodic utility bill. The utility may recover from the lender the cost incurred by the utility in carrying out the repayment program. Accounts in arrears will be returned to the lender for collection.

(2) Covered utilities or approved lenders which loan monies for the purchase or installation of program measures shall abide by the following:

(A) Permit a customer to make a lump sum payment of the outstanding principal and interest upon default as determined by local or state law.

(B) Not impose a penalty on a customer who repays all or a portion of the outstanding loan amount prior to the payment due date.

(C) Allow a customer to repay a RCSP measures loan in not less than three years, unless the customer specified a shorter repayment period.

(c) No covered utility shall terminate utility service to any customer who defaults on payments due for RCS program services.

*(Department of Commerce; Division of Energy; 55 IAC 3.1-2-8; filed Mar 28, 1984, 9:07 am; 7 IR 1167; readopted filed Dec 2, 2001, 12:30 p.m.; 25 IR 1267)*

**55 IAC 3.1-2-9 Master record listing of suppliers, contractors, and lenders**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 9. (a) The Indiana department of commerce, division of energy policy has been designated by the Governor to be the Listing Agency for the preparation and maintenance of the state's master record. The responsibilities of the Listing Agency include the following:

(1) Informing all suppliers, contractors, and lenders in the state who sell, install or finance program measures of the compilation of the master record and its intended use. The notification of intent to develop the master record will be published in the state's largest newspapers. This announcement will be repeated annually. In addition to the newspaper notification the major supplier, installer and lender associations will be informed of the record through individual letters.

(2) Ensuring that all persons who agree to comply with the listing requirements, and only such persons are included in the master record.

(3) Ensuring that all persons in the master record who fail to comply with the listing criteria will be removed from the master record. A listee which has been removed will be given the following:

(A) A written notice of the proposed removal and the grounds for removal action. This letter will be forwarded 30 or more days before the actual delisting.

(B) An opportunity to respond in writing to the Lead Agency's written allegations. Any rebuttal must be received by the Lead Agency within 30 days of receipt of the initial delisting letter.

(C) Access to the Lead Agency's records regarding quality-control inspections conducted on work performed by the installer.

- (D) An opportunity to file a complaint through, and participate in the redress proceedings for the purpose of contesting removal from the list.
- (4) Ensuring that all persons deleted from the master record have an opportunity to reapply for listing. Delisted individuals may reapply by:
  - (A) Presenting evidence that the cause for initial delisting has been corrected and is not likely to reoccur.
  - (B) Correcting the violations to the satisfaction of the state quality control inspectors. In cases where the customer alleging injury will not allow the installer to correct the situation, the Lead Agency can consider the matter has [*sic.*] having been satisfied.
- (5) Ensuring that the name and address of any supplier, contractor, or lender who has been added to or deleted from the master record is forwarded to the covered utility.
- (6) Ensuring that each applicant is acknowledged in writing of the receipt of his application within 45 days.
- (b) All installation contractors when installing program measures under the RCSP shall:
  - (1) Provide a written warranty stating that any defect in materials, manufacture, design, or installation found within one year from the date of installation of the program measure shall be remedied without charge and within a reasonable period of time.
  - (2) Participate in good faith in an RCSP conciliation conference when there is a complaint by an eligible customer against the installer.
  - (3) Possess the necessary current state and local government licenses required for the applicable installation.
  - (4) Furnish the customer with a written contract describing the job to be done and its cost. The contract must also contain a guarantee that any proven violation of an installation standard found in 55 IAC 3.1-4-3 will be corrected without further charge to the customer.
  - (5) Enter into an agreement with the Lead Agency by completing a copy of the installer's application as outlined on Figure III.
  - (6) Comply with all applicable federal, state and local laws and regulations.

FIGURE III  
INSTALLERS APPLICATION FOR MASTER RECORD LISTING

1. General data:

- A. Business name(s): \_\_\_\_\_
- B. Business address(es): \_\_\_\_\_
- C. Business telephone number(s): \_\_\_\_\_
- D. Contact person: \_\_\_\_\_
- E. Counties in which your company does business:  
\_\_\_\_\_  
\_\_\_\_\_
- F. Associations in which your company is a member:  
\_\_\_\_\_  
\_\_\_\_\_

2. Please complete the following:

Check the measures your company will install under the RCS program

- \_\_\_ Caulking/weatherstripping materials
- \_\_\_ Wall insulation
- \_\_\_ Floor insulation
- \_\_\_ Ceiling/attic insulation
- \_\_\_ Duct insulation
- \_\_\_ Heating pipe insulation
- \_\_\_ Water heater insulation
- \_\_\_ Storm windows
- \_\_\_ Thermal windows
- \_\_\_ Clock thermostats
- \_\_\_ Heat reflective and absorbing window and door material
- \_\_\_ Replacement heating system
- \_\_\_ Replacement oil burner

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- Gas furnace vent dampers
- Solaria/sunspaces
- Window heat gain retardants
- Window heat loss retardants
- Replacement solar swimming pool heaters

3. My company agrees to meet the requirements as outlined in the program description. To the best of my knowledge, all of the submitted information is correct.

Signature: \_\_\_\_\_

Title of Signer: \_\_\_\_\_

Date of Signature: \_\_\_\_\_ (Corporate seal as applicable)

IN RCSP/DOC APRIL 83(01)

(c) All suppliers when supplying program measures under the RCS program shall:

(1) Supply program measures covered by a warranty which states that appropriate replacement parts or materials for those measures found within one year from the date of purchase to be defective due to materials, manufacture or design can be obtained within a reasonable period of time and without charge.

(2) Participate in good faith in a RCSP conciliation conference when there is a complaint by an eligible customer against the supplier.

(3) Note on the customer's bill of sale that the measure supplied to the customer meets the applicable Department of Energy material standards and carries a one year manufacturer's and supplier's warranty.

(4) Comply with any applicable federal, state and local laws and regulations.

(5) Enter into an agreement with the Lead Agency by completing a copy of the supplier's application, as outlined in Figure IV.

(d) All lenders who finance the sale or installation of program measures under the RCS program shall:

(1) Comply with all applicable federal, state and local laws and regulations.

(2) Participate in good faith in an RCSP conciliation conference when there is a complaint by an eligible customer against the lender.

(3) Not take security in real property which is used as the principal residence of the eligible customer, unless the customer acknowledges in writing that he is aware of the consequences of default on the loan.

FIGURE IV

SUPPLIERS APPLICATION FOR MASTER RECORD LISTING

1. General data:

A. Business name(s): \_\_\_\_\_

B. Business address(es): \_\_\_\_\_

C. Business telephone number(s): \_\_\_\_\_

D. Contact person: \_\_\_\_\_

E. Counties in which your company does business: \_\_\_\_\_

\_\_\_\_\_

F. Associations in which your company is a member: \_\_\_\_\_

\_\_\_\_\_

2. Please complete the following:

Check the measures your company will install under the RCS program:

Caulking/weatherstripping materials

Wall insulation

Floor insulation

Ceiling/attic insulation

Duct insulation

Heating pipe insulation

Water heater insulation

Storm windows

- Thermal windows
- Clock thermostats
- Heat reflective and absorbing window and door material
- Replacement heating system
- Replacement oil burner
- Gas furnace vent dampers
- Solaria/sunspaces
- Window heat gain retardants
- Window heat loss retardants
- Replacement solar swimming pool heaters

3. My business agrees to meet the requirements as outlined in the program description. To the best of my knowledge, all of the submitted information is correct.

Signature: \_\_\_\_\_

Title of Signer: \_\_\_\_\_

Date of Signature: \_\_\_\_\_ (Corporate seal as applicable)

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(4) Permit a rebate of unearned finance charges if an eligible customer prepays a loan for any reason. If prepayment is as a result of default action, any rebate will be computed from the day of acceleration.

(5) Enter into an agreement with the Lead Agency by completing a copy of the lenders application, as outlined in Figure V.

(e) List distribution to eligible customers will be completed as follows:

(1) Every covered utility is required to provide, upon request, to every eligible customer a copy of the master record of contractors, suppliers, and lenders who sell, install or finance program measures in their county or surrounding counties.

(2) The list will be prepared by presenting the company name, address, phone number and service area limits in the appropriate sections of the master record by random selection. The measures installed, supplied, or financed by each listee will also be identified. The measure's brand or trade names will not be used to amplify a measure's term name. Additionally, if information on the type of program measures is reflected for one measure, it shall be reflected for all measures of the same category. For example, a storm window could be identified as a wood, metal, vinyl or aluminum window.

(3) The list of contractors, suppliers, and lending institutions will be distributed by the covered utilities in a fair, open and non-discriminatory manner.

(4) The master record will be updated on a periodic basis. The complete list will be republished in its entirety each January beginning in 1982. The January publication will reflect a position arrangement of the listees.

(5) The master record of lenders will include a notation informing the customers that financial assistance under the solar energy and energy conservation bank may be available from the lenders included in the list.

FIGURE V  
LENDERS APPLICATION [sic.] FOR MASTER  
RECORD LISTING

1. General data:

A. Business name(s): \_\_\_\_\_

B. Business address(es): \_\_\_\_\_

C. Business telephone number(s): \_\_\_\_\_

D. Contact person: \_\_\_\_\_

E. Counties in which your company does business: \_\_\_\_\_

F. Associations in which your company is a member: \_\_\_\_\_

2. Please complete the following:

Check the measures your company will install under the RCS program:

Caulking/weatherstripping materials



- \_\_\_\_\_ Wall insulation
- \_\_\_\_\_ Floor insulation
- \_\_\_\_\_ Ceiling/attic insulation
- \_\_\_\_\_ Duct insulation
- \_\_\_\_\_ Heating pipe insulation
- \_\_\_\_\_ Water heater insulation
- \_\_\_\_\_ Storm windows
- \_\_\_\_\_ Thermal windows
- \_\_\_\_\_ Clock thermostats
- \_\_\_\_\_ Heat reflective and absorbing window and door material
- \_\_\_\_\_ Replacement heating system
- \_\_\_\_\_ Replacement oil burner
- \_\_\_\_\_ Gas furnace vent dampers
- \_\_\_\_\_ Solaria/sunspaces
- \_\_\_\_\_ Window heat gain retardants
- \_\_\_\_\_ Window heat loss retardants
- \_\_\_\_\_ Replacement solar swimming pool heaters

3. My company agrees to meet the requirements as outlined in the program description. To the best of my knowledge, all of the submitted information is correct.

Signature: \_\_\_\_\_

Title of Signer: \_\_\_\_\_

Date of Signature: \_\_\_\_\_ (Corporate seal as applicable)

IN RCSP/DOC APRIL 83(03)

*(Department of Commerce; Division of Energy; 55 IAC 3.1-2-9; filed Mar 28, 1984, 9:07 am: 7 IR 1168; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 3.1-2-10 Complaint processing and redress procedures**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8; IC 33-4; IC 33-5; IC 33-10.5; IC 33-11.6

Sec 10. (a) The Lead Agency is responsible for establishing and conducting an informal mediation process to resolve complaints from eligible customers against master record listees. The conference will be conducted by a RCS program staff individual who is knowledgeable of the situation and has no financial interest in the outcome of the complaint.

(b) A conference can either be conducted by telephone or in-person with the customer, listee and conciliator meeting at a convenient location.

(c) The conciliator will maintain notes on all proceedings reflecting the events, complaint, and other pertinent issues. The conciliator's final recommendation will be presented in written form to the involved parties outlining the rationale for the decision.

(d) Any person who alleges injury resulting from a violation of any state plan provision is entitled to redress. While various state agencies are available to assist in the resolution of a RCSP dispute, the ultimate authority to determine legal liability lies with the courts. Depending on the dollar amount in question, the small claims court system offers an informal legal process of resolving dispute. To use the small claims courts for purposes of RCSP redress, the individual alleging injury files a court claim. The statutory authority for the small claims court is found at IC 33-4, IC 33-5, IC 33-10.5 and IC 33-11.6.

The redress proceeding is available to an eligible customer, even if the customer has not participated in a conciliation conference. All persons who have a substantial interest in the outcome of the redress proceedings will be given adequate notice of the proceedings and have an unrestricted opportunity to participate. For claims in excess of the small claims jurisdictional dollar limits, the Indiana Circuit and Superior Courts are available. *(Department of Commerce; Division of Energy; 55 IAC 3.1-2-10; filed Mar 28, 1984, 9:07 am: 7 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 3.1-2-11 Coordination of program**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 11. (a) The Lead Agency is responsible for coordinating the Indiana RCSP plan with all local, state, and federal conservation programs within and affecting the state.

(b) The state plan and any subsequent amendments will also be presented to the public service commission of Indiana for their review. The public service commission is the state's regulatory agency.

(c) Covered utilities, the utility industry including municipalities and REMC's, and the home heating suppliers will be advised of the plan and its preparation and asked for their contributions.

(d) Utilities with residential customers outside of Indiana may coordinate directly with the Lead Agency to resolve any implementation differences. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-11; filed Mar 28, 1984, 9:07 am: 7 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-2-12 Home heating suppliers**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 12. (a) A home heating supplier can voluntarily request to participate in the Indiana residential conservation service program by informing the Lead Agency through written correspondence of its intentions. A supplier may enter the program at any time. The Lead Agency will consider the ability of the supplier to satisfy unwaiverable program requirements, any waivers requested and the resources of the supplier. Participating suppliers may also request voluntary withdrawal from the program by submitting a written statement to the Lead Agency.

(b) Many of the general program requirements for home heating suppliers are the same requirements specified for the participating utilities. However, upon adequate demonstration to the Lead Agency that the resources of the supplier do not enable it to comply with a particular requirement, the requirement may be waived after thorough review.

(c) The requirements which cannot be waived are the following sections which prohibit anticompetitive activities or unfair discrimination:

(1) 55 IAC 3.1-2-5(e) (prohibitions concerning program audits)

(2) 55 IAC 3.1-2-5(h) (furnace audits)

(3) 55 IAC 3.1-2-6(b) and (c) (prohibitions against discrimination in installation and financing)

(4) 55 IAC 3.1-2-9(e)(2) and (3) (prohibitions against discrimination in listing)

(*Department of Commerce; Division of Energy; 55 IAC 3.1-2-12; filed Mar 28, 1984, 9:07 am: 7 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 3.1-2-13 Program measures**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 13. (a) The program measures for Indiana that the auditor shall consider for evaluation are the following:

(1) Caulking (both inside and outside).

(2) Weatherstripping.

(3) Furnace efficiency modifications.

(A) Replacement heating system.

(B) Replacement oil burner.

(C) Flue opening modifications (vent damper).

(4) Ceiling insulation.

(5) Wall insulation.

(6) Floor insulation.

(7) Duct insulation.

(8) Pipe insulation.

(9) Water heater insulation.

(10) Storm or thermal window.

(11) Heat reflective and absorbing window and door materials.

(12) Clock thermostat.

- (13) Passive solar space heating and cooling system.
  - (A) Solaria/sunspace system.
  - (B) Window heat loss retardants.
  - (C) Window heat gain retardants.
- (14) Replacement solar swimming pool heater.

These measures are the measures identified by the Federal Department of Energy in the "June 25, 1982 Federal Register" which meet the program's seven year payback criteria.

(b) The Lead Agency has the option of adding any measure to the state's recommended list of program measures without approval from the Department of Energy. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-13; filed Mar 28, 1984, 9:07 am; 7 IR 1173; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 3.1-2-14 Records and reports**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 14. (a) An annual report will be submitted by the Lead Agency to the assistant secretary of the Department of Energy no later than July 1 of each calendar year through July 1, 1986. The annual report will cover the twelve month period ending the preceding April 1.

The information needed to fulfill this reporting requirement will be derived from records maintained by the Lead Agency and the participating utilities. Prior to the submission of the report, the Lead Agency will forward a standardized reporting form to each participating utility for their completion.

The annual report will include:

- (1) The number and nature of program services such as energy audits, arranged installation and arranged financing requested and provided.
- (2) The nature and status of any direct financing activities or exempted or waived supply or installation activities engaged in by the utilities.
- (3) The estimated state costs and utility costs of implementing the program.
- (4) The general nature and approximate number of complaints received about the program and the operation of the complaint processing procedures.
- (5) A copy of any covered utility's program announcement which had not been previously provided to the Department of Energy.

(b) Participating utilities are required to retain a copy of the data collected during each audit and a copy of the costs and savings presented to the customer, on file for five years from the date of the audit. In addition to this information, the utility will also retain on file for five years a copy of all furnace evaluation requests and the name and address of each customer who participated in the arranging service.

(c) The utility will maintain records for two years which indicate the amount and cost of energy purchased during each billing period, for twelve months prior to, if available, and twelve months following the customer's audit.

(d) The Lead Agency will provide to the assistant secretary, as he deems essential to departmental implementation of program responsibilities, additional information. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-14; filed Mar 28, 1984, 9:07 am; 7 IR 1173; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 3.1-2-15 Quality assurance**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 15. (a) In accordance with the federal guidelines, the Lead Agency must assure that reasonable levels of effectiveness and safety are maintained in the supply and installation of RCS program measures. The effectiveness and safety of the Indiana program measures will be maintained through several quality assurances. These include the following:

- (1) A random post installation inspection program of the installations performed by a master record listee. These inspections will be conducted by the Lead Agency staff and the division of energy policy's auditing team. A one year post installation inspection program administered by the Lead Agency through a consulting company concluded on June 30, 1982.

(2) Licensing of installers of flue opening modifications. Every business or individual which installs vent dampers and desires to be listed on the state's master record under the category "Natural Gas Furnace Vent Damper" must take and pass the RCSP qualification installation test.

(3) A written agreement signed by the master record installers that they will comply with applicable Department of Energy, state and local installation standards. These standards are reflected in 55 IAC 3.1-4-3(1) through (13).

(4) A written agreement signed by the master record suppliers that they will supply program measures which meet applicable Department of Energy material standards. The measures shall be labeled as complying with these standards. The material standards are reflected in 55 IAC 3.1-3-2.

(5) Identifying to consumers by means of the master record those contractors and suppliers who have agreed to comply with the Department of Energy and the state installation and material standards.

(6) A description of the RCS program consumer protection features outlined by the utility auditor and included in the program announcement and master record listings.

(b) In addition to the assurances initiated by the Lead Agency, there are numerous existing private sector mechanisms enforced by the energy industry, to ensure that reasonable levels of quality in supplying and installing program measures are maintained. (*Department of Commerce; Division of Energy; 55 IAC 3.1-2-15; filed Mar 28, 1984, 9:07 am: 7 IR 1173; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **Rule 3. Material Standards**

#### **55 IAC 3.1-3-1 Definitions**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 1. (a) The following definitions apply to 55 IAC 3.1-3:

"AAMA" means Architectural Aluminum Manufacturers Association.

"ANSI" means American National Standards Institute.

"ASTM" means American Society for Testing and Materials.

"ASTM C 516" means ASTM Standard Specification for Vermiculite Loose-Fill Insulation.

"ASTM C 520" means ASTM Standard Method for Density of Granular Loose-Fill Insulation.

"ASTM C 578" means ASTM Standard Specification for Performed, Block-Type Cellular Polystyrene Thermal Insulation.

"ASTM 576-76" means ASTM Standard Test Method for Dew/Frost Point of Sealed Insulating Glass Units in Vertical Position.

"ASTM E 84" means ASTM Standard Test Method for Surface Burning Characteristics of Building Materials.

"ASTM E 96" means ASTM Standard Test Method for Water Vapor Transmission of Materials in Sheet Form.

"Cellular Polystyrene Thermal Insulation" means an organic foam composed principally of polymerized styrene resin processed to form a homogeneous rigid mass of cells.

"CPSC" means U.S. Consumer Product Safety Commission.

"CPSC Part 120" means U.S. Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials.

"CPSC Part 1209" means U.S. Consumer Product Safety Commission Interim Safety Standard for Cellulose Insulation, 16 CFR Part 1209 (July 6, 1979) and any amendments thereto.

"CPSC Part 1404" means U.S. Consumer Product Safety Commission Cellulose Insulation Labeling Requirement, 16 CFR Part 1404 (July 6, 1979).

"Critical Radiant Flux" means the level of incident radiant heat on the insulation below which flames will cease to propagate, as determined according to the test procedure described in CPSC 16 CFR Part 1209.

"F.H.D.A." means Fir and Hemlock Door Association.

"HH-I-515D" means Federal Specification HH-I-515D Insulation, Thermal (Loose-Fill for Pneumatic or Poured Application): Cellulosic or Wood Fiber.

"HH-I-524B" means Federal Specification HH-I-524B Insulation Board, Thermal (Polystyrene).

"HH-I-530A" means Federal Specification HH-I-530A Insulation Board, Thermal (Polyurethane and Polyisocyanurate).

"HH-I-558B" means Federal Specification HH-I-558B Insulation Blocks, Boards, Blankets, Felts, Sleeving, and Pipe Fitting Coverings.

“HH-I-574B” means Federal Specification HH-I-574B Insulation, Thermal (Perlite).

“HH-I-585C” means Federal Specification HH-I-585C Insulation, Thermal (Vermiculite).

“HH-I-1030A” means Federal Specification HH-I-1030A Insulation, Thermal (Mineral Fiber for Pneumatic or Poured Application).

“HH-I-1252B” means Federal Specification HH-I-1252B Insulation, Thermal Reflective (Aluminum Foil).

“Loose-fill cellulosic or wood fiber thermal insulation” means thermal insulation composed of chemically treated cellulosic or wood fibers, or any combination thereof, suitable for pneumatic or poured application.

“Loose-fill mineral fiber thermal insulation” means insulation composed of mineral substances such as slag, rock, or glass, suitable for pneumatic or poured application.

“Mineral fiber blanket and batt thermal insulation” means flexible units composed of felted inorganic fibers with or without binders, in rolls or strips, with or without attached membrane coverings.

“Multi-glazing” means an arrangement of two or more separated layers of glazing (providing one or more insulating air spaces). Multi-glazing can be achieved by installing a preassembled, sealed insulating glass unit, or by affixing one or more additional sheets of glazing onto an existing window, sash, or glass.

“NBS/PS” means National Bureau of Standards Voluntary Product Standard.

“NWMA” means National Woodworking Manufacturers Assoc.

“Smoldering combustion” means the combustion of solid materials without the accompaniment of flame, when determined according to the test procedure described in CPSC 16 CFR Part 1209.

“Storm door” means a door installed outside or inside a prime door, creating an insulating air space to provide greater resistance to heat flow than the prime door alone.

“Storm window” means a unit consisting of glazing installed in a window opening either outside or inside a prime window, creating an insulating air space to provide greater resistance to heat flow than the prime window alone. The storm window may be removable or permanently attached.

“Thermal door” means a unit installed in a door opening which has an R-value of at least two (2) and is weatherstripped to provide greater resistance to heat flow.

“Thermal resistance” (R-value) means the resistance to the flow of heat of a particular body or assembly. “R-value” is measured in the United States customary units, ft<sup>2</sup>-hr-degrees F/Btu.

“Thermal resistivity” is a property of a homogenous material measured by its thermal resistance per unit thickness. Thermal resistivity is measured in the United States customary units, ft<sup>2</sup>-hr-degrees F/Btu-in.

“Thermal window” means a window system with improved thermal performance through the use of multiple glazing and more airtight construction. Some thermal windows also provide an insulating frame and sash to provide greater thermal efficiency.

“Vent damper” means a device which automatically closes vents on oil and gas-fired appliances to prevent the escape of heat through the vent pipe when the main burner is not being fired. The device may be thermally, mechanically, or electrically actuated. (*Department of Commerce; Division of Energy; 55 IAC 3.1-3-1; filed Mar 28, 1984, 9:07 am; 7 IR 1174; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **55 IAC 3.1-3-2 Composition standards**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 2. (a) Only products which meet the material composition standards as listed in sections (b) through (d) may be identified as conforming to DOE standards. The composition of sample materials shall not be altered to produce qualifying specimens for the material testing process.

(b) The following applies to loose-fill cellulosic or wood fiber insulation:

(1) For vermin-resistance and odor emission, the material shall meet the requirements *[sic.]* of HH-I-515D.

(2) For moisture absorption, the material shall meet the requirements of HH-I-515D, except the container may be 200 mm × 200 mm × 100 mm (8 inches × 8 inches × 4 inches).

(3) For fungi resistance, the material shall meet the requirements of HH-I-515D with the following changes:

(A) The core of 12.5mm (0.5 ins) regular gypsum wall board shall be used as the control; and constant temperature and humidity shall be maintained.

(B) Examine the test samples of insulation and the control as 40X magnification for evidence of fungal growth.

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- (C) Ascertain whether any of the test samples show more fungal growth than the control.
- (4) At a minimum each bag of thermal insulation shall be permanently marked with the following information:
- (A) Name of manufacturer.
  - (B) Recommended method of application (blowing or pouring).
  - (C) Minimum net weight of insulation.
  - (D) Figure I filled in. Where the insulation is intended for application by both blowing or pouring, the bag shall have a separate coverage chart for each type of application if the coverage is different.
  - (E) The following warning statements: "Skin irritation: During installation, insulation material can cause some local skin irritation; protect skin by wearing loose clothing, including gloves. Wash work clothing separately from other clothing. Eye and lung protection: To prevent irritation to eyes and lungs from fibers which may become airborne during installation, a dust mask and goggles are suggested."

FIGURE I  
(Cellulosic Loose-Fill Insulation)

To obtain thermal Resistance (R-value) of*	Minimum number of bags per 1,000 ft <sup>2</sup> (MSF net)	Installed insulation should not be less than:	Maximum net square feet coverage per bag	The weight per net square foot of installed insulation should be not less than:
<b>Attic:</b>				
R-32 .....	___ bags/MSF .....	___ inches thick .....	___ sq. ft. ....	___ lbs/sq. ft.
R-24 .....	___ bags/MSF .....	___ inches thick .....	___ sq. ft. ....	___ lbs/sq. ft.
R-19 .....	___ bags/MSF .....	___ inches thick .....	___ sq. ft. ....	___ lbs/sq. ft.
R-13 .....	___ bags/MSF .....	___ inches thick .....	___ sq. ft. ....	___ lbs/sq. ft.
<b>Sidewalls:</b>				
R___ .....	___ bags/MSF .....	___ 2 inches thick (nominal) ..	___ sq. ft. ....	___ lbs/sq. ft.
R___ .....	___ bags/MSF .....	___ 4 inches thick (nominal) ..	___ sq. ft. ....	___ lbs/sq. ft.
R___ .....	___ bags/MSF .....	___ 6 inches thick (nominal) ..	___ sq. ft. ....	___ lbs/sq. ft.

\*The thermal resistance of loose-fill cellulose thermal insulation shall be measured at the manufacturer's settled density.

- (c) The following applies to loose-fill mineral fiber insulation:
- (1) For fire safety, the material shall meet CPSC Part 1209 when tested at the manufacturer's recommended installed density.
  - (2) For corrosiveness, the material shall meet the requirements of HH-I-1030A.
  - (3) For odor emission, the material shall meet the requirements of HH-I-515D.
  - (4) For fungi resistance, the material shall meet the requirements of HH-I-515D, with the changes specified in paragraph (3), above.
  - (5) The weight loss on ignition shall be no greater than 12 percent when tested in accordance with HH-I-1030A.
  - (6) At a minimum, each bag of insulation shall be permanently marked in accordance with CPSC Part 1404 without the word: "cellulose". If a product is tested and meets the requirements of ASTM E-136, and is labeled as such, it need not be labeled with the specific requirements of CPSC Part 1404 relating to vents and chimneys. Each bag shall also be marked with the following information:
    - (A) Name of manufacturer.
    - (B) Recommended method of application (blowing or pouring).
    - (C) Minimum net weight of insulation.
    - (D) Figure II, filled in. Where the insulation is intended for application by both blowing or pouring, the bag shall have a separate coverage chart for each type of application, if coverage is different. Products not intended for sidewall applications shall be labeled with a statement to that effect, and need not carry the sidewall portion of the coverage chart.
    - (E) The following warning statements (or a CPSC approved label): "Skin irritation: During installation, insulation material can cause some local skin irritation, protect skin by wearing loose clothing, including gloves. Wash work clothing separately from other clothing. Eye and lung protection: To prevent irritation to eyes and lungs from fibers which may become airborne during installation a dust mask and goggles are suggested."

FIGURE II  
(Loose-Fill Insulation Other Than Cellulosic)

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To obtain thermal Resistance (R-value) of*	Minimum number of bags per 1,000 ft <sup>2</sup> (MFS net)	Installed insulation should not be less than:	Maximum net square feet coverage per bag	The weight per net square foot of installed insulation should be not less than:
<b>Attic:</b>				
R-22 .....	__ bags/MSF .....	__ inches thick .....	__ sq.ft. ....	__ lbs/sq. ft.
R-19 .....	__ bags/MSF .....	__ inches thick .....	__ sq.ft. ....	__ lbs/sq. ft.
R-11 .....	__ bags/MSF .....	__ inches thick .....	__ sq.ft. ....	__ lbs/sq. ft.
<b>Sidewalls:</b>				
R __ .....	__ bags/MSF .....	__ 2 inches thick (nominal) ..	__ sq.ft. ....	__ lbs/sq. ft.
R __ .....	__ bags/MSF .....	__ 4 inches thick (nominal) ..	__ sq.ft. ....	__ lbs/sq. ft.
R __ .....	__ bags/MSF .....	__ 6 inches thick (nominal) ..	__ sq.ft. ....	__ lbs/sq. ft.

- \*The thermal resistance of insulation shall be measured at the manufacturer's recommended installed density.
- (d) The following applies to mineral fiber blanket and batt thermal insulation for residential applications:
    - (1) For fire safety, the material shall meet the requirements for CPSC Part 1209. These requirements are as follows:
      - (A) For critical radiant flux test, blankets and batts with a reflective or nonreflective membrane covering on one principal face shall be tested with the membrane covering face down in the tray. Blankets and batts with a reflective or nonreflective membrane covering on both principal faces, only one of which shall be a vapor barrier, shall be tested with the breather paper face up in the tray.
      - (B) For smoldering combustion test, the mineral fiber blanket shall be tested without the membrane at the recovered thickness.
    - (2) For corrosiveness, the material shall meet the requirements of HH-I-1030A.
    - (3) For odor emission, the material shall meet the requirements of HH-I-515D.
    - (4) For fungi resistance, the material shall meet the requirements of HH-I-515D with the changes specified in 55 IAC 3.1-3-2(b)(3) above.
    - (5) Vapor permeance:
      - (A) Vapor resistant membrane coverings on mineral fiber blanket and batt thermal insulation shall have a vapor permeance of not more than 1.0 perm. This shall be verified by testing in accordance with Procedure A of ASTM E 96.
      - (B) Vapor permeable membrane coverings on mineral fiber blanket and batt thermal insulation shall have a vapor permeance of not less than five perms. This shall be verified by testing in accordance with Procedure A of ASTM E 96.
    - (6) The dimensional tolerance on a specified length of mineral fiber blanket or batt thermal insulation shall be 12.5 mm (0.5 inch) for blankets 2,500 mm (100 inches) or shorter, and 0.5 percent for blankets longer than 2,500 mm. The tolerance on a specified width shall be 12.5 mm (0.5 inch).
    - (7) At a minimum, mineral fiber blanket and batt thermal insulation shall be permanently marked in accordance with CPSC Part 1404 (without the word "cellulose"). If a product is tested and meets the requirements of ASTM E-136, and is labeled or marked as such, it need not be labeled with the specific requirements of CPSC Part 1404 relating to vents and chimneys. Each bag shall also be marked with the following information:
      - (A) The following warning statement shall be permanently marked on applicable insulation:
 

"Caution: This membrane covering is flammable. It should not be left exposed."
      - (B) The following warning statements (or a CPSC-approved label) shall be marked on insulation or its packaging *[sic.]*:
 

"Skin irritation: During installation, insulation material can cause some local skin irritation; protect skin by wearing loose clothing, including gloves. Wash work clothing separately from other clothing."

"Eye and lung protection: To prevent irritation to eyes and lungs from fibers which may become airborne during installation, a dust mask and goggles are suggested."
  - (e) The following applies to expanded or exfoliated vermiculite insulating materials:
    - (1) For fire safety, the material shall meet the combustibility requirements of HH-I-585C.
    - (2) For water repellency, the material shall meet the requirements of HH-I-585C.
    - (3) Density shall be less than 88 kg/m<sup>3</sup> (5.5 lb/ft<sup>3</sup>) when tested in accordance with ASTM C-520.
    - (4) Particle size of vermiculite insulation shall be graded to meet the requirements of ASTM C-516.

(5) At a minimum, each bag of vermiculite thermal insulation shall be permanently marked in accordance with CPSC Part 1404 (without the word “cellulose”), and shall include the following information:

- (A) Name of manufacturer.
- (B) The density and grade of vermiculite.
- (C) Minimum net weight of insulation.
- (D) Recommended method of application (blowing or pouring).
- (E) Figure II, filled in. When insulation is intended for application by both blowing and pouring, the bag shall have a separate coverage chart for each type of application if the coverage is different.
- (F) The following warning statement:  
“Eye and lung protection: To prevent irritation to eyes and lungs from particles which may become airborne during installation, a dust mask and goggles are suggested.”

(f) The following applies to loose-fill perlite insulation:

(1) For fire safety (combustibility), water repellence, and solvent solubles, the material shall meet the requirements of HH-I-574B.

(2) The material shall have density of not more than 128 kg/m<sup>3</sup> (8 lb/ft<sup>3</sup>), when tested in accordance with ASTM C 520.

(3) Particle size of perlite insulation shall be graded [*sic.*] to meet the requirements of HH-I-574B.

(4) Each bag of perlite thermal insulation shall be permanently marked in accordance with CPSC Part 1404 (without the word, “cellulose”), and shall include the following information:

- (A) Name of manufacturer.
- (B) Density and grade of perlite.
- (C) Minimum net weight of insulation.
- (D) Recommended method of application (blowing or pouring).
- (E) Figure II, filled in. Where insulation is intended for application by both blowing and pouring, the bag shall have a separate coverage chart for each type of application if the coverage is different.
- (F) The following warning statement:  
“Eye and lung protection: To prevent irritation to eyes and lungs from particles which may become airborne during installation, a dust mask and goggles are suggested.”

(g) The following applies to cellular polystyrene insulation board:

(1) For fire safety, polystyrene thermal insulation shall have a flame spread classification of not greater than 75 when tested in accordance with ASTM E 84.

(2) For water absorption, water vapor transmission, compressive strength and flexural strength, the material shall meet the requirements of HH-I-524B.

(3) The dimensional tolerances of the material shall conform to the values in table 3 of ASTM C 578.

(4) At a minimum, each package of polystyrene thermal insulation board shall be permanently marked to include the following information:

- (A) Name of manufacturer.
- (B) The type of insulation (as defined in HH-I-524B).
- (C) And the following statements:  
“Interior applications of polystyrene thermal insulation board must be covered with a layer of gypsum board 12.5 mm (0.5 inches) thick, or an equivalent fire barrier.  
Keep this insulation from exhaust flues of furnaces, water heaters, space heaters, or other heat-producing devices.”

(h) The following applies to faced and unfaced rigid cellular polyurethane and polyisocyanurate insulation board:

(1) For fire safety, the flame spread classification of polyurethane and polyisocyanurate insulation board shall be no greater than 75 when tested in accordance with ASTM E 84.

(2) For water absorption, compressive strength, flexural strength, dimensional tolerance, and moisture vapor permeability, the material shall meet the requirements of HH-I-530A.

(3) At a minimum, each package of polyurethane and polyisocyanurate thermal insulation shall be permanently marked to include the following information:

- (A) Name of manufacturer.
- (B) And the following statements:



“Interior applications are limited to spaces separated from the living space by 12.5 mm (0.5 inch) thick layer of gypsum board, or an equivalent fire barrier.

Keep this insulation away from exhaust flue of furnaces, water heaters, space heaters, or other heat-producing devices.”

(i) The following applies to single and multilayer aluminum foil reflecting insulation:

(1) For water vapor permeability, pliability, thickness, bonding adhesive, content of foil and kraft paper, the material shall meet the requirements of HH-I-1252B.

(2) For finished insulation, the layers shall be securely bonded together along the edges, forming an attachment flap suitable for nailing or stapling.

(3) At a minimum, each package of aluminum foil thermal insulation shall be permanently marked in accordance with CPSC Part 1404 (without the word “cellulose”), and shall include the name of the manufacturer.

(j) The following applies to caulks and sealants:

(1) Caulks and sealants shall conform to the applicable federal specifications and ASTM standards indicated in Figure III.

FIGURE III

Examples of caulks or sealants	Application specification
Putty . . . . .	F.S. TT-P-00791B-modified to allow natural calcium carbonate.
Oil and Resin Base . . . . .	F.S. TT-C-00598C and ASTM C-570-72.
Acrylic (Solvent Type) . . . . .	F.S. TT-S-00230C.
Butyl Rubber . . . . .	F.S. TT-S-001657.
Chlorosulphonated Polyethylene . . . . .	F.S. TT-S-00230C.
Latex Sealing Compound . . . . .	ASTM C 834-76.
Polysulfide-single-component . . . . .	F.S. TT-S-00230C.
Polysulfide-multicomponent . . . . .	F.S. TT-S-00227E.
Polyurethane-single-component . . . . .	F.S. TT-S-00230C.
Polyurethane-multicomponent . . . . .	F.S. TT-S-00227E.
Silicone . . . . .	F.S. TT-S-001543A.

(k) The following applies for water heater insulation:

(1) Water heater insulation shall conform to Federal Specification HH-I-558B, “Federal Specification: Insulation Blocks, Boards, Blankets, Felts, Sleeving, and Pipe Fitting Covering.” In addition, the exterior facing shall have a flame spread, when tested in accordance with ASTM E 84, of:

(A) No more than 150 when installed on electric water heaters, and

(B) No more than 25 when installed on gas or oil-fired water heaters.

(2) If insulation is packaged specifically for the purpose of insulating water heaters, it shall be marked with the following information: R-value, length, width, thickness, square feet of insulation in the package, and flame spread of the facing.

(3) Mineral fiber insulation which meets the requirements of subsection (d)(1) of this section, but which is not packaged specifically for the purpose of insulating water heaters may be labelled “Conforms to DOE standards for water heater insulation.” In addition, it shall also be marked reflecting: the R-value and flame spread of facing.

(l) The following applies for heating/air conditioning duct insulation:

(1) Heating/air conditioning duct insulation shall conform to F.S. HH-I-558B, “Federal Specifications: Insulation Blocks, Boards, Blankets, Felts, Sleeving, and Pipe Fitting Covering.”

(2) Duct covering shall have a flame spread, when tested in accordance with ASTM E 84, of no more than 25.

(3) Packages of duct insulation shall be marked with the following information: the R-value length, width, thickness, and square feet of insulation in the package.

(m) The following applies for pipe insulation:

(1) Federal specification HH-I-558B, “Federal Specification for Mineral Fiber Batts and Blankets-Industrial Type”, or

(2) Federal specification HH-I-573B, “Organic Cellular Flexible Unicellular Pipe Covering.” In addition, the exterior facing shall have a flame spread, when tested in accordance with ASTM E 84, of no more than 25.

