ARTICLE 2. INDIANA RESIDENTIAL CONSERVATION SERVICE PROGRAM

NOTE: IC 4-4-3 was repealed by P.L.4-2005, SECTION 148, effective February 9, 2005.
NOTE: 16 IAC 2 was transferred from 55 IAC 3.1. Wherever in any promulgated text there appears a reference to 55 IAC 3.1, substitute 16 IAC 2.

Rule 1. State Plan

16 IAC 2-1-1 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-1-1; filed Mar 28, 1984, 9:07 am: 7 IR 1153; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-1-1) to the Office of the Lieutenant Governor (16 IAC 2-1-1) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-1-2 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-1-2; filed Mar 28, 1984, 9:07 am: 7 IR 1153; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-1-2) to the Office of the Lieutenant Governor (16 IAC 2-1-2) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-1-3 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 assitance *[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 purvue

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 (10×10^9 cu.ft.) or;

(2) Sales of electric energy for purposes other than resale which exceeded 750 million kilowatt hours (75×10^7 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 drafthood 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 (± 45° 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-1-3; filed Mar 28, 1984, 9:07 am: 7 IR 1153; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-1-3) to the Office of the Lieutenant Governor (16 IAC 2-1-3) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-1-4 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-1-4; filed Mar 28, 1984, 9:07 am: 7 IR 1157; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-1-4) to the Office of the Lieutenant Governor (16 IAC 2-1-4) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

Rule 2. Program Guidelines

16 IAC 2-2-1 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 utitilies 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-1; filed Mar 28, 1984, 9:07 am: 7 IR 1157; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-1) to the Office of the Lieutenant Governor (16 IAC 2-2-1) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-2 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 8-1-1-1 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-2; filed Mar 28, 1984, 9:07 am: 7 IR 1158; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-2) to the Office of the Lieutenant Governor (16 IAC 2-2-2) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-3 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 acitvities *[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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-3; filed Mar 28, 1984, 9:07 am: 7 IR 1158; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-3) to the Office of the Lieutenant Governor (16 IAC 2-2-3) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-4 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 feet 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 feet 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 includng *[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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-4; filed Mar 28, 1984, 9:07 am: 7 IR 1159; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-4) to the Office of the Lieutenant Governor (16 IAC 2-2-4) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-5 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 my *[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 utilizied *[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.

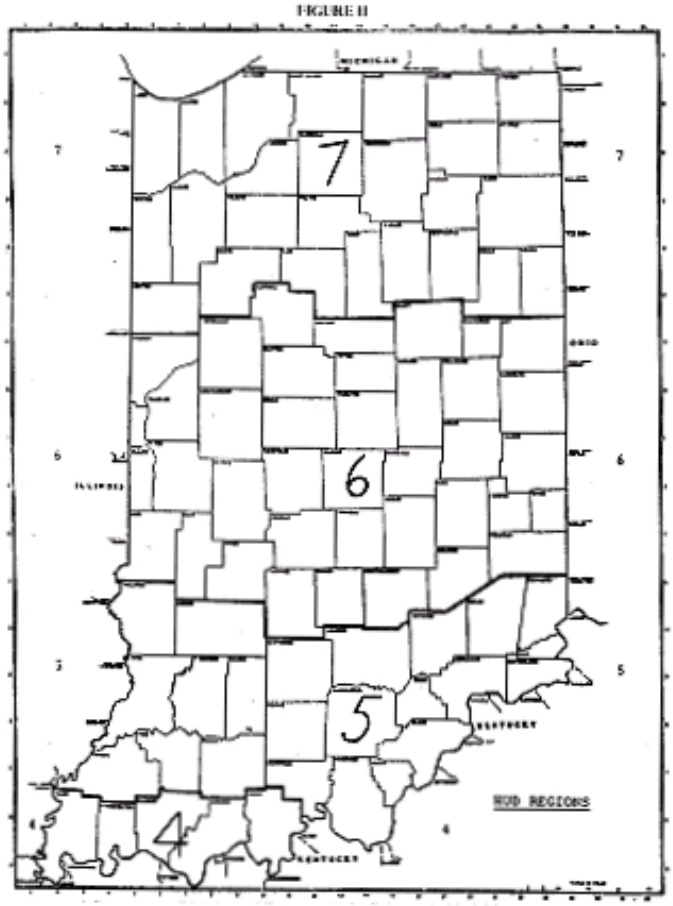
(8) A general knowledge of solar energy, to include insulation, shading, and heat capture and transfer as they apply to program measures.

(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. Candidates for testing must bring a 1″ × 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	Floor Insulation *(R-Value)	Storm or Thermal Windows	Vent Damper	Window Heat Loss Retardents	Window Heat Gain Retardents	Solaria/Sunspace	Solar Swimming Pool Heater
Region 4 (3501-4500 Days) Perry, Posey, Spencer, Vanderburgh, & Warrick	Electricity	x	x	30	x	19	x	x	x	x	x	x
	Electric Heat Pump	x	x	30	x	11	x	x	x	x	x	x
	Gas	x	x	30	x	11	x	x	x	x	x	x
	Oil	x	x	30	x	11	x	x	x	x	x	x
	Other Fuels	x	x	30	x	11	x	x	x	x	x	x
Region 5 (4501-5000 Days) Clark, Crawford, Daviess, 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	
	Electric Heat Pump	x	x	30	x	11	x	x	x	x	x	
	Gas	x	x	30	x	11	x	x	x	x	x	
	Oil	x	x	30	x	11	x	x	x	x	x	
	Other Fuels	x	x	30	x	11	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 Putnum, Randolph, Rush, Shelby, Tippecanoe, Tipton, Union, Vermillion, Vigo, Warren, Wayne	Electricity	x	x	30	x	19	x	x	x	x	x	
	Electric Heat Pump	x	x	30	x	19	x	x	x	x	x	
	Gas	x	x	30	x	11	x	x	x	x	x	
	Oil	x	x	30	x	11	x	x	x	x	x	
	Other Fuels	x	x	30	x	11	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	
	Electric Heat Pump	x	x	38	x	19	x	x	x	x	x	
	Gas	x	x	30	x	11	x	x	x	x	x	
	Oil	x	x	30	x	11	x	x	x	x	x	
	Other Fuels	x	x	30	x	11	x	x	x	x	x	



(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-5; filed Mar 28, 1984, 9:07 am: 7 