(n) The following applies for storm and thermal windows:

(1) Aluminum combination storm windows shall conform to ANSI/AAMA 1002.9-1977, “Voluntary Specification for Aluminum Combination Storm Windows for External Applications.” C1.3, C1.4, and C1.6 of ANSI/AAMA 1002.9-1977,

may be modified to permit plastic as well as glass.

(2) Wood frame storm and thermal windows shall conform to Section 3 of ANSI/NWMA I.S. 2-73, "Industry Standard for Wood Windows," modified to allow plastic as well as glass.

(3) Rigid vinyl frame storm and thermal windows shall be constructed with vinyl profile extrusions which conform to NBS/PS26-70, "Rigid Polyvinyl-Chloride Profile Extrusions."

(4) Rigid acrylic frame storm windows shall conform to the requirements in the BOCA research report No. 72-33 for thermoplastic molding powders VS, VM, or DR.

(5) Exterior storm windows shall have an air infiltration no greater than 0.003 m<sup>3</sup>/s for each linear meter (2.0 ft<sup>3</sup>/min for each linear foot) of crack at a static pressure difference of 75 Pa (1.56 psf). Interior storm windows shall have an air infiltration not greater than 0.00075 m<sup>3</sup>/s for each linear meter (0.5 ft<sup>3</sup>/min for each linear foot) of crack at a static pressure difference of 75 Pa (1.56 psf).

(6) Thermal windows shall have a thermal conductance no greater than 0.7 BTU/h ft<sup>2</sup> degrees F) correct for framing for an exterior wind velocity of 24 km/h (15 mph) and an infiltration rate no greater than 0.00075 m<sup>3</sup>/s for each linear meter (0.5 ft<sup>3</sup>/min for each linear foot) of crack at a static pressure difference of 75 Pa (1.56 psf).

(7) Infiltration through storm and thermal windows shall be measured in accordance with ASTM E 283-73, "Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors." Heat transmission factors of thermal windows shall be measured in accordance with ASTM C 236. Framing correction factors shall be taken from ASHRAE Handbook 1977 Fundamentals, P. 22.24, Table 8.

(8) As an alternative to meeting the provisions discussed in subsection (n)(1)-(7) of this section, above, HUD Use of Materials Bulletin No. 39 may be substituted for use with aluminum windows, and HUD Use of Materials Bulletin No. 59 may be substituted for use with wood windows.

(o) The following applies for multi-glazing:

(1) The frost point of each test specimen sealed insulating glass unit shall be no higher than -29 degrees C (-20 degrees F) when tested in accordance with ASTM E-576-76.

(2) Sealed insulating glass units, when used in doors, shall conform to CPSC Part 1201.

(p) The following applies for replacement gas-fired central heating systems:

(1) Gas-fired central heating systems shall conform to ANSI Z21.46-1978, entitled, "American National Standard for Gas-Fired Low Pressure Steam and Hot Water Heating Boilers," or ANSI Z21.59-1974, "Gas-Fired High Pressure Steam and Hot Water Heating Boilers."

(q) The following applies for replacement oil-fired central heating systems:

(1) Oil-fired central heating systems shall conform to UL 726/ANSI Z96.3-1975 "Oil-fired Boiler Assemblies" or UL 727/ANSI Z96.1-1978 "Oil-fired Central Furnaces."

(r) The following applies for replacement oil burners:

(1) Oil burners shall conform to UL 296/ANSI Z96.2-1974 "Oil Burners" and ANSI Z91.2-1976, entitled "Performance Requirements for Automatic Pressure Oil Burners of the Mechanical-Draft Type."

(s) The following applies for heat pumps:

(1) Heat pumps shall conform to UL 559 "Standard for Heat Pumps."

(t) The following applies for vent dampers for gas-fired systems:

(1) Vent dampers for gas-fired systems shall meet the appropriate standard(s) listed below.

(A) ANSI Z21.66-1977, American National Standard for Electrically Operated Automatic Vent Damper Devices for use with Gas-Fired Appliances.

(B) ANSI Z21.67-1978, American National Standard for Mechanically Actuated Automatic Vent Damper for use with Gas-Fired Appliances.

(C) ANSI Z21.68-1978, American National Standard for Thermally Actuated Automatic Vent Damper Devices for use with Gas-Fired Appliances.

(2) All vent dampers shall contain a label stating: "This device should be installed only by an approved contractor."

(3) Wiring diagrams and instructions.

(A) Manufacturers of electrical connections, shall provide to all persons approved for installing the device an interconnection or wiring diagram(s) which is representative of the wiring configuration found on the appliance on which damper is to be installed.

(B) Manufacturers of mechanical automatic vent dampers shall provide to all persons approved for installing the device

an interconnection or wiring diagram(s) which is representative of the wiring configuration found on the appliance on which damper is to be installed.

(C) Included with the damper shall be enclosed a verification-of-installation card which the installer will complete and return to the manufacturer. The following information will be reflected on the card:

- (i) Name of installer.
- (ii) Name of installer's company.
- (iii) Name of *[sic.]* address of purchaser.
- (iv) Model and type of device installed.
- (v) Date of installation.

*(Department of Commerce; Division of Energy; 55 IAC 3.1-3-2; filed Mar 28, 1984, 9:07 am: 7 IR 1175; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

#### **Rule 4. Installation Standards**

##### **55 IAC 3.1-4-1 Definitions**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 1. The following definitions apply to 55 IAC 3.1-4:

“Approved” means acceptable to whatever authority regulates the installation procedures discussed in this practice. Such authority is normally an underwriters' inspection or rating bureau.

“Conditioned Space” means any space in a residential building which is served by a heating or cooling system.

“Draft Hood” means a component of gas-fired water heaters which mixes secondary air with the combustion gases leaving the unit thus enabling a smooth, continuous relief of gases up the vent pipe.

“Duct Insulation” means mineral fiber batt and blanket thermal insulation with a membrane which has a frame spread classification of no more than 25 when tested in accordance with ASTM Designation E 84-77.

“Galvanic Corrosion” means a form of deterioration resulting from the electrochemical reaction that occurs when certain dissimilar metals are in contact.

“Hi-Limit Switch” means a temperature control that senses temperature changes in electric, gas, and oil-fired water heaters and cuts off the energy supply or fuel flow to the unit when the internal water temperature rises above a certain point.

“Mastic” means a pasty material used as an adhesive for installing insulation board.

“Mineral Cellular Loose-fill Thermal Insulating Materials” means mineral particulate material in granular, modular, powdery, or similar form designed to be installed dry by pouring, blowing, or hand placement between retaining surfaces or as a covering layer.

“Mineral Fiber Batt and Blanket Thermal Insulating Materials” means flexible units composed of felted inorganic fibers with or without binders, in rolls or strips, with or without attached membrane coverings.

“Mineral Fiber Loose-fill Thermal Insulating Material” means insulation composed of mineral substances such as slag, rock, or glass suitable for pneumatic or poured application.

“Multi-glazing” means an arrangement of two or more separated layers of glazing (providing one or more insulating air spaces). Multi-glazing can be achieved by installing a preassembled, sealed insulating glass unit or by affixing one or more additional sheets of glazing onto an existing window, sash, or glass.

“Oil Burner” means a device which, for oil-fired heating equipment in a residential building, atomizes, vaporizes, or otherwise disperses the fuel oil, mixes it with air and ignites the fuel-air mixture, and is an integral part of an oil-fired furnace or boiler, including the combustion chamber.

“Organic Cellular Rigid Board Thermal Insulation” means an organic foam composed principally of polymerized styrene resin or catalyzed reaction products expanded with a fluorocarbon blowing agent to form a homogeneous rigid mass of cells.

“Organic (Cellulosic or wood fiber) Loose-fill Thermal Insulating Materials” means thermal insulation composed of chemically treated cellulosic or wood fibers, or any combination thereof, suitable for pneumatic or poured application.

“Pressure Relief Valve” means a safety valve which opens to vent pressure when the pressure *[sic.]* in the water tank exceeds a pre-set level due to excessive water temperature.

“Prime Window (door)” means the original window (door) to which a storm window (door) or multi-glazing is added to

provide greater thermal resistance.

“Reflective Thermal Insulation” means thermal insulation depending for its efficiency in large part on reduction of radiant heat transfer across spaces by use of one or more surfaces of high reflectance and low emittance.

“Replacement Oil Burner” means an oil burner that conforms to the requirements of the most recent revisions of American National Standard Safety Standard for Oil Burners, Z96.2 (UL 296) and American National Standard Performance Requirements for Automatic Pressure Atomizing Oil Burners of the Mechanical Draft Type, Z91.2, and approved by a nationally recognized testing agency.

“Storm Door” means a door installed outside or inside a prime door, creating an insulating air space to provide greater resistance to heat flow than the prime door alone.

“Storm Window” means a unit consisting of glazing installed in a window opening, either outside or inside a prime window, creating an insulating air space to provide greater resistance to heat flow than the prime window alone. The storm window may be removable or permanently attached.

“Thermal Door” means a unit installed in a door opening which has an R-value of at least two, and is weatherstripped to provide greater resistance to heat flow.

“Thermal Window” means a window system with improved thermal performance through the use of multiple glazing and more airtight construction. Some thermal windows also provide an insulating frame and sash to provide greater thermal efficiency.

“Unconditioned Space” means any space, out-of-doors or in a residential building, which is not served by a heating or cooling system.

“Unit” means a storm window, thermal window, multi-glazing or storm door as defined herein. It is a manufactured item assembled in a factory or a knock down unit assembled at the site prior to installation.

“Vapor Barrier” means any material (as defined in ASTM Designation C 755-73) that has a water vapor permeance (perm) rating of one or less.

“NOTE 1—The following materials, upon proper application, constitute vapor barriers. Asphalt impregnated kraft paper, aluminum foil, plastic film, and paint and wallcoverings which are labeled by the manufacturer as having a perm rating of one or less when applied in accordance with the manufacturer's instructions.

“Vent Pipe” means an exhaust pipe carrying products of combustion from oil-fired and gas-fired water heaters to the outside environment.

“Water Heater Insulation” means mineral fiber batt and blanket thermal insulation with a membrane facing which has a flame spread classification of no more than 150 for electric water heaters and 25 for oil and gas-fired water heaters, when tested in accordance with ASTM Designation E 84-77.

“Water Heater Damper” means a device which automatically closes vents on oil and gas-fired water heaters to prevent the escape of heat through the vent pipe when the main burner is not being fired. (*Department of Commerce; Division of Energy; 55 IAC 3.1-4-1; filed Mar 28, 1984, 9:07 am: 7 IR 1181; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

## 55 IAC 3.1-4-2 References

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 2. (a) This section includes reference to several technical publications [*sic.*]. They are as follows:

(1) ASTM Designation C 168-67 means “Standard Definition of terms relating to thermal insulation materials.”

(2) ASTM Designation C 755-73 means “Standard Recommended Practice for Selection of Vapor Barriers for Thermal Insulation.”

(3) ASTM Designation E 84-77 means “Standard Test Method for Surface Burning Characteristics of Building Materials.”

(4) ASTM Designation E 119-76 means “Standard Methods of Fire Tests of Building Construction and Materials.”

(5) ASTM Designation E 136-79 means “Test for Non-Combustibility of Elementary Materials.”

(6) ANSI/ASTM D2156-65 (1975) means “American National Standard Method of Tests for Smoke Density in the Flue Gases from Distillate Fuels.”

(7) ANSI Z91.2-1976 means “American National Standard Performance Requirements for Automatic Pressure Atomizing Oil Burners of the Mechanical Draft Type.”

(8) ANSI Z95.1-1974 means “American National Standard Installation of Oil Burning Equipment.”

(9) ANSI Z96.2-1974 (UL 296-Sept. 1974) means “American National Standard Safety Standard for Oil Burners.”

(10) NFPA-31 means “Standard for the Installation of Oil Burning Equipment.”

(11) NFPA-54 means “National Fuel Gas Code.”

(12) NFPA-70 means “National Electrical Code.”

(13) NFPA-211 means “Standard for Chimneys, Fireplaces, and Vents.”

*(Department of Commerce; Division of Energy; 55 IAC 3.1-4-2; filed Mar 28, 1984, 9:07 am; 7 IR 1182; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 3.1-4-3 Installation standards**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 3. (a) The installation of any measure for which a standard exists in this section shall conform to that standard. Exceptions are as follows:

(1) When a manufacturer's installation instructions regarding specific requirements that affect safety and effectiveness result in a higher level of performance for these characteristics, such manufacturer's installation instructions may apply.

(2) These practices are not intended to supersede the authority of local codes but are instead intended to establish minimum criteria for safety and effectiveness. When local codes specifically address these provisions, they may apply; when local codes do not address the provisions these practices shall prevail.

(b) Additional requirements which apply to the installation of select measures in this section include the following:

(1) At the completion of each installation of thermal insulation materials discussed in paragraph (5) of this section *[sic.]* the person responsible for such installation shall comply with the requirements of paragraph (5)(A) of this section “Certification Procedures for the Installation of Thermal Insulation Materials.”

(2) The installation practices in this section contain certain “recommendations” regarding the application of vapor barriers in condensation zones. The term “recommended” is used to signify that the procedures identified are not required to provide a safe and effective installation of insulation in every instance, but may prevent the occurrence of moisture problems under certain conditions. The eligible customer ultimately needs to accept or reject the “recommended” practices contained herein. Therefore, whenever a “recommendation” is contained in these practices, the person responsible for the installation shall present to the eligible customer the “recommendation” and any additional information which he can provide to assist the eligible customer in making a decision.

(c) The program measures and their applicable installation standards are as follows:

(1) The following applies to the installation of loose-fill insulation:

(A) This practice covers the installation of dry organic (cellulosic or wood) and mineral (rock, slag, or glass) fiber loose-fill thermal insulation on ceilings, attics, floors and in frame wall cavities; and mineral cellular (perlite or vermiculite) loose-fill thermal insulation in attic floors and various masonry wall cavities of existing residential buildings.

(B) A working knowledge of the terminology and fundamentals of construction and applicable codes is necessary for the proper application of this standard.

(C) Safety Precautions. During installation, do not smoke in the attic or any truck or van used for installation.

(D) Pre-Installation Procedures.

(i) Identify all recessed lighting fixtures (including wiring compartments and ballasts) furnaces, vents, chimneys, and other heat-producing devices in all areas where insulation is to be installed.

(ii) Install blocking, such as wood, metal, or unfaced mineral wool batts around all heat-producing devices to permanently maintain a minimum clearance of three inches. Install all blocking at least as high as the height of the finished insulation, and in a manner that ensures that all devices which may require maintenance or servicing remain accessible after the insulation is installed.

(iii) Install blocking to provide a three-inch minimum clearance around all recessed lighting fixtures (including wiring compartments and ballasts) and other heat producing devices. Do not cover these devices so as to entrap heat or prevent the free circulation of air unless they are approved for the purpose.

(iv) Install blocking around gas-fired appliances to provide the minimum clearances specified in NFPA-54, the National Fuel Gas Code. Install blocking around oil-fired appliances to provide the minimum clearances specified in NFPA-31, Standard for the Installation of Oil Burning Equipment. Install blocking around masonry chimneys

or masonry enclosing a flue to provide a minimum two inch (50 mm) clearance from the outside face of the masonry. Install blocking around vents, chimney and vent connectors, and chimneys other than masonry chimneys, to provide the minimum clearance specified in NFPA-211, Standard for Chimneys, Fireplaces, and Vents.

(v) When installing mineral fiber or mineral cellular insulation which, in addition to meeting all the requirements specified in the material standards, is also non-combustible (as defined in ASTM Designation E 136-79), the blocking and airspaces around vents and chimneys need not be provided.

(vi) Inspect the roof, walls, ceilings, and attic floors to identify areas where a previous moisture problem has caused paint peeling, warpage, stain, visible fungus growth, rotting, or other structural damage. Do not install insulation in such areas until the resident has been informed and these conditions have been corrected and their source(s) eliminated. If the resident, after being informed of the moisture condition and the effect of installing insulation in such areas elects to proceed with the insulation, the resident must so state in writing on the contract.

(vii) Block all openings in ceilings, floors, and sidewalls through which the insulating material may escape. Seal all wall cavities which open into a basement or crawl space before wall insulation is installed.

(E) Walls. For buildings located in Zone II of Figure 1, provide a vapor barrier on the interior surface of all walls to be insulated in bathrooms and unvented kitchens and laundry areas. Caulk or seal all major cracks on the interior face of exterior walls of these rooms including joints between the floor and wall (except where impractical because of carpeting), between wall and ceiling, at joints around window frames, and around wall penetrations for electrical services (outlets and switches) and plumbing stacks, and heating and air-conditioning ducts.

NOTE 1—The above requirements for moisture control are minimum requirements needed to prevent long-term moisture damage. Homes which are characterized by one or more of the following conditions are more likely to experience excessive moisture accumulation which can be corrected by application of a vapor barrier and caulking as described above, and/or additional venting of the wall cavity from the exterior, or additional ventilation of the occupied space:

- (i) Homes with an area of less than 800 square feet (75 square meters);
- (ii) Homes with less than 250 square feet (23 square meters) per occupant;
- (iii) Homes with tight wall and ceiling construction and weatherstripped windows and doors;
- (iv) Electrically heated homes or homes with a heating system which uses outside combustion air.

(A relative humidity indicator may be installed to monitor the humidity level and determine when excessive moisture accumulation is likely to occur.)

(F) Attics and Ceilings.

(i) Identify and measure ventilation area in attics. Do not install insulation in attics unless ventilation openings in attic areas conform to one of the following requirements:

- (a) 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 150 ft<sup>2</sup> (15 m<sup>2</sup>) of attic floor area if no vapor barrier exists in the attic;
- (b) 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 300 ft<sup>2</sup> (30 m<sup>2</sup>) of attic floor area if a vapor barrier does exist;
- (c) 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 300 ft<sup>2</sup> (30 m<sup>2</sup>) of attic floor space if at least 50 percent of the required ventilating area is provided with fixed ventilation located in the upper portion of the space to be ventilated (at least three feet (900 mm) above eave or soffit vents) with the remainder of the required ventilation provided by eave or soffit vents, if no vapor barrier exists. If the free ventilation area of louvers is not known, assume that it is half of the area of the ventilation opening and increase the opening accordingly.

(ii) Ensure that all ventilation openings have suitable louvers or screens to prevent rain or snow from entering the attic.

NOTE 2—For buildings in Zone II of Figure 1, where there is existing ceiling insulation and no vapor barrier, it is recommended that a vapor barrier such as paints and wall coverings which are labeled by the manufacturer as having a perm rating of one or less, and are applied in strict accordance to the manufacturer's instructions, be installed on the interior ceiling surface of bathrooms and unvented kitchens and laundry areas. It is also recommended that all cracks and penetrations on the interior ceiling surface of these rooms (such as around lighting fixtures and at wall and ceiling joints) be caulked.

NOTE 3—The above requirements for ventilation and moisture control are minimum requirements needed to prevent long-term moisture damage. Homes which are characterized by one or more of (i), (ii), (iii), or (iv) of NOTE 1 are more

likely to experience excessive moisture accumulation which can be corrected by application of a vapor barrier and caulking as described above, or by additional ventilation of the occupied space.

A relative humidity indicator may be installed to monitor the humidity level and determine when excessive moisture accumulation is likely to occur.

(iii) Install permanent blocking around attic trap doors and vents which open into the attic, if the level to which the insulation will be installed exceeds their height. Ensure that the blocking is installed around vent openings in a manner that enables the free movement of air through the vent into the attic.

(iv) Cover all bathroom and kitchen vent openings in the attic with temporary blockings prior to the installation of insulation to assure that no insulation material falls into the vents.

(v) Install permanent blockings to restrain loose-fill insulation from clogging soffit vents at the eaves restricting attic ventilation. Install blocking so as to ensure free movement of air through soffit vents into the attic.

(G) Installation Procedures.

(i) Do not install insulation unless the pre-installation procedures have been carried out, and any defects which were identified are corrected and their causes eliminated.

(ii) Structural damage can be caused by excessive pressures during the installation or can result from installing insulation in construction too weak to support the imposed load. Install insulation only so as not to cause any of the following conditions:

(a) Separation of finish materials from joists or studs.

(b) Cracking of materials or opening of joints between boards.

(c) Deflection of more than 1/200 of the joist or stud spacing.

NOTE 4—The following table, which is based on tests and other data submitted by gypsum board manufacturers, may be used to determine whether a gypsum board surface is likely to exceed the maximum allowable deflection specified above. Actual deflection or other failure in service depends on various factors such as:

– Whether the gypsum board is installed with its long side parallel or at right angles to the joists.

– Relative humidity.

– Temperature conditions.

MAXIMUM SUGGESTED LOADS		
(1)	(2)	(3)
Gypsum board ceiling thickness	Frame spacing	Suggested load <sup>1</sup>
1/2 in. . . . .	24 in o.c. . . . .	1.3 psf.
1/2 in. . . . .	16 in o.c. . . . .	2.2 psf.
5/8 in. . . . .	24 in o.c. . . . .	2.2 psf.

<sup>1</sup>Includes the weight of both the new and any existing insulation.

(iii) Handle all insulation material in accordance with manufacturer's instructions and keep it dry and free of extraneous materials.

(iv) For pneumatic installation, use only equipment compatible with the insulation material, and operate the equipment in accordance with the manufacturer's instructions.

(v) Install insulation so that it will not be in contact with the ground or other sources of water.

(vi) Install insulation only between conditioned and unconditioned spaces.

(H) Walls.

(i) Do not fill wall cavities which themselves are air ducts for heating, ventilation, and/or cooling systems.

(ii) Locate entry holes in walls (if required) to permit the complete filling of wall cavities.

(iii) After the entry holes have been opened use them to check the wall cavity for fire stops and other obstructions which will necessitate additional entry holes to assure complete filling of the cavity.

(iv) With the exception of spaces identified above (a)(4)(C) and (D) completely fill wall cavities in accordance with the manufacturer's recommendations.

(v) Close all entry holes in a workmanlike manner using materials compatible with the original materials. Do not close entry holes in sheathing *[sic.]* which is covered by an exterior brick veneer or siding.

(I) Attics and Ceilings.

(i) For pneumatic installation in ceiling areas use the least air pressure meeting the manufacturer's instructions.

- (ii) Do not blow insulation into electrical devices or vents which open into the attic or other spaces identified above (a)(4)(C) and (D).
  - (iii) Fit the attic side of trap doors or panels with an insulation batt (or equivalent material), except where prevented by a retractable ladder.
- (J) Post-Installation Procedures.
- (i) Inspect the coverage and depth of the insulation. Fill all “pockets” and voids in the insulation. Level insulation in a manner which will not damage wiring or any other items.
  - (ii) Turn off electric power and clear all electric wall outlet boxes and switch boxes of any insulation material.
  - (iii) Remove all temporary blockings which were installed over vent openings in attics.
- (2) The following applies to the installation of mineral fiber batts and blanket insulation:
- (A) This practice covers the installation of mineral (rock, slag, or glass) fiber batt and blanket thermal insulation in ceilings, attics, floors, walls, and on basement and crawl space walls and ducts of existing residential buildings.
  - (B) A working knowledge of the terminology and fundamentals of construction and applicable codes is necessary for the proper application of this standard.
  - (C) Safety Precautions. Do not smoke in the attic.
  - (D) Pre-installation Procedures.
    - (i) Identify all recessed lighting fixtures (including wiring compartments and ballasts) furnaces, vents, chimneys, and other heat-producing devices in all areas where insulation is to be installed.
    - (ii) Inspect the roof, walls, ceilings, and attic floors to identify areas where a previous moisture problem has caused paint peeling, warpage, stain, visible fungus growth, rotting, or other structural damage. Do not install insulation in such areas until the resident has been notified and these conditions have been corrected and their source(s) eliminated. If the resident, after being informed of the moisture condition and the effects of installing insulation in such areas, elects to proceed with the installation, the resident must so state in writing on the contract.
  - (E) Attics and Ceilings.
    - (i) Identify and measure ventilation area in attics. Do not install insulation in attics unless ventilation openings in attic areas conform to one of the following requirements:
      - (a) 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 150 ft<sup>2</sup> (15 m<sup>2</sup>) of attic floor area if no vapor barrier exists in the attic;
      - (b) 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 300 ft<sup>2</sup> (30 m<sup>2</sup>) of attic floor area if a vapor barrier does exist;
      - (c) 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 300 ft<sup>2</sup> (30 m<sup>2</sup>) of attic floor space if at least 50 percent of the required ventilating area is provided with fixed ventilation located in the upper portion of the space to be ventilated (at least three feet above eave or soffit vents), with the remainder of the required ventilation provided by eave or soffit vents if no vapor barrier exists. If the free ventilation of louvers is not known, assume that it is half of the area of the ventilation opening and increase the opening accordingly.
    - (ii) Ensure that all ventilation openings have suitable louvers or screens to prevent rain or snow from entering the attic.
    - (iii) For buildings in Zone II of Figure 1, where there is existing ceiling insulation and no vapor barrier, it is recommended that a vapor barrier such as paints and wall coverings (which are labeled by the manufacturer as having a perm rating of one or less, and are applied in strict accordance to the manufacturer's instructions) be installed on the interior surface of bathrooms and unvented kitchen and laundry areas. It is also recommended that all cracks and penetrations on the interior ceiling surface of these rooms (such as around lighting fixtures and at wall/ceiling joints) be caulked.
- NOTE 1—The above requirements for moisture control are minimum requirements needed to prevent long-term moisture damage. Homes which are characterized by one or more of the following conditions are more likely to experience excessive moisture accumulation which can be corrected by application of a vapor barrier and caulking as described above, or by additional ventilation of the occupied space:
- (a) Homes with an area of less than 800 square feet (75 m<sup>2</sup>);
  - (b) Homes with less than 250 square feet (23 m<sup>2</sup>) per occupant;
  - (c) Homes with tight wall and ceiling construction and weatherstripped windows and doors;



(d) Electrically heated homes or homes with a heating system which uses outside combustion air.

A relative humidity indicator may be installed to monitor the humidity level and determine when excessive moisture accumulation is likely to occur.

(F) Floors and Basement and Crawl Space Walls.

(i) Where insulation is to be installed beneath floors over crawl spaces or on crawl space walls, cover the ground surface with a ground cover which acts as a vapor barrier (such as 6 mil (0.15 mm) polyethylene sheeting lapped at the joints). Turn the ground cover up at least six inches (150 mm) at the walls.

(ii) Where practical in crawl spaces provide a free ventilation area of one square foot (0.1 m<sup>2</sup>) for every 1500 square feet (150 m<sup>2</sup>) of the ground area of the crawl space. Provide cross ventilation where possible.

(iii) Where insulation is to be installed on crawl space walls, provide a means to seal off the ventilation area(s) during the heating season.

NOTE 2—Insulation of floors over unheated spaces will cause these spaces to be colder. Accordingly, appropriate measures may need to be taken to keep water pipes from freezing during colder weather.

(iv) Provide a vapor barrier on the winter warm side of floor insulation in buildings located in Zone II of Figure 1.

(G) Ducts.

(i) Inspect duct to assure that it is dry and clean and that all joints are securely connected. Seal all joints that do not appear airtight with duct tape or other appropriate materials.

NOTE 3—Insulation of ducts located in unheated spaces will cause these spaces to be colder. Accordingly, appropriate measures may need to be taken to keep pipes from freezing during colder weather.

(H) Installation Procedures.

(i) Do not install insulation unless the pre-installation procedures have been carried out, and any defects which were identified were corrected, and their causes eliminated.

(ii) Handle all insulation material in accordance with manufacturer's instructions and keep it dry and free of extraneous materials.

(iii) Install insulation so that it will not be in contact with the ground or other sources of water.

(iv) Install insulation only between conditioned and unconditioned spaces.

(v) Install insulation so that it fits tightly between framing members on all sides. Cut insulation that is too long for a space to the correct size. If insulation is too short for a space, cut a piece to fill the void and tightly butt-joint batts. Do not double-over or unnecessarily compress insulation.

(vi) Permanently maintain the clearances around all heat producing devices.

(vii) Provide a three-inch (75 mm) minimum clearance around all recessed lighting fixtures (including wiring compartments and ballasts) and other heat producing devices. Do not cover these devices so as to entrap heat or prevent the free circulation of air unless they are approved for the purpose.

(viii) Provide the minimum clearances around gas fired appliances specified in NFPA-54, the National Fuel Gas Code. Around oil-fired appliances, provide the minimum clearances specified in NFPA-31, Standard for the Installation of Oil Burning Equipment. Around masonry chimneys or masonry enclosing a flue provide a minimum two-inch (50 mm) clearance from the outside face of the masonry. Around vents, chimney and vent connectors and chimneys other than masonry chimneys, provide the minimum clearances specified in NFPA-211, Standard for Chimneys, Fireplaces, and Vents.

(ix) When installing mineral fiber blanket insulation having no membrane (or having a non-flammable membrane) which, in addition to meeting all the requirements specified in the material standards, is also non-combustible as defined in ASTM Designation E 136-79, the airspaces specified in this paragraph need not be provided around vents and chimneys.

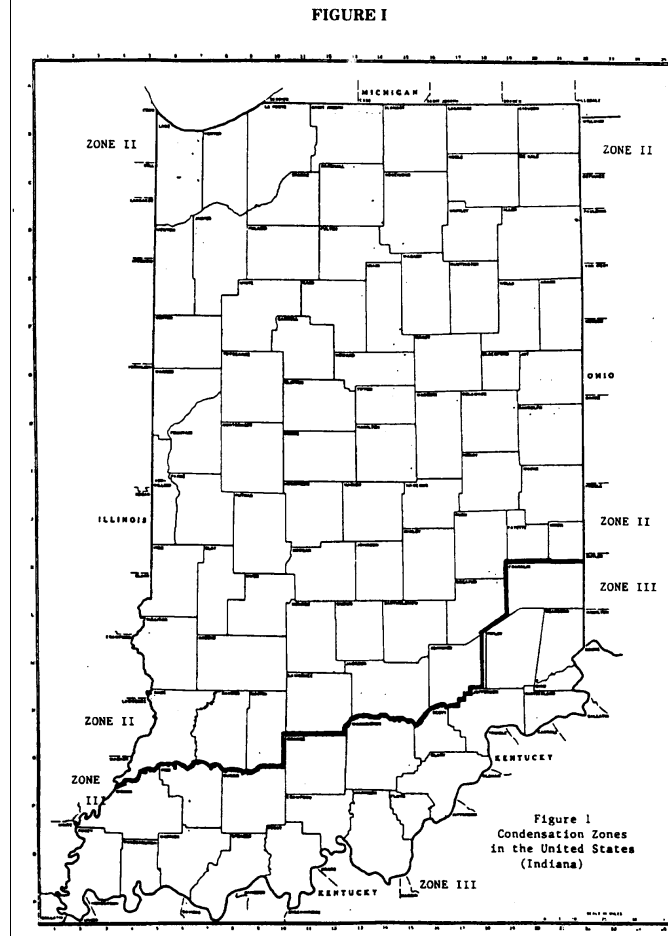
(x) Assure that all devices which may require periodic servicing remain accessible after the insulation is installed.

(I) Walls.

(i) In Zone II of Figure 1, install a vapor barrier on the winter warm side of insulation installed in exterior walls. Secure the vapor barrier to the studs so as to avoid gaps and fishmouths. If the insulation does not have a vapor barrier attached to it provide a separate vapor barrier on the winter warm side over the installed insulation.

(ii) With duct tape (or equivalent), tape all tears and penetrations in the vapor barrier, and all joints which are not overlapped by at least three inches.

- (iii) If the insulation material is provided with a flammable vapor barrier, or if a separate vapor barrier which is flammable is installed, cover the insulation with a finish material having a finish rating of not less than 15 minutes when tested according to ASTM Designation E 119-76.
- (J) Attics, Ceilings, and Floors.
  - (i) Always place vapor barriers on the winter warm side of the insulation. Never install a combustible vapor barrier so that it remains exposed.
  - (ii) When installing insulation around bridging or cross bracing of ceiling or floor joists fit the insulation material tightly around these obstructions and assure that there are no gaps in the insulation.
  - (iii) When recessing insulation batts in floor joist cavities turn insulation up at the header or cut and attach pieces of insulation to the header to avoid heat loss through the header.
  - (iv) Fit insulation tightly in floor joist areas and secure in place with either wire fasteners, galvanized wire, nylon mesh, or galvanized screen held in place by stapling or nailing, or galvanized wire lacing held in place by stapling or nailing.
  - (v) Do not cover soffit vents with insulation nor in any other way restrict attic ventilation.
  - (vi) Install insulation around vents which open into the attic in a manner that will ensure free movement of air through the vent into the attic.
  - (vii) Fit the attic side of trap doors or panels with an insulation batt except where prevented by a retractable ladder.
- (K) Basement and Crawl Space Walls.
  - (i) Where the joists run parallel to the wall, install the wall insulation by stapling the top of each batt to the band joist. Where the joists run at right angles to the wall, install short pieces of insulation against the header, ensuring that there are no gaps in the insulation. Then, install the wall insulation by stapling the top of each batt to the sill.
  - (ii) Ensure that the batts fit snugly against each other and that they are sufficiently long to cover the wall and two feet of the crawl space floor.
- (L) Ducts.
  - (i) Install duct insulation only on ducts located in unconditioned spaces.
  - (ii) Install insulation batt or blanket with the vapor barrier on the outside.
  - (iii) Butt joints of batts tightly and in such a way that a vapor barrier tab overlaps the joints by at least two inches. Mechanically fasten the tab to the underlying vapor barrier and seal the joints with duct tape, or alternatively, overlay insulation and tape when vapor barriers are attached.
  - (iv) On rectangular ducts install insulation so that at the corners it is not compressed more than 50 percent of its nominal thickness.
  - (v) On horizontal ducts over 24 inches (600 mm) wide, secure the bottom of the insulation with mechanical fasteners as required by the manufacturer. Seal fastener penetrations to provide an airtight system.
  - (vi) Install any protective covers required by local codes or regulations.
- (M) Post-installation Procedures.
  - (i) Ensure that insulation does not restrict attic soffit vents.
  - (ii) Ensure that all required clearances have been maintained.
  - (iii) Ensure that, where required, all insulation is covered with a suitable covering material.



- (3) The following applies to the installation of organic cellular rigid board insulation:
- (A) This practice covers the installation of organic cellular rigid board thermal insulation on concrete floors, foundation perimeters, interior of masonry walls, interior of frame walls, ceilings, and as exterior sheathing on walls and roofs of existing residential buildings.
  - (B) This practice covers the installation of the rigid board, but does not include in detail the installation of exterior siding or roofing required to protect rigid board insulation from the effects of weather, or the installation of interior fire protective coverings.
  - (C) A working knowledge of the terminology and fundamentals of construction and applicable codes is necessary for the proper application of this standard.
  - (D) Safety Precautions.
    - (i) Do not smoke in any area in which insulation is being installed or cut.
    - (ii) The vapors of many solvents used in mastics and adhesives in the installation of organic cellular rigid board thermal insulation are flammable. Keep solvents in approved containers and follow the specific label instructions.
  - (E) General Requirements.
    - (i) For all rigid board applications, carry out the pre-installation, installation, and post-installation procedures in the order prescribed below.
    - (ii) For interior applications of rigid board insulation on walls and ceilings install, on all exposed faces and edges of the insulation material, a cover having a finish rating of not less than 15 minutes, when tested according to ASTM Designation E 119-76. For purposes of this standard, 12.5mm (0.5 inch) or thicker plaster board installed according to the manufacturer's instructions is deemed to meet this requirement.

- (iii) Install insulation only between conditioned and unconditioned spaces for energy conservation, except as provided below.
  - (iv) Follow the requirements applicable to the control of moisture in buildings to be insulated as detailed in Figure 2.
  - (v) Install all vapor barriers required by this practice on the interior of the innermost insulation.
  - (vi) Follow all insulation manufacturer's recommendations relative to the venting of wall construction.
  - (vii) Ensure that only mastics and solvents compatible with the board insulation material are used.
- (F) Foundation Perimeter.
- (i) The following applies to the installation of organic cellular rigid board thermal insulation to the exterior of foundation walls and around the perimeter of concrete slab-on-grade floors. Only insulation board which has a moisture absorption rate no greater than 0.3 percent when tested in accordance with ASTM C-272-33, and a water vapor transmission rate no greater than 2.0 perm/inch (when tested in accordance with ASTM C-355-64), may be used for this application.
  - (ii) Pre-Installation Procedures.
    - (a) Identify any termite shields that would be covered by the insulation. Do not install board insulation unless the termite shield is effectively extended beyond the insulation and cover to be installed.
    - (b) Prepare a trench of not less than 12 inches (300 mm) in depth on the exterior of the foundation.
    - (c) Install any anchoring devices required for the application of the covering material.
    - (d) Identify surface projections, such as electrical outlets, utility meters, piping, and faucets, which will require special attention.
  - (iii) Installation Procedure.
    - (a) Do not install insulation board with adhesives when the wall surface is wet or the temperature is below freezing.
    - (b) Cut board insulation to fit around any surface projections, around windows, and at corners so as to fit tightly against each other and against the anchoring devices.
    - (c) Attach the insulation board against the wall or slab edge.
    - (d) To provide impact resistance to those parts of the boards which will remain exposed after backfilling, install a protective cover.
    - (e) Back-fill and tamp ground around foundation or slab edge to slope away from the building.
    - (f) Post-Installation Procedures. Ensure that any termite shields are effectively extended beyond the insulation and its cover.

FIGURE 2  
MOISTURE CONTROL REQUIREMENTS APPLICABLE TO THE  
INSTALLATION OF RIGID BOARD THERMAL INSULATION

Material	Where Installed	Cavity	Requirements
Board with vapor barrier facings (Also boards which are rated by the manufacturer to have a permeability	Interior	filled or empty	No additional winter-warm side vapor barrier
	Exterior	filled	In Zone II of Figure 1, vapor barrier on the winter-warm side and sealing of interior cracks
of less than 1 in the thickness in which the board will be installed)	Exterior	empty	No additional winter-warm side vapor barrier
Board without vapor barrier facings	Interior	filled or empty	In Zone II of Figure 1, vapor barrier on the winter-warm side and sealing of interior cracks
	Exterior	filled	In Zone II of Figure 1, vapor barrier and sealing of interior cracks only in bathrooms and other high moisture areas
	Exterior	empty	No additional winter-warm side vapor barrier required

(G) Concrete Floors.

(i) The following applies to the installation of organic cellular rigid board thermal insulation on concrete floors over unheated basements and crawl spaces, or on concrete slabs-on-grade.

(ii) Pre-Installation Procedures.

(a) Ensure that the concrete floor surface is clean, dry, and free of oil and loose paint.

(b) Fill any cracks in concrete floors with patching cement several days prior to installation.

(c) Seal joints between the floor and walls to reduce air infiltration.

(d) Identify all floor drains. Do not cover such drains unless permitted by local codes.

(e) Prior to installing insulation on a slab-on-grade, provide a waterproof barrier such as two separate brushed-on coatings of asphalt emulsion.

(iii) Installation Procedure.

(a) Cut the insulation board to appropriate size so as to provide tight but not forcefit joints.

(b) Adhere the board thermal insulation to the concrete, assuring an intimate and continuous bond.

(c) Mechanically fasten to the concrete floor slab an underfloor of sufficient strength to distribute any imposed load so as not to crush the insulation.

(d) Protect the floor area around any permanently installed heat-producing equipment in accordance with the requirements of NFPA 31, Standard for the Installation of Oil Burning Equipment or NFPA 54, the National Fuel Gas Code, for gas-fired equipment. Consult the foam manufacturer for additional requirements regarding the protection of foam from excessive heat.

(iv) Post-Installation Procedures.

(a) Ensure that the overlayment subfloor is flat, all subfloor panel butt or tongue and groove joints are tight, and the subfloor is securely fastened.

(b) Ensure that, where required, protective coverings around heat-producing equipment have been provided.

(H) Masonry Wall Interior.

(i) The following applies to the installation of organic cellular rigid board insulation to the interior of masonry walls, particularly basement walls, which separate conditioned and unconditioned spaces.

(ii) Pre-Installation Procedures.

(a) Ensure that the walls are structurally sound; that they are dry and do not show signs of recent dampness (such as mold); and are clean; free of grease; loose paint; and loose material.

(b) Remove any baseboards or moldings on walls to be insulated.

(c) Install any anchoring devices required for the application of the covering material.

(d) Determine edge treatment to be provided at windows and doors after the insulation and covering are installed.

(e) Identify all electrical outlets and switches. Have an approved electrician extend these to the level of the new surface, if required.

(f) Identify and seal cracks at ceiling/wall and floor/wall joints, and window and door frames to reduce air infiltration.

(iii) Installation Procedures.

(a) Provide the minimum clearances around gas-fired appliances specified in NFPA-54, the National Fuel Gas Code. Around oil-fired appliances, provide the minimum clearances specified in NPFA-31 [*sic.*, *NFPA-31*], Standard for the Installation of Oil Burning Equipment. Around masonry chimneys or masonry enclosing a flue, provide a minimum two-inch (50 mm) clearance from the outside face of the masonry. Around vents, chimney and vent connectors, and chimneys other than masonry chimneys, provide the minimum clearances specified in NFPA-211, Standard for Chimneys, Fireplaces, and Vents. Consult the foam manufacturer for additional requirements regarding the protection of foam from excessive heat.

(b) Cut the board insulation to fit around any surface projections such as windows, electrical outlets, conduits, and surface mounted water and drain pipes.

(c) Attach the insulation board to the wall.

(d) Do not cover water or drain pipes with insulation board (during cold weather, heat from the house may be necessary to prevent the pipes from freezing). If possible, wedge some insulating board pieces between the pipes and the wall.

(e) After all insulation board is applied, install a cover having a finish rating of not less than 15 minutes when

- tested according to ASTM Designation E 119-76. Water and drain pipes may be covered with approved covering material.
- (f) Cover the edges of the insulation around electrical outlets and switches, leaving sufficient space to permit their convenient use.
  - (g) Replace moldings at floor and install trim as needed around doors and windows.
  - (iv) Post-Installation Procedures.
    - (a) Ensure that electrical outlets and switches operate freely.
    - (b) Ensure that the required clearances around heat producing equipment have been maintained.
- (I) Masonry Crawl Space Walls.
- (i) The following applies to the installation of organic cellular rigid board insulation to the interior of crawl space walls as an alternate to insulating the floor over a crawl space.
  - (ii) Pre-installation, Installation, and Post-installation Procedures.
    - (a) Ensure that all applicable provisions of masonry wall interior installation are carried out.
    - (b) Do not cover ventilation openings but provide a means for closing the openings during the heating season.
    - (c) Cover the ground surface with a ground cover which acts as a vapor barrier (such as 6-mil (0.15 mm) polyethylene sheeting lapped at the joints). Turn the ground cover up at least six inches (150 mm) at the walls.
- (J) Frame Wall Interior.
- (i) The following applies to the installation of organic cellular rigid board insulation to the interior of finished framed wall construction which separate conditioned from unconditioned spaces.
  - (ii) Pre-installation Procedures.
    - (a) Ensure that all provisions of masonry crawl space wall installation are carried out.
    - (b) Secure any anchoring devices required for the application of the covering material to the wall framing studs.
    - (c) Identify water and drain pipes both on the surface of the wall and in the wall cavities. Provide nailers as needed for attaching the covering material.
  - (iii) Installation Procedures.
    - (a) Install the insulation boards in accordance with the requirement masonry wall interior installation.
    - (b) Do not install insulation over stud spaces that contain water supply or waste pipes (during cold weather, heat from the house may be necessary to prevent the pipes from freezing). The covering material may be placed over such stud spaces containing pipes.
  - (iv) Post-installation Procedures.
    - (a) Conduct post-installation procedures in accordance with masonry wall interior installation.
- (K) Ceilings.
- (i) The following applies to the installation of organic cellular rigid board insulation to the underside (winter warm side) of existing plaster or gypsum board ceilings. See exposed wood deck ceilings for requirements for the interior installation of insulation board to wood roof decks.
  - (ii) Pre-installation Procedures.
    - (a) Ensure that the ceilings are structurally sound, that they are dry and do not show signs of recent dampness or mold; are clean; free of grease; loose paint; and loose material.
    - (b) Remove any existing moldings on the wall to ceiling joints, or on the ceiling itself.
    - (c) Identify electrical outlets and any recessed lighting fixtures. Have an approved electrician lower these to the level of the new finished ceiling surface, if required.
    - (d) Identify the location of ceiling joists.
    - (e) Seal all cracks at wall to ceiling joints, and any other cracks such as at electrical outlets.
  - (iii) Installation Procedure.
    - (a) Maintain a three inch (75 mm) minimum clearance around all recessed lighting fixtures (including wiring compartments and ballasts) and other heat producing devices. Do not cover these devices so as to entrap heat or prevent free circulation of air unless they are approved for this purpose.
    - (b) Provide the minimum clearances around gas-fired appliances specified in NFPA-54, the National Fuel Gas Code. Around oil-fired appliances, provide the minimum clearances specified in NFPA-31, Standard for the Installation of Oil Burning Equipment. Around masonry chimneys or masonry enclosing a flue, provide a minimum two-inch (50 mm) clearance from the outside face of the masonry. Around vents, chimney and vent

connectors, and chimneys other than masonry chimneys, provide the minimum clearances specified in NFPA-211, Standard for Chimneys, Fireplaces, and Vents. Consult the foam manufacturer for additional requirements regarding the protection of foam from excessive heat.

(c) Cut the insulation board to appropriate size and attach the board to the ceiling.

(d) Install a cover having a finish rating of not less than 15 minutes when tested according to ASTM Designation E 119-73.

(e) If the cover consists of gypsum or similar board material, install the board so that the joints fall on the center line of the ceiling joists and nail the board to the joists with nails of sufficient length to penetrate the cover material, the insulation board, the existing ceiling, and into the ceiling joist.

(f) Finish the ceiling with tape and spackle as required.

(v) Post-installation Procedures.

(a) Ensure that all surfaces and edges of insulation board are covered with a material having a finish rating of at least 15 minutes when tested according to ASTM Designation E 119-76.

(b) Ensure that the required clearances around heat producing equipment have been maintained.

(L) Exposed Wood Deck Ceilings.

(i) The following applies to the installation of organic cellular rigid board insulation to the underside (winter warm side) of exposed wood roof decks.

(ii) Pre-installation Procedures. Apply all provisions of ceiling installation.

(iii) Installation Procedure.

(a) Cut the insulation board to fit snugly between any exposed joists or rafters.

(b) Maintain the minimum clearances around heat producing devices specified in ceiling installation.

(c) Install the insulation board securely to the wood deck. If mechanical fasteners are used, do not puncture the roofing.

(d) Install a cover having a finish rating of not less than 15 minutes when tested in accordance with ASTM Designation E 119-76.

(e) Secure the cover through the insulation board to the wood deck. Do not puncture the roofing.

(f) Finish the ceiling with tape, and spackle as required; and install edge trim as needed.

(iv) Post-installation Procedures.

(a) Ensure that all surfaces and edges of insulation board are covered with a material having a finish rating of at least 15 minutes when tested according to ASTM Designation E 119-76.

(b) Ensure that the required clearances around heat producing equipment have been maintained.

(M) Frame Wall Exterior.

(i) The following applies to the installation of organic cellular rigid board insulation to the exterior of frame walls.

(ii) Pre-installation Procedures.

(a) Assure that the walls are free of fungus growth (dry rot) and that they can support the load of the insulation and the weather-resistant exterior finish. If the existing exterior wall cover is sound and free of rot, insulation can be installed over the existing siding. If the existing surface is attacked by fungus growth, remove the old siding. If the old siding is removed, assure that the structural integrity of the wall is maintained either by the remaining cross bracing or the installation of new siding.

(b) Remove any trim around windows, doors, corners, and at the sills, as required, to install the insulation.

(c) Identify any termite shields that would be covered by the insulation. Do not install board insulation unless termite shields are effectively extended beyond the insulation and cover to be installed.

(d) Determine edge treatment to be given at corners, sills, windows, and doors.

(e) Identify surface projections, such as electrical outlets, utility meters, and faucets, which will require special attention.

(iii) Installation Procedure.

(a) If the existing wood siding is sound and left in place, install the insulation board with mechanical fasteners to the wood siding in accordance with the manufacturer's instructions.

(b) If the existing siding was removed, or if the siding consists of light gage metal over an "insulation board" sheathing, install the organic cellular rigid insulation board with mechanical fasteners to the wall studs or to an

existing wood sheathing in accordance with the manufacturer's instructions.

(c) Maintain the clearances around chimneys and vents specified in NFPA 211, Standard for Chimneys, Fireplaces, and Vents. Consult the foam manufacturer for additional requirements regarding the protection of foam from excessive heat.

(d) Cover the insulation board with a suitable weather resisting exterior finish, such as aluminum or vinyl siding, wood or asbestos shingles, or metal lath and stucco.

(e) Attach the cover through the insulation board and existing wood siding or sheathing to the wood frame studs; or attach furring strips or a plywood nailer through the insulation board to the stud wall, and attach the finish to the strips or nailer.

(f) Install flashing and trim at windows, doors, corners, and sills so as to preclude the penetration of water into the wall cavity.

(g) Flash and seal around any obstructions such as at water faucets and electrical outlets.

(h) Provide weep holes at the sill plate as required.

(i) Where insulation board is installed on walls which have cavity insulation, provide for moisture control in accordance with the requirements of Figure 2, above.

(iv) Post-installation Procedures.

(a) Ensure that the required clearances around chimneys and vents have been maintained.

(b) Ensure that all surfaces of insulation board are covered with a suitable weather resisting finish material.

(c) Ensure that joints in trim, flashing, and protective cover at windows, doors, corners, faucets, and electrical outlets are tight and sealed as required.

(d) Ensure that weep holes in the cover are provided, as required, and are free of clogging material.

(N) Masonry Wall Exterior.

(i) The following applies to the installation of organic cellular rigid board insulation to the exterior of masonry or masonry veneer walls.

(ii) Pre-installation Procedures.

(a) Ensure that the walls are free of grease, loose paint and loose material, and major cracks.

(b) Remove any trim around windows, doors, corners, and at the sill, as required, to install the insulation.

(c) Identify any termite shields that would be covered by the insulation. Do not install board insulation unless the termite shield is effectively extended beyond the insulation and cover to be installed.

(d) Determine edge treatment to be given at corners, sills, windows, and doors.

(e) Identify surface projections such as electrical outlets, utility meters, and faucets which will require special attention.

(iii) Installation Procedure.

(a) Attach the insulation board to the wall as recommended by the manufacturer.

(b) Maintain the clearances around chimneys and vents specified in NFPA 211, Standard for Chimneys, Fireplaces, and Vents. Consult the foam manufacturer for additional requirements regarding the protection of foam from excessive heat.

(c) Cover the insulation board with a suitable weather resistant exterior finish, such as aluminum or vinyl siding, wood or asbestos shingles, or metal lath and stucco.

(d) Fasten the cover through the insulation board onto the masonry wall, or secure furring strips or a plywood nailer base through the insulation board onto the masonry wall. Attach the finish to the strips or nailer base.

(e) Install flashing and trim at windows, doors, corners, and sills so as to preclude the penetration or *[sic.]* water.

(f) Flash and seal around any obstructions such as at water faucets and electrical outlets.

(g) Provide weep holes at the sill plate as required.

(iv) Post-installation Procedures.

(a) Ensure that the required clearances around chimneys and vents have been maintained.

(b) Ensure that the insulation board has been properly covered.

(c) Ensure that all required flashing and sealing has been provided.

(d) Check that all necessary weep holes at the sill plate have been provided and are unobstructed.

(O) Roof Exterior.

(i) The following applies to the installation of organic cellular rigid board insulation to the exterior of sloped



roofs. It does not apply to roofs over unheated attics.

(ii) Pre-installation Procedures.

(a) Inspect the roof to assure that it is not sagging or showing evidence of rot in shingles, sheathing, or structural members. Do not install insulation on roofs that are not able to support the additional load of the insulation and new roofing system, or over roofs that show signs of rot.

(b) If there are two or more layers of roofing, remove all roofing. Insulation may be applied over a single layer of roofing.

(c) Install nailers the thickness of the insulation board along all edges and along the ridge.

(iii) Installation Procedure.

(a) Install insulation board as recommended by the manufacturer. Use an application method which fastens the insulation to the roof sheathing. Do not use adhesive to fasten the insulation to shingles or roofing felt only.

(b) Maintain the clearances around chimneys and vents specified in NFPA 211, Standard for Chimneys, Fireplaces, and Vents. Consult the foam manufacturer for additional requirements regarding the protection of foam from excessive heat.

(c) Install a plywood overlay, mechanically fastened to the original sheathing on top of the insulation board, and cover the plywood with roofing.

(d) Install all flashing, gutters, and trim as required.

(iv) Post-installation Procedures.

(a) Ensure that the required clearances around chimneys and vents have been maintained.

(b) Ensure that the new roofing entirely covers the insulation.

(c) Ensure that all flashing is properly installed, particularly at dormers, chimneys, or where the roof adjoins vertical wall sections.

(4) The following applies to the installation of reflective insulation.

(A) This practice covers the installation of reflective (aluminum foil) insulation in ceilings, attics, floors, and wall cavities of existing residential buildings.

(B) A working knowledge of the terminology and fundamentals of construction and applicable codes is necessary for the proper application of this standard.

(C) Pre-installation Procedures.

(i) Identify and examine all visible wiring, junction boxes, and other metallic or electrical equipment in the areas where insulation is to be installed. Do not install reflective insulation if the wiring is found to have frayed, cracked, deteriorated or missing electrical insulation.

(ii) Ensure that all electrical equipment in the building is grounded. Do not install reflective (aluminum foil) insulation in buildings in which electrical equipment is not grounded.

(iii) Identify air supply and return ducts, pipes, electrical wires, and other obstructions located in spaces between joists and studs. Ground all metallic heating and air conditioning ducts which may come in contact with the installed insulation. Do not install reflective insulation where metallic heating and air conditioning ducts are not grounded.

NOTE 1—Repairs or replacement of electrical wiring to eliminate defects as well as all other electric-related activities are to be carried out only by personnel approved for such work.

NOTE 2—Insulation of floors over unheated spaces will cause these spaces to be colder. Accordingly, appropriate measures may need to be taken to keep water pipes from freezing during colder weather.

(D) Attics and Ceilings.

(i) Identify and measure ventilation area in attics. Do not install insulation in attics unless 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) minimum of free ventilation area per 300 ft<sup>2</sup> (30 m<sup>2</sup>) of attic floor area is provided. If the free ventilation area of louvers is not known, assume that it is half of the area of the ventilation opening and increase the opening accordingly.

(ii) Ensure that all ventilation openings have suitable louvers or screens to prevent rain or snow from entering the attic.

(iii) Identify all recessed lighting fixtures (including wiring compartments and ballasts) and other heat producing devices.

(E) Floors.

(i) Where insulation is to be installed beneath floors over crawl spaces, cover the ground surface with a ground

cover which acts as a vapor barrier (such as 6-mil (0.15 mm) polyethylene sheeting lapped at the joints). Turn the ground cover up at least six inches (150 mm) at the walls.

(ii) Where practical in crawl spaces, provide a free ventilation area of one square foot (0.1 m<sup>2</sup>) for every 1500 square feet (150 m<sup>2</sup>) of the ground area of the crawl space. Provide cross-ventilation where possible.

(F) Installation Procedures.

(i) Do not install reflective insulation unless the pre-installation procedures have been carried out, and any defects which were identified were corrected and their causes eliminated.

(ii) Install insulation only between conditioned and unconditioned spaces.

(iii) Do not cover recessed lighting fixtures (including wiring compartments and ballasts) and other heat producing devices so as to entrap heat or prevent free circulation of air unless they are approved for this purpose.

(iv) Handle the insulation materials in accordance with the manufacturer's instructions.

(v) Ensure that the reflective surfaces are free of dirt, oil film, and other surface coatings which can reduce the effective reflectance of the surfaces.

(vi) Install reflective insulation flush or recessed with the framing members as shown in Figures III and IV.

(vii) Secure the insulation in place with aluminum, coated copper-clad steel, plastic, or coated galvanized steel staples.

(viii) Ensure that the insulation is cut to the correct size, fits tightly between joists and studs on all sides, and that there are no wrinkles or fishmouths. Where wrinkles and fishmouths cannot be avoided, tape the joint between the insulation and framing members, or between adjacent sections of insulation (in flush installations).

(ix) Ensure that where the material is installed to form multiple reflective air spaces, the spaces measure, at a minimum, 3/4 of an inch (19 mm). Maintain the distance between reflective surfaces as uniformly as possible. Reflective surfaces must not touch each other or the thermal performance of the insulation will be reduced.

(x) Tape and seal all splices and tears in the insulation. Seal all punctures in the insulation by taping reflective materials to the damaged area.

(xi) Avoid joints within the length between joist supports or stud spaces. Seal joints which are required with tape.

(xii) Tightly seal the ends of reflective insulation against the surfaces which they contact.

(xiii) Closely fit insulation around plumbing and other obstructions, and tape securely to eliminate gaps through which air may pass into the reflective air spaces.

(G) Walls.

(i) Do not install insulation in contact with the ground or other sources of water.

(ii) Cut the insulation around wall switches and outlet boxes; tape the openings.

(H) Attics, Ceilings, Floors.

(i) When installing insulation around bridging or cross bracing of ceilings or floor joists, ensure that the insulation material is fitted tightly around these obstructions, and that there are no gaps in the insulation.

(ii) Do not cover soffit vents with insulation nor in any other way restrict attic ventilation.

(iii) Install insulation around vents which open into the attic in a manner that will ensure the free movement of air through the vent into the attic.

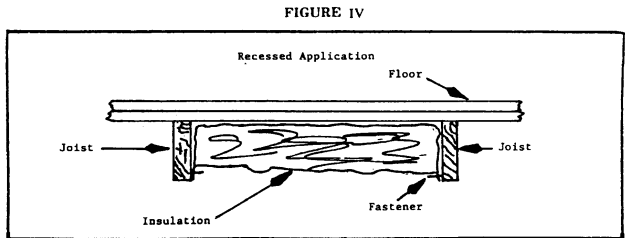
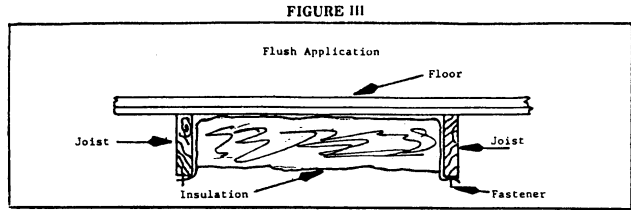
(iv) Fit the attic side of access doors or panels with a suitable insulation material, except where prevented by a retractable ladder.

(I) Post-installation Procedures.

(i) Ensure that the reflective insulation provides a continuous and unbroken surface between framing members; that no gaps, tears, and other openings exist; and that all joints are tightly taped.

(ii) Ensure that insulation installed in attics does not restrict soffit or other vents which open into the attic.

(iii) Ensure that the required clearances around heat-producing devices have been provided.



- (5) The following applies to the certification procedures for the installation of thermal insulation materials.
- (A) Upon completion of each installation of thermal insulation materials performed under the circumstances described in the installation standards, the person responsible for carrying out such installation shall complete, in triplicate, a "Certification of Insulation" form such as shown below.
- (B) Content. The "Certification of Insulation" shall contain the following information:
- (i) Address of the building;
  - (ii) Date of completion of installation;
  - (iii) Name and address of the contractor;
  - (iv) Insulation type;
  - (v) Insulation manufacturer;
  - (vi) Location and dimension (in square feet) of each space which was insulated;
  - (vii) The amount of insulation which was installed in each of the locations identified above, expressed in the units in which the materials is *[sic.]* most commonly available (e.g. the number of batts, bags, etc., of a specified size, or the number of square feet, etc.);
  - (viii) The R Value installed in each of the locations identified above;
  - (ix) A statement, signed by the installer or his authorized representative, certifying that the installation was carried out in conformance to the applicable standard practices, codes, and regulations.
- (C) Distribution and Posting Requirements. The "Certification of Installation" shall be distributed and posted as follows:
- (i) One copy shall be permanently affixed to the structure in an accessible but inconspicuous location;
  - (ii) One copy shall be submitted to the homeowner or building occupant; and
  - (iii) One copy shall be retained for a period of five years by the agency performing the installation.

**FIGURE V**  
**CERTIFICATION OF INSULATION**

**PART I - GENERAL**

ADDRESS OF RESIDENCE:

NAME AND ADDRESS OF CONTRACTOR

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

DATE OF INSTALLATION  
COMPLETION:

\_\_\_\_\_

DEPARTMENT OF COMMERCE

PART II - AREAS INSULATED

WALLS(\_\_\_\_\_ sq. ft.)

CEILINGS(\_\_\_\_\_ sq. ft.)

FLOORS(\_\_\_\_\_ sq. ft.)

TYPE OF INSULATION:

TYPE OF INSULATION:

TYPE OF INSULATION:

MANUFACTURER:

MANUFACTURER:

MANUFACTURER:

R VALUE INSTALLED	AMOUNT INSTALLED

R VALUE INSTALLED	AMOUNT INSTALLED

R VALUE INSTALLED	AMOUNT INSTALLED

PART III - CERTIFICATION

I, \_\_\_\_\_ certify that the residence identified in PART I was insulated as specified in PART II  
(PRINT NAME)

and the installation was conducted in conformance to applicable codes, standards, and regulations.

\_\_\_\_\_  
Authorized Signature

- (6) The following applies to the installation of storm windows, thermal windows, and multi-glazing units.
  - (A) The installation of storm windows, thermal windows, or multi-glazing units shall be performed in accordance with ASTM E-737-80 "Standard practice for the installation of storm windows, replacement windows, multi-glazing, storm doors, and replacement doors."
- (7) The following applies to the installation of insulation on gas-fired, oil-fired, and electric resistance water heaters:
  - (A) Pre-installation Procedures.
    - (i) General. Determine the fuel type (gas, electric, oil) of the water heater.
    - (ii) Electric Resistance Water Heater. (Figure VI) Determine the location of the pressure relief valve, thermostat control, and hi-limit switch.
    - (iii) Gas-Fired Water Heater.(Figure VI)
      - (a) Determine whether the gas-fired water heater is equipped with a vent damper. Do not insulate gas-fired water heaters so equipped.
      - (b) Determine the location of the pressure relief valve and draft hood on the water heater.
      - (c) Determine the location of the burner air inlet, pilot light access plate, and drain valve.
    - (iv) Oil-Fired Water Heater.(Figure VI)
      - (a) Determine the location of the pressure relief valve, vent pipe, and barometric draft gauge.
      - (b) Determine the location of the thermostat control, peep sight, and drain valve.
  - (B) Installation Procedures.
    - (i) Do not install insulation unless the pre-installation procedures have been carried out.
    - (ii) Handle insulation in accordance with manufacturer's instructions and keep dry and free of extraneous materials.
    - (iii) Apply the insulation to the water heater with the facing to the outside.
    - (iv) Secure the sections of insulation to the water heater using a tape of the size and type recommended by the

insulation manufacturer.

(v) Do not install insulation over the water heater operating instructions and other components identified below.

(vi) Electric Resistance Water Heater.

(a) Install insulation on the sides and top plate of the water heater.

(b) Cut the insulation to leave holes for the pressure relief valve, thermostat control, hi-limit switch, plumbing pipes, and other necessary access plates.

(vii) Gas-Fired Water Heater.

(a) Do not install insulation on the top plate of gas-fired water heaters.

(b) Cut the insulation to leave holes for the burner air inlet, thermostat control, pilot light access plate, drain valve, plumbing pipes, and other necessary access plates.

(viii) Oil-Fired Water Heaters.

(a) If the vent pipe is top-mounted, do not install insulation on the top plate of the water heater.

(b) If the vent pipe is side-mounted, maintain the minimum vent connector clearances specified in the latest edition of NFPA 211, Standard for Chimneys, Fireplaces, and Vents.

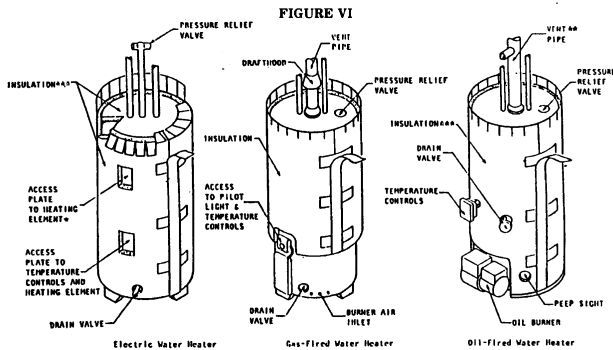
(c) Cut the insulation to leave holes for the pressure relief valve, thermostat control, flame peep sight, burner access plate, drain valve, plumbing pipes, and other necessary access plates.

(C) Post-installation Procedures.

(i) Ensure that the insulation is securely attached to the water heater.

(ii) Ensure that the required clearances have been maintained around vent pipes, and that insulation has not been installed on the top of oil-fired water heaters which have a top-mounted vent pipe, or on any gas-fired water heater.

(iii) Ensure that air inlets, access plates, drain valves, temperature controls, and pressure relief valves are not covered by insulation.



\* Only found on water heaters with two heating elements.

\*\* The pipe may be side-mounted.

\*\*\* Top insulated on all electric water heaters and oil-fired water heaters with side-mounted flue pipes.

(8) The following applies to the installation of replacement oil burners:

(A) This practice provides minimum requirements for the installation of replacement oil burners for the purpose of significantly reducing the amount of fuel oil consumed by increasing combustion efficiency and reducing firing rate. It is intended for use on warm air, hot water, and steam systems, but does not cover firing rate reductions for steam heating systems.

(B) This practice covers the installation process from pre-installation inspection for inefficient operation, through post-installation tune-up for best efficiency. Special considerations for maximizing system efficiency are emphasized.

(C) This practice is intended for use by approved installers. It outlines the general procedure to be followed, but leaves the detailed step-by-step methodology to the approved installers. It is therefore not intended for use by the general public or by untrained persons, since such use may be unsafe or result in damaged equipment.

(D) Tune-up and Evaluation of Existing Burner. Clean, adjust, and measure the efficiency of the existing burner. Carry

out the following procedures:

- (i) Clean soot from heat transfer surfaces.
- (ii) Seal air leaks around burner tube, clean-out doors, and seal secondary air dampers and firing doors on converted coal burners.
- (iii) Clean or replace air filter.
- (iv) Clean or replace oil filters.
- (v) Check flame ignition. Ignition should be nearly instantaneous. Adjust electrodes or make other repairs necessary to achieve nearly instantaneous ignition.
- (vi) Observe flame color. Repair or adjust burner to achieve an acceptable flame color for the type of furnace being evaluated.
- (vii) Observe flame shape. If the flame is lopsided or distorted, replace the nozzle, adjust the electrodes, or repair the air cone.
- (viii) Check for flame impingement on walls of furnace or combustion chamber. Correct impingement resulting in soot or petroleum coke deposits on the target wall.
- (ix) Check for flame cut-off. The flame should disappear within three seconds of cut-off. If the flame lingers, check that the burner is level. It may be necessary to install an oil supply line solenoid to insure rapid cut-off.
- (x) If possible, check the nozzle size, type, and spray angle against the burner specifications recommended by the manufacturer. Manufacturers' nozzle specifications should always be followed.
- (xi) Start the burner. Determine and correct the cause of any abnormal starting or running noise.
- (xii) Measure either flue or over-fire draft as specified by the manufacturer. Adjust draft regulator to provide the manufacturer-specified draft. Ensure the draft regulator is operating smoothly.
- (xiii) Check oil supply pressure. Adjust pressure regulator to manufacturer's specification.
- (xiv) Check oil pressure entering pump. Reading should be two to six inches of mercury vacuum when the tank is below the burner, and zero or above when the tank is above the burner. If there is a low reading, correct a possible restriction in the fuel supply.
- (xv) Allow the burner to run as least 15 minutes to reach a steady-state operating condition. Check for odor at observation port and draft regulator and, if appropriate, correct improper draft, improper venting, or a defective nozzle.
- (xvi) Adjust the air gate to give a smoke reading of #1 or greater when measured in accordance with the procedure outlined in American National Standard ANSI/ASTM D2156-65 1975.
- (xvii) Measure the flue gas temperature and the percentage of CO<sub>2</sub> in the flue gas through a 1/4" diameter hole in the flue located between the barometric draft regulator and the furnace outlet.
- (xviii) Using Figures VII or VIII determine the steady-state efficiency of the furnace from the flue gas temperature and percent CO<sub>2</sub> concentration.

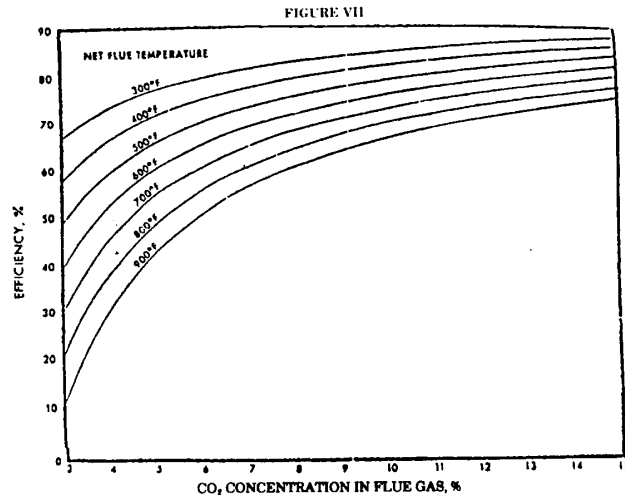


Figure VII Effect of net flue temperature and percent CO<sub>2</sub> on efficiency for furnaces operating on No. 1 heating oil.

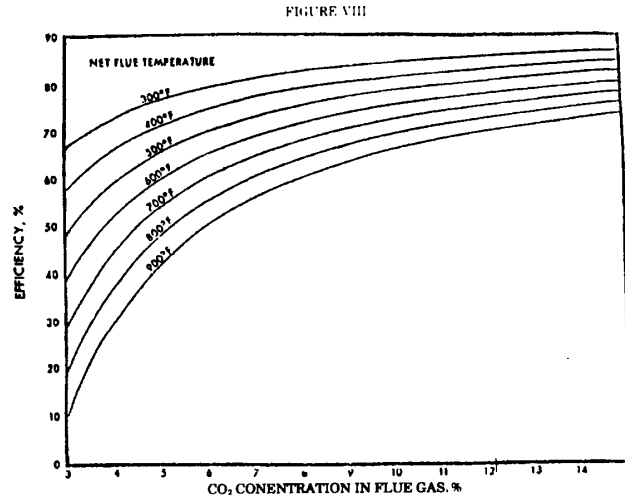


Figure VIII Effect of net flue temperature and percent CO<sub>2</sub> on efficiency for furnaces operating on No. 2 heating oil.

(xix) As an alternative, steady-state efficiency may be calculated as follows:

(a) The steady state efficiency of the furnace may be determined directly from Figure IX, for furnaces using No. 2 fuel oil.

(b) Alternatively, the following equations may be used to calculate the furnace efficiency:

$$N_{SS} = 100 - L_{L,A} L_{S,SS,A}$$

$$R_{T,F} = A + \frac{B}{X_{CO_2} S}$$

$$L_{S,SS,A} = \frac{100}{HHV_A} \sum_{i=1}^5 ((1 + A/F (CF (i) + I(A/F) (R_{T,F} - 1) (CA(i))) \times ((TF,SS + 460)^i - (TRA + 460)^i)$$

- Where:  $N_{SS}$  = Steady State, full load efficiency %  
 $L_{L,A}$  = Average latent loss, % = 6.55 for No. 1 oil  
 6.50 for No. 2 oil  
 $L_{S,SS,A}$  = Average sensible heat loss, %  
 $R_{T,F}$  = Ratio of combustion air to stoichiometric air  
 $X_{CO,F}$  = Concentration by volume of CO<sub>2</sub> present in dry flue gas, %  
 $T_{F,SS}$  = Flue gas temperature at steady-state, °F  
 $T_{RA}$  = Ambient temperature in furnace room, °F  
 (c) Additional required constants are as follows:

FIGURE IX

	For No. 1 oil	For No. 2 oil
HHVA . . . . .	19,800	19,500
A/F . . . . .	14.56	14.49
A . . . . .	0.0679	0.06668
B . . . . .	14.22	14.22
CF (1) . . . . .	$-2.4416834 \times 10^{-1}$	$-2.4361163 \times 10^{-1}$
CF (2) . . . . .	$-3.3711449 \times 10^{-6}$	$-3.6702686 \times 10^{-6}$
CF (3) . . . . .	$-8.8906305 \times 10^{-9}$	$-8.7098897 \times 10^{-9}$
CF (4) . . . . .	$-1.3619019 \times 10^{-12}$	$-1.3094378 \times 10^{-12}$
CF (5) . . . . .	$-1.4367410 \times 10^{-16}$	$-1.5029209 \times 10^{-16}$
	For Air	
CA (1) . . . . .	$-2.5462121 \times 10^{-1}$	
CA (2) . . . . .	$-3.0260126 \times 10^{-5}$	
CA (3) . . . . .	$-2.7608571 \times 10^{-8}$	
CA (4) . . . . .	$-7.4253321 \times 10^{-12}$	
CA (5) . . . . .	$-6.4307377 \times 10^{-16}$	

(d) This calculation procedure is explained more fully in: NBSIR 78-1543, “Recommended Testing and Calculation Procedures for Determining the Seasonal Performance of Residential Control Furnaces and Boilers.” Department of Energy “Final Energy Conservation Test Procedures” Federal Register, Part II, May 10, 1978. 43 FR 20128, 20147.

(E) Replacement Criteria.

(i) Replace the burner only if the estimated savings resulting from installation of a more efficient burner will pay for the cost of the replacement burner. If the savings calculated in Figure X below, multiplied by the homeowner's desired payback period in years exceed the total cost of burner replacement (labor plus parts), the burner should be replaced.

(ii) Figure X shows the annual dollar savings per \$100 of annual fuel costs that can be achieved by increasing furnace efficiency. The efficiency of the furnace with a new burner conforming to the requirements of ANSI Z91.2 may be estimated by assuming a stack CO<sub>2</sub> concentration of 10 percent and a stack temperature equal to that measure in subsection (c)(8)(D)(xviii) of this section. If the burner manufacturer specifies a CO<sub>2</sub> concentration greater than 10 percent for his burner when tested in accordance with ANSI Z91.2, this should be used instead of the minimum value of 10 percent which that standard requires.

(iii) As an example, if the original stack conditions were 6 percent CO<sub>2</sub> and 500°F (72 percent efficiency) and the manufacturer of the replacement burner stated that 12 percent CO<sub>2</sub> was obtainable with his burner, the assumed new conditions with the replacement burner installed would be 12 percent CO<sub>2</sub> and 500°F (81 percent efficiency). Using these two values an estimated annual saving of \$11.10 per \$100 of annual fuel cost can be



read.

If the annual fuel costs were \$500, the annual savings would be  $\$11.10 \times 5 = \$55.50$ . If the desired payback period were seven years, the total savings justifying burner replacement would be  $\$55.50 \times 7 = \$388.50$ .

(iv) In this example the burner should be replaced if the total replacement cost (labor plus parts) is less than \$388, and should not be replaced if the total replacement cost is more than \$388. Use an additional average savings of \$5.80 per \$100 of annual fuel cost in the payback period calculation if the firing rate of the new burner is optimized as described in subsection (c)(8)(F)(i) of this section, below, and the resulting value is smaller than the original firing rate by 20 percent or more.

FIGURE X

ANNUAL DOLLAR SAVINGS PER \$100 OF ANNUAL FUEL COST AS A RESULT OF INCREASED FURNACE EFFICIENCY

From original efficiency of	To an increased efficiency of (percent)						
	74	76	78	80	82	84	86
Percent:							
50 .....	\$32.40	\$34.20	\$35.90	\$37.50	\$39.00	\$40.50	\$41.90
52 .....	29.70	31.60	33.30	35.00	36.60	38.10	39.50
54 .....	27.00	28.90	30.80	32.50	34.10	35.70	37.20
56 .....	24.30	26.30	28.20	30.00	31.70	33.30	34.90
58 .....	21.60	23.70	25.60	27.50	29.30	31.00	32.60
60 .....	18.90	21.10	23.10	25.00	26.80	28.60	30.20
62 .....	16.20	18.40	20.50	22.50	24.40	26.20	27.90
64 .....	13.50	15.80	17.90	20.00	22.00	23.80	25.60
66 .....	10.80	13.20	15.40	17.50	19.50	21.40	23.30
68 .....	8.10	10.50	12.80	15.00	17.10	19.00	20.90
70 .....	5.40	7.90	10.30	12.50	14.60	16.70	18.60
72 .....	2.70	5.30	7.70	10.00	12.20	14.30	16.30
74 .....		2.60	5.10	7.50	9.80	11.90	14.00
76 .....			2.60	5.00	7.30	9.50	11.60

(F) Selection of Replacement Burner.

(i) Determine design nozzle size. Using the local outdoor design temperature of the area and the measured average winter K-Factor for the residence (degree days per gallon), determine the minimum nozzle size by the formula:

$$\text{Minimum nozzle Size} = \frac{(65 - T_D)}{(\text{K-Factor})(24)} \times \frac{\text{Efficiency of Furnace Measured in (c)(8)(D)(xviii)}}{\text{Expected Efficiency of Furnace with New Burner as calculated in (c)(8)(E)(ii)}}$$

(a) (Where  $T_D$  is the local outdoor design temperature in °F and the K-Factor is in degree days per gallon of oil.) If the outdoor design temperature is not known, refer to Chapter 33 of the ASHRAE Handbook and Product Directory-1977 Fundamentals. Use the 97.5 percent values for the nearest weather station listed. The winter K-Factor is an average value derived over one or more complete heating seasons.

(b) The K-Factor for a residence is defined as the number of degree days occurring in a time period, divided by the total number of gallons of oil used during the same period to maintain a house at its normal thermostat setting.

(c) Determine from the occupant whether storm windows or a substantial amount of new insulation has been

installed since the last heating season. If so, the calculation of the K-Factor with the above formula may be too low and must be adjusted accordingly.

(d) If the heat requirement of the house has been significantly reduced by insulation or storm windows, it may also be possible to reduce the cut-off set point of the aquastat on hot water boilers by 10° to 20°F to reduce standby heat losses. This setback may not be desirable, however, if the boiler is used to heat domestic hot water.

(e) Thermostat setback is to be encouraged as an additional energy conservation practice. If the owner plans to practice nighttime setback, in order to insure adequate temperature recovery, increase the size of the burner replacement nozzle by adding a value in gallons per hour equal to the heated house floor area in square feet, times the pickup capacity factor (PCF), divided by 140,000, where PCF is given by FIGURE XI:

FIGURE XI

Outdoor design temperature, °F:	Pickup capacity factor,* BTU/hour/sq. foot floor area
40 .....	9.5
30 .....	13.0
20 .....	14.9
10 .....	15.8
0 .....	17.0
-10 .....	17.7
-20 .....	18.8

\*This Figure is based upon a 10° thermostat setback and a 2-hour pickup time.

(f) Select a nozzle that gives the spray pattern and angle recommended by the manufacturer of the replacement burner that is not larger than the original nozzle.

(ii) Choose the replacement burner recommended by its manufacturer for use with the design nozzle size calculated in the formula above.

(iii) Do not select a flame retention replacement burner for use on a hot water or steam boiler equipped with stainless steel combustion chambers. Higher temperature levels produced by high performance flame retention burners may cause the combustion chamber to burn out.

(G) Installation of Replacement Burner.

(i) Install fixed firing rate replacement burners with a nozzle of the size calculated in subsection (c)(8)(F)(i) of this section.

(ii) Replace the burner in accordance with the manufacturer's instructions following normal, sound installation practices.

(iii) It is anticipated that most burner replacements will involve replacing a conventional burner with a high speed flame retention head burner. If this is done, the combustion chamber must be brought into conformance with the burner manufacturer's specifications for size and design. In addition, the combustion chamber material must have a minimum rating of 2300°F (most existing chambers for conventional burners have a rating of 1800°F).

(iv) Check that the completed installation is in conformance with all local and state building and fire safety codes. Where local codes do not exist verify conformance with American National Standard Installation of Oil Burning Equipment, Z95.1-1974 (NFPA No. 31-1974).

(v) Test-operate the installed burner and measure its efficiency following the guidelines of U.S. Environmental Protection Agency Report No. EPA 600/2-75-069a (October 1975), "Guidelines for Residential Oil Burner Adjustments". If the replacement burner results in an appreciable reduction in stack temperature, the stack switch heat controls (if the unit is so equipped) for ignition cut-off may need to be readjusted.

(vi) The temperature [*sic.*] of the combustion gases entering the draft regulator must be at least 370°F for chimneys enclosed within the insulated structure to prevent condensate and subsequent corrosion. The temperature of the combustion gases entering the draft regulator must be at least 450°F if 2 or 3 sides of the

chimney are exposed to an outdoor ambient design temperature of 0°F or less to prevent condensation and freezing within the chimney. If the temperature of the combustion gases entering the draft regulator is below the specified minimum valve, fit a larger nozzle to increase that temperature.

(H) Date to be Recorded. Record the following information in duplicate and leave one copy with the owner and one as a tag attached to the equipment:

- (i) Date of replacement.
- (ii) Identity of installing mechanic and company.
- (iii) The original burner make, model, model number, and nozzle size.
- (iv) The replacement burner make, model number, and nozzle size.
- (v) The number and size of any additional nozzles tried in the replacement burner.
- (vi) Other modifications to the unit.
- (vii) The initial and final CO<sub>2</sub> net stack temperature, efficiency, and smoke readings.

(9) The following applies to the field installation of electrically-operated, mechanically-actuated, and thermally-actuated automatic vent dampers for use with existing gas-fired central furnaces and low pressure hot-water boilers.

(A) This practice is intended to achieve a safe installation of electrically-operated, mechanically-actuated, or thermally-actuated, automatic vent dampers on existing gas-fired central furnaces and low-pressure hot water boilers, hereinafter referred to as “heating appliances”, or as simply “appliances”. A safe installation requires knowledge and equipment that may be possessed only by qualified installers.

A qualified installer is a person who has specialized training and a working knowledge of the applicable codes and regulations, tools, equipment, and methods necessary for the safe installation of automatic vent dampers for gas-fired appliances, and the necessary understanding of the fundamentals of gas-fired heating systems, and has successfully passed the Indiana RCSP Vent Damper Test administered by the Lead Agency. NOTE: An improper installation could result in injury or death from the venting of exhaust gases, including carbon monoxide, into the residence. Electrical shock to the installer could also result. No installation procedure can anticipate all situations. Accordingly, in some cases deviation from this procedure may be necessary for a safe installation. For this reason, only qualified installers shall perform installations under the IN RCSP.

(B) A safe installation requires that only safe vent damper and heating appliance designs be used. Therefore, the vent damper and heating appliance designs must, as a minimum, be listed by a nationally recognized testing laboratory, must meet state and local codes, and meet appropriate nationally recognized standards. These standards are ANSI Z21.66-1977, American National Standard for Electrically-Operated Automatic Vent Damper Devices for Use with Gas-Fired Appliances; ANSI Z21.67-1978, American National Standard for Mechanically-Actuated Automatic Vent Damper Devices for Use with Gas-Fired Appliances; ANSI Z21.68-1978, American National Standard for Thermally-Actuated Automatic Vent Damper Devices for Use with Gas-Fired Appliances; ANSI Z21.13-1977, American National Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers; ANSI Z21.47-1978, American National Standard for Gas-Fired Gravity and Forced Air Central Furnaces. NOTE: Often the local authority having jurisdiction over the installation of gas equipment in a locality will have requirements that must be met before equipment is considered safe and is approved for use in that locality. Often equipment must be listed before it is approved. Listed equipment is that included in a list published by a nationally recognized testing laboratory that maintains periodic inspection of production of equipment that it lists. Each listing states that the equipment either meets nationally recognized standards or has been tested and found suitable for use in a specified manner. Listed vent dampers and heating appliances are intended to include only safe designs. Using a listed vent damper on a listed heating appliance does not necessarily imply a safe retrofitted system, however. Not all listed vent dampers are compatible with all listed heating appliances. In addition, the safety of a retrofitted systems [*sic.*] depends not only on the safe designs of the existing heating appliance and vent damper but also on the manner in which the vent damper is installed.

(C) The installer shall ensure that mechanically-actuated vent dampers are only installed on appliances with which they are compatible. Compatibility is to be determined by comparing the appliances as found, with diagrams furnished by the damper manufacturer showing interconnections among the heating appliance, the damper, the motive force, and the control circuits. Electrically-operated vent dampers and thermal vent dampers with electrical connections shall only be installed on appliances where the wiring diagrams supplied by the vent damper manufacturer show the device to be compatible with the appliance. If a wiring or interconnection diagram is not supplied by the vent damper manufacturer which duplicates the heating system on which the installation is desired, the installation must not be attempted.

(D) This practice is intended only for use with individual, automatically operated, natural gas-fired, hot-air (forced or gravity) furnaces; and gas-fired low-pressure, hot water boilers equipped with draft hoods.

(E) Because vent dampers save energy by reducing the flow of heated air up the vent during periods when the main burner of the heating appliance is off, do not install vent dampers in areas that are essentially at outdoor temperatures, such as unheated attics, crawl spaces, or basements with openings directly to the outdoors.

(F) Because vent capacities are reduced when the difference between indoor and outdoor temperatures are the least, and, generally, when wind velocities are low, it is desirable that all checks of venting capacity or draft hood spillage be conducted when the outside temperature is above 65°F and the wind velocity is less than 10 mph. Venting may be particularly dependent on wind conditions in certain special situations. Extra caution must be exercised in these special situations that include exposed locations in high wind areas; locations in very hilly terrain; difficult constructional features for venting purposes, such as high pitched roofs; and neighborhoods with sharply varying building heights. In these situations, wind currents directed at the top of the chimney may cause downdrafts at times. If any of these situations are suspected of causing draft problems, it will be necessary to conduct the vent capacity or draft hood spillage checks on several days under various wind conditions.

(G) At any point, if it is determined that there is a condition that could result in unsafe operation of the heating system, the appliance must be shut off, the owner and the authority having jurisdiction informed of the required repairs, and the repairs made before continuing with the installation.

(H) This practice requires the following items be followed in order:

- (i) Pre-Installation Procedure in subsection (I) of this section.
- (ii) General Installation Procedure in subsection (J) of this section.
- (iii) Post-Installation Procedure in subsection (K) of this section.

(I) Pre-Installation Procedure.

(i) This pre-installation procedure is to determine whether a gas heating appliance is properly installed and is in a safe condition for continuing use. Perform this procedure before making any attempt to install a vent damper, and do not install a vent damper on an appliance if the determinations required below cannot be made.

(ii) Determine with suitable instruments, that there is no detectible concentration of combustible gas and/or carbon monoxide in the vicinity of the heating appliance. The absence of combustible gas is indicated by a reading less than 20 percent of the lower explosive limit on the appropriate instrument or by a smell test indicating complete freedom from odor of odorized natural gas. (The lower limit for detecting fuel gas by smell is approximately 20 percent of the lower explosive limit.) The absence of CO is indicated by a reading of less than 50 ppm which is the lowest marking on several CO test instruments in common use.

(iii) Determine that the heating system installation meets the requirements of all applicable codes and regulations. The heating system installation should at least meet the requirements of the American National Standard Fuel Gas Code, ANSI Z223.1-1974 (NFPA No. 54-1974) Part 1, Installation of Gas Piping and Gas Equipment on Nonindustrial Premises.

(iv) Conduct a gas leakage test of the appliance piping and control system downstream of the shut-off valve in the supply line to the appliance. Do not use a flame or other source of ignition to check for gas leaks.

(v) Inspect the venting system to determine that the cross-sectional area of the vent connector is not less than the area of the draft hood outlet (the chimney side of the draft hood) and that the area of the vent is not less than the area of the largest connected draft hood outlet plus 50 percent of the areas of additional connected draft hood outlets. If these criteria are not met, the vent system must be in accordance with the National Fuel Gas Code (ANSI Z223.1-1974) paragraphs 1.5.6.3 and 1.5.8.3. Determine that there are no manually adjustable dampers in the vent system. Also visually inspect for positive horizontal pitch (not less than 1/4-inch/foot). Determine through an inspection of the entire interior of the vent system that there is no blockage, restriction, leakage, corrosion, etc., which could cause an unsafe condition. If this inspection is not performed, an outdoor temperature above 65°F and a wind velocity of less than 10 mph are mandatory during all tests for venting capacity or draft hood spillage.

(vi) Determine that the outside termination of the vent is satisfactory (see National Fuel Gas Code, ANSI Z223.1-1974, 1.5.5.2 and 1.5.6.3). Determine that the chimney is in good condition and is either a lined masonry chimney or an approved Type B or Type L vent, or a factory-built chimney. Do not install a vent damper in a heating system using any other chimney type, including unlined masonry chimneys and uninsulated, single-wall metal

pipes. Determine that the vent connector does not project into the chimney.

(vii) Determine that the comfort thermostat(s) is in satisfactory operating condition. Check for excessive dust, corrosion, pitted contacts, and cracked or broken base or housing. Note the comfort thermostat setting so it can be reset after the installation is completed. Then adjust the thermostat for continuous operation. Determine that the burner input is in accordance with the heating appliance manufacturer's instructions.

(viii) Visually determine that the main burner gas is burning properly and that there is no floating, lifting, or flashback. Adjust the primary air shutter(s) as required. If the appliance is equipped with flame modulation, check for proper main burner operation at low and high flame. Observe burning for evidence of plugged burners, improper flame alignment, combustion product leakage, and improperly adjusted pilot lights.

(ix) Shut off all gas to the appliance using the shut-off valve in the supply line to the appliance. Shut off the main burners of all other appliances located within the same room or connected to the same vent. Note the settings of any thermostats that are to be changed so they can be reset after the installation is completed.

(x) Determine that there is sufficient combustion air. In unconfined spaces in buildings of conventional frame or masonry construction, infiltration normally is adequate to provide air for combustion, ventilation, and dilution of flue gases. If the unconfined space is within a building of unusually tight construction, air must be obtained from outdoors or from spaces freely connected with outdoors. Permanent openings having a total free area of not less than one square inch per 5,000 Btu/hr of total input rating of all appliances must be provided. For appliances located within confined areas, follow the recommendations of the National Fuel Gas Code (ANSI Z223.1-1974) paragraphs 1.3.4.3 through 1.3.4.6. Check any ducts for obstructions and other unsafe conditions.

(xi) Shut off electricity to the heating appliance. Determine that all electrical wiring at the appliance has no loose connections, charred insulation, cracked or worn insulation, and potential shorting to ground. Determine that fuses and circuit breakers are of correct size and that wires are of correct size for the appliance. Turn electricity back on.

(xii) Determine that all appliance burners and gas manifolds are not blocked or corroded. Determine that the burner is properly aligned and shows no evidence of burner misalignment and in particular no evidence of hot spots on the heat exchanger.

(xiii) Applicable only to furnaces: Determine that the heat exchanger has no cracks, openings, leakage deposits, excessive corrosion, and/or evidence of excessive hot spots. Determine that the recirculating air section of the appliance has no flammable materials, or materials that could emit toxic fumes on being heated.

(xiv) Applicable only to boilers: Determine that there is no evidence of water or combustion product leaks.

(xv) Insofar as is practicable, close all building outside doors and windows. Turn on all exhaust fans (range hood, bathroom exhausts, etc.) so they will operate at maximum speed. Turn on any clothes dryers vented to the outside. Do not operate summer exhaust fans. Make certain that any fireplace(s) is not operating. Close fireplace dampers.

(xvi) For the following vent system checks, the worst venting conditions that may reasonably exist should be duplicated. The worst venting conditions exist when the space occupied by the heating appliance is at the lowest pressure. If there are exhaust fans in the same room as the heating appliance, or if there are no exhaust fans in the residence, the lowest pressure will probably occur when the doors to other spaces of the building are closed. If there are exhaust fans in other rooms, the pressure will probably be lowest when doors connecting these rooms with the heating appliance space are open. Based on these considerations, open or close doors to other spaces of the building as required to produce the lowest pressure in the space occupied by the heating appliance. If it is not known which condition results in the lowest pressure, perform sections (xvi) through (xx) twice—once with doors to other spaces of the building open and once with the doors closed. After the appliances have been off for at least 30 minutes, turn on the gas to the appliance being inspected and place it in operation. Follow the appliance manufacturer's lighting instructions. Adjust the comfort thermostat for continuous, full-burner appliance operation.

(xvii) Test for spillage at the draft hood relief opening at 2 minutes of main burner operation. This short time is necessary if the test is to simulate a reasonably severe condition. Use a device that will produce unpressurized flame or smoke, such as a match flame or cigarette smoke. Considerable care must be used to determine if flow is in or out of the draft hood. Adequate lighting must be provided for observation and the flow through all areas of the draft hood opening(s) must be carefully observed. After testing for spillage at the heating appliance draft

hood, also test for spillage at other draft hoods connected to the same vent.

(xviii) Shut off the main burner and let the appliance cool for at least 15 minutes.

(xix) Turn on all other fuel-burning appliances that are within the same room or that are connected to the same vent so they will operate at their full inputs. Turn on the appliance being inspected so that it will operate at its full rated input.

(xx) Repeat (xvii).

(xxi) At 5 minutes of main burner operation, measure the flue gas temperature and carbon monoxide (CO) concentration at a point one inch before the inlet to the draft hood at the center of the flue passage(s). This temperature should be at least 200°F. This temperature is necessary to limit condensation within the vent. This temperature should also be less than 550°F, the vent damper maximum design temperature. The maximum carbon monoxide concentration should be 0.04 percent (400 ppm), as permitted for new heating appliances. If the heating appliance is equipped with flame modulation, rerun the minimum (200°F) flue gas temperature test and the CO test at the lowest flame conditions.

(a) For installation of thermally-actuated vent dampers only: Measure the temperature at the center of the vent connector six inches after the outlet of the draft hood. The vent gas temperature must be at least 370°F but less than 550°F. The damper design has been tested for flow restriction at 370°F.

(b) For installation of electrically-operated or mechanically-actuated vent dampers only: If the vent damper is not installed with a redundant gas valve, it must be equipped with a damper-closing temperature control, and the temperature at the center of the vent connector six inches after the outlet of draft hood must be measured. This damper-closing temperature control is intended to keep the damper open whenever the main burner is operating even if there is a malfunction and the comfort thermostat is not calling for heat. The vent gas temperature must be more than 375°F under normal conditions to ensure that the damper-closing temperature control will function properly (i.e., keep the damper open) under an abnormal condition of restricted fuel gas input. If the vent gas temperature at full output is not above 375°F, do not install a vent damper with a damper-closing temperature control.

(xxii) Return doors, windows, exhaust fans, fireplace dampers, and other appliances to their previous conditions of use.

(xxiii) Determine that the pilot(s) is burning properly and that main burner ignition is satisfactory by turning the main power supply switch for the main power supply switch for the heating appliance off and on. Test the pilot safety device to determine if it is operating properly by extinguishing the pilot burner(s) when the main burner is off and determine that the main gas valve does not open upon a call for heat beyond the safety shut off time specified by the automatic gas ignition device manufacturer. If this time is not known, a safety shut off time of one minute must be met. Relight the pilot(s) after this time check.

(xxiv) Applicable only to furnaces: Check both the limit control and the fan control to determine that they operate within the heating appliance manufacturer's specifications.

(xxv) Applicable only to hot water boilers: Test low-water cutoffs, automatic-feed controls, high-pressure limit controls, high-temperature-limit controls, relief valves, water pumps, and the circulating system to determine that they are operating within the manufacturer's specifications.

(J) General Installation Procedure.

(i) The general installation procedure is to be used in conjunction with installation instructions supplied by the automatic vent damper manufacturer to aid in safely installing a vent damper on an existing appliance. At any point, if it is determined *[sic.]* that there is a condition that could result in unsafe operation of the heating system, the appliance must be shut off, the owner and authority having jurisdiction informed of the necessary repairs, and the repairs made before continuing with the installation.

(ii) Ensure that the damper manufacturer has supplied an interconnection or wiring diagram which matches the wiring configuration found on the appliance on which the damper is to be installed. Determine that the heating system and vent damper are listed and approved models. Ensure that the damper and other materials are in good condition and free of damage resulting from shipping or other causes, and ensure that all parts are included. Determine if the vent damper includes a damper-closing temperature control. On any damper with electrical connections ensure that the required voltage of the damper is compatible with the voltage of the control circuit of the heating appliance. Determine that the heating appliance automatic gas valve does not have a manual

override feature which would permit operation of the heating appliance while the damper is in the closed position, or while any damper safety system is not operational. If a valve with such an override feature is found, the manual override feature must be removed or the valve replaced before proceeding with installation of the damper. NOTE: For installation of mechanically-actuated vent dampers only: Determine that the range of available motive force (gas pressure, water pressure, etc.) is within the vent damper manufacturer's specified operating range.

(iii) Shut off all gas and electricity to the heating appliance. To shut off the electricity, use the main power switch for the heating appliance.

(iv) Install the automatic vent damper in strict accordance with the manufacturer's installation instructions. Make certain that the damper is located in the portion of the venting system that serves only the appliance on which the damper is being installed, and that the damper is between the appliance draft hood and the first branch (if any) in the vent system. The vent damper must be installed after the draft hood and the chimney. If the damper is equipped with a damper-closing temperature control, or is a thermal damper, the damper must be located within three diameters of the draft hood. The inlet size of the vent damper must not be less than the outlet size of the draft hood. Do not add any components (such as relays) not specified by the vent damper manufacturer.

(v) Determine that the vent system is adequately supported to hold the additional weight of the vent damper without sagging. This may require band iron straps attached overhead and/or self-tapping screws at each joint. Visually inspect the modified venting system for proper horizontal pitch (not less than 1/4-inch/foot).

(vi) For installation of electrically-operated or mechanically-actuated vent dampers only: If the vent damper is not equipped with a damper-closing temperature control, an additional approved automatic gas valve must be installed in accordance with the vent damper manufacturer's installation instructions. This gas valve is intended to shut off gas flow if the other gas valve should fail to close completely. It may be either an additional valve (without pilot features) located in the gas line between the existing valve and the main burner, or a replacement valve that includes two main gas valves within a single unit. Follow the vent damper manufacturer's instructions. After installing a new gas valve, purge air from the affected gas lines and conduct a gas leakage test of the appliance piping and control system downstream of the shut-off valve in the supply line to the appliance.

(vii) Make sure electrical connections are tight and wires are clear of high-temperature locations and properly supported. Route wires to minimize the possibility of their being damaged. All wiring must meet the requirements of all applicable codes and regulations. As a minimum, wiring must meet the requirements of the National Electrical Code, NFPA 70-1975.

(K) Post-Installation Procedure.

(i) This post-installation procedure is to determine that the automatic vent damper is properly installed and that the retrofitted system is in a safe condition for use. At any point, if it is determined that there is a condition that could result in unsafe operation of the heating system, the appliance must be shut off, the owner and authority having jurisdiction informed of the necessary repairs, and the repairs made before continuing.

(ii) Turn on electrical power to the heating appliance [*sic.*].

(iii) For installation of electrically-operated or mechanically-actuated vent dampers only: By operating the furnace burner through the control circuit, determine that the damper operates properly and is correctly sequenced with the heating appliance's operating controls. The damper should be nearly open before the automatic gas valve(s) opens and the damper should remain open while there is a call for main burner operation. The automatic gas valve(s) should close when the damper begins to close. The automatic gas valve(s) and the damper should remain closed when there is no call for heat. The damper must open and close freely without evidence of interference or binding. Also determine that the automatic gas valve(s) and damper closes fully. NOTE: If a boiler automatic gas valve(s) is sequenced by an aquastat, determine that the damper has opened fully, or is nearly open prior to the opening of gas valve(s).

(iv) If the damper has electrical current requirements, determine the amperage draw of all the circuits served by the heating appliance transformer (including such items as thermostats, humidifiers, controls for electronic filters, the vent damper, etc.). Check the heating appliance transformer for adequate capacity. If the transformer does not have adequate capacity, it must be replaced.

(v) Check the setting of any heat anticipator in the comfort thermostat and readjust as necessary.

(vi) Insofar as is practical, close all building outside doors and windows. Turn on any exhaust fans (range hood,

bathroom exhausts, etc.) so they will operate at maximum speed. Turn on any clothes dryers vented to the outside. Do not operate summer exhaust fans. Make certain that any fireplace(s) is not operating. Close fireplace dampers.

(vii) For installation of thermally-actuated vent dampers only: For the following vent system checks, the worst venting conditions that may reasonably exist should be duplicated. The worst venting conditions exist when the space occupied by the heating appliance is at the lowest pressure. If there are exhaust fans in the same room as the heating appliance or if there are no exhaust fans in the residence, the lowest pressure will probably occur when the doors to other spaces of the building are closed. If there are exhaust fans in other rooms, the pressure will probably be lowest when doors connecting these rooms with the heating appliance space are open. Based on these considerations, open or close doors to other spaces of the building as required to produce the lowest pressure in the space occupied by the heating appliance. If it is not known which condition results in the lowest pressure, perform the work specified in sections (vi) through (viii) of this document twice—once with doors to other spaces of the building open and once with the doors closed. After the appliances have been off for at least 30 minutes, turn on the gas to the appliance on which the damper has been installed and place the appliance in operation. Follow the manufacturer's lighting instructions. Adjust the comfort thermostat for continuous full burner appliance operation.

(viii) For installation of electrically-operated and mechanically-actuated vent dampers only: Turn on the gas to the heating appliance and place it in operation. Follow the manufacturer's lighting instructions. Adjust the comfort thermostat for continuous, full-burner operation.

(ix) Test for spillage at the draft hood relief opening at 2 minutes of main burner operation. This short time is necessary to simulate a reasonably severe test. Use a device that will produce unpressurized flame or smoke, such as a match flame or cigarette smoke. Considerable care must be used to determine if flow is in or out of the draft hood. Adequate lighting must be provided for observation and the flow through all areas of the draft hood opening(s) must be carefully observed.

(x) For installation of thermally-actuated vent dampers only: If the appliance is equipped with flame modulation, repeat sections (vi) and (vii) at the lowest flame conditions.

(xi) Visually determine that main burner gas is burning properly and that there is no floating, lifting, or flashback. If the appliance is equipped with flame modulation, determine that proper main burner operation at low and high flame is maintained.

(xii) Determine that the pilot(s) is burning properly and the main burner ignition is satisfactory by turning the main power supply switch for the heating appliance off and on. Test the pilot safety service to determine that it is operating properly by extinguishing the pilot burner(s) when the main burner is off and determining that the main gas valve does not remain open upon a call for heat beyond the safety shut off time specified by the automatic gas ignition device manufacturer. If this time is not known, a safety shut off time no longer than 1 minute must be met. Relight the pilot(s) after this check.

(xiii) For installation of thermally-actuated vent dampers only: Cycle the heating appliance through at least three normal operating cycles. The damper must open and close properly without evidence of interference or binding. Determine that the damper closes fully. The damper may not close immediately with the thermostat but after a period of time, it should close.

(xiv) For installation of electrically-operated and mechanically-actuated vent dampers only: Cycle the heating appliance through at least three normal operating cycles. Determine that the damper is nearly fully open before the main burner gas flow begins and that the main burner gas flow stops as or before the damper begins to close. Damper must open and close freely without evidence of interference or binding. The damper must close fully. If the vent damper includes a damper-closing temperature control, the damper may not close immediately with the thermostat. Check this by operating the heating appliance for 10 minutes. Then lower the setting on the comfort thermostat to shut off the main burner gas flow. The damper should remain open for a period of time and then close. If the heating appliance is equipped with flame-modulation and the vent damper includes a damper-closing temperature control, operate the heating appliance for 10 minutes at the lowest flame conditions. Then reduce the comfort thermostat to shut off the main burner gas flow. The damper should remain open for a period of time and then close.

(xv) Applicable only to furnaces: If the furnace electrical circuit has been modified during vent damper



installation, check both the limit control and the fan control to determine that they operate within the heating appliance manufacturer's specifications.

(xvi) Applicable only to boilers: If the boiler electrical circuit has been modified during vent damper installation, test low-water cutoffs, automatic-feed controls, high-temperature-limit controls, water pumps, and the circulating system to determine that they are operating within manufacturer's specifications.

(xvii) For installation of thermally-actuated vent dampers only: Return doors, windows, exhaust fans, fireplace dampers, other appliances, and comfort thermostat(s) to their previous conditions of use.

(xviii) Fill in the label on the damper with the name and address of the installing company, the name of the individual installer, and the date of the installation.

(xix) Complete the verification-of-installation card supplied by the vent damper manufacturer and return this promptly to the manufacturer.

(xx) Leave the vent damper manufacturer's instructions in a conspicuous location near the heating appliance and advise the resident to read these instructions especially for observations to be performed by the resident.

(xxi) As required by codes and regulations, notify the appropriate authority that the installation has been completed and turn off the heating appliance until any required inspection is completed.

(10) The following applies to the installation of caulks and sealants:

(A) This standard applies to the on-site installation of caulks and sealants used to control rain water leakage and major air infiltration through building walls.

(B) Material selection, joint preparation, and installation procedures. The type of caulk or sealant chosen for a given application depends on the composition of the adjacent materials, temperature fluctuation, exposure to direct sunlight, width and depth of the crack or joint to be sealed, and movement in the joint. Select caulks and sealants, prepare the joint and substrata, and install the material in conformance with the following standards and provisions:

(i) Putty and Oil and Resin Base Types: ASTM C-797-75, Standard Recommended Practices and Terminology for Use of Oil- and Resin-Based Putty and Glazing Compounds.

(ii) Acrylic (Solvent Type) and Butyl Rubber: ASTM C-804-75, Standard Recommended Practices for Use of Solvent-Release Type Sealants.

(iii) Latex Sealing Compounds: ASTM C-790-74, Standard Recommended Practices for Use of Latex Sealing Compounds.

(iv) Chlorosulphonated Polyethylene, Polysulfide-Single Component, Polysulfide-Multi-Component, Polyurethane-Single Component, Polyurethane-Multi-Component and Silicone: Follow the provisions relating to application and use included in the applicable federal specifications.

(11) The following applies to the installation of solar swimming pool heater systems:

(A) Solar swimming pool heater systems using glazed flat plate collectors or a nonpotable heat transfer liquid to capture and transfer solar insolation, shall be constructed and installed in compliance with the applicable provisions of the HUD Intermediate Minimum Property Standards Supplement, Solar Heating and Domestic Hot Water Systems, 4930.2, 1977 Edition. Solar pool heater systems employing nonglazed collectors and the direct heating of recirculated pool water are exempt from the above HUD standards; however, must meet accepted industry installation standards (carpentry, plumbing, electrical, etc.), or as applicable, local codes.

(12) The following applies to the installation of passive solar systems:

(A) Passive systems will be installed in compliance with applicable local codes; to generally accepted industry standards of workmanship; and, as specified in the installer/customer contract until such time D.O.E. finalizes its passive solar rules and regulations.

*(Department of Commerce; Division of Energy; 55 IAC 3.1-4-3; filed Mar 28, 1984, 9:07 am; 7 IR 1183; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

## **ARTICLE 4. SOLAR ENERGY INCOME TAX CREDIT**

### **Rule 1. Active Solar Thermal Programs**

**55 IAC 4-1-1 Definitions**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 1. For the purposes of IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credits.*] and 55 IAC 4-1 these words and terms are defined as follows:

“Absorber” means that part of the solar collector that receives solar radiation and transforms it into thermal energy. It usually is a solar surface through which energy is transmitted to the transfer fluid; however, the transfer fluid itself could be the absorber in certain configurations.

“Active energy system” means any energy-producing system designed for the purpose of thermal conditioning of space and/or water, which utilizes solar devices thermally isolated from the living space to provide for collection, storage, and distribution and control of solar energy.

“Ambient air” means the outdoor air in the vicinity of the solar collector being tested.

“ASHRAE” means the American Society of Heating, Refrigeration Air Conditioning Engineers, Inc.

“Auxiliary or conventional energy equipment” means an energy system that depends upon any depletable fuel resource such as coal, wood, petroleum products, propane, natural gas, nuclear fuel, or any fuel type not specified by IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credits.*].

“Collector enclosure” means the structural frame which supports the components of the collector and protects internal components from the environment.

“Concentrating collector” means a solar collector which uses reflectors, lenses, or optical elements to concentrate the radiant energy passing through the aperture onto an absorber which has a surface area smaller than the aperture. Some collectors using concentrating elements also fit the definition of a flat-plate collector; thus, this document treats non-concentrating flat-plate collectors, concentrating flat-plate collectors, and concentrating tracking collectors.

“Concentrator” means that part of the concentrating collector which directs the incident solar radiation onto the absorber.

“Control subsystem” means that assembly of devices and their electrical, pneumatic or hydraulic auxiliaries that have the sole purpose of regulating the processes of collecting, transporting, storing and utilizing solar energy and providing for the safety of the occupants. It does not include those controls normally used for heating and cooling with conventional energy.

“Corrosion” means the deterioration of a substance or its properties caused by an electrochemical reaction with its environment.

“Cover plate” means the material or materials covering the aperture and most directly exposed to solar radiation. These materials generally are used to reduce the heat loss from the absorber to the surroundings and to protect the absorber.

“Crazing” means the development of minute surface cracks.

“Cross connection” means any physical connection or arrangement between two otherwise separate piping systems, one of which contains potable water and the other either water of unknown or questionable safety or steam, gas, chemicals or other substances whereby there may be a flow from one system to the other, the direction of flow depending on the pressure differential between the two systems.

“Delamination” means separation into constituent layers.

“Design life” means the period of time during which a system is expected to perform its intended function without requiring major maintenance or replacement.

“Double-wall heat exchanger” means a heat exchanger having two walls or interfaces which are physically separated from each other to prevent possible contamination of potable water resulting from any leak in either or both walls.

“Drain-back or drain-down” means a system in which the fluid in the solar collectors is drained from the system under prescribed conditions.

“Eligible cost” means those costs incurred in the installation of a qualified energy system for devices which are solely used for the collection, absorption, storage, distribution, and control of the qualified energy source.

“Evaporative cooling (with collectors)” means a space-conditioning system which accomplishes space cooling by evaporating water as it circulates through the collectors. The thermal energy is stored and later transferred to the interior of the building during the cooling period.

“Flat-plate collector” means a solar collector (either liquid- or air-circulating) in which the surface absorbing the incident radiation is essentially flat and employs no concentration. However, in 55 IAC 4 the term refers to all collectors designed to perform satisfactorily with all parts of the collector in fixed positions.

“Fpm” is an abbreviation for feet per minute.

“Freeze protection” means preventing damage from freezing of solar components by the most energy-efficient and/or cost-efficient method possible. Examples include, but are not limited to, using anti-freeze solutions and providing for manual or automatic draining of fluids to an inside reservoir, storage tank, or drain. Even with anti-freeze thermosiphoning can freeze indoor coils, etc.

“Gross collector area” means the maximum projected area of the complete collector module, including integral mounting means.

“Innovative equipment” means solar equipment which, due to its design, cannot be evaluated fairly and adequately by the test methods described in 55 IAC 4.

“Instantaneous efficiency” means the amount of energy removed by the transfer fluid over a given measuring period divided by the total incident solar radiation onto the gross collector area during the measuring period.

“Integrity of construction” means those physical and mechanical properties of the solar collector which collectively are responsible for the overall thermal performance and physical structure of the solar collector.

“Irradiance” means the rate of solar radiation received by a unit surface area in unit time in  $W/m^2$  (Btu/hr.ft<sup>2</sup>).

“Iwc” means an abbreviation of inches of water column and is normally used in measuring pressure drop of air flowing through ducts, coils, rock beds, etc. It is equivalent in pressure to the weight of the water column.

“KPa” means kilopascal, a metric measurement.

“Liquid storage” means that solar thermal storage which is liquid when a storage medium, but also refers to phase-change and thermochemical systems.

“Low pressure service hot water (SHW) and swimming pool solar collectors” means collectors which, by virtue of their installation, will not have a direct fluid interchange with an auxiliary heater or street-pressure supply. Heat transfer from such collectors to the service water system would be accomplished by use of an appropriate heat exchanger.

“MPQ” means manufacturer's pre-qualification certification.

“Manufacturer” means any individual, partnership, corporation, association, or other legal entity which manufactures, assembles or produces energy system components, or any person designated by the manufacturer as a distributor, sales or service representative.

“Manufactured solar collector” means any solar collector designed and reproduced for sale.

“Maximum allowable temperature” means the maximum temperature permitted in a system, and the basis for the temperature setting of the temperature-relieving devices protecting the system.

“Model” means a unit of solar equipment that is identifiable by a specified size, set of materials, and performance. A change in any of these basic characteristics constitutes a new model.

“NEC” means the National Electric Code.

“No-flow condition” means the condition that results when the heat transfer fluid does not flow through the collector array due to shut-down or malfunction, and the collector is exposed to the amount of solar radiation that it would receive under normal operating conditions.

“Non-combustible” means incapable of supporting combustion.

“Non-pressurized” means tanks that operate at atmospheric pressure at the liquid surface. They may be sealed with a simple liquid trap.

“Operation indicators” means lights or alarms that indicate when the system is on or off.

“Other solar collector” means solar collectors other than manufactured solar collectors. This definition includes, but is not limited to, user-built, custom-built, and site-built collectors not designed for reproduction and sale.

“Outgassing” means the generation of vapors by materials, usually during exposure to elevated temperature and/or reduced pressure.

“Pitting” means the process by which localized material loss is caused in materials or components by erosion, corrosion, or chemical decomposition.

“Plenum” means an air compartment to improve distribution of air through rock beds, air coils, distribution ducts, etc.

“Potable water” means water meeting the requirements of the public health service drinking water standards or the regulations of the public health authority having jurisdiction.

“Pre-qualified collector” means any solar collector which has successfully completed all quality and performance tests of the Solar Rating and Certification Corporation's (SRCC) Standard 100-81 or the SRCC equivalent; and has met all requirements for manufacturer's pre-qualification with the department of commerce.

“Pre-qualified system” means any active energy system which (1) utilizes pre-qualified collector(s); and (2) utilizes

components for which compliance with minimum standards set forth in 55 IAC 4-1-6, 55 IAC 4-1-7, and 55 IAC 4-1-8 has been demonstrated.

“Pressure drop” means static pressure loss in fluid pressure, as in one end of a conduit to the other due to friction.

“Psig” means pounds per square inch gauge.

“Pyranometer” means a radiometer used to measure the total solar radiation (direct, diffuse, and reflected) incident on a surface per unit time per unit area.

“Qualified energy device or system” means an individual device or a configuration of devices designed for the purpose of thermal conditioning for space and/or water, and which utilize an energy resource specified by IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credits.*].

“Radiant sky cooling (using collectors)” means a space-conditioning system that circulates fluid through the collectors during those hours which have the appropriate conditions for cooling (usually night or early morning). The thermal energy is stored and later transferred to the building exterior during the cooling period.

“Rated performance” means the solar equipment thermal output characteristics determined by tests specified in 55 IAC 4.

“Recommended” means provisions that are good practice but not required for qualification.

“Reflector or reflective surface” means a surface intended primarily for the function of reflecting radiant energy.

“Relief device” means a pressure-activated valve or rupture member designed to automatically relieve excessive pressure.

“Rock or pebble bed storage” means a common storage method for thermal energy in air systems.

“SBCCI” means Southern Building Code Conference International.

“Sensors” means devices used to sense individual parameters. Examples are, but are not limited to, pressure transducers, thermocouples, and flow meters.

“Similar model” means a collector model which varies from a laboratory-tested model only by variation in size. All other materials and design features must be identical in order to qualify as a similar model. A similar model may be certified based on test results and specifications for the laboratory-tested model.

“Site-dependent collector” means a collector intended to be assembled only at the site of its application. This may be because parts of the building (e.g., rafters insulation) are part of the collector or because the size of the collector makes pre-assembly impractical.

“Solar collector” means a device designed to absorb incident solar radiation, to convert it to thermal energy, and to transfer the thermal energy to a fluid coming in contact with it.

“Solar energy” means the energy originating from the sun's radiation primarily encountered in the wavelength region from 0.3 to 2.7 micrometers.

“Solar Rating and Certification Corporation (SRCC)” means a non-profit organization whose primary purpose is the development and implementation of certification programs and national rating standards for solar energy equipment.

“Standard” means a document which specifies the performance, durability or safety, requirements for a product.

“Storage media” means the storage material such as water, rock, anti-freeze, heat pipes, etc.

“Street-pressure solar collectors” means collectors which, by virtue of their installation in a municipal water system, will be directly subjected to variations in street water pressure and hot water tank pressure.

“Superficial flow rate” means, in rock and pebble storage bins, the flow rate divided by the cross-sectional area of the bin.

“Thermal shock” means a rapid change in temperature e.g., the resumption of circulation in a collector after the fluid present within it had reached stagnation temperature.

“Thermal storage” means the storage of energy (either positive or negative, i.e., hot or cold) by means such as rock, water, anti-freeze, phase-change products, etc.

“Thermosiphon action” means circulation of fluid by action of the change in density when the fluid is heated or cooled.

“Time constant” means the time required for the fluid leaving a solar collector to attain 63.2 percent of its steady state value following a step change in insolation or inlet fluid temperature.

“Toxic fluids” means gases or liquids which are poisonous, irritating, and/or suffocating.

“Transfer fluid” means a medium such as air, water, or other fluid which passes through or in contact with the solar collector and carries the thermal energy away from the collector.

“Transparent frontal area” means the projected area of that part of the collector designed to transmit incident solar energy to the interior of the collector.

“U.L. listing” means having undergone testing by Underwriters Laboratory, which is an agency established to test and approve electrical appliances, wire, and other electrical equipment.

“Warranty” means a minimum warranty which most manufacturers provide for one year against defect in material and workmanship. (*Department of Commerce; 55 IAC 4-1-1; filed Jan 15, 1982, 12:35 pm: 5 IR 336; filed Mar 16, 1984, 3:40 pm: 7 IR 1211; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-1-2 Tests required for manufactured solar collectors**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 2. All manufactured solar collectors must undergo the following quality and performance tests in order to receive a pre-qualification [*sic.*] certificate. This requirement pertains to glazed and unglazed flat-plate liquid collectors; air collectors; dual-axis parabolic collectors, linear tracking concentrating collectors; and vacuum-tube collectors. Special exceptions are denoted by “\*”. The collector must be tested according to the following sequence, which is identical to the Solar Rating & Certification Corporation's (SRCC) Standard 100-81, to qualify according to IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*]:

- (1) receiving inspection;
- (2) static pressure test;
- (3) thirty day exposure (“no-flow” or “stagnation”) test;
- (4) thermal shock/water spray test;
- (5) thermal shock/cold fill test;\*
- (6) static pressure test;
- (7) collector time constant determination test;
- (8) thermal performance test;
- (9) incident angle modifier test;\*\*
- (10) disassembly and final inspection.

\*Not required for air collectors.

\*\*Two incident angle modifier tests are required for dual-axis parabolic and vacuum-tube collectors: both for north/south and east/west orientation, based on total irradiation. (*Department of Commerce; 55 IAC 4-1-2; filed Jan 15, 1982, 12:35 pm: 5 IR 339; filed Mar 16, 1984, 3:40 pm: 7 IR 1216; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-1-3 Performance tests for manufactured solar collectors**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 3. Each of the tests listed in 55 IAC 4-1-2 for manufactured solar collectors shall be performed in accordance with the following standards: (a) Manufactured solar collectors. Manufactured solar collectors shall have testing performed in the following sequence:

- (1) Receiving inspection: Upon receiving a collector for tests, the test laboratory shall inspect and document the condition of the collector.
- (2) Static pressure test: A static pressure test shall be conducted prior to exposure testing as follows on street pressure collectors, low-pressure service hot water (SHW) and swimming pool solar collectors, hybrid and alternate fluid solar collectors.
  - (A) The basis of test pressure shall be:
    - (i) 1100 kPa gauge (160 psig) for street pressure collectors. This standard is based on two (2) items:
      - (AA) Two (2) times the allowable street gauge pressure 550 kPa gauge (80 psig) in a dwelling (SBCCI, Plumbing Code, Sec. 1213.9); and
      - (BB) The test pressure exceeding the required P-T valve relief setting on approved hot water tanks, which is 1030 kPa gauge (150 psig).
    - (ii) Collectors specified for positive operating pressure less than street pressure 550 kPa gauge (80 psig) will be pressure-tested at one and one-half (1 1/2) times the manufacturer's rated operating gauge pressure, but a minimum of 170 kPa gauge (25 psig).
    - (iii) Collectors specified for operating pressures greater than 550 kPa gauge (80 psig) will be pressure tested at

one and one-half (1 1/2) times the manufacturer's rated operating gauge pressure or 1100 kPa gauge (160 psig), whichever is greater.

(iv) Collectors specified for operating at atmosphere pressure or below will be pressure tested at the discretion of the test director, but at no greater than 170 kPa gauge (25 psig).

(B) Method of pressure testing shall be either hydrostatic or pneumatic pressure sources may be used on liquid filled collectors. (Pneumatic pressure sources will be used for air collectors.)

(i) Liquid collector pressure test procedures is as follows:

(AA) A pressure gauge will be attached to read pressure at the exit port of the collector, the collector completely filled with unheated fluid, and the exit port closed off.

(BB) Hydraulic pressure will be applied via the inlet port until the gauge indicates the test pressure.

(CC) After stable test pressure has been achieved, the exit port shall be closed and the pressure shall be monitored for fifteen minutes.

(ii) Air collectors pressure test procedure is as follows:

(AA) A pressure tap, pipe, or tubing will be sealed into the exit port of the test specimen and connected to a manometer which can be read directly to 2.5 Pa (0.01 inches water column) or to a pressure gauge of equivalent accuracy. An air volume meter, accurate to within 142 cm<sup>3</sup> (±0.5 cubic feet) shall be placed in the air supply system between the supply source and the collector.

(BB) Apply pressure via the inlet port of 125 Pa (0.5 inch water column) and monitor pressure for one hour. The volume of air added or removed in order to maintain the required pressure shall be documented.

(3) Exposure test. The purpose of this test is to verify integrity of construction after at least thirty (30) days of exposure to adverse conditions. (Note: There presently exist no correlations between real-time and accelerated aging; such correlations need to be established to properly quantify the results obtained from this short-term test.) The exposure method of testing shall be as follows:

(A) Liquid collectors shall be filled completely with clean liquid, following which the liquid shall be allowed to gravity-drain for fifteen (15) minutes with the collector mounted at a 45° tilt angle. The collector inlet and outlet shall be loosely sealed.

(B) Exposure conditions shall consist of thirty (30) days of cumulative exposure to a minimum daily incident solar radiation flux of 17,000 (kJ/m<sup>2</sup>.day) or 1,500 (BUT/ft<sup>2</sup>.day [*sic.*, BTU/ft<sup>2</sup>.day]) as measured in the plane of the collector aperture. The exposure conditions shall include at least one consecutive four-hour period with a minimum instantaneous flux of 950 W/m<sup>2</sup> pr (300 BTU/ft<sup>2</sup>.hour).

(C) The average baseline ambient temperature shall be 27.0°C (80°F) or higher during the four-hour period.

(D) Data recorded and reported during exposure testing shall include integrated daily solar radiation data. A regularly scheduled weekly visual inspection shall also be made, and record of changes in the physical appearance of the collector shall be kept.

(4) Thermal shock/water spray test. The thermal shock/water spray test shall be performed during a five (5) minute period on three (3) different days of the exposure tests. The collector shall be subjected to heavy spray from above or in front of the collector. Spray testing shall be conducted after at least one (1) hour of direct sun (minimum 850 W/m<sup>2</sup>) (270 BTU/ft<sup>2</sup>) and within two (2) hours of solar noon. These three (3) spray tests shall be conducted during the last ten (10) days of the exposure test. Water delivery shall be at a rate not less than 20 mL per minute per square meter of collector (1.8 gallons/ft<sup>2</sup>.hour) (2.9 inches of rainfall per hour), with the spray pattern designed to wet the surface that would be wet during a normal rain shower. Temperature of the water shall be 24 ±5.0°C (75 ±10°F) during the spray test. The procedure of NBSIR 1305A, test 7.3, shall be used.

(5) Thermal shock/cold fill test. The thermal shock/cold fill test shall be performed to the following specifications:

(A) At one (1) time during the test sequence the unfilled collector will be exposed to full sun, not less than 950 W/m<sup>2</sup> (300 BTU/ft<sup>2</sup>), for one (1) hour. While the collector is still so exposed, liquid will be circulated through the collector for five (5) minutes at a flow rate of approximately 15 mL per minute per square meter of collector (1.5 gallons/hour.ft<sup>2</sup>). The temperature of the entering liquid shall be 24°C ±5.0°C (75 ±10°F) during this test. The procedure of NBSIR 1305A, test 7.4, shall be used.

(B) Solar collectors may be certified without the thermal shock/cold fill if their designs are such that cold refill of a hot collector is not allowed. This statement must be made by the manufacturer and shall be included in the certification document.

(6) Second static pressure test. A second static pressure test following the provision of the previous section on static pressure test shall be conducted after exposure and prior to thermal performance testing.

(7) Collector time constant. A time constant test will be conducted to determine the time required for the outlet fluid temperature to attain 63.2 percent of its steady state value following in a step change in the input. The test method used will conform to the method described in the ASHRAE Standard 93-77, "Method of Testing to Determine the Thermal Performance of Solar Collectors".

(8) Thermal performance test. A thermal performance test will be conducted on those collectors that have passed the requirements of the preceding sections and for which the collector time constant has been determined. The thermal performance test determines "instantaneous" efficiency of the solar collector over a wide range of operating temperatures. Efficiency is defined as the ratio of collected energy to the available energy falling upon the entire collector area. Collected energy is determined by the produce of fluid mass flow, specific heat and integrated temperature gain across the collector. Available energy is determined by the integrated solar irradiance. Typically, four (4) data points of at least five (5) minute duration are taken at each of four (4) different inlet fluid temperatures. For unglazed collectors, the inlet fluid temperatures include test temperatures below and above ambient air temperature. Glazed collectors are normally tested over a range of inlet fluid temperatures from near ambient to approximately 70°C (126°F) above ambient temperature. The test method used for glazed collectors shall conform to the ASHRAE Standard 93-77. The test method for unglazed collectors shall conform to the ASHRAE Standard 96-80, "Methods of Testing the Thermal Performance of Unglazed Flat Plate Liquid Type Solar Collector". Any deviation from this standard will be delineated in the test report.

(9) Collector incident angle modifier. The performance curve for a collector is determined when the insulation incident on the collector is within 30 degrees of normal to the aperture [*sic.*] of the collector. To predict collector performance of a wide range of conditions, tests will be conducted to determine the collector incident angle modifier. This is used to modify the efficiency curve (determined within 30 degrees of normal incidence) to account for changes in performance as a function of the sun's incident angle. The test method used will conform to the ASHRAE Standard 93-77 or ASHRAE 96-80. Biaxial incident angle modifiers are required on collectors which are nonsymmetrical in their response to irradiance as solar altitude and azimuth change.

(10) Disassembly and final inspection. After exposure and performance testing, the collector shall be disassembled [*sic.*]. Conditions that may lead to abnormally short collector life will be justification for denying qualification of a manufactured solar collector.

(b) Innovative and site-dependent collectors.

(1) Innovative equipment. solar collectors which cannot be tested by the standard test sequence of ASHRAE 93-77 or ASHRAE 96-80 will be evaluated using case-specific procedures developed or adopted by the SRCC and intended to provide comparable results to ASHRAE testing.

(2) The basis for certifying site-dependent collectors shall be testing and evaluating a sample collector not less than two (2) square meters (22 ft<sup>2</sup>) in area. The sample collector shall be typical of an installed collector in absorber plate materials and finish, supporting materials enclosing the absorber, manifolding or absorber plate and treatment and cover plate material attachments.

*(Department of Commerce; 55 IAC 4-1-3; filed Jan 15, 1982, 12:35 pm: 5 IR 340; filed Mar 16, 1984, 3:40 pm: 7 IR 1216; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 4-1-4 Design and construction standards for manufactured solar collectors**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 4. The following criteria represent the requirements for durability in collector design and construction. (a) Cover Plate: All glass cover plates must be of a nonshattering or tempered type.

(b) Condensation: The collector shall be designed to prevent condensate build-up. The use of desiccants to control condensation will be permitted. The test report shall note any unusual condensate build-up.

(c) Pressure test results

(1) After testing, a liquid-circulating collector shall be considered passable if:

(A) a loss of pressure does not occur,

(B) there is no evidence of fluid leakage, and

(C) there is no evidence of fluid path deterioration (swelling, stretching, etc.).

(2) After testing, an air-circulating collector shall be considered passable if there is no evidence of fluid path deterioration (swelling, stretching, etc.).

(d) After the thermal shock/water spray: The collector structure and performance shall not be degraded by moisture penetration. There shall be no cracking, crazing, warping, or buckling, of the cover plate.

(e) Exposure test results: The test shall be terminated if it is apparent without collector disassembly that the unit no longer meets the quality requirements of the following section.

(f) After exposure and performance testing, the collectors shall be disassembled. Conditions that may lead to abnormally short collector life will be justification for denying pre-qualification. The conditions are as follows:

(1) Severe deformation\* of the absorber.

(2) Severe deformation\* of the fluid flow passages.

(3) Loss of bonding between fluid flow passages and absorber plate.

(4) Leakage from fluid flow passages or connections.

(5) Loss of mounting integrity.

(6) Severe corrosion\* or other deterioration caused by chemical action.

(7) Crazing, cracking, blistering or flaking of the absorber coating or delamination of reflective surfaces.

(8) Retention of water in the insulation.

(9) Swelling, severe outgassing or other detrimental changes in collector insulation which adversely affect collector performance.

(10) Cracking, loss of elasticity, or loss of adhesion of gaskets and sealants.

(11) Leaking or damage to hoses inside the collector enclosure or leakage from mechanical connections.

(12) Cracking, crazing, permanent warping or buckling of the cover plate.

(13) Cracking or warping of the collector enclosure materials.

\*Deformation or corrosion shall be considered severe if it impairs the function of the collector or there is evidence that it will progress. (*Department of Commerce; 55 IAC 4-1-4; filed Jan 15, 1982, 12:35 pm: 5 IR 342; filed Mar 16, 1984, 3:40 pm: 7 IR 1218; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

## **55 IAC 4-1-5 Minimum standards for other solar collectors (Repealed)**

Sec. 5. (*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

### **55 IAC 4-1-5.1 User-built and custom-built solar collector standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 5.1. (a) The following standards apply to solar collectors which are user-built or custom built, or are otherwise not appropriately categorized as a *[sic.]* “manufactured” solar collectors.

Demonstration of compliance with this section shall be provided by the builder of the system. A thirty (30) day no-flow test followed by a disassembly and final inspection must be conducted in order to meet performance and durability requirements of this section. Additionally, specifications for materials used in the collector must be provided, as well as verification that the collector has been installed in accordance with local building codes and safety standards.

(b) Safety/construction standards.\* (1) Cover plates.

Cover plates shall comply with standard building codes for wind, weight, snow and line loads.

Cover plates shall be in compliance with standard building codes for safety standards. Glass materials must be of a tempered type; plastic materials must be of non-shattering type.

(2) Enclosures.

The collector enclosure materials must be of materials which comply with local building codes as well as state and federal fire and safety standards.

The collector enclosure shall be constructed of noncombustible materials (e.g., metal) or of combustible materials provided the combustible material is completely insulated from the high temperatures inside the collector.

Note: Long-term exposure (years) of wood to temperatures above 212°F can result in auto-ignition of wood.



(3) All components.

All collector components exposed to high temperature areas of the collector (i.e., in contact with the absorber or receiving direct solar radiation within the collector) shall be noncombustible or have a flame-spread rating not exceeding twenty-five (25) and a smoke-development rating not exceeding fifty (50), when tested in accordance with ASTM E 84-80, unless it can be shown that temperatures in the collector will not exceed 200°F.

Transmission losses due to outgassing. Outgassing of volatiles that will reduce collector performance below specified design values shall not occur when the collector is exposed to the temperature and pressure that will occur in actual service.

All gaskets, caulking, and sealants must be capable of withstanding the theoretical design temperature of the collector.

(c) Performance/durability standards. The collector must be constructed of materials capable of withstanding temperatures experienced during a minimum of thirty (30) days under a no-flow condition (minimum insolation: 1500 BTU/ft<sup>2</sup>/day).

Following the thirty (30) day exposure and subsequent disassembly, the following conditions shall be noted:

(1) Cover plates. (A) Cover plates must resist clouding, cracking, warping, discoloration and buckling when exposed to direct clear-sky radiation in a "no-flow" condition for a minimum of thirty (30) days.

(B) Cover plates shall not expand and contract excessively causing structural deformation during the day or leakage during the night.

(C) Reflective surfaces must not develop cracking or delamination due to high temperature.

(D) Condensation formed on the underside of the cover plate(s) shall not reduce its transmittance during its design life to a degree that would affect the performance as declared in disclosure statement form.

(E) The cover plate(s) under normal weather conditions shall not, with normal maintenance, collect or retain dirt to an extent that would reduce its ability to transmit sunlight to a degree that would substantially affect the performance of the collector.

(2) Absorber plates. (A) Paint or coating material shall be capable of withstanding the above-mentioned condition without developing flaking or change in color.

RECOMMENDATION: Glazed collectors can reach, (depending on the design temperatures) up to 400°F. All coatings should be capable of withstanding the design temperature of the collector.

(B) Separation between the fluid-flow passage and the absorber plate should not become greater due to temperature stress.

(C) The absorber plate should not develop any evidence of thermal-bonding material leakage when exposed to the above-mentioned temperature conditions.

(3) Enclosure. The collector enclosure must not warp or deviate to the extent that gaps can exist between the enclosure and any gasketing or glazing material when being exposed to the above temperature conditions.

(4) Insulation. (A) Insulation shall not show evidence of swelling, oozing, charring, or expanding to the extent that it will affect the performance of the collector.

(B) Insulation shall not outgas into the collector, causing clouding of the cover plate or emittance of toxic odors.

Note: Insulation should be capable of withstanding the theoretical design temperature of the collector. (*Department of Commerce; 55 IAC 4-1-5.1; filed Mar 16, 1984, 3:40 pm: 7 IR 1219; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-1-6 Qualification for income tax credit**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 6. To be eligible for Indiana income tax credit, active solar heating and cooling systems including solar water heating systems shall meet the following requirements: (a) All components (including heat exchangers, pumps, piping, fans and ducts) shall be sized to carry the heat transfer fluid at design flow rates without significant operational impairment or corrosion. Consideration should be given to minimizing pressure drops and fluctuations.

(b) Over-temperature and over-pressure protection shall be provided to maintain the system within the temperature and pressure operating limits as required by the design.

(c) A means shall be provided to isolate the solar system for servicing or emergencies. Such isolation shall not interrupt service from conventional heating and cooling systems; no section shall be allowed to be isolated from a pressure-relief device where hazardous or damaging pressures may occur.

(d) The system components and assemblies shall include adequate provisions for the thermal expansion of heat transfer fluids, thermal storage fluids, and system components.

(e) Means shall be provided to prevent undesired escape of the thermal energy from storage through thermosiphoning action.

A damper in a primary solar duct system shall have felt blade edges or be otherwise treated to ensure a tight cut-off of the air stream.

(f) Incompatible materials shall be isolated or treated to prevent degradation.

(g) System components containing liquids shall be protected from freeze damage. Systems which use potable water as the heat-transfer fluid, or any fluid mixture not formulated to resist freezing at a temperature of -25°F., or integrated collector/storage systems (“batch” or “breadbox” water-heaters) shall include:

(1) Manual isolation and drain-down features for the solar loop. Vacuum relief must be assured and drainage plumbing standards observed.

RECOMMENDED automatic freeze-protection measures include: A thermostatically-controlled electrical element in the collector/storage tank, and thermostatically-controlled heat tapes on all plumbing exposed to unheated space may be used; power capacity and thermostat setting of these controls must be sufficient to prevent freeze damage from occurring.

Alternatively, passively-actuated automatic drain-down protection may be used (i.e., a “normally-open, spring-actuated” valve and controller system).

(2) Adequate system features must be included, and system user operation assured to preclude the possibility of damage to the system or the building through the freezing of a filled solar loop or the stagnation of a drained solar loop. Details of these features, and owner's instructions, must accompany the application for tax credit.

(h) Heat exchangers used for transfer of heat between the potable water system and heat transfer or thermal storage fluids shall meet local building and/or plumbing codes for protection of potable water from contamination.

RECOMMENDATION – According to normal practice when using toxic fluids in heat transfer with potable water, the potable water system should be protected with a “double-wall heat exchanger”.

(i) The system shall be designed so as to eliminate any hazard to the building or occupants during normal or abnormal system operating conditions.

(j) Overload and overcurrent protection of electrically-operated components shall be consistent with the maximum current rating of the device and with provisions of the National Electrical Code, and National Fire Protection Administration (NFPA) Code 70 and all Indiana building codes.

(k) Collectors, tanks, pumps, valves, regulating orifices, pressure regulators, heat exchangers, piping, hoses and other components shall be capable of operation within design pressures and design temperature ranges without significant deterioration.

(l) The system shall be able to withstand prolonged periods of stagnation (high solar flux, low demand) without significant system deterioration and with no maintenance. This includes conditions encountered during loss of electric power to the system.

(m) Components or materials shall not be affected by exposure to sunlight to an extent that will significantly impair their function during their design life.

Note: Components often utilized with a solar energy system which do not qualify for tax credit include air-source heat pumps and wood-burning devices. When utilized in an active-solar thermal system, a liquid- or water-source heat pump, or a heat pump circulating its refrigerant charge directly through collectors, may qualify for tax credit under this section. (*Department of Commerce; 55 IAC 4-1-6; filed Jan 15, 1982, 12:35 pm: 5 IR 343; filed Mar 16, 1984, 3:40 pm: 7 IR 1220; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-1-7 Storage sub-system standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 7. For the purposes of IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*] thermal storage sub-systems shall meet the standards listed below. (a) Thermal storage in air-circulating systems:

(1) Heat-storage media and thermal storage container materials, including any interior protective coatings, shall not impart toxic elements to air distributed to areas of human occupancy (e.g., rocks containing asbestos must not be used due to the potential carcinogenic hazard).

(2) Rocks and pebbles shall be washed free of particulate matter and organic material prior to placement in the storage enclosure.

(3) Materials exposed to the air passage shall be noncombustible or have a flame spread rating not exceeding twenty-five (25) and a smoke development rating not exceeding fifty (50), when tested in accordance with ASTM E 84-80, unless it can be shown that temperatures in the thermal-storage sub-system will not exceed 200°F.

EXCEPTION: In one- and two- family dwellings, materials not meeting the criteria of (3) above may be used when smoke detectors approved for duct installation are installed which, when actuated, stop all air flow through the storage device and sound an alarm. Minimum sensitivity of approved smoke devices shall be set to operate when smoke reduces the intensity of a one (1) foot long beam of white light by four (4) percent or the equivalent.

(4) Where storage units are located outside or underground, they shall be protected against the intrusion of water.

(5) Rock bins shall have a plenum at both their inlet and outlet.

(6) Insulation of a storage container shall have a minimum thermal resistance of  $R = 12$  when within the insulated shell of the building or  $R = 30$  when outside the insulated shell of the building.

(b) Thermal storage in liquid-circulating systems:

(1) Pressurized tanks shall be leak-tested after installation, except when the tank contains markings to indicate prior testing has been accomplished. If testing is required, the test pressure shall be 1.5 times the maximum allowable pressure. Non-pressurized tanks shall be tested visually for leaks by filling.

(2) Potable water systems shall be protected from make-up water cross-connection to the solar energy storage system in accordance with the requirements of local plumbing codes.

(3) All openings into tanks, except vents, shall be tightly covered and secured in place. Vents shall be screened with corrosion-resistant material having not less than twenty (20) openings per linear inch, or shall be otherwise protected.

(4) Non-pressurized tanks connected to a make-up water system shall have overflows directed to an approved point of disposal. Make-up water piping from the potable water systems shall be connected as required in local plumbing codes.

(5) The liquid solar energy storage system shall be capable of being emptied.

(6) Shutoff valves shall be provided between the supply system and cold- and hot-water storage tanks.

(7) Insulation of a storage container shall have a minimum thermal resistance of  $R = 12$  when within the insulated shell of the building or  $R = 30$  when outside the insulated shell of the building.

(8) Insulation of an integrated collector/storage unit shall have a minimum thermal resistance of  $R = 16$ , except for the collector aperture, which shall be triple-glazed at minimum.

RECOMMENDATION: Manual or automatic collector covers should be used, to minimize heat-loss during periods of inadequate insolation, for freeze protection, and as protection against collector stagnation when drained, under certain conditions.

(c) Recommended practices for thermal storage sub-systems;

(1) One to two gallons of water or 1/2 to 1 cubic foot of pebbles per square foot or *[sic.]* collector area should normally be allowed for solar hot water and space heating applications.

(2) The superficial flow rate through the rock bin should be between twenty (20) and thirty (30) fpm at a minimum pressure drop of 0.10 iwc and a maximum drop of 0.38 iwc depending on available fan power.

(3) Insulation should be installed per manufacturers recommendations for the application.

(4) Means should be provided to prevent any undesired loss of thermal energy from storage through thermosiphon action during shut down.

(5) Closed storage tanks should be designed to withstand vacuum-induced pressures or should provide controls to prevent it.

(6) Solar components that are to be buried in soils should be protected against degradation.

*(Department of Commerce; 55 IAC 4-1-7; filed Jan 15, 1982, 12:35 pm: 5 IR 344; filed Mar 16, 1984, 3:40 pm: 7 IR 1222; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

#### **55 IAC 4-1-8 Control sub-system standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 8. (a) The following conditions shall be prevented either by inherent design features or by equipping the system with the necessary controls.

(1) Standards pertaining to manufacturer.

(A) Damage resulting from thermal shock shall be prevented.

(B) Manufactured electrical devices shall be U.L. listed; for innovative and custom-fabricated equipment not so listed, a complete schematic diagram and description shall be included in the application, for individual evaluation.

- (2) Standards pertaining to installation.
  - (A) Wiring of the control circuit shall be in conformity with all local code requirements and in accordance with the National Electrical Code.
  - (B) Control circuit wiring and terminals shall be identified and marked or color coded so the wires can be readily traced.
  - (C) The wiring, pneumatic lines and/or other means for transmitting sensor outputs to control devices shall be protected from damage or from introducing false signals as a result of environmental or system operating conditions.
- (b) Recommended practices for solar control sub-systems may pertain to either manufacture or installation.
  - (1) System controls should include provisions for by-pass, adjustment, or override of manual or automatic controls as is required to facilitate installation, startup, operation, shutdown, and maintenance.
  - (2) Operation indicators should allow an observer to determine readily that the system is operating.
  - (3) Control sensors should be protected from environmental influence such as wind, moisture, temperature, etc. that might alter their intended function.
  - (4) Closed storage tanks should be protected against damage from vacuum-induced pressure or should be designed to withstand it.
  - (5) Systems using liquid heat-transfer fluids should provide suitable means for air or gas removal from points in the piping system where air is most likely to accumulate.
  - (6) All switches and controls should be clearly identified as to function.
  - (7) Aluminum wiring should not be used.
  - (8) Controls should be placed in the correct environment as specified by the manufacturer.

*(Department of Commerce; 55 IAC 4-1-8; filed Jan 15, 1982, 12:35 pm: 5 IR 345; filed Mar 16, 1984, 3:40 pm: 7 IR 1223; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 4-1-9 Minimum standard for thermal energy conversion sub-system (Repealed)**

Sec. 9. *(Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239)*

**55 IAC 4-1-10 Qualified energy system certificate; application**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 10. In order to receive a tax credit under IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*] this procedure shall be followed in submitting and processing an application for such credit.

(a) The applicant must file an application for a qualified energy system certificate with the department of commerce. This application shall include the following items:

- (1) The completed application form provided by the department of commerce;
  - (2) Proof of costs for the purchase and installation of the qualified energy system including:
    - (A) proof that the system was complete, in operation, and paid for as of December 31st of the applicable tax year prior to application for benefits;
    - (B) proof that the system is installed on in-state property owned by the applicant; and
  - (3) A list of the persons or corporations who supplied labor or materials for the installation of the system;
  - (4) The completed installers statement of compliance signed by the person responsible for the installation of the system, attesting to the installation's compliance with all standards set forth in 55 IAC 4; and
  - (5) Evidence of manufacturer's compliance as demonstrated by:
    - (A) The manufacturer's pre-qualification MPQ number for the system; or
    - (B) The MPQ number for the collector PLUS a list of all components including manufacturer and model number; a schematic diagram of the system, labeling all parts; and product literature on each component (usually available from the manufacturer); or
    - (C) Evidence that the solar collector meets the standards of 55 IAC 4-1-5 [*sic., 55 IAC 4-1-5.1*] (results of no-flow test, schematic drawing, etc.) for other solar collectors, including, but not limited to user-built collectors and systems. Other system components must meet the standards of 55 IAC 4-1-6, 55 IAC 4-1-7, and 55 IAC 4-1-8.
- (b) Upon receiving the application, the department of commerce shall evaluate it, to determine whether the energy system

qualifies for tax credit under IC 6-3-3.3 [IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.].

If the department of commerce determines that the energy system qualifies for tax credit, the department of commerce shall issue a certificate of approval to the applicant; it shall also interpret and make recommendations to the department of revenue concerning the costs within the system that are eligible for credit.

(c) The department of commerce shall forward approved applications to the department of revenue for determination of the amount of credit that the applicant is entitled to under IC 6-3-3.3 [IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.]. The department of commerce shall also notify the taxpayer in writing whether the application is approved or rejected. (*Department of Commerce; 55 IAC 4-1-10; filed Jan 15, 1982, 12:35 pm: 5 IR 346; filed Mar 16, 1984, 3:40 pm: 7 IR 1224; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 4-1-11 Manufacturer pre-qualification number; application**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 11. In order to receive a manufacturer's pre-qualification (MPQ) number, this procedure shall be followed in submitting and processing an application for such number: (a) The manufacturer must file an application for pre-qualification of a collector or system with the department of commerce.

(b) Upon receiving the application, the department of commerce shall determine whether the energy system or collector meets all of the pre-qualification requirements of 55 IAC 4-1.

Note: Collector pre-qualification is a pre-requisite for system pre-qualification.

(c) Prior to application the applicant shall have a representative collector tested at an independent testing facility. These tests shall have been conducted in accordance with procedures set forth in 55 IAC 4-1-3, "Procedures for Performance of Tests for Manufactured Solar Collectors" (i.e., in accordance with SRCC Standard 100-81). The completed test results will be attached to the application and submitted to the department of commerce for review.

(d) The manufacturer must also provide a description and schematic diagram of each system for which pre-qualification is sought. All components must be labeled by brand name, manufacturer, and model number. The manufacturer must verify in writing that all components comply with the requirements of 55 IAC 4-1-6. Similar verification must be provided for storage sub-systems (55 IAC 4-1-7), and solar control sub-systems (55 IAC 4-1-8).

(e) If the department of commerce determines that the manufactured solar collector or system does meet all of the requirements of this chapter, a pre-qualification number will be assigned to the system and the manufacturer notified of this number.

(f) After a pre-qualification number has been assigned to a manufactured solar energy system, that system, unaltered, will qualify for tax credit, provided that the installation of the system complies with all applicable standards.

(g) In the event that a manufacturer has not subjected the collector to the tests required by 55 IAC 4-1-2, the department of commerce shall accept, on an interim basis only, demonstration of compliance with 55 IAC 4-1-5, "Minimum Standards for Other Solar Collectors" [*sic.*, 55 IAC 4-1-5.1]. Manufacturers are expected to make arrangements for collector testing during this interim period, the length of which is to be determined by the department of commerce. Collectors for which compliance with such minimum standards has been demonstrated will be qualified for the energy credit; however, no pre-qualification number will be issued for the collectors or systems using such collectors. (*Department of Commerce; 55 IAC 4-1-11; filed Jan 15, 1982, 12:35 pm: 5 IR 347; filed Mar 16, 1984, 3:40 pm: 7 IR 1224; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 4-1-12 Appeals**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 12. These rules establish the procedures for the filing of an administrative appeal of a tax credit decision issued by the director of the department of commerce, division of energy policy or his designee. In all cases, efforts shall be made by the director and any aggrieved parties to informally confer and resolve issues prior to scheduling an appeal.

(a) Appeals taken from the decision of the director shall be presented, heard and decided by a three (3) member appeal board. The division of energy policy director shall select a board member from the Indiana department of commerce, division of energy policy, not involved in the tax credit program and a representative from the industry with technical expertise to serve on the set-aside

appeal board.

(b) The applicant aggrieved by an order issued by the director may file an appeal with the board in accordance with these guidelines. The appeal shall be filed within fifteen (15) days of service after order from which the appeal is taken.

(c) All notices of appeal shall be in writing and signed by the appellant; shall designate clearly on its face that it is an appeal; shall be accompanied by any documents or briefs, if any, which pertain to the appeal.

(d) If the board determines that the appeal raises material issue(s) of fact, the board shall grant a request for an evidentiary hearing by the appellant or any other party. Upon the granting of a request for an evidentiary hearing, the director shall schedule such hearing as soon as possible taking into account the convenience of the parties and the circumstances surrounding the appeal.

(e) The notice shall include:

(1) a statement of the time, place and nature of the hearing;

(2) a statement that the hearing is held pursuant to these rules and any other relevant legal authority;

(3) a reference to the particular sections of any statutes and standards involved;

(4) a short and plain statement of the matters to be considered at the hearing.

*(Department of Commerce; 55 IAC 4-1-12; filed Jan 15, 1982, 12:35 pm: 5 IR 347; filed Mar 16, 1984, 3:40 pm: 7 IR 1225; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

## **Rule 2. Passive Solar Thermal Systems**

### **55 IAC 4-2-1 Definitions (Repealed)**

Sec. 1. *(Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239)*

### **55 IAC 4-2-2 Requirements for receiving a passive solar tax credit (Repealed)**

Sec. 2. *(Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239)*

### **55 IAC 4-2-3 Application procedure (Repealed)**

Sec. 3. *(Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239)*

### **55 IAC 4-2-4 Appeals procedure (Repealed)**

Sec. 4. *(Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239)*

### **55 IAC 4-2-5 Definitions**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 5. For the purposes of IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*] and 55 IAC 4-2, certain words and terms are defined as follows:

“Adjustable shading” means a device designed to shade glazing from undesired radiation but which may be adjusted to permit glazing to receive desired radiation. This term may include awnings or overhangs installed on the building’s exterior, or devices enclosed between panes of glazing. Only when conditions do not permit practical installation as above can installations on the building’s interior qualify as adjustable shading. Loose-fitting interior shades, blinds, curtains or drapes do not qualify as adjustable [*sic.*] shading; moveable insulation does.

“Attached sunspace” means habitable space, adjacent to but with the capacity for thermal separation from, the building’s occupied space on at least one (1) side, that qualifies as a type of indirect-gain passive-solar thermal system. It may be constructed in either the “greenhouse” or the “solarium” style.

“Atrium sunspace” means habitable space, adjacent to but with the capacity for thermal separation from, the building’s occupied space on at least three (3) sides, that qualifies as a type of indirect-gain passive-solar thermal system. It may be constructed in either the “greenhouse” or the “solarium” style.

“Absorption” means the conversion of radiant energy into thermal (heat) energy. When absorber material is claimed for credit, it must involve a fully or partially insulated surface; it is typically used in conjunction with or as the exposed surface of thermal-storage mass.

“Aperture” means an opening within a building's construction, typically permitting the penetration of light or air (e.g., “collection aperture”, “ventilation aperture”).

“Attributable” means obtained to serve an exclusive purpose (cf. “dedicated”).

“Clerestory” means a window within a vertical exterior wall, usually above a roof surface, primarily for introducing ventilation, illumination, or solar radiation into occupied or habitable space.

“Collection” means glazed aperture(s) permitting direct radiation and providing useable insolation.

“Comfort range” means that range of environmental conditions ideal for human occupancy.

“Controls” means devices that have the sole purpose of operating the solar-energy system.

“Conduction” means the transmission of heat energy through material by way of the excitation of its molecules.

“Convection” means the circulatory motion that occurs in a fluid of a nonuniform temperature owing to the variation of its density and the action of gravity; also, the transfer of heat by this automatic circulation of a fluid.

“Conventional energy system” means an energy system that depends upon any depletable fuel resource such as coal, wood, petroleum products, propane, natural gas, nuclear fuel, or any fuel type not specifically qualified [*sic.*] IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*].

“Dedicated” means solely or primarily intended for the purpose of utilizing an energy resource specifically qualified by IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*]; dedicated devices may only incidentally serve other purposes. Cost for devices which are primarily components of a qualifying system, but which substantially serve other purposes, may be eligible at the rate of fifty percent (50%).

“Direct-gain” means the method of passive-solar heating in which solar radiation is collected and utilized directly within a structure's occupied space.

“Direct solar radiation” means unimpaired or unshaded sunlight striking the glazed surface of a passive solar system for at least four (4) hours between 9 a.m. and 4 p.m. on a clear December 21st.

“Distribution” means forcing or facilitating the circulation of thermally-conditioned fluid throughout a system or a space.

“Double-envelope construction” or “double-shell-construction” means a building that has, throughout half or more of the combined area of four [*sic.*] (or attic) and north wall, two (2) envelopes or shells with a continuous airspace at least six inches (6") thick between them; has a large sunspace integral with the south side; has a large below-grade airspace, such as a crawl-space, basement, or sub-basement space; and has full continuity from one (1) airspace to the next, so that air is free to circulate around a complete circuit, or convective loop, that includes the sunspace, the roof or attic, the north wall system, and the crawl-space or equivalent.

“Equivalent net thermal performance” means achieving equal ( $\pm 5\%$ ) heat-retention results throughout twenty-four (24) hour days over the course of the heating season.

“Glazing” means rigid transparent or translucent glass or plastic material of reasonable permanence, installed in the wall(s) or roof(s) of a building; it may include head, jambs, sills, and/or sealants, but not members that are structural requirements of the building as a whole.

“Greenhouse” means a style of attached-sunspace or atrium-sunspace typically using a prefabricated construction system, and consisting of at least eighty percent (80%) glazing over all exposed or exterior surfaces.

“Habitable space” means space in a structure for living, sleeping, eating, or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, and similar areas are not considered habitable space. (From Section 409, Indiana Construction Rules, 1980 edition.) A space need not be continuously thermally conditioned to levels within the human comfort range to be defined as habitable space (cf. “occupied space”).

“Indirect-gain” means the method of passive-solar heating in which solar radiation is collected within a space that can be thermally separated from a building's occupied space. Indirect-gain systems include, but are not limited to, attached-sunspaces, atrium-sunspaces, and trombe walls.

“Insolation” means direct solar radiation that has been received.

“Isolated-gain” means the method of solar heating in which solar radiation is collected at a location that is physically remote from its point of use. If collection, storage, and distribution of solar energy is thermally isolated from the living space, such systems must qualify for credit under IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*] through compliance with standards for active-solar thermal systems; if these functions occur within and utilize

the structural elements of the building, they must qualify for credit under IC 6-3-3.3 [IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.] through compliance with standards for passive-solar thermal systems. If in question, this distinction will be made by the department of commerce.

“Movable insulation” means an assembly of glazing and insulation with a minimum thermal resistance (R-value) of 5 as an entire unit in place, including glazing material and dead air space, which serves the function of preventing heat loss through apertures in a solar energy system. Movable insulation includes, but is not limited to, insulated shutters, panels, curtains, and blinds forming an airtight seal between the aperture and the occupied or habitable space.

Movable insulation does not include non-airtight devices, even if backed with insulating material.

“Occupied space” means the area of the building within its insulated shell that is continuously thermally conditioned to levels within the human comfort range. Basements, attics, crawl spaces, garages, and storage rooms are not normally included in the occupied space.

“Oriented toward” means facing, or falling on an axis perpendicular to a line drawn from, a specified point on the compass.

“Radiation” means the process of emission, transmission, and absorption of heat energy by way of the motion of electromagnetic waves.

“Retrofit” means demolition and subsequent replacement and/or addition.

“Semipassive” or “hybrid” means a thermal system which utilizes the structure of a building and is augmented by mechanical components to provide for collection, storage and distribution of solar energy for heating or cooling.

“Skylight” means a glazed ceiling/roof penetration.

“Solarium” means a style of attached-sunspace or atrium-sunspace typically using a conventional, site-fabricated construction system.

“Structural” means elements of a building required to support the weight of its roof and/or the integrity of its walls or foundation.

“Substantial” means existing in a quantity sufficient to maximize a design's potential benefit, in accordance with accepted construction practice.

“Sunspace” means an enclosure or room designed both as habitable space and as a passive collector/absorber for solar radiation. A sunspace must have the capacity for thermal separation from the building's occupied space; it may or may not be “occupied space”.

“Thermal mass” means that medium used to store solar energy as heat for re-distribution into the occupied space during periods of inadequate solar gain.

“Thermal separation” means an air tight separation between spaces with a minimum thermal resistance of  $R = 1.5$ ; this thermal resistance is typical of double-glazing.

“Thermal storage” means any thermal mass utilized to store energy accumulated by a heat transfer medium or by direct solar gain. Examples of thermal storage include, but are not limited to, stone or masonry walls or floors, containers of water, rock beds, and phase change materials.

“Thermocirculating” means functioning by means of natural convection.

“Thermosiphon energy system” means any system which utilizes either air or liquid as a heat transfer medium that moves through a collection device by natural convection forces. To qualify as a passive solar thermal system, all components must exist within the insulated shell of the building. No pumps or fans are utilized in a thermosiphon energy system.

“Trombe wall” means a masonry wall or portion of a wall utilized in connection with south-facing glazing to store and re-radiate direct solar radiation. A trombe wall may re-radiate heat directly into occupied space or into a distribution medium for utilization elsewhere in the building. (*Department of Commerce; 55 IAC 4-2-5; filed Mar 16, 1984, 3:40 pm: 7 IR 1226; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 4-2-6 Compliance with standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 6. A passive solar energy system that does not comply with the standards in 55 IAC 4-2 does not qualify for tax credits under IC 6-3-3.3 [IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.]. However, this section does not apply to a standard that is declared to be only optional or recommended. (*Department of Commerce; 55 IAC 4-2-6; filed Mar 16, 1984, 3:40 pm: 7 IR 1228; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)



**55 IAC 4-2-7 Direct-gain systems; collection**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 7. (a) This section applies to direct-gain systems.

(b) (Orientation) Claimed collector glazing must be oriented toward a compass-point within 30° of magnetic south; claimed collector roof-glazing or skylights must be elevated to a pitch or angle-above-horizontal of 30° or more.

(c) (Exposure) Claimed collector glazing must be exposed to direct solar radiation.

(d) (Materials) Single, double, or triple glazing is acceptable, as is light-diffusing glazing such as fiberglass. Reflective or tinted glazing does not qualify when used in a collection aperture. Its use in roof-glazing or skylights elevated to a pitch or angle-above-horizontal of less than 30° does not disqualify the system; however, such glazing must be operable to be eligible for credit, as a control device for ventilation.

(e) (Eligibility) In direct-gain systems in new construction only, the quantity of qualifying collector glazing that is eligible for credit must be computed by subtracting the average glazed area that might be expected for conventional purposes (view, daylighting, emergency access, aesthetic design) from the actual collection aperture area, to yield the excess glazing area dedicated to the purpose of solar heating. The expected-average glazing area will be established by views of the portion of the building's exterior shell enclosing occupied space, excluding the portion containing the collection aperture itself. A worksheet for this computation is provided in the application.

Where existing glazing has been demolished, qualifying retrofitted collector glazing is fully eligible for credit. (*Department of Commerce; 55 IAC 4-2-7; filed Mar 16, 1984, 3:40 pm: 7 IR 1228; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-8 Direct-gain systems; absorption**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 8. (a) This section applies to direct-gain systems.

(b) (Exposure) Where claimed, absorber surfaces must be located immediately within the insulated space, and must not be obscured by materials of low conductivity such as carpeting or furnishings [*sic.*].

(c) (Materials) This subsection is an optional standard. Where enclosing solid or phase-change thermal-storage mass, these surfaces should be of a hard, dense material or dark color and low sheen, that achieves a minimum absorptivity of sixty-five percent (65%) (e.g., common red brick). The surface of liquid containers may be as above, or may be transparent or translucent. When insolation occurs on surfaces not enclosing thermal-storage mass, these surfaces should be more highly reflective. Absorber surfaces should be capable of withstanding constant surface temperatures of 180°F., and constant ultraviolet radiation without degradation or the release of potentially harmful byproducts.

(d) (Eligibility) Where claimed, absorber surfaces must be in direct contact or used in conjunction with substantial thermal-storage mass. (*Department of Commerce; 55 IAC 4-2-8; filed Mar 16, 1984, 3:40 pm: 7 IR 1228; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-9 Direct-gain systems; storage**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 9. (a) This section applies to direct-gain systems.

(b) (Placement) Where claimed, thermal-storage mass must be positioned so as to receive substantial direct, reflective or conductive heat gain.

(c) (Heat-retention) Where claimed, thermal-storage mass must either be insulated to minimize re-radiation of heat to unheated areas of the building, or must be completely enclosed within the insulated shell of the building so that re-radiation is contributed directly to the occupied space.

(d) (Eligibility) For thermal-storage mass materials used with a pressurized heat-transfer sub-system, no limit to the material eligible for credit is imposed; for solid materials not used with such a sub-system, not more than eight inches (8") of storage-material thickness or depth, in addition to any structural requirement of the building, is eligible for credit.

Only the cost for foundation or wall construction that is dedicated or attributable to the use of thermal-storage mass (that is, otherwise not required or in excess of that typically required by the building, using its remainder to establish the norm) is fully eligible for credit. Thermal-storage mass also used for structural purposes may be eligible for credit based on fifty percent (50%) of its actual cost. (*Department of Commerce; 55 IAC 4-2-9; filed Mar 16, 1984, 3:40 pm: 7 IR 1229; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-10 Direct-gain systems; distribution**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 10. (a) This section applies to direct-gain systems.

(b) (Provision) Heat-gain must be distributed into occupied space. Where convection of heated air is relied upon, a thermocirculating loop must be established.

(c) (Eligibility) Where plenums, apertures, and hatches, fans and ductwork, or pumps and piping are dedicated to the distribution of heat-gain, they are eligible for credit. (*Department of Commerce; 55 IAC 4-2-10; filed Mar 16, 1984, 3:40 pm: 7 IR 1229; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-11 Direct-gain systems; controls**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 11. (a) This section applies to direct-gain systems.

(b) (Provision and eligibility) Heat-loss must be controlled. The collection aperture must be equipped with moveable insulation, or window treatments of demonstrably equivalent net thermal performance, for use during periods of inadequate insulation. Such devices are eligible for credit.

(c) (Provision and eligibility) Heat-gain must be controlled. The collection aperture must be equipped with moveable insulation, adjustable shading, properly-designed overhangs, or a pressurized heat-ventilation system. Such devices are eligible for credit; only the dedicated cost for an overhang (that which is in excess of the cost of overhangs typical of the remainder of the building) is eligible for credit.

(d) (Eligibility) Where qualifying distribution devices have been equipped with manual or automatic physical or electrical switches, they are eligible for credit, as is dedicated electrical service. Such control devices or sub-systems must be dedicated to controlling the passive-solar energy system; control devices connected to the conventional heating system, such as room thermostats, furnace controls, and upper-limit cut-offs, are not eligible for credit.

Where insulation has been applied in direct contact with eligible components such as thermal-storage mass or distribution devices, and is dedicated or attributable to the retention of the system's heat-gain, it is eligible for credit. Conventional insulation measures that are typical of the building (using its remainder to establish the norm) are ineligible for credit. (*Department of Commerce; 55 IAC 4-2-11; filed Mar 16, 1984, 3:40 pm: 7 IR 1229; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-12 Indirect-gain sunspace systems; collection in greenhouse-style attached or atrium sunspaces**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 12. (a) This section applies to greenhouse-style attached or atrium sunspaces.

(b) (Orientation) The claimed collector/enclosure must, as an average of all glazed areas, be oriented toward a compass-point within 30° of magnetic south; a minimum pitch or angle-above-horizontal for a greenhouse-style roof is not imposed.

(c) Standards in 55 IAC 4-2-7(c) and (d) concerning exposure and materials apply.

(d) (Eligibility) In greenhouse-style construction only, the eligible cost of the qualifying collector/enclosure itself is fifty percent (50%) of its actual cost; unless specifically excepted by the department of commerce, such a sunspace is considered to serve as an enclosure of habitable space.

(e) (Eligibility) Any structural or solid portion of the exterior walls and/or roof (that is, neither a collection nor a ventilation aperture) is ineligible for credit. (See also 55 IAC 4-2-15(b)). (*Department of Commerce; 55 IAC 4-2-12; filed Mar 16, 1984, 3:40*

*pm: 7 IR 1230; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 4-2-13 Indirect-gain sunspace systems; collection in solarium-style attached or atrium sunspaces**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 13. (a) This section applies to solarium-style attached or atrium sunspaces.

(b) Standards in 55 IAC 4-2-7(b), (c), and (d) concerning orientation, exposure, and materials apply.

(c) (Eligibility) In solarium-style construction only, the eligible cost of its qualifying glazing is its actual cost; unless specifically excepted by the department of commerce, such a sunspace is considered to serve as an enclosure of habitable space.

Standards in 55 IAC 4-2-12(e) concerning eligibility applies *[sic.]*. (*Department of Commerce; 55 IAC 4-2-13; filed Mar 16, 1984, 3:40 pm: 7 IR 1230; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-14 Indirect-gain sunspace systems; absorption; storage; distribution**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 14. (a) This section applies both to greenhouse-style and to solarium-style attached or atrium sunspaces.

(b) Absorption standards in 55 IAC 4-2-8(b), (c), and (d) concerning exposure, materials, and eligibility apply. The standards in this subsection are optional only if they are optional under 55 IAC 4-2-8(c).

(c) Storage standards in 55 IAC 4-2-9(b), (c), and (d) concerning placement, heat-retention, and eligibility apply.

(Eligibility) Further, a cost for masonry construction serving both as a foundation for the sunspace and as thermal-storage mass may be eligible for credit at the rate of fifty percent (50%) of its actual cost.

(d) Distribution standards in 55 IAC 4-2-10(b) and (c) concerning provision and eligibility apply. (*Department of Commerce; 55 IAC 4-2-14; filed Mar 16, 1984, 3:40 pm: 7 IR 1230; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-15 Indirect-gain sunspace systems; controls**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 15. (a) This section applies both to greenhouse-style and to solarium-style attached or atrium sunspaces.

(b) (Provision and Design) Heat-loss from conditioned space must be controlled. If thermal-storage mass is used in the sunspace, complete moveable insulation or window treatments of demonstrably equivalent net performance must be used in conjunction with either mechanically-forced distribution or operable thermal separation(s) that may be opened to permit natural convection, enabling occupied space to gain stored heat even during periods of inadequate insolation.

If thermal-storage mass is not used in the sunspace, either mechanically-forced distribution or operable thermal separation(s) that may be opened to permit natural convection must be used, enabling occupied space to gain heat during periods of insolation. During periods of inadequate insolation, distribution must be stopped and/or operable thermal separation(s) must be closed. Complete moveable insulation or equivalent window treatments may be used instead of thermal separation.

Any structural member or solid portion of the exterior walls and/or roof (that is, neither a collection nor a ventilation aperture) must be insulated to a minimum thermal resistance of  $R = 12$ . Such insulation is ineligible for credit.

Foundations or slabs enclosing or being claimed as thermal-storage mass must be insulated to a nominal minimum thermal resistance of  $R = 4$ . Such insulation is eligible for credit.

(c) (Eligibility) If moveable insulation is used in any aperture in the sunspace, it is eligible for credit.

If window treatments are used, only the dedicated insulation cost (that for heat-retention in excess of typical double-glazing, or  $R = 1.5$ ) is eligible for credit when such treatments are used in apertures not qualified as collection.

If thermal separation is established, only the cost for separating devices that are dedicated or attributable to controlling the distribution of heat-gain, such as operable windows or hatches, or moveable insulation, is eligible for credit.

(d) (Provision) Heat-gain into conditioned space must be controlled. All apertures in the exterior walls may be equipped with moveable insulation or with operable shading devices, or convective or fan-forced ventilation may be utilized. Both techniques may be used in conjunction.

(e) (Eligibility) If moveable insulation is used in any aperture in the sunspace, it is eligible for credit.

If operable shading devices are used, only those which are mounted on the exterior of the sunspace (such as awnings or “dedicated” overhangs), are enclosed between layers of glazing, or are suspended beneath roof-glazing that is otherwise impractical to shade will be eligible for credit. Other kinds of loose-fitting interior shades, blinds, curtains, or drapes are not qualifying shading devices, and are ineligible for credit.

If convective or fan-forced ventilation of heat-gain is relied upon, all plenums, apertures, hatches, dampers, fans, ductwork, wiring, and switches [*sic.*] dedicated to such ventilation are eligible for credit. (*Department of Commerce; 55 IAC 4-2-15; filed Mar 16, 1984, 3:40 pm: 7 IR 1230; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-16 Indirect-gain trombe wall systems**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 16. (a) This section applies to indirect-gain trombe wall systems.

(b) Collection standards in 55 IAC 4-2-7(b), (c), and (d) concerning orientation, exposure, and materials apply.

(Eligibility) When used in a trombe-wall system, all collector glazing is eligible for credit.

(c) Absorption standards in 55 IAC 4-2-8(b), (c), and (d) concerning exposure, materials, and eligibility apply.

(d) Storage standards in 55 IAC 4-2-9(b), (c), and (d), and 55 IAC 4-2-14(d) concerning placement, heat-retention, and eligibility apply.

(Sizing) A trombe-wall assembly must be a minimum of eight inches (8") thick, including its thermal-mass wall, air chamber, and collector glazing.

(e) Distribution standards in 55 IAC 4-2-10(b) and (c) concerning provision and eligibility apply.

(f) Controls. (Provision and eligibility) Heat-loss from conditioned space must be controlled. Counter-flow dampers to prevent the establishment of a reverse-thermocirculating loop may be used, or the collection aperture may be equipped with moveable insulation on its interior or exterior side. Such devices are eligible for credit.

Standards in 55 IAC 4-2-15(d) and (e) concerning the provision and eligibility of heat-gain controls apply. (*Department of Commerce; 55 IAC 4-2-16; filed Mar 16, 1984, 3:40 pm: 7 IR 1231; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-17 Double-envelope construction systems**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 17. (a) This section applies to double-envelope construction systems.

(b) (Design) Solar heat-gain must be introduced into the airspace-loop within the double-envelope by way of an indirect-gain system constructed in compliance with the applicable foregoing standards.

(c) (Eligibility) Cost for devices that uniquely distinguish this construction technique from standard construction are eligible for credit. These include costs for framing the internal envelope, and fire-protection and/or vapor-barrier devices installed within the airspace-loop. (*Department of Commerce; 55 IAC 4-2-17; filed Mar 16, 1984, 3:40 pm: 7 IR 1231; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-18 Isolated-gain thermosiphon systems; categorization**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 18. (a) For an isolated-gain thermosiphon systems energy system to be categorized [*sic.*] as a passive-solar thermal system, all components must be installed within the insulated shell of the building.

(b) No fans, pumps, or mechanical devices may be used to circulate the heat-transfer medium within the system. (*Department of Commerce; 55 IAC 4-2-18; filed Mar 16, 1984, 3:40 pm: 7 IR 1232; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-19 Isolated-gain thermosiphon systems; collection**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 19. (a) This section applies to isolated-gain thermosiphon systems.

(b) (Orientation) Claimed collector glazing must be oriented toward a compass-point within 30° of magnetic south. Collector glazing for air-circulating systems must be elevated to a pitch or angle-above-horizontal of 55° or more; for liquid-circulating systems this angle must be 45° or more.

(c) Standards in 55 IAC 4-2-7(c) and (d) concerning exposure and materials apply.

(d) (Eligibility) When used in an isolated-gain thermosiphon system, all collector glazing is eligible for credit. (*Department of Commerce; 55 IAC 4-2-19; filed Mar 16, 1984, 3:40 pm: 7 IR 1232; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-20 Isolated-gain thermosiphon systems; absorption**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 20. (a) This section applies to isolated-gain thermosiphon systems.

(b) Standards in 55 IAC 4-2-19(a) concerning collector orientation also apply to absorber orientation.

(c) Standards in 55 IAC 4-2-8(b) concerning exposure applies [*sic.*].

(d) (Design) Liquid thermosiphon systems may be non-glazed; they must be freezeproof without manual assistance.

(e) (Materials) All elements within the collector/absorber enclosure (or the absorber if installed separately) exposed to high temperatures shall be non-combustible or have a flame-spread rating not exceeding twenty-five (25) and a smoke-development rating not exceeding fifty (50), when tested in accordance with ASTM E 84-80, unless it can be shown that the associated temperatures will not exceed 200°F.

Further, the collector/absorber enclosure (or the absorber enclosure if installed separately) shall be constructed of non-combustible materials (e.g., metal), or of combustible materials provided the combustible materials are insulated from the associated high temperatures.

Note: Long-term exposure (years) of wood to temperatures above 212°F. can result in autoignition of the wood.

Insulation of the collector/absorber enclosure (or the absorber enclosure if installed separately) shall be capable of withstanding the temperatures developed during a minimum of thirty (30) days of “no-flow” condition. (*Department of Commerce; 55 IAC 4-2-20; filed Mar 16, 1984, 3:40 pm: 7 IR 1232; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-21 Isolated-gain thermosiphon systems; storage**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 21. (a) This section applies to isolated-gain thermosiphon systems and is an optional standard.

(b) Standards in 55 IAC 4-2-9(b), (c), and (d) concerning placement, heat-retention and eligibility apply.

(c) (Design) Storage tanks used in liquid thermosiphon systems must be located at a higher elevation than the collector and/or absorber.

(d) (Heat-retention) Further, insulation of a storage container shall have a minimum thermal resistance of  $R = 12$  when installed within the insulated shell of the building, or  $R = 30$  when forming part of the insulated shell of the building. (*Department of Commerce; 55 IAC 4-2-21; filed Mar 16, 1984, 3:40 pm: 7 IR 1232; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-22 Isolated-gain thermosiphon systems; distribution**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 22. (a) This section applies to isolated-gain thermosiphon systems.

(b) (Provision) Heat-gain must be distributed to storage and/or its point of use.

(c) (Design) Distribution must be achieved by way of natural convection (i.e., thermocirculation).

Further, potable water must be protected from contamination by the use of a double-wall heat exchanger if a toxic heat-transfer fluid is used in the system.

(d) (Eligibility) Where plenums, apertures, hatches, ductwork, grilles, or piping are dedicated to the distribution of heat-gain, they are eligible for credit. (*Department of Commerce; 55 IAC 4-2-22; filed Mar 16, 1984, 3:40 pm: 7 IR 1233; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-23 Isolated-gain thermosiphon systems; controls**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 23. (a) This section applies to isolated-gain thermosiphon systems.

(b) (Provision and eligibility) Heat-loss must be controlled. Check-valves or counter-flow dampers to prevent the establishment of a reverse-thermocirculating loop may be used, the collection aperture may be equipped with moveable insulation on its interior or exterior side, or the collector's/absorber's inlet and outlet ports may both be installed above the absorber so cold fluid contained within it stops natural convection.

(c) (Provision and eligibility) If the thermal conditioning of space is the purpose of the system, heat-gain must be controlled. Standards in 55 IAC 4-2-15(d) concerning the provision and eligibility of heat-gain controls apply. (*Department of Commerce; 55 IAC 4-2-23; filed Mar 16, 1984, 3:40 pm: 7 IR 1233; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-24 Semipassive or hybrid systems; mechanically pressurized thermal storage and control sub-systems**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 24. Mechanically-pressurized thermal storage and control sub-systems of a semipassive or hybrid system shall comply with all the applicable standards of 55 IAC 4-1-7 and 55 IAC 4-1-8. (*Department of Commerce; 55 IAC 4-2-24; filed Mar 16, 1984, 3:40 pm: 7 IR 1233; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-25 Qualified energy system certificate; compliance with application procedures**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 25. An applicant seeking tax credit under 55 IAC 4-2 shall comply with the application procedures in 55 IAC 4-1-10. However, the provisions in 55 IAC 4-1-10(a)(5) concerning the need to show evidence of manufacturer's compliance does not apply to such an application. (*Department of Commerce; 55 IAC 4-2-25; filed Mar 16, 1984, 3:40 pm: 7 IR 1233; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-2-26 Appeals**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 26. The appeal procedure in 55 IAC 4-1-12 applies to an appeal under 55 IAC 4-2. (*Department of Commerce; 55 IAC 4-2-26; filed Mar 16, 1984, 3:40 pm: 7 IR 1233; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**Rule 3. Wind Energy Systems (Repealed)**

(*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

**Rule 4. Active Geothermal Systems**

**55 IAC 4-4-1 Definitions**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 1. For purposes of IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*] and 55 IAC 4-4, certain words and terms are defined as follows:

“Aquifer” means water-bearing subsurface stratum of permeable rock, sand, or gravel.

“ARI” means American Refrigeration Institute.

“BTU” means the amount of heat necessary to raise one (1) pound of water 1°F.

“COP (coefficient of performance)” means the measurement of efficiency, figured by dividing the quantity of energy supplied to operate a device into the quantity of heat energy delivered as an end product. (COP = Btu/hr ÷ (Watts × 3.413))

“Closed-loop geothermal heat pump system” means a water-to-air or water-to-water heat pump that utilizes underground tubing to circulate the water through the heat pump without introduction of new water or disposal of waste water, from the system. All systems that require pre-heating of water by natural gas, oil or electricity or the use of an evaporative cooling tower are excluded.

“Direct cooling coils” means large finned coils through which cold well water is pumped; warm air passes across coil, transferring its heat to the colder water.

“EER” means ratio of net capacity output in Btu/hr to energy input in watts. (EER = Btu/hr ÷ Watts)

“Geothermal heat pump” means a water-to-air or water-to-water heat pump that utilizes water whose temperature is moderated by the thermal mass of the earth.

“Groundwater” means water from beneath the ground surface, including percolating, flowing and interstitial water.

“Open-loop geothermal heat pump system” means a water-to-air or water-to-water heat pump that utilizes the water from a well or water from the bottom of a lake, and pumps that water through a water-to-air or water-to-water heat pump, then disposes of that water either into a storm sewer, into a stream or pond, or into an injection well.

“Scaling” means mineral encrustation or build-up on heat pump system piping. (*Department of Commerce; 55 IAC 4-4-1; filed Mar 9, 1982, 4:11 pm: 5 IR 703; filed Mar 16, 1984, 3:40 pm: 7 IR 1233; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-4-2 Requirements for receiving tax credit (Repealed)**

Sec. 2. (*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

**55 IAC 4-4-3 Application procedure for manufacturer pre-qualification number (Repealed)**

Sec. 3. (*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

**55 IAC 4-4-4 Application procedure (Repealed)**

Sec. 4. (*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

**55 IAC 4-4-5 Appeals procedure (Repealed)**

Sec. 5. (*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

**55 IAC 4-4-6 Minimum standards**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 6. In order for each active geothermal energy systems to become eligible for a tax credit pursuant to IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*], such systems must meet the standards in 55 IAC 4-4-7 and 55 IAC 4-4-8. (*Department of Commerce; 55 IAC 4-4-6; filed Mar 16, 1984, 3:40 pm: 7 IR 1234; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-4-7 Open-loop systems**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 7. (a) This section applies to open-loop systems.

(b) Open-loop systems shall have a coefficient of performance (COP) of 3.0 for the heating cycle, utilizing test procedures prescribed in ARI Standard 325-82 for groundwater-source heat pumps in a low-temperature heating climate (50°F entering water temperature); or utilizing ARI Standard 320-81 for water-source heat pumps (70°F entering water temperature).

(c) Open-loop systems shall have an energy efficiency rating (EER) in the cooling mode of at least 9.5 utilizing ARI Standard 325-82 for groundwater-source heat pumps in a high-temperature cooling climate (70°F entering water temperature); or utilizing ARI Standard 320-81 for water-source heat pumps (85°F entering water temperature).

(d) Open-loop systems shall utilize no more than 2.5 gallons of water per minute per ton capacity for either heating or cooling (except for direct cooling coils), based on 55°F entering water temperature. (Not applicable to lake and pond applications or closed-loop systems).

(e) Direct cooling coil systems shall utilize no more than four (4) gallons of water per minute per ton capacity; based on 55°F entering water temperature.

(f) Open-loop systems shall utilize a minimum entering water temperature of 45°F in open-loop system installations.

(g) Open-loop systems shall utilize a minimum entering water temperature of 36°F for lake and pond installations.

(h) Open-loop systems shall not dispose of waste water into a sanitary sewer.

(i) Open-loop systems may dispose of waste water into a combination storm and sanitary sewer where approved by local code.

(j) Open-loop systems shall not be an air-to-air, or air-to-water heat pump system.

(k) Any installation using ten (10) gallons of water per minute or more shall be required to submit a four (4) hour minimum pump test to show that there is adequate water in the supply well. If the well does not stabilize after four (4) hours, the test should continue for an additional twenty (20) hours. If the well does not stabilize after twenty-four (24) hours it is recommended that the owner contact the department of natural resources for information on a hydrogeological analysis. (*Department of Commerce; 55 IAC 4-4-7; filed Mar 16, 1984, 3:40 pm: 7 IR 1234; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-4-8 Closed-loop systems**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 8. (a) This section applies to closed-loop systems.

(b) Closed-loop systems shall operate at a minimum average circulating temperature of 30°F in a closed-loop installation.

(c) Closed-loop systems shall utilize non-toxic antifreeze solution to lower the freezing point to at least 20°F and operate at a maximum of 100°F.

(d) A closed loop installed in a lake must be submerged to a minimum depth of six (6) feet.

(e) Horizontal closed-loop piping systems must have at least 300 feet of two (2) inch diameter pipe per ton of capacity or its equivalent heat-exchange area.

(f) Horizontal closed-loop pipes may be installed at a minimum of four (4) feet in the same trench with a pipe installed at a depth of at least five and one-half (5 1/2) feet.

(g) Two (2) horizontal closed-loop pipes may be installed at the same depth on each side of a trench at least two (2) feet wide.

(h) Horizontal closed-loop systems must space trenches at least four (4) feet apart, measured between center-lines.

(i) Shall not be an air-to-air or air-to-water heat pump system. (*Department of Commerce; 55 IAC 4-4-8; filed Mar 16, 1984, 3:40 pm: 7 IR 1235; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-4-9 Qualified energy system certificate; application**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 9. (a) In order to receive a tax credit under IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*], the procedure in this section must be followed in submitting and processing an application



for such credit.

(b) The applicant must file an application for a qualified energy system certificate with the department of commerce. This application shall include the following items:

- (1) The completed application form provided by the department of commerce.
- (2) Proof of costs for the purchase and installation of the qualified energy system including:
  - (A) Proof that the system was complete, in operation, and paid for as of December 31st of the applicable tax year prior to application for benefits.
  - (B) Proof that the system is installed on in-state property owned by the applicant.
  - (C) A breakdown of costs must be provided on each receipt. Separate costs should appear for the heat pump, cooling coils, duct work, etc. Also, labor costs must be itemized.
  - (D) Identification of supplier(s).

(3) The completed installer's statement of compliance, signed by the person responsible for installation of said system attesting to compliance with all standards set forth in 55 IAC 4-4.

(4) Results of a pump test showing the level of drawdown is required on open-loop systems using ten (10) gallons or more of well water per minute. System should be tested every fifteen (15) minutes for four (4) hours at a rate twenty percent (20%) higher than the maximum usage of the heat pump system.

(5) Either a manufacturer's pre-qualification (MPQ) number, or evidence that the active geothermal system meets the performance standards set forth in 55 IAC 4-4-6.

(c) Upon receiving the application, the department of commerce shall evaluate it to determine whether the energy system qualifies for the tax credit under IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*].

(d) If the department of commerce determines that the energy system qualifies for the tax credit, the department of commerce shall issue a qualified energy system certificate to the applicant; it shall also interpret and make recommendations to the department of revenue concerning the costs within the system that are eligible for credit.

(e) The department of commerce shall forward approved applications to the department of revenue for determination of the amount of credit that the applicant is entitled to under IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*]. (*Department of Commerce; 55 IAC 4-4-9; filed Mar 16, 1984, 3:40 pm: 7 IR 1235; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 4-4-10 Manufacturer pre-qualification number; application**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 10. (a) In order to receive a manufacturer pre-qualification number, the procedure in this section must be followed in submitting and processing an application for such number.

(b) The manufacturer must file an application for a pre-qualified geothermal heat pump number with the department of commerce.

(c) Upon receiving said application, the department of commerce shall determine whether the geothermal heat pump meets all of the pre-qualification requirements of this chapter.

(d) Prior to application the applicant shall have a representative geothermal heat pump tested at a test laboratory. This test shall have been conducted in accordance with either the requirements of ARI Standard 320-81 (tested for COP at 70° entering water temperature (EWT) and for EER at 85° EWT); or Standard 325-82 (tested for COP at 50° EWT and for EER at 70° EWT). The heat pump must have a minimum COP of 3.0; and minimum EER of 9.5.

(e) If the department of commerce determines that the manufactured [*sic.*] geothermal system does meet all of the requirements of this chapter, a pre-qualification number will be assigned to the geothermal heat pump and the manufacturer notified of said number.

(f) After a pre-qualification number has been assigned to a geothermal heat pump, that device, unaltered, will qualify for a tax credit, provided that the installation of the geothermal heat pump meets all of the requirements in these regulations. (*Department of Commerce; 55 IAC 4-4-10; filed Mar 16, 1984, 3:40 pm: 7 IR 1236; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-4-11 Appeals**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 11. The appeal procedure in 55 IAC 4-1-12 applies to an appeal concerning 55 IAC 4-4. (*Department of Commerce; 55 IAC 4-4-11; filed Mar 16, 1984, 3:40 pm: 7 IR 1236; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**Rule 5. Hydroelectric Energy Systems (Repealed)**

(*Repealed by Department of Commerce; filed Mar 16, 1984, 3:40 pm: 7 IR 1239*)

**Rule 6. Passive Geothermal Systems (Earth-sheltered Construction)**

**55 IAC 4-6-1 Minimum standards**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 1. In order for each passive geothermal system to become eligible for tax credit pursuant to IC 6-3-3.3 [*IC 6-3-3.3 was repealed by P.L.51-1984, SEC. 3. See IC 6-3.1-8 concerning energy systems tax credit.*] such systems must meet the standards in 55 IAC 4-4-10 and 55 IAC 4-4-11. (*Department of Commerce; 55 IAC 4-6-1; filed Mar 16, 1984, 3:40 pm: 7 IR 1236; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-6-2 Building standards**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 2. (a) An earth-sheltered building must utilize one (1) other qualifying space-heating system in its design. Examples of such a system include active and passive solar thermal systems and active geothermal systems.

(b) Exterior rigid-board insulation to the local frostline, plus a complete vapor barrier, must be incorporated into the earth-sheltered building shell.

(c) The cost for earth-sheltering is eligible at the rate of fifty percent (50%) of its actual cost. This includes costs for unit masonry, poured or precast concrete, and reinforcing and stabilizing elements; vapor barriers; insulation; drainage measures; excavation and backfill; structural members only of interior walls that support earth-sheltered roofs; and air-to-air heat-exchangers and dehumidifiers to assure suitable air quality.

Interior finishing of walls (sheetrock, panelling, etc.) and landscaping are ineligible for credit.

Eligible costs must be limited to the portions of the building that are actually earth-sheltered, and to components that are attributable solely to the earth-sheltering technique. (*Department of Commerce; 55 IAC 4-6-2; filed Mar 16, 1984, 3:40 pm: 7 IR 1236; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-6-3 Air-change tube standards**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 3. (a) Earth-sheltered air-change tubes must form part of an air-to-air thermal-conditioning system; they must be protected from the intrusion of water into the tubes; they must be protected from the intrusion of foreign objects, by way of screens or grilles over all openings; and they must be buried, except for inlet and outlet ports, at minimum depth of six feet (6') beneath the surface.

(b) The cost for such tubes and all required accessories, plus excavation, backfill, and associated drainage measures, and any fans, wiring, and controls dedicated to augmenting the airflow through the tubes are eligible for credit based on its actual cost. (*Department of Commerce; 55 IAC 4-6-3; filed Mar 16, 1984, 3:40 pm: 7 IR 1237; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-6-4 Qualified energy system certificate; compliance with application procedures**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 4. An applicant seeking tax credit under 55 IAC 4-6 shall comply with the application procedures in 55 IAC 4-1-10. However, the provisions in 55 IAC 4-1-10(1)(5) concerning the need to show evidence of manufacturer's compliance does not apply to such an application. (*Department of Commerce; 55 IAC 4-6-4; filed Mar 16, 1984, 3:40 pm: 7 IR 1237; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-6-5 Appeals**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 5. The appeal procedure in 55 IAC 4-1-12 applies to an appeal under 55 IAC 4-6. (*Department of Commerce; 55 IAC 4-6-5; filed Mar 16, 1984, 3:40 pm: 7 IR 1237; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**Rule 7. Alternative Energy Generating Systems; Photovoltaic, Wind, and Hydro Conversion Energy**

**55 IAC 4-7-1 Definitions**

Authority: IC 4-4-3-21  
Affected: IC 6-3.1-8

Sec. 1. In 55 IAC 4-7:

“Conduit” means a natural or artificial channel through which water is conveyed.

“Generator” means a machine by which mechanical energy is changed into electrical energy.

“Governor” means a device that regulates turbine speed through water flow on synchronous generators.

“Head” means the vertical height in feet from the headwater or the point where the water enters the intake pipe, to where the water leaves the turbine housing.

“Horizontal axis wind turbine (HAWT)” means a WECS whose rotor axis is substantially parallel ( $\pm 5^\circ$ ) to the wind velocity.

“Innovative” means a device or practice introduced into an energy system on an experimental or prototypical basis; not yet manufactured or reproduced on a large scale.

“Inverter” means a solid state, integrated circuit or rotary mechanical device for converting direct current (DC) to alternating current (AC).

“Manufacturer” means any individual, partnership, corporation, association, or other legal entity which manufactures, assembles, or produces energy system components, or any person designated by the manufacturer as a distributor, sales, or service representative.

“Overspeed” means the speed above the designed maximum revolutions per minute (RPM) of the windmill.

“Photovoltaic system” means a system that generates electricity directly from the radiant energy of the sun.

“Turbine” means a rotary device actuated by the reaction or impulse or bolts of a current of fluid subject to pressure and usually made with a series of curved vanes on a central rotating spindle.

“Turbulence” means fluctuation in wind velocity or direction of the wind caused by obstruction in the path of the wind.

“U.L.” means Underwriters Laboratory.

“Vertical axis wind turbine (VAWT)” means a WECS whose rotor axis is vertical.

“Water wheel” means a wheel made to rotate by direct action of water.

“Wind barrier” means an obstacle which impedes wind flow.

“WECS” means wind energy conversion system, a horizontal or vertical axis device for converting the kinetic energy of the wind into mechanical, thermal, or electrical energy. (*Department of Commerce; 55 IAC 4-7-1; filed Mar 16, 1984, 3:40 pm: 7 IR 1237; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-7-2 Solar photovoltaic system standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 2. (a) In order for a solar photovoltaic system to qualify for tax credit, such a system must meet the requirements of this section.

(b) Appropriate federal and state permits necessary for the installation of a photovoltaic system must be obtained; these may include a Federal Energy Regulatory Commission license or exemption, and evidence that the system meets the Indiana public service commission's interconnection standards for selling power to a utility.

(c) Applicable local building and zoning codes must be observed. Copies of any applicable permits must be submitted with the application for tax credit.

(d) Any photovoltaic system which produces greater than thirty-seven (37) watts of electricity in peak sun conditions (clear, summer sun) is eligible for a tax credit.

(e) Only those portions of the project, i.e., collection and inversion equipment related to the production of energy, are eligible for the tax credit. The cost of any bracing or storage sub-system used with a photovoltaic system is also eligible for tax credit. (*Department of Commerce; 55 IAC 4-7-2; filed Mar 16, 1984, 3:40 pm: 7 IR 1238; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-7-3 Wind energy conversion system standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 3. (a) In order for a wind energy conversion system to qualify for tax credit, such a system must meet the requirements of this section.

(b) Appropriate federal and state permits necessary for the installation of a WECS must be obtained; these may include a Federal Energy Regulatory Commission license or exemption, and evidence that the system meets the Indiana public service commission's interconnection standards for selling power to a utility.

(c) Applicable local building and zoning codes must be observed. Copies of any applicable permits must be submitted with the application for tax credit.

(d) Equipment must comply with this subsection.

(1) WECS used to generate power must yield a minimum output of thirty-seven (37) watts of electricity or equivalent mechanical energy in a twenty-five (25) MPH wind.

(2) WECS equipment shall be designed for a life expectancy of five (5) years; equipment removed prematurely shall be subject to a tax recapture.

(3) The interconnected WECS electrical system shall not sustain self-excitation or in any manner energize the electric utility service after a utility outage has occurred. The WECS electrical system shall de-energize or disconnect itself after a utility outage within a reasonable time period and not damage other connected loads or compromise the safety of the utility system.

(4) The WECS electrical system shall be designed to be capable of surviving typical utility transients, i.e., voltage spikes, low and high voltage, and over- and under-frequency.

(e) Standards for site evaluation and installation.

(f) This subsection applies to all WECS:

(1) Whenever possible, units installed in hilly terrain should be situated on top of a rise or slope exposed to prevailing wind currents.

(2) Tower structure and installation, and installation of any WECS shall be in conformance with Federal Aviation Administration (FAA) height restrictions.

(3) WECS must contain both automatic and manually-activated systems to disconnect utility interfacing in the event of a utility power failure.

(4) WECS must contain both automatic and manually-activated overspeed control to protect the system from overspeed failure.

(5) Innovative systems will be evaluated on a case-by-case basis, provided that they meet all requirements of this chapter.

(6) All wiring shall be in conformity with all local code requirements and the National Electric Code.

(g) This subsection applies to horizontal-axis WECS:

(1) Horizontal-axis WECS should be at a height principally above turbulent airflow to maximize power output and to maintain the lifespan of the unit.

(2) Horizontal-axis WECS constructed within 500 feet of wind barrier (i.e., buildings, trees, etc.) should be fixed at a height so as to allow a complete rotor to be a minimum of thirty (30) feet above such barrier(s).

(3) The rotor of a horizontal-axis WECS shall clear the ground by a minimum of fifteen (15) feet.

(h) Only those portions of the project, i.e., turbine, generator, and inversion equipment related to the production of energy are eligible for the tax credit. The cost of any bracing or storage sub-system used with a WECS is also eligible for tax credit. (*Department of Commerce; 55 IAC 4-7-3; filed Mar 16, 1984, 3:40 pm: 7 IR 1238; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-7-4 Hydroelectric system standards**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 4. (a) In order for a hydropower system to qualify for tax credit, such a system must meet the requirements of this section.

(b) Appropriate federal and state permits necessary for the installation of a hydroelectric system must be obtained; these may include a Federal Energy Regulatory Commission license or exemption, and evidence that the system meets the Indiana public service commission's interconnection standards for selling power to a utility.

(c) Applicable local building and zoning codes must be observed, and the Indiana department of natural resources rules must be observed. Copies of any applicable permits must be submitted with the application for tax credit.

(d) Only those portions of the project, i.e., the power-source and power-train related to the production of energy, are eligible for tax credit. The cost of a dam is not eligible for tax credit. (*Department of Commerce; 55 IAC 4-7-4; filed Mar 16, 1984, 3:40 pm: 7 IR 1239; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-7-5 Qualified energy system certificate; compliance with application procedures**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 5. An applicant seeking tax credit under 55 IAC 4-7 shall comply with the application procedures in 55 IAC 4-1-10. However, the provisions in 55 IAC 4-1-10(a)(5) concerning the need to show evidence of manufacturer's compliance does not apply to such an application. (*Department of Commerce; 55 IAC 4-7-5; filed Mar 16, 1984, 3:40 pm: 7 IR 1239; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 4-7-6 Appeals**

Authority: IC 4-4-3-21

Affected: IC 6-3.1-8

Sec. 6. The appeal procedure in 55 IAC 4-1-12 applies to an appeal concerning 55 IAC 4-7. (*Department of Commerce; 55 IAC 4-7-6; filed Mar 16, 1984, 3:40 pm: 7 IR 1239; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**ARTICLE 5. INDIANA DAIRY EXPORT CERTIFICATION PROGRAM**

**Rule 1. Program Requirements**

**55 IAC 5-1-1 Definitions**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 1. (a) "Department" means the Indiana department of commerce division of agriculture.

(b) "U.S.D.A." means the United States Department of Agriculture.

(c) "D.H.I.A." means a dairy herd improvement association program for creating, maintaining, and supervising milk production records and which is approved by the national cooperative dairy herd improvement program and by the department as satisfactory for this purpose.

(d) "D.H.I.R." means milk production records maintained exclusively for registered purebred dairy cattle by a dairy herd improvement association under the supervision of a purebred dairy registry association.

(e) "Mature equivalency" the standardizing production to a 305 day, twice daily milking; and the adjustments for the age of the cow when she calved; and for the month of calving. (*Department of Commerce; Division of Agriculture; 55 IAC 5-1-1; filed Mar 16, 1983, 11:14 am: 6 IR 863; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 5-1-2 Eligibility requirements for grading**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 2. (a) Only bovine females of a dairy breed over 4 months of age which show no evidence of beef type crossbreeding shall be eligible for grading under 55 IAC 5.

(b) A female born in a multiple birth with a bull shall not be eligible for grading unless she has had a calf or has been examined by a veterinarian and pronounced pregnant.

(c) Any animal which has been altered, disguised or otherwise misrepresented to conceal defects to make it appear to be of greater value than it is shall not be eligible for grading.

(d) DHIR and DHI milk and butterfat production records, if such are available, shall accompany animals which are to be graded. Non-official DHI records which are a part of the national DHI program (including owner-sampler) properly identified may be used. The producer of animals shall verify by his signed statement as to the accuracy of all production, breeding and identification records, and any other information required to be furnished by him to the department.

(e) To be eligible for grading, the animal shall be identified with an official alpha numeric ear tag or by registration papers of the appropriate purebred dairy cattle registry association. (*Department of Commerce; Division of Agriculture; 55 IAC 5-1-2; filed Mar 16, 1983, 11:14 am: 6 IR 863; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 5-1-3 Grader duties**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 3. (a) All animals represented as graded as provided for herein shall be graded by a person specifically employed by the department for this purpose.

(b) Graders shall issue a certificate of grade for each animal graded. Such certificate shall be in the form provided by the department and shall contain the date of grading, grade as of that date, and the identification of the sire and dam and information required by the grade specifications. This certificate shall be designed in such a way that it does not resemble any existing purebred dairy cattle registration certificate or official health certificate.

(c) Graders shall evaluate animals for physical characteristics on the basis of the current "Dairy Cow Unified Score Card" published by the purebred Dairy Cattle Association. Copies of this card are on file at the offices of the department, secretary of state and the revisor of rules, and may be obtained from the department at its offices at 440 N. Meridian, Indianapolis, Indiana 46204. (*Department of Commerce; Division of Agriculture; 55 IAC 5-1-3; filed Mar 16, 1983, 11:14 am: 6 IR 863; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 5-1-4 Grade specifications**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 4. (a) Indiana Registered Supreme DHIA.

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be above average in body capacity, dairy

character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) To be eligible for this classification, animals must be born to a registered sire and a registered dam and be registered with their breed registry association.

(3) To be eligible for this grade, cows shall meet the following minimums:

(A) Lactating animals over 20 months of age shall have an official classification in order to be eligible.

(B) Breed classification: Ayrshire—Good plus or above, Brown Swiss—Good plus or above, Guernsey—Desirable or above, Holstein—Good plus or above, Jersey—Desirable or above, Red Poll—Desirable or above, Milking Shorthorn—Desirable or above.

(C) Production requirements: animals that have completed one lactation of 305 days or less must have produced 500 pounds of butterfat or at least the Indiana official DHI or mature equivalency breed average for milk or butterfat production for the current year, regardless of age. Production records must be DHIR or official DHI.

(D) A heifer that has not completed a lactation of 305 days or less may qualify [*sic.*] for this classification if her dam meets the requirements for production and type classification, and the heifer has a projected mature equivalency meeting the requirements and the physical characteristics and weight requirements for the Indiana Registered Supreme DHIA classification.

(i) The registration certificate and signed transfer shall be provided by the owner for registered animals.

(ii) Registered animals not meeting requirements for this classification shall be placed into other classifications for which they qualify.

(b) Indiana Registered Superior DHIA. To be eligible for this classification, all heifers and cows shall meet the following standards and specifications:

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be above average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) Weight: shall conform to the weight requirement for breed and age as is provided in 55 IAC 5-1-7, Table 1.

(3) Color: shall meet breed requirements for registration.

(4) Sire: shall have a registered sire with registered name and registration number provided.

(5) Dam: shall have a registered dam with registered name and registration number provided.

(6) To be eligible for this classification, cows shall meet the following minimums:

(A) Lactating animals over 20 months of age shall have an official classification in order to be eligible.

(B) Breed classification: Ayrshire—Good, Brown Swiss—Good, Guernsey—Acceptable, Red Poll—Acceptable, Milking Shorthorn—Acceptable, Holstein—Good, Jersey—Acceptable.

(C) Production requirements: animals that have completed a lactation of 305 days or less must have produced a minimum of 400 pounds of butterfat and milk production of a minimum of 10,000 pounds or the breed mature equivalency for the current year regardless of age. Records must be official DHIR or DHI.

(c) Indiana Registered Choice DHIA. To be eligible for this classification, all heifers and cows shall meet the following standards and specifications:

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, conditions and development. Shall be average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and properly placed on the udder.

(2) Weight: shall conform to the weight requirement for breed and age as is provided in 55 IAC 5-1-7, Table 1.

(3) Color: shall meet breed requirements for registration.

(4) Sire: shall have a registered sire with registered name and registration number provided.

(5) Dam: shall have a registered dam with registered name and registration number provided.

(6) To be eligible for this classification, cows must meet the following minimums:

(A) Lactating animals over 20 months of age shall have an official classification in order to be eligible.

(B) Breed classification: Ayrshire–Fair, Brown Swiss–Fair, Guernsey–Fair, Holstein–Fair, Jersey–Fair, Red Poll–Fair, Milking Shorthorn–Fair.

(C) Production requirements: animals that have completed a lactation of 305 days or less must have produced an average butterfat production or mature equivalency of no more than 100 pounds below the official DHI breed average butterfat production or no less than 80 percent of the Indiana official DHI breed average for milk production for the current year regardless of age. Records must be official DHIR or DHI.

(D) A heifer that has not completed a lactation of 305 days or less may qualify for this classification if she is obtained from an official or non-official DHI breed herd with an average butterfat production or mature equivalency of no more than 100 pounds below the Indiana official DHI average butterfat production or less than 80 percent of the Indiana official DHI average milk production for the current year.

(d) Indiana 1/2 Registered Supreme DHIA.

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be above average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) To be eligible for this classification, animals must be born to a non-registered dam of the same breed and a registered sire of the same breed registered with its breed registry association.

(3) To be eligible for this classification, cows shall meet the following minimums:

(A) Production requirements: animals that have completed one lactation of 305 days or less must have produced 500 pounds of butterfat or at least the Indiana official DHI or mature equivalency breed average of milk or butterfat production for the current year, regardless of age. Production records must be official DHI.

(B) A heifer that has not completed a lactation of 305 days or less may qualify for this classification if her dam meets the requirements for production and type classification, and the heifer has projected mature equivalency meeting the requirements and the physical characteristics and weight requirements for the Indiana Registered Supreme DHIA classification.

(i) The registration certificate (if available) or identification certificate and signed transfer shall be provided by the owner for the 1/2 registered animals.

(ii) 1/2 registered animals not meeting requirements for this classification shall be placed into other classifications for which they qualify.

(e) Indiana 1/2 Registered Superior. To be eligible for this classification, all heifers and cows shall meet the following standards and specifications:

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be above average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) Weight: shall conform to the weight requirement for breed and age as is provided in 55 IAC 5-1-7, Table 1.

(3) Color: shall meet breed requirements for registration.

(4) Sire: shall have a registered sire with registered name and registration number provided.

(5) Dam: shall have a non-registered dam of the same breed.

(6) To be eligible for this classification, cows shall meet the following minimums:

(A) Production requirements: animals that have completed a lactation of 305 days or less must have produced a minimum of 400 pounds of butterfat and milk production of a minimum of 10,000 pounds or the breed mature equivalency for the current year regardless of age. Records must be official DHIA, owner sampler or any other acceptable production records.

(B) A heifer that has not completed a lactation of 305 days or less may qualify for this classification if she is obtained from an official or non-official DHI breed herd with an average butterfat production or mature equivalency of a minimum of 400 pounds and milk production of 10,000 pounds. Production records must be official DHIR or DHI records.

(i) The registration certificate (if available) or identification certificate and signed transfer shall be provided by the



owner for the 1/2 registered animals.

(ii) 1/2 registered animals not meeting requirements for this classification shall be placed into other classifications for which they qualify.

(f) Indiana 1/2 Registered Choice. To be eligible for this classification, all heifers and cows shall meet the following standards and specifications:

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) Weight: shall conform to the weight requirement for breed and age as is provided in 55 IAC 5-1-7, Table 1.

(3) Color: shall meet breed requirements for registration.

(4) Sire: shall have a registered sire with registered name and registration number provided.

(5) Dam: shall have a non-registered dam of the same breed.

(6) To be eligible for this classification, cows shall meet the following minimums:

(A) Production requirements: animals that have completed a lactation of 305 days or less must have produced an average butterfat production or mature equivalency of no more than 100 pounds below the official DHI breed average butterfat production or no less than 80 percent of the Indiana official DHI breed average for milk production for the current year regardless of age. Records must be official DHIA records, owner-sampler or any other acceptable production records.

(B) A heifer that has not completed a lactation of 305 days or less may qualify for this classification if she is obtained from an official or non-official DHI breed herd with an average butterfat production or mature equivalency of no more than 100 pounds below the Indiana official DHI average butterfat production or less than 80 percent of the Indiana official DHI average milk production for the current year.

(i) The registration certificate and signed transfer shall be provided by the owner for registered animals.

(ii) Registered animals not meeting requirements for this classification shall be placed into other classifications for which they qualify.

(g) Indiana Non-Registered Supreme.

(1) To be eligible for this classification, animals must be born to a sire and dam of the same breed.

(2) To be eligible for this grade, cows shall meet the following minimums:

(A) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be above average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(B) Weight: shall conform to the weight requirement for breed and age as is provided in 55 IAC 5-1-7, Table 1.

(C) Color: shall meet breed requirements for registration.

(D) Sire: shall have a sire and dam of the same breed.

(E) Production requirements: animals that have completed a lactation of 305 days or less must have produced 500 pounds of butterfat or at least the Indiana official DHI or mature equivalency breed average for milk or butterfat production for the current year, regardless of age. Production records must be official DHI or owner-sampler records or other acceptable production records.

(F) A heifer that has not completed a lactation of 305 days or less may qualify for this classification if she is purchased from a herd or area where butterfat and milk production is at least equivalent to the state breed production average for the current year.

(G) Non-registered animals not meeting requirements for this classification shall be placed into other classifications for which they qualify.

(h) Indiana Non-Registered Superior. To be eligible for this classification, all heifers and cows shall meet the following standards and specifications:

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be above average in size, condition and development. Shall be above average in body capacity, dairy

character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) Weight: shall conform to the weight requirement for breed and age as is provided in 55 IAC 5-1-7, Table 1.

(3) Color: shall meet breed requirements for registration.

(4) Sire: shall have a sire of the same breed.

(5) Dam: shall have a dam of the same breed.

(6) To be eligible for this classification, cows shall meet the following minimums:

(A) Production requirements: animals that have completed one lactation of 305 days or less must have produced 400 pounds of butterfat or at least 10,000 pounds of milk production or the Indiana official DHI mature equivalency for the current year regardless of age. Production records must be official DHIA or owner-sampler records or other acceptable production records.

(B) A heifer that has not completed a lactation of 305 days or less may qualify for this classification if she is obtained from an official or non-official DHI breed herd with an average butterfat production or mature equivalency of a minimum of 400 pounds and milk production of a minimum of 10,000 pounds. Production records must be official DHI records, owner-sampler or any other acceptable production records.

(i) Indiana Non-Registered Choice. To be eligible for this classification the animal must meet the following standards and specifications:

(1) Physical characteristics: shall present a very pleasing appearance for type with balance of parts showing strength and breed character. Shall be average in size, condition and development. Shall be average in body capacity, dairy character, general appearance, and shall have a good set of feet and legs. The udder of a heifer shall be desirable for age, with no obvious defects of teats or udder. Udder of any animal in milk shall be well balanced, strongly attached and of good quality. Teats shall be of desirable size and be properly placed on the udder.

(2) Weight: shall conform to the weight requirement for breed as is provided in 55 IAC 5-1-7, Table 1.

(3) Color: shall meet breed requirements for registration.

(4) Sire: shall have a sire and dam of the same breed.

(5) Production requirements: a heifer that has not completed a lactation of 305 days or less may qualify for this classification if she is purchased from a herd or area where the butterfat and milk production is at least equivalent to the national breed average for the current year.

*(Department of Commerce; Division of Agriculture; 55 IAC 5-1-4; filed Mar 16, 1983, 11:14 am: 6 IR 864; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 5-1-5 Classification for bulls, semen, embryos**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 5. Bulls, semen and embryos will be classified according to the weight, registration and production data of the dam and sire.

Prohibitions:

(1) No person shall offer for sale or represent any dairy cattle as graded cattle unless such cattle have been graded by a department grader in accordance with 55 IAC 5-1.

(2) No person shall misrepresent the grade of any dairy cattle, nor shall represent any dairy cattle as being of a grade provided for herein unless such cattle have been graded by a department grader in accordance with 55 IAC 5-1.

(3) No person shall use any terminology with respect to the quality of any dairy cattle which is deceptively similar to the grade terminology provided for herein.

*(Department of Commerce; Division of Agriculture; 55 IAC 5-1-5; filed Mar 16, 1983, 11:14 am: 6 IR 867; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 5-1-6 Fees**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

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Sec. 6. The department shall establish and collect fees sufficient to cover the actual cost of the grading service provided for herein. (*Department of Commerce; Division of Agriculture; 55 IAC 5-1-6; filed Mar 16, 1983, 11:14 am: 6 IR 867; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 5-1-7 Weight requirements; tables**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 7. (a) All animals shall be weighed; however, if a scale cannot be provided, taped weights may be used. Tapes shall be U.S.D.A. approved for measurements and weights.

(b) Minimum weight requirements for the classifications prescribed in 55 IAC 5-1 shall conform to the following tables of weights expressed in pounds:

(1) Heifers

TABLE 1  
NUMBERS OF MONTHS PREGNANT AFTER CALVING

	*3 Months	*4 Months	*5 Months	*6 Months	*7 Months	*8 Months	Week or less	Week or less	2 Months
Holstein and Brown Swiss									
Supreme .....	1000	1025	1050	1075	1100	1125	1175	1075	1100
Superior .....	950	975	1000	1025	1050	1075	1125	1025	1050
Choice .....	900	925	950	975	1000	1025	1075	975	1000
Guernsey, Ayrshire, Milking Shorthorn and Red Poll									
Supreme .....	795	815	835	855	875	900	925	850	875
Superior .....	770	790	810	830	850	875	900	825	850
Choice .....	720	740	760	780	800	825	850	775	800
Jersey									
Supreme .....	670	690	710	730	750	775	800	725	750
Superior .....	645	665	685	705	725	750	775	700	725
Choice .....	595	615	635	655	675	700	725	650	675

(2) Open heifers and heifers less than 7 months pregnant. Registered Superior DHIA, 1/2 Registered Superior and Non-registered Superior heifers shall conform to the weight for age in this table. Choice heifers may weigh 15% less. Heifers that weigh less than the minimum weight requirement for Choice will not be classified.

TABLE 2

Age (months)	Weight (lbs.)			Estimating Weight from Heart Girth Measurement	
	Holstein and Brown Swiss	Guernsey and Ayrshire, Milking Shorthorn and Red Poll	Jersey	Weights (lbs)	Heart Girth (inches)
4 .....	270	205	160	200	40
6 .....	380	300	250	300	46
8 .....	500	400	350	400	51
10 .....	600	495	440	500	55
12 .....	700	575	520	600	59
14 .....	775	645	580	700	62
16 .....	850	710	630	800	65

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18 .....	915	765	680	900	68
20 .....	975	820	725	1000	71
22 .....	1040	870	770	1100	73
24 .....	1100	920	820	1200	75

TABLE 3

	Supreme	Superior	Choice
1. Holstein and Brown Swiss			
3-year old or 2nd calf .....	1200	1150	1075
4-year old or 3rd calf .....	1300	1250	1150
Mature .....	1350	1300	1200
2. Guernsey and Ayrshire, Milking Shorthorn and Red Poll			
3-year old or 2nd calf .....	925	900	850
4-year old or 3rd calf .....	975	950	900
Mature .....	1000	975	925
3. Jersey			
3-year old or 2nd calf .....	800	775	725
4-year old or 3rd calf .....	850	825	775
Mature .....	875	850	800

*(Department of Commerce; Division of Agriculture; 55 IAC 5-1-7; filed Mar 16, 1983, 11:14 am; 6 IR 868; readopted filed Dec 2, 2001, 12:30 p.m.; 25 IR 1267)*

**55 IAC 5-1-8 Dairy cattle grading certificate**

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

Sec. 8.

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DAIRY CATTLE  
GRADING CERTIFICATE

Owner's Name	Selling Agency
Address	Address
Post Office Zip	Post Office Zip
Name of Herd of Origin (if different than owner)	Address of Herd of Origin

ANCESTRY RECORD

Official Ear Tag No.	Grading Ear Tag No.	Breed	Date of Birth
Registered (Check One) Yes No	Registration No.	Registration Name	Breed Assoc. Score of Animal
Date Bred	Service Sire	Due Date (Approx)	Last Calving Date
Sire Registration No.	Name of Sire	Breed Assoc. Score of Sire	
Dam Ear Tag or Reg. No.	Name of Dam	Breed Assoc. Score of Dam	

PRODUCTION RECORD

Check One		RECORD OF INDIVIDUAL	RECORD OF DAM	DHIA HERD CODE NUMBER on which record was established				
ANIMAL	DHIR	AGE	DAYS	MILK	TEST	FAT	YEAR	COMMENTS
	DHIA - STANDARD							
	DHIA - OWNER SAMPLER (Based on Owner's Weights & Samples)							
	DHIA - STANDARD (Yearly Average)							
HERD	DHIA - OWNER SAMPLER (Yearly Average) (Based on Owner's Weights & Samples)							

DAIRY CATTLE GRADING CERTIFICATE (CON'T)

PRICE VERIFICATION

THE ACTUAL PRICE RECEIVED BY THE SELLER FOR THE PURCHASE OF THE ABOVE MENTIONED ANIMAL TOTALS \_\_\_\_\_  
DOLLARS

I HEREBY CERTIFY THAT THE INFORMATION GIVEN IS CORRECT AND TRUE

SELLER'S SIGNATURE

GRADE CERTIFICATION

(TO BE COMPLETED BY GRADER)

DATE GRADED	INDIANA GRADE
Graded at (Farm or Name of Location)	
<p>I, THE UNDERSIGNED, A DULY AUTHORIZED INSPECTOR OF THE INDIANA DEPARTMENT OF COMMERCE, DIVISION OF AGRICULTURE, DO HEREBY CERTIFY THAT ON THE DATE INDICATED I PERSONALLY GRADED THE ABOVE DESCRIBED ANIMAL AND IT MET THE STANDARDS FOR THE GRADE INDICATED AS SET FORTH IN THE RULES AND REGULATIONS OF THE INDIANA DAIRY EXPORT CERTIFICATION PROGRAM IN ACCORDANCE WITH HOUSE ENROLLED ACT 148 P.L. 14, CODE IC 15-2-18 (ACTS 1983).</p> <p>I DO HEREBY VERIFY THAT BASED UPON THE SELLER'S SIGNED STATEMENT, THE TOTAL ACTUAL PRICE OF _____ DOLLARS WAS PAID TO SAID SELLER FOR THE ABOVE DESCRIBED ANIMAL.</p> <p>Weight _____ Grader's Signature _____</p>	

(Department of Commerce; Division of Agriculture; 55 IAC 5-1-8; filed Mar 16, 1983, 11:14 am: 6 IR 870; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)

55 IAC 5-1-9 Indiana livestock export certification

Authority: IC 4-4-3; IC 15-5-16

Affected: IC 15-5-16

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Sec. 9.

**DAIRY CERTIFICATE**  
(Non-Registered)

State of Indiana  
Lt. Governor John M. Mutz, Commissioner

Department of Commerce  
Division of Agriculture

Farm/Owner Signature	Rt. Ear Metal #	Lt. Ear Plastic #	Ag e	Weight U.S. lbs.	Tape Scale- Weight	Pregnancy Check Pos Neg	Fetus Development	Grade	Date Graded	Price Pd. Owner

I, THE UNDERSIGNED, a duly authorized inspector of the Indiana Department of Commerce, Division of Agriculture, do hereby certify that on the date indicated I personally graded the above described animals and they met the standards for the grades indicated as set forth in the rules and regulations of the Indiana Dairy Export Certification Program in accordance with House Enrolled Act 1434 P.L.114, Code IC 15-2-16 [sic., IC 15-5-16] (Acts 1982).

I do hereby verify that based upon the seller's signed statement, the total actual prices stated on this document \_\_\_\_ were paid to said seller for the above described animals.

Grader's Signature \_\_\_\_\_ Date \_\_\_\_\_  
Signature of Licensed Veterinarian \_\_\_\_\_ Date \_\_\_\_\_

*(Department of Commerce; Division of Agriculture; 55 IAC 5-1-9; filed Mar 16, 1983, 11:14 am; 6 IR 872; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**ARTICLE 6. INDIANA COMMERCIAL AND APARTMENT CONSERVATION SERVICE PROGRAM**

**Rule 1. General Provisions and Definitions**

**55 IAC 6-1-1 Purpose and scope**

Authority: IC 4-4-3-21  
Affected: IC 4-4-3-8

Sec. 1. (a) The "Indiana Commercial and Apartment Conservation Service Program State Plan" contains the regulations specific to Indiana for the implementation of the Commercial and Apartment Conservation Program (CACS program). This program is required by Title VII of the National Energy Conservation Policy Act, Public Law 95-619 (42 U.S.C. 8281-8284), as enacted in Subtitle D of Title V of the Energy Security Act, Public Law 96-294.

(b) The final regulations for the CACS program (10 CFR Part 458) appeared in the October 26, 1983, "Federal Register," Vol. 48, No. 208. These regulations are hereby incorporated by reference into the state plan as though set forth herein.

(c) In the event that Title VII of the National Energy Conservation Policy Act as enacted in Subtitle D of Title V of the Energy Security Act, or any regulations thereunder, are amended or repealed so as to eliminate the necessity for, or render voluntary, the continuation of the state plan, the lead agency shall take no further action to enforce the provisions of the CACS state program. (*Department of Commerce; Division of Energy; 55 IAC 6-1-1; filed Jun 3, 1985, 10:35 am: 8 IR 1259; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-1-2 Definitions**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 2. The following definitions apply to 55 IAC 6: "Apartment Building" means a building which is used for residential occupancy, contains five (5) or more apartments and uses any of the following: a central heating system; a central cooling system; or a central meter for the heating or cooling system.

"Assistant Secretary" means the Assistant Secretary for Conservation and Renewable Energy of the U.S. Department of Energy.

"Audit Announcement" means the offer of an audit which 55 IAC 6 requires a covered utility or covered building heating supplier to provide to each eligible customer.

"Building Heating Supplier" refers to any person engaged in the business of selling No. 2, No. 4, or No. 6 heating oil, kerosene, or propane to eligible customers.

"Commercial and Apartment Conservation Service Program (CACS program)" means the audit program which 55 IAC 6 requires each covered utility and covered building heating supplier to implement pursuant to an approved state plan, an approved nonregulated utility plan, or a federal standby plan.

"Commercial Building" means a building:

(1) which is used primarily for carrying out a business (including a nonprofit business) or for carrying out the activities of a state or local government;

(2) which is not used primarily for the manufacture or production of products, raw materials, or agricultural commodities;

(3) which is not a federal building;

(4) for which the average monthly use of energy for the latest twelve (12) month period for which information is readily available, was less than the following:

(A) 4,000 kilowatt hours of electricity, unless it is determined that the building exceeds the average monthly fuel prescribed in either (4)(B) or (C);

(B) 1,000 therms of natural gas, unless it is determined that the building exceeds the average monthly fuel use prescribed in either (4)(A) or (C); and

(C) 100 million Btu of any other fuel, unless it is determined that the commercial building exceeds the average monthly fuel use prescribed in (4)(A) and (B);

(5) for purposes of determining the consumption limits in (4), all exterior devices which are connected to the same meter as the building may be considered part of the building;

(6) for purpose of 55 IAC 6, "building" means any space which has permanent walls with no openings connecting the space to any adjacent conditioned space, is separately heated and cooled, and has its own meter(s).

"Covered Building Heating Supplier" means a building heating supplier included in a state plan.

"Covered Utility" means in any calendar year a public utility (regulated or nonregulated) which during the second preceding calendar year had either:

(1) sales of natural gas for purposes other than resale which exceeded ten billion cubic feet ( $10 \times 10^9$  cu. ft.) or;

(2) sales of electric energy for purposes other than resale which exceeded 750 million kilowatt-hours ( $75 \times 10^7$  KWH).

"DOE" means the United States Department of Energy.

"Eligible Customer" means any of the following:

(1) with respect to a covered utility, the owner or tenant of a commercial building or the owner (or the owner's agent) of an apartment building to whom the covered utility sells electricity or natural gas, for use in the building and who is the utility customer of record; or

(2) with respect to a building heating supplier, the owner or tenant of a commercial building or the owner (or the owner's agent) of an apartment building to whom the building heating supplier sells No. 2, No. 4, or No. 6 heating oil, kerosene, or propane for use in the building and who is the supplier's customer of record.

"Energy Conserving Operation and Maintenance Procedures" means changes in the operation or maintenance of a commercial building or an apartment building which are designed primarily to reduce energy consumption in the building including those which are defined as follows:

(1) "Air Conditioner Efficiency Maintenance" means periodic cleaning or replacement of air filters and cleaning of coils on forced-air cooling systems.

(2) "Conditioned Space Reduction" means closing off unoccupied areas, and/or reducing the heating and cooling supply to these areas.

(3) "Efficient Use of Shading" means using existing shades, drapes, awnings, and other methods:

(A) to block sunlight from entering a building in the cooling season;

(B) to allow sunlight to enter a building during the heating season; or

(C) to cover windows at night during the heating season.

(4) "Furnace Efficiency Maintenance and Adjustments" means cleaning and combustion efficiency adjustments of gas or oil-fired furnaces (including burners), periodic cleaning or replacement of air filters on forced-air heating systems including heat pumps, lowering the bonnet or plenum fan thermostat to 80° F on a gas or oil fired furnace and turning off the pilot light on a gas furnace during the summer.

(5) "Lighting System Cleaning and Maintenance" means periodic cleaning of lamps and fixtures.

(6) "Plugging Infiltration Leaks" means:

(A) installing scrap insulation or other pliable materials in gaps around pipes, conduits, ducts, or other gaps which connect conditioned with unconditioned spaces; and

(B) adding weatherstripping around areas such as ceiling access doors or basement doors.

(7) "Sealing Leaks in Pipes and Ducts" means applying appropriate sealants to any leak in a heating or cooling duct that is located outside the conditioned space, tightening or plugging any leaking joints in hot water or steam pipes, and replacement of washers in leaking hot water valves.

(8) "Steam Distribution System Maintenance" means the inspection of the visible distribution system for the purpose of detecting steam leaks, ensuring that steam is not entering the condensate system and that condensate return lines return all condensate to the boiler where practical and desirable.

(9) "Temperature Raising in Summer" means raising the thermostat or other temperature control for occupied space to as high a temperature as reasonable during the cooling season. The temperature of space that is not continuously occupied may be allowed to rise further than that of occupied space.

(10) "Temperature Reduction in Winter" means lowering the thermostat or other temperature control for occupied space to as low a temperature as reasonable during the heating season. The temperature of space that is not continuously occupied may be allowed to drop further than that of occupied space.

(11) "Water Flow Reduction in Showers and Faucets" means reducing the hot water flow in showers, faucets, or other equipment as low as reasonable by the use of any practical or feasible method.

(12) "Water Temperature Reduction" means turning the hot water heater off or manually setting back the heater thermostat temperature to as low a temperature as practical, consistent with the needs for hot water.

"Federal Building" means any building or other structure owned in whole or part by the government of the United States or a federal agency, including any structure occupied by a federal agency under a lease-acquisition agreement under which the United States or a federal agency will receive fee simple title under the terms of the agreement without further negotiations.

"Governor" means the governor or chief executive officer of a state or the governor's designee.

"Lead Agency" means a state agency authorized by law or designated by the governor to develop and submit a state plan.

"NECPA" means the National Energy Conservation Policy Act, Public Law 95-619.

"Nonregulated Utility" means a public utility which is not a regulated utility.

"Program Audit" means an on-site inspection of a commercial building or an apartment building carried out in accordance with the requirements of 55 IAC 6.

"Program Information" means the audit announcement and any information dissemination activities related to the CACS program.

"Program Measures" includes the following items:



- (1) "Air Conditioner Replacement" means an air conditioner which replaces an existing air conditioner of the same fuel type and which reduces the amount of fuel consumed due to an increase in efficiency.
- (2) "Automatic Energy Control System" means devices and associated equipment which regulate the operation of heating, cooling or ventilating equipment based on time, inside and/or outside temperature or humidity, or utility load management considerations in order to reduce energy demand and/or consumption.
- (3) "Caulking" means pliable materials used to reduce the passage of air and moisture by filling small gaps such as around window and door frames, around unsealed glass panes, at fixed joints on a building, underneath baseboards inside a building, at electrical outlets, around pipes and wires entering a building, and around dryer vents and exhaust fans. Caulking includes, but is not limited to, materials commonly known as "sealants", and "putty", and "glazing compounds."
- (4) "Energy Recovery Systems" means equipment designed primarily to recover building waste energy from sources such as refrigeration or air conditioning for some useful purpose such as heating water.
- (5) "Furnace, or Utility Plant and Distribution System Modifications" means installation of the devices or components which are defined as follows:
  - (A) "Intermittent Pilot Ignition Device (IID)" means a device which, when installed in a gas-fired furnace or boiler, automatically ignites the pilot or burner and replaces a continuously burning pilot light.
  - (B) "Flue Opening Modification (vent damper)" means an automatically operated damper installed in a gas-fired or oil-fired furnace or boiler which:
    - (i) is installed downstream from the draft hood or barometric damper; and
    - (ii) conserves energy by substantially reducing the flow of heated air through the chimney when the furnace is not in operation.
  - (C) "Replacement Burner (oil or gas)."
    - (i) "Replacement Burner (oil)" means a device which atomizes the fuel oil, mixed it with air, and ignites the fuel-air mixture; is an integral part of an oil-fired furnace or boiler (including the combustion chamber); and which, because of its design, achieves a reduction in the oil used from the amount of oil used by the device it replaces.
    - (ii) "Replacement Burner (gas)" means a device designed for installation in an existing gas-fired boiler which uses a fan and/or control mechanisms to supply and control combustion air to achieve an optimal fuel to air ratio for maximum gas combustion efficiency and which, because of its design, achieves a reduction in the gas used from the amount of gas used by the device which it replaces.
  - (D) "Replacement Furnace or Boiler" means a furnace or boiler, including a heat pump, which replaces an existing furnace or boiler of the same fuel type and provides reduced fuel consumption due to higher energy efficiency of the heating system.
  - (E) "Distribution System Modifications" means modifications to an energy distribution system and associated components that increase the energy efficiency, such as:
    - (i) improved flow control devices;
    - (ii) improved pipes or duct routing to reduce pressure drop and/or heat losses;
    - (iii) flow balancing mechanisms; or
    - (iv) point of use water heaters of the same fuel type.
- (6) "Ceiling Insulation" refers to a material, primarily designed to resist heat flow, which is installed between the conditioned area of a building and unconditioned space beneath the roof. When the conditioned area of a building extends to the roof the term "ceiling insulation" applies to such material used beneath the roof. Ceiling insulation also includes such material used on the exterior of the roof.
- (7) "Duct Insulation" refers to a material, primarily designed to resist heat flow, which is installed on heating or cooling supply and return ducts in an unconditioned area of a building such as the space above a dropped ceiling.
- (8) "Floor Insulation" refers to a material, primarily designed to resist heat flow, which is installed between the lowest conditioned level of a building and a lower unconditioned level. For a structure with an open crawl space, the term "Floor Insulation" also means skirting to enclose the space between the building and the ground.
- (9) "Pipe Insulation" refers to a material, primarily designed to resist heat flow, which is installed on:
  - (A) pipes and fittings carrying hot or cold fluids for space conditioning purposes; or
  - (B) hot water pipes and fittings with continuous recirculating systems.
- (10) "Wall Insulation" refers to a material, primarily designed to resist heat flow, which is installed within or on exterior walls or walls between conditioned and unconditioned areas of a building.

- (11) “Water Heater Insulation” refers to a material, primarily designed to resist heat flow, which is wrapped around the exterior surface of the water heater casing.
- (12) “Lighting Systems Replacement or Modification” means devices and actions which reduce overall lighting energy consumption and/or demand while maintaining satisfactory lighting levels. These devices and actions include:
- (A) Reducing light levels to levels cited in existing applicable guidelines in each are [*sic.*] of the building. This action may include installation of task lighting and reduction of overhead task lighting.
  - (B) Controlling lamp operating time to limit lighting operation to periods of area use. Installation of local manual switching, time control devices and space use sensing devices is included.
  - (C) Replacement of lamps with more efficient sources. These devices and actions may include, but are not limited to, replacement of incandescent and fluorescent lighting with lumen-equivalent low energy lamps, replacement of old fluorescent lighting ballasts with new electronic ballasts, or replacement of any fixture type with one (1) or greater lumens per watt efficiency such that total lighting demand can be reduced.
  - (D) Use of “Daylighting” by automatically switching off electric lights in areas where satisfactory lighting levels can be maintained using either existing windows or skylights in a commercial building or a common area of an apartment building.
- (13) “Passive Solar Space Heating and Cooling Systems” means systems that make the most efficient use of, or enhance the use of natural forces—including solar irradiation, winds, night time coolness, and the opportunity to lose heat by irradiation to the night sky—to heat or cool space by the use of conductive, convective, or radiant energy transfer.
- (A) “Thermosyphon Air System” which means a solar day time heater attached to the south-facing ( $\pm 45^\circ$ ) of true south) wall of a building which operates either through natural convection or through use of a fan or low power to draw air from near the floor, exposes the air to a solar-heated surface, and discharges heated air near the ceiling, and which is able to be closed off from the conditioned area at night and on cloudy days.
  - (B) “Solaria/Sunspace System” which means an enclosed structure of glass, fiberglass, or similar transparent material attached to the south-facing ( $\pm 45^\circ$  of true south) wall of a structure which absorbs solar heat and utilized air circulation to bring this heat into the building and which is able to be closed off from the structure at night and on cloudy days.
  - (C) “Window and Door Heat Loss Retardants” refers to those mechanics which significantly reduce winter heat loss through windows by use of external or internal devices such as insulated shades, drapes, movable rigid insulation, awnings, metals or fiberglass solar screening, or heat absorbing films, that cover the windows during the winter both at night and when no appreciable amount of sunlight is entering the window during the day.
  - (D) “Window and Door Heat Gain Retardants” refers to those mechanisms which significantly reduce summer heat gain through windows in the summer by use of devices such as awnings, solar screens, insulated shades, or heat reflective films.
- (14) “Solar Domestic Hot Water Systems” means equipment designed to absorb the sun's energy and to use this energy to heat water for use in a structure other than for space heating, including solar thermosyphon hot water heaters.
- (15) “Solar Replacement Swimming Pool Heater” means a device which is used solely for the purpose of using the sun's energy to heat swimming pool water and which replaces a swimming pool heater using electricity, gas or other fossil fuel.
- (16) “Weatherstripping” means narrow strips of material placed over or in movable joints or windows and doors to reduce the passage of air and moisture.
- (17) “Window and Door System Modification” include the measures defined as follows:
- (A) “Storm Window” means a window or glazing material placed outside or inside a prime window, creating an insulating airspace, to provide greater resistance to heat flow than the prime window alone.
  - (B) “Thermal Window” means a window unit with improved thermal performance through the use of two (2) or more sheets of glazing materials affixed to a window frame to create one (1) or more insulating airspaces. It may also have an insulating frame and sash.
  - (C) “Storm or Thermal Door” means:
    - (i) a second door, installed outside or inside a prime door, creating an insulating airspace;
    - (ii) a door with enhanced resistance to heat flow through the glass area, constructed by affixing two (2) or more sheets of glazing material;
    - (iii) a prime exterior door with an R-value of at least 2; or
    - (iv) a door that is designed to minimize air exchange during operation, including revolving doors, and double doors with a foyer.

“Public Utility” means any person, state agency, or federal agency which is engaged in the business of selling natural gas or electric energy, or both, for use in commercial buildings or apartment buildings.

“Rate” means any price, rate, charge, or classification made, demanded, observed, or received with respect to sales of electric energy or natural gas, any rule, regulations, or practice respecting any rate, charge or classification, and any contract pertaining to the sales of electric energy or natural gas.

“Rate Making Authority” means authority to fix, modify, approve, or disapprove rates.

“Regulated Utility” means a public utility with respect to whose rates a state regulatory authority has rate making authority.

“Secretary” means the secretary of energy.

“State” means a state, the District of Columbia, and Puerto Rico.

“State Agency” means a state, a political subdivision thereof, or any agency or instrumentality of either.

“State Plan” means a plan developed pursuant to the federal guidelines.

“State Regulatory Authority” means any state agency which has rate making authority with respect to the sales of electric energy or natural gas by any public utility. (*Department of Commerce; Division of Energy; 55 IAC 6-1-2; filed Jun 3, 1985, 10:35 am; 8 IR 1259; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

## **Rule 2. Program Guidelines**

### **55 IAC 6-2-1 Covered utilities**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 1. (a) In Indiana there are eight (8) utilities which presently meet the definition of a “covered utility” and consequently must participate in the CACS program. These utilities include:

Citizens Gas & Coke Utility  
2020 N. Meridian Street  
Indianapolis, IN 46202

Indiana Gas Company  
1630 N. Meridian Street  
Indianapolis, IN 46202

Indiana & Michigan Electric Company  
125 E. Washington Street  
P.O. Box 60  
Fort Wayne, IN 46802

Indianapolis Power & Light Company  
P.O. Box 1595B  
Indianapolis, IN 46206

Northern Indiana Public Service Company  
5265 Hohman Avenue  
Hammond, IN 46320

Public Service Company of Indiana, Inc.  
1000 East Main Street  
Plainfield, IN 46168

Southern Indiana Gas & Electric Company  
P.O. Box 569  
Evansville, IN 47741

Terre Haute Gas Corporation  
632 Cherry Street  
Terre Haute, IN 47808

(b) There are no nonregulated utilities in Indiana which meet the definition of a covered utility and are participating in the program.

There are also no building heating suppliers presently covered under the state plan. However, the Lead Agency continually encourages involvement of the various building heating suppliers, the nonregulated utilities and non-covered utilities. These energy suppliers have been informed that they may enter the program at anytime. Plan amendments will be made in accordance with the appropriate rules and regulations subparts should the building heating suppliers or non-covered utilities voluntarily or through executive order become subject to the plan. (*Department of Commerce; Division of Energy; 55 IAC 6-2-1; filed Jun 3, 1985, 10:35 am: 8 IR 1263; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-2 Implementation and monitoring of state plan**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8; IC 8-1-12; IC 8-1-13

Sec. 2. (a) Each CACS participant as identified in 55 IAC 6-2-1(a) must comply with the state plan.

(b) Neither the department of commerce, division of energy policy nor the public service commission has direct authority to order the utilities to implement the CACS program and enforce the provisions of the state plan. Consequently, the division of energy policy is relying on voluntary compliance with this plan on the part of the covered utilities. Compliance letters of agreement shall be provided to the department of commerce, division of energy policy by the covered utilities. The Lead Agency will forward copies of these letters to the U.S. Department of Energy.

(c) The Lead Agency will monitor the CACS program implementation through a variety of methods including conducting quarterly meetings with the covered utilities, obtaining weekly status reports as to the number of audits requested and performed, investigating any program complaints, and randomly participating in the audit process. Compliance violations will be resolved with the appropriate utility and, if necessary, reported to the public service commission, the state's attorney general's office, and the U.S. Department of Energy.

(d) The Indiana public service commission (PSC) is responsible for the monitoring and enforcement of program accounting and payment of cost considerations. The PSC authority to perform this role is the PSC Act of 1941, IC 8-1-11 [*Repealed by P.L. 28-1975, SECTION 1.*] through IC 8-1-13. (*Department of Commerce; Division of Energy; 55 IAC 6-2-2; filed Jun 3, 1985, 10:35 am: 8 IR 1264; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-3 Program announcement**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 3. (a) Each covered utility shall offer a CACS program audit to each eligible customer no later than twelve (12) months after the approval by DOE of the state plan and every two (2) years thereafter until January 1, 1990. Customers who have requested and received a CACS audit do not have to be sent a subsequent announcement.

(b) The program announcement shall include the following information:

(1) A general overview of the CACS program.

(2) A list of program measures, as identified in the state plan, for the category of buildings owned or occupied by the eligible customer.

(3) A state-provided estimate expressed in percentages of the approximate first year savings, or range of savings, which could result from the installation of each measure.

(4) A list of operation and maintenance procedures, as identified in the state plan, which are designed to reduce energy consumption in the building.

(5) A state-provided estimate expressed in percentages of the approximate first year savings, or range of savings, which could result from the adoption of the procedures. Calculations can be provided for each procedure individually or collectively.

(6) A description of the services offered.

(7) An explanation of how the eligible customer may request a program audit.

(8) A description as to when the customer will receive the audit based upon such factors as serving one (1) geographic area at a time or serving certain types of energy users first. If the audit is not conditioned on such factors, a statement outlining that the audit will be provided within a reasonable time period, convenient to the customer and the utility, should be included in the announcement.

(9) A general statement issued by the Indiana department of commerce/division of energy policy explaining any federal and Indiana tax credits and deductions as related to the program measures and type of building.

(10) The direct cost of the program audit to the customer by type of building.

(11) An explanation that a subsequent customer may obtain upon request a copy of the audit report free of charge, provided that the building has been previously audited.

(c) The offer of a program audit may be conditioned upon nondiscriminatory and reasonable factors such as serving one (1) geographic area at a time or serving certain types of energy users first. Each covered utility shall submit to the Lead Agency for approval prior to program announcement, a proposed schedule for distribution of audit announcements and for responding to audit requests.

(d) The CACS program announcement shall not include advertising for the sale, installation, or financing of any energy conserving product. However, a utility may state in general terms the existence of any financing program for the sale or installation of measures. Also information regarding any products which are not program measures or operation and maintenance procedures as defined in the state plan, shall not be included in the audit announcement.

(e) Each participating utility is required to forward to the Lead Agency, a draft version of the program announcement prior to its intended use. The Lead Agency is responsible for suggesting changes and approving the announcement prior to release.

(f) The covered utilities shall coordinate their initial announcement and all subsequent versions with any covered utility(ies) that also provide service to the same customers.

(g) Utilities are prohibited from unfairly discriminating among measures, operation and maintenance procedures, eligible customers, consulting companies, and contractors in the providing of, and in the content of, information concerning the CACS program announcement and its distribution. (*Department of Commerce; Division of Energy; 55 IAC 6-2-3; filed Jun 3, 1985, 10:35 am; 8 IR 1264; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-4 Program audits**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 4. (a) Each covered utility shall provide a program audit to each eligible customer within a reasonable time after the request for an audit. Allowances will be made for special circumstances such as difficulty in contacting a customer or determining a convenient audit time.

(b) The covered utilities may condition their audits based upon such factors as serving one (1) geographic area at a time or serving certain type of energy users first. Utilities which decide to condition their audits must provide the Lead Agency with a description of the basis for conditioning and the annual audit schedule.

(c) Each covered utility will use the conversion factors listed in (c)(1)–(5) in determining the eligibility of a commercial building for a program audit on the basis of the on-site consumption of less than 100 million Btu of a fuel other than electricity or natural gas:

(1) Coal: 24.5 million Btu/short ton.

(2) Distillate fuel oil: 138,690 Btu/gallon.

(3) Liquified [*sic.*] propane gas: 91,500 Btu/gallon. The 91,500 average figure was obtained from the Air Conditioning Contractors of America and the American Gas Association.

(4) Purchased steam: 1160 Btu/pound. This figure was derived from the steam department of the only covered utility which sells the product.

(5) Residual fuel oil: 149,690 Btu/gallon.

(d) The participating utilities serving the same customer base shall coordinate their efforts in determining the eligibility of customers under the CACS program. The utilities may freely exchange applicable audit records, usage records, profile costs for similar buildings where past usage information is not established, and other pertinent information.

(e) Each eligible apartment building customer must certify as a condition for receiving a program audit, that the customer agrees to supply tenants in a timely manner after receipt of the audit, information developed by the audit relating to operation and

maintenance procedures and program measures which are applicable to an individual apartment. The covered utilities shall provide to the apartment building customer, brochures, pamphlets, or reports which can be directly distributed to the apartment building residences. The materials must include information on the following items:

- (1) conditioned space reduction;
- (2) efficient use of shading;
- (3) plugging infiltration leaks;
- (4) temperature raising in summer;
- (5) temperature reduction in winter;
- (6) water flow reduction in showers and faucets;
- (7) water heater temperature reduction;
- (8) energy use reduction when the unit is unoccupied.

(f) Each utility participating in the state plan shall provide, upon request, to each eligible customer an on-site program audit which includes, or is conducted in accordance with, the following:

(1) A discussion of the applicable operation and maintenance procedures, emphasizing their importance individually and collectively. The approved procedures for Indiana are:

- (A) air conditioner efficiency maintenance;
- (B) conditioned space reduction;
- (C) efficient use of shading;
- (D) furnace efficiency maintenance and adjustments;
- (E) lighting system cleaning and maintenance;
- (F) plugging infiltration leaks;
- (G) sealing leaks in pipes and ducts;
- (H) steam distribution system maintenance;
- (I) temperature raising in summer;
- (J) temperature reduction in winter;
- (K) water flow reduction in showers and faucets;
- (L) water temperature reduction;

(2) An energy analysis of the building which considers the following approved measures:

- (A) air conditioner replacement;
- (B) automatic energy control system;
- (C) caulking;
- (D) furnace, or utility plant and distribution system modifications;
  - (i) intermittent pilot ignition device;
  - (ii) flue opening modification (vent damper);
  - (iii) replacement burner (oil or gas);
  - (iv) replacement furnace or boiler;
  - (v) distribution system modifications;
- (E) ceiling insulation;
- (F) duct insulation;
- (G) floor insulation;
- (H) pipe insulation;
- (I) wall insulation;
- (J) water heater insulation;
- (K) lighting systems replacement or modifications;
- (L) passive solar space heating and cooling systems;
  - (i) thermosyphon air system;
  - (ii) solaria/sunspace system;
  - (iii) window and door heat loss retardants;
  - (iv) window and door heat gain retardants;
- (M) solar domestic hot water systems;
- (N) solar replacement swimming pool heater;

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- (O) weatherstripping;
- (P) window and door system modifications;
  - (i) storm window;
  - (ii) thermal window;
  - (iii) storm or thermal door.

(g) The auditor shall determine the applicability of each program measure in the building based upon the applicability factors list in 55 IAC 6-3, Program Measure Applicability Criteria. If a given applicability factor is not met, the auditor need not address the program measure.

(h) Auditors are prohibited from recommending or estimating costs and savings for any measure or procedure which is not approved per listing in the state plan.

(i) Reserved. The audit methodologies to be employed by the utilities will be described in this subsection after the commercial vendor selection process is completed.

(j) Reserved. The method of obtaining the audits results will be described after the commercial vendor selection process is completed.

(k) The audit procedures employed by the selected contractors will be reviewed for completeness; and validated to ensure accuracy and consistency of the audit results conducted within the state. This process will be the responsibility of a technical advisory committee consisting of qualified representatives of the covered utilities and chaired by the Indiana department of commerce, division of energy policy.

(l) The committee members will compare the calculations used to obtain the audit results to the following standards references:

TABLE OF STANDARDS

NUMBER	TITLE
ANSI:	
ANSI/AAMA 1002.9-1977	“Voluntary Specification for Aluminum Combination Storm Windows for External Applications.”
ANSI/AAMA 1102.7-1977	“Voluntary Specifications for Aluminum Storm Doors”
ANSI/ASTM B 152-79	“Standard Specification for Cooper Sheet, Strip, Plate, and Rolled Bar”
ANSI/ASTM B 446-75	“Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNSO6625) Rod and Bar”
ANSI/ASTM D 2156-65 (1975)	“ANSI Standard Method of Tests for Smoke Density in the Flue Gases from Distillate Fuels”
ANSI Z21.13-1977	“Gas-fired Low Pressure Steam and Hot Water Heating Boilers”
ANSI Z21.20-1975	“ANSI Standard for Automatic Gas Ignition Systems and Components”
ANSI Z21.47-1978	“ANSI Standard for Gas-fired Central Furnaces
ANSI Z21.59-1974	“Gas-fired High Pressure Steam and Hot Water Heating Boilers”
ANSI Z21.66-1977	“ANSI Standard for Electrically-Operated Automatic Vent Damper Devices for Use with Gas-fired Appliances”
ANSI Z21.67-1978	“ANSI Standards for Mechanically-Actuated Automatic Vent Damper Devices for Use with Gas-fired Appliances”
ANSI Z21.68-1978	“ANSI Standard for Thermally-Actuated Automatic Vent Damper Devices for Use with Gas-fired Appliances”
ANSI Z91.2-1976	“Performance Requirements for Automatic Pressure Oil Burners of the Mechanical Draft Type”
ANSI Z96.1-1978/UL727	“Oil-fired Central Furnaces”
ANSI Z96.2-1974/UL296	“Oil Burners”
ANSI Z96.3-1975/UL726	“Oil-fired Boiler Assemblies”
ANSI Z223.1-1974	“Installation of Gas Piping and Gas Equipment on Non-industrial Premises”
ANSI/NWMA I.S. 2-73	“Industry Standard for Wood Windows”
ANSI/NWMA I.S. 5-73	“Ponderosa Pine Doors”

ASTM

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ASTM C-177-76	“Standard Test Method for Steady State Thermal Transmission Properties by Means of the Guarded Hot Plate”
ASTM C-236-66 (Reapproved 1971)	“Standard Test Method for Thermal Conductance and Transmittance of Built-up Sections by Means of the Guarded Hot Box”
ASTM C-516	“Standard Specification for Vermiculite Loose Fill”
ASTM C-518-76	“Standard Test Method for Steady State Thermal Transmission Properties by the Means of Heat Flow Meter”
HH-I-524 B	“Insulation Board, Thermal (Polystyrene)”
HH-I-530 A	“Insulation Board, Thermal (Polyurethane and Polyisocyanurate)”
HH-I-558 B	“Insulation Blocks, Boards, Blankets, Felts, Sleeving, and Pipe Fitting Coverings”
HH-I-573 B	“Organic Cellular Flexible Unicellular Pipe Covering”
HH-I-574 B	“Insulation, Thermal (Perlite)”
HH-I-585 C	“Insulation, Thermal (Vermiculite)”
HH-I-1030 A	“Insulation, Thermal (Mineral Fiber for Pneumatic or Poured Application)”
HH-I-1252 B	“Insulation, Thermal Reflective (Aluminum Foil)”
TT-S-001543 A	“Sealing Compound, Silicone Rubber Base (for Caulking, Sealing, and Glazing in Buildings and Other Structures)”
TT-S-00227 E	“Sealing Compound, Elastomeric Type, Multi-Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures)”
TT-S-001657	“Sealing Compound, Single Component Butyl Rubber Base, Solvent Release Type (for Buildings and Other Types of Construction)”
TT-S-00230 C	“Sealing Compound, Elastomeric Type, Single-Component (for Caulking, Sealing and Glazing in Buildings, and Other Structures)”
TT-C-00598 C	“Caulking Compound, Oil and Resin Type (for Building Construction)”
TT-P-00791 B	“Putty Linseed-oil Type (for Wood-Sash Glazing)”
FHDA: FHDA 6-77	“Industry Standard for Douglas Fir, Western Hemlock, and Sitka Spruce Doors and Blinds”
HUD: HUD Intermediate	
MPS Supplement 4930.2	“Solar Heating and Domestic Hot Water Systems”
NBS: NBS/PS 26-70	“Rigid Polyvinyl-chloride Profile Extrusions”
NFPA: NFPA-31	“Standard for the Installation of Oil Burning Equipment”
NFPA-54	“National Fuel Gas Code”
NFPA-70-1978	“National Electric Code”
NFPA-211	“Standard for Chimneys, Fireplaces, and Vents”
Sandia Laboratories Report	
SAND 77-1375	“Performance Evaluation of Wind Energy Conversion Systems Using the Method of Bins”
UL: UL 599	“Standard for Heat Pumps”
ASTM C-520	“Standard Method for Density of Granular Loose-fill Insulation”
ASTM C-570-72	“Specification for Oil and Resin Based Caulking Compound for Building Construction”
ASTM C-578	“Standard Specification for Preformed, Block-Type Cellular Polystyrene Thermal Insulation”
ASTM C-755-73	“Standard Recommended Practice for Selection for Vapor Barriers for Thermal Insulation”
ASTM C-790-74	“Standard Recommended Practices for Use of Latext Sealing Compounds”
ASTM C-792-75	“Standard Test Method for Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants”
ASTM C-797-75	“Standard Recommended Practices and Terminology for Use of Oil- and Resin-Based Putty and Glazing Compounds”
ASTM C-804-75	“Standard Recommended Practices for Use of Solvent Release Type Sealants”
ASTM C-834-76	“Specification for Latex Sealing Compounds”



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ASTM D-257-78	“Test for DC Resistance or Conductance of Insulating Materials”
ASTM C-1622-63 (Reapproved 1975)	“Standard Method of Test for Apparent Density of Rigid Cellular Plastics”
ASTM E-84	“Standard Test Method For Surface Burning Characteristics of Building Materials”
ASTM E-96	“Standard Test Method for Water Vapor Transmission of Materials in Sheet Form”
ASTM E-119-76	“Standard Methods of Fire Tests of Building Construction and Materials”
ASTM E-136-79	“Test for Non-Combustibility of Elementary Materials”
ASTM E-283-73	“Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors”
ASTM E-576-76	“Standard Test Method for Dew/Frost Point of Sealed Insulating Glass Units in Vertical Position”
ASTM G-1-72	“Standard Recommended Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens”
BPCA: BOCA Research Report No. 72-23	
EPA: EPA Report No. 600/2- 75-069a	“Guidelines for Residential Oil Burner Adjustments”
Federal Specifications:	
HH-I-515 D	“Insulation, Thermal (loose-fill for Pneumatic or Poured Application): Cellulosic or Wood Fiber”

Illuminating Engineering Society Standards

(m) In the event that calculations do not exist in standard reference, the committee will review the calculations for accuracy as well as all assumptions used in the cost/savings calculations to determine appropriateness and reasonableness.

(n) Covered utilities are prohibited from discriminating unfairly among eligible customers in providing program audits.

(o) Unfair discrimination among program measures in conjunction with the Indiana CACS program is prohibited. (*Department of Commerce; Division of Energy; 55 IAC 6-2-4; filed Jun 3, 1985, 10:35 am: 8 IR 1265; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-5 Results of audit**

Authority: IC 4-4-3-21  
Affected: IC 4-4-3-8

Sec. 5. (a) The covered utilities shall provide to each eligible customer who receives a program audit the following information:

- (1) A report of the type, quantity, and rate of energy consumption of the audited building.
- (2) Identification and explanation of the applicable energy conserving operation and maintenance procedures defined in 55 IAC 6-2-4(f)(1) which would be appropriate for the building, as well as an indication of the energy savings to result from the application of these procedures.
- (3) A report on the need, if any, for the combined purchase and installation costs of all applicable program measures defined in 55 IAC 6-2-4(f)(2). This report shall include information on:
  - (A) The approximate combined cost, expressed in dollars or range of dollars, of purchasing and installing the program measures. The Lead Agency will provide the utilities with cost estimates for each measure for the four (4) HUD regions located within the state. This information will be obtained through surveys of local suppliers, contractors, and trade associations.
  - (B) An estimate of the energy savings, expressed in dollars or a range of dollars, which could accrue during the first year after installation of each applicable measure. Estimates do not have to be provided for caulking and weatherstripping.

The customer shall be advised in writing, that the cumulative effect of installing multiple measures may be less than the sum of each measure installed individually. The following disclosure statement shall be contained in the written audit report.

“The procedures used to make these estimates have been evaluated by the state of Indiana, Indiana department of commerce, division of energy policy for accuracy. However, the actual installation costs incurred, and possible energy savings resulting from the installation of any measure, may be different from the estimates provided by your auditor. Although the estimates are based on measurements of your building, they are also based on certain assumptions which may not apply in your situation. Further, the total energy cost savings from the installation of several measures will be less than the total savings estimated for each measure installed individually.”

(C) The simple payback for all recommended program measures except caulking and weatherstripping wherever

feasible.

(D) An explanation of how to find more specific information on the purchase, financing and installation of program measures and information on other commercially available audit services. As a minimum, the auditor can fulfill this requirement by referring the customer to the appropriate section in the telephone yellow pages or to the type of commercial businesses that could perform the specific installation or audit services. Additionally, auditors should note the availability of energy service companies which provide a shared savings approach to conservation services or financing, if there are any located in the area.

Auditors shall not recommend any supplier, contractor, or lender who supplies, installs, or finances the sale or installation of any energy conserving product.

(b) In the event that the audit results are not presented at the conclusion of the audit, the auditor will show the customer a typical audit format and discuss how to interpret the actual measures and procedure calculations when received. If the auditor performs the calculations other than on-site, the results must be returned to the customer in-person or by mail within ten (10) working days following the date of the audit. Utilities which do not provide the results of the audit in person are required to inform the customer of the opportunity to discuss the results of the audit with a qualified utility employee or utility contractee. As a minimum, the auditor shall provide a telephone number which the customer can call to discuss the results. (*Department of Commerce; Division of Energy; 55 IAC 6-2-5; filed Jun 3, 1985, 10:35 am: 8 IR 1269; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-6 Duplicate audits**

Authority: IC 4-4-3-21  
Affected: IC 4-4-3-8

Sec. 6. (a) Covered utilities are not required to conduct a CACS program audit of any commercial or apartment building which was audited previously pursuant to this plan. An exception to the above could occur if a subsequent customer requested a new audit rather than receiving a copy of the report from the previous audit, or the use of the building changed warranting a new audit.

(b) Utilities are not required to conduct a program audit of any building which received an energy audit under the grant programs for schools and hospitals and buildings owned by units of local government and public care institutions. The Lead Agency will provide the utilities a list of the schools and hospitals which have received an energy audit since the inception of the program in 1979.

This list will be updated on a periodic basis and distributed to the participating entities.

(c) Utilities are encouraged to coordinate their efforts to avoid duplication of audits. (*Department of Commerce; Division of Energy; 55 IAC 6-2-6; filed Jun 3, 1985, 10:35 am: 8 IR 1270; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-7 Auditor qualifications**

Authority: IC 4-4-3-21  
Affected: IC 4-4-3-8

Sec. 7. (a) Each person who performs a CACS program audit shall possess the following qualifications:

(1) A general understanding of commercial and apartment building construction, particularly a knowledge of the heating and cooling systems, heat transfer and related environmental effects, the different types and applications of program measures and any relevant state installation standards.

(2) The capability to conduct the audit including:

- (A) a familiarity with the program operation and maintenance procedures;
- (B) the capability to determine the applicability of the program measures;
- (C) a proficiency in pertinent auditing procedures for each applicable program measure;
- (D) a working ability to calculate or determine the steady state efficiency of a furnace or boiler;
- (E) a general knowledge of pneumatic, electrical and hydronic control systems and their applicability to automatic energy control systems;
- (F) an understanding of the inter-relationship between the various loads in the eligible building population including the ability to anticipate the corresponding effect on one load of changes to the other;
- (G) a general knowledge of lamps and lighting systems used in commercial and multi-family buildings;
- (H) a general knowledge of the functions and operating characteristics of steam systems in commercial and apartment

buildings, as well as the various types and symptoms of steam system failure; and

(I) an understanding of automatic energy control systems and the relationships among the occupants, the structure and the mechanical and lighting systems (energized systems).

(3) A general knowledge of the nature of solar energy and its applications.

(4) A general knowledge of utility rates.

(b) A determination as to whether an individual is qualified will be based on the results of a state-administered test designed to evaluate the potential auditor's knowledge of (1)–(4) above.

(c) The auditor's test is available to all persons in a non-discriminatory manner. However, individuals who are not employed by, or are not under a CACS program contractual employment relationship with a covered utility, will receive a restricted license. Such an individual cannot perform a sanctioned CACS program audit. An unrestricted license will be issued if the auditor becomes employed by a utility, or a utility's subgrantee, within one (1) year of the original test date. An auditor candidate may take the exam three (3) times in any consecutive thirty (30) day period. Further testing iterations must be approved by the Lead Agency. (*Department of Commerce; Division of Energy; 55 IAC 6-2-7; filed Jun 3, 1985, 10:35 am: 8 IR 1270; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-8 Subsequent customers**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 8. (a) Each covered utility shall retain in its files, for not less than ten (10) years from the date of the program audit, a report of each program audit performed pursuant to the CACS program.

(b) A covered utility shall make available to any customer who would be an eligible customer except for the fact that the building had previously been audited under the CACS program, a copy of the program audit report.

(c) A covered utility may perform a new audit of a building which was previously audited under the CACS program instead of providing the report described in subsection (b) if the customer requests a new audit after being informed of the cost of the audit and the availability of the previous audit report.

(d) The public service commission of Indiana concurs that the covered utilities may perform new audits of buildings previously audited under the CACS program at current audit costs. The commission's decision was based upon such factors as customer confidentiality problems, lack of relevance of out-dated audit information, and change of building use.

(e) Each covered utility shall inform each subsequent customer of the availability of a report of a previous audit. The utility may use the audit announcement procedures to fulfill this requirement. There shall be no direct cost to the subsequent customer for obtaining a copy of the report. (*Department of Commerce; Division of Energy; 55 IAC 6-2-8; filed Jun 3, 1985, 10:35 am: 8 IR 1271; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-9 Accounting and payment of cost**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 9. (a) Reserved. The accounting and payment of cost procedures will be incorporated per the adoption and promulgation by the public service commission of Indiana of Cause No. 37425 concerning accounting and record keeping practices. (*Department of Commerce; Division of Energy; 55 IAC 6-2-9; filed Jun 3, 1985, 10:35 am: 8 IR 1271; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 6-2-10 Customer billing**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 10. (a) Customer billing for CACS program fees shall be conducted in the following manner:

(1) Every charge by a covered utility to an eligible customer for any portion of the costs of carrying out a program audit pursuant to this plan, that is charged to the customer for whom the program audit is performed, shall be stated separately on the billing from the cost of providing utility service. At the option of the utility, CACS program charges can be reflected on

the monthly statement or on an entirely separate billing.

(2) The customer's payment of any CACS program charges may be included with the payment for service and fuel. Utilities which receive a payment which includes payment for both utility service and CACS program costs shall first credit repayment for utility service with the balance credited to the CACS program charges. Exceptions will be made if the customer requests an alternate distribution of payment in writing.

*(Department of Commerce; Division of Energy; 55 IAC 6-2-10; filed Jun 3, 1985, 10:35 am: 8 IR 1271; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 6-2-11 Coordination of plan with local, state, and federal conservation programs**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 11. (a) The Lead Agency shall be responsible for coordinating the Indiana CACS program plan with local, state, and federal conservation programs. This coordination effort will be enhanced by the fact that the Lead Agency, the Indiana department of commerce, division of energy policy, is also the state agency responsible for the administration of the majority of conservation programs conducted within the state. The program manager and staff will be informed no less than quarterly of the status and direction of the Indiana CACS program. Ongoing discussions concerning the interfacing of the CACS program and the multitude of conservation programs directed by the state will also occur. The programs administered by the Lead Agency include:

- Indiana Energy Information Center
- Residential Conservation Service Program
- Energy Conservation Financial Assistance Program
- Residential Energy Management Program
- Community Outreach Program
- Energy Education in Schools
- Schools and Hospital Grant Program
- Energy Extension Service Program

(b) Covered utilities and other interested organizations such as the Citizen's Action Coalition, the Apartment Association, the Public Service Commission of Indiana, and the Building Owners and Managers Association will continue to be advised and asked for their contributions, if any, at quarterly advisory committee meetings. This committee was initiated in December of 1983 and will continue their responsibilities throughout the existence of the CACS program.

(c) The state public service commission will be advised of any subsequent amendments to the plan or regulation changes which may affect their orders.

(d) Utilities with eligible customers outside the state shall coordinate with the Lead Agency to resolve any implementation differences. *(Department of Commerce; Division of Energy; 55 IAC 6-2-11; filed Jun 3, 1985, 10:35 am: 8 IR 1271; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 6-2-12 Home heating suppliers**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 12. (a) A home heating supplier can voluntarily request to participate in the CACS program by informing the Lead Agency through written correspondence of its intentions. The Lead Agency will consider the ability of the supplier to satisfy the program requirements, any waivers requested, and the resources of the supplier.

(b) Upon adequate demonstration to the governor that the resources of the supplier to *[sic.]* not enable it to comply with a particular requirement, this requirement may be waived after thorough review.

(c) Participating suppliers may request voluntary withdrawal from the program by submitting a written statement to the Lead Agency. *(Department of Commerce; Division of Energy; 55 IAC 6-2-12; filed Jun 3, 1985, 10:35 am: 8 IR 1272; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 6-2-13 Reports and recordkeeping**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 13. (a) The state of Indiana will submit a report to the assistant secretary no later than July 1 following the state plan approval and annually thereafter through July 1, 1990, covering the twelve (12) month period ending the preceding April 1.

(b) The report, at a minimum, shall include the following:

(1) The number and nature of program audits requested from, and provided by, each covered utility for commercial and apartment buildings. This information shall be reported separately by category of building.

(2) Estimated state and utility costs of implementing the CACS program.

(3) The number of eligible customers by category of building, if known.

(4) Copies of the latest audit announcement.

(c) The information required to complete the annual report will be derived from records maintained by the Lead Agency and participating utilities. Prior to submission of the report, a standardized format sheet will be forwarded to each utility for their completion.

(d) The utilities shall maintain records, for the twelve (12) months prior to and the twelve (12) months following the customer's audit, which indicate the amount and cost of energy purchased.

(e) The Lead Agency shall provide to the assistant secretary additional information that may be deemed essential to the Department of Energy's implementation of the CACS program. The covered utilities shall provide to the Lead Agency, if requested, information which will assist in fulfilling the additional federal requirements.

(f) The participating utilities shall retain a copy of the report of the results of each program audit, on file for ten (10) years from the date of the audit. (*Department of Commerce; Division of Energy; 55 IAC 6-2-13; filed Jun 3, 1985, 10:35 am: 8 IR 1272; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**Rule 3. Program Measure Applicability Criteria**

**55 IAC 6-3-1 Applicability criteria of program measures**

Authority: IC 4-4-3-21

Affected: IC 4-4-3-8

Sec. 1. (a) A program measure is applicable in a building if the measure is not already present in good condition and the potential exists to save energy and/or reduce energy demand in the building by installing it, and the installation of the measure is not a violation of federal, state, or local law or regulations. A replacement measure is applicable only if a less efficient device performing the same function, which is more than five (5) years old, is already present in the building.

(b) Energy recovery systems (when waste heat from an air conditioner is used to assist in heating water) are applicable if:

(1) the building uses at least fifty (50) gallons of hot water per day;

(2) the building has a source of water heat of 3400-5800 Btu/hour (e.g. the equivalent of waste heat from a two-ton air conditioner; and

(3) the building is located in an area with more than 2000 cooling degree days.

(c) Furnace flue opening modifications are applicable if the furnace combustion air is taken from a conditioned area.

(d) Ceiling insulation is applicable if the differential between the existing insulation and the insulation level recommended by the state plan exceeds the differential established by the state plan. The recommended ceiling insulation level for commercial and multi-family buildings is R 20.

(e) Lighting system modification to use daylighting is applicable if any electric lighting fixtures are located within fifteen (15) feet of an existing window or skylight in a commercial building or in common areas of an apartment building.

(f) Passive solar heating thermosyphon air systems are applicable if the building has a south-facing ( $\pm 45^\circ$  of true south) wall free of a major obstruction to sunshine during the heating season.

(g) Solar domestic hot water systems are applicable if the building consumes more than eighty (80) gallons of hot water per day and has access to a site clear of major obstructions to solar radiation which allows solar collectors to be oriented  $\pm 45^\circ$  of true south.

(h) Solaria/sunspace systems are applicable to an apartment building if it has existing balconies, patios or available adjacent

ground area on the south-facing ( $\pm 45^\circ$  of true south) wall. Solaria/sunspace systems are not applicable to commercial buildings.

(i) Solar swimming pool heater replacements are applicable only for apartment buildings and only if the pool uses electricity or other nonrenewable energy for heating.

(j) Window heat gain retardants are applicable to buildings which have glass on the south, east or west sides if they are exposed to sunlight.

(k) Pipe and duct insulation is applicable to hot water pipes and to heating and cooling ducts which extend through unconditioned spaces. (*Department of Commerce; Division of Energy; 55 IAC 6-3-1; filed Jun 3, 1985, 10:35 am: 8 IR 1272; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

## **ARTICLE 7. ETHANOL FUEL PRODUCTION INCENTIVES GRANT PROGRAM (EXPIRED)**

*(Expired under IC 4-22-2.5, effective January 1, 2002.)*

## **ARTICLE 8. DEBARMENT PROCEDURE**

### **Rule 1. Scope and Definitions**

#### **55 IAC 8-1-1 Scope of action**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4

Sec. 1. These proceedings apply to any federal or state program administered by the Indiana department of commerce. (*Department of Commerce; 55 IAC 8-1-1; filed Jul 29, 1985, 2:42 pm: 8 IR 1701; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

#### **55 IAC 8-1-2 Definitions**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4

Sec. 2. "Debarment" means the exclusion from participation in any such program for the period of time specified in accordance with 55 IAC 9 [sic., 55 IAC 8].

"Department" means the Indiana department of commerce.

"Division" means the division of internal audit, or its successor, of the department.

"Person" whenever used in this procedure means any person, firm, association, partnership or corporation. It shall also include all political subdivisions and their affiliated entities against which any state or federal agency may make an order or determination. (*Department of Commerce; 55 IAC 8-1-2; filed Jul 29, 1985, 2:42 pm: 8 IR 1701; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

### **Rule 2. Causes for Debarment**

#### **55 IAC 8-2-1 Causes for debarment**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4

Sec. 1. A person may be debarred if any of the following have occurred within a reasonable period of time before institution of debarment proceedings:

(1) Serious or repetitive violation of any federal or state law, or department program regulation or instruction.

(2) Serious or repetitive failure to perform contractual obligations or carry out representations or warranties to the department or to any grantee under any program administered by the department.

(3) Acts of misconduct indicating a lack of business integrity directly affecting responsibility to participate in department programs, including but not limited to false representation, embezzlement, theft, forgery, fraud, negligent service, bribery, falsification of records, and receiving stolen property.

(4) Serious or repetitive violation of any nondiscrimination or equal opportunity requirements in connection with any program administered by the department.

(5) Debarment from any agency of the federal government or of any state government.

*(Department of Commerce; 55 IAC 8-2-1; filed Jul 29, 1985, 2:42 pm: 8 IR 1701; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

### **Rule 3. Procedure for Debarment**

#### **55 IAC 8-3-1 Notice of recommended debarment**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4

Sec. 1. The initial determination of the department, entitled Notice of Recommended Debarment, shall be mailed to the person against whom debarment is recommended, in writing and signed by the director of the division, and shall include the following:

(1) a statement indicating that as a result of an investigation made by the department, debarment is recommended and would be exclusion from participation in all department programs;

(2) one or more of the grounds stated in 55 IAC 9-2-1 [*sic.*, 55 IAC 8-2-1];

(3) a short, plain statement of the reasons for the recommended debarment; and

(4) a statement that the person has the right to file a written objection within fifteen (15) days with the director of the division; and if no written objection is timely filed, the determination of debarment shall be made.

*(Department of Commerce; 55 IAC 8-3-1; filed Jul 29, 1985, 2:42 pm: 8 IR 1702; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

#### **55 IAC 8-3-2 Pre-hearing conference**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4

Sec. 2. (a) Any person who has received an initial determination recommending debarment is entitled to a pre-hearing conference to discuss all charges, provided that the conference is requested in the objection filed pursuant to 55 IAC 9 [*sic.*, 55 IAC 8].

(b) The pre-hearing conference shall be an informal proceeding, scheduled by and involving the director of the division.

(c) If after the pre-hearing conference, the initial determination is settled or adjusted, a written synopsis shall be prepared by the department and submitted to the person for approval. This synopsis shall be filed with the director of the division within ten (10) days following mailing of the synopsis. The person's failure to file the synopsis within ten (10) days of mailing by the department is evidence of approval by the person.

(d) If any person, after being duly notified, fails to appear at a pre-hearing conference that person shall be deemed to have waived their request for a pre-hearing conference. *(Department of Commerce; 55 IAC 8-3-2; filed Jul 29, 1985, 2:42 pm: 8 IR 1702; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

#### **55 IAC 8-3-3 Hearing; recommendations**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4

Sec. 3. (a) A hearing officer, appointed by the director of the department, shall conduct the debarment hearing.

(b) Upon conclusion of the hearing, the hearing officer shall issue recommendations to the director of the department as to the determination of debarment, which shall not exceed three (3) years.

(c) Any interested and affected person may file with the department his objections to the entry of such determination within ten (10) days thereafter. *(Department of Commerce; 55 IAC 8-3-3; filed Jul 29, 1985, 2:42 pm: 8 IR 1702; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267)*

**55 IAC 8-3-4 Final order**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4; IC 4-21.5

Sec. 4. The director of the department, or his designee, shall issue a final order pursuant to IC 4-22-1 [*Repealed by P.L.18-1986, SECTION 2. See IC 4-21.5.*]. (*Department of Commerce; 55 IAC 8-3-4; filed Jul 29, 1985, 2:42 pm: 8 IR 1702; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

**55 IAC 8-3-5 Judicial review**

Authority: IC 4-4-3-8; IC 4-4-3-21

Affected: IC 4-4; IC 4-21.5

Sec. 5. For any procedure not specifically provided in 55 IAC 9 [*sic., 55 IAC 8*], the provisions of the Administrative Adjudication Act, IC 4-22-1-1 [*Repealed by P.L.18-1986, SECTION 2. See IC 4-21.5.*] shall be followed. Any person aggrieved by the final order or determination made by the department shall be entitled to judicial review thereof in accordance with said provisions. (*Department of Commerce; 55 IAC 8-3-5; filed Jul 29, 1985, 2:42 pm: 8 IR 1702; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267*)

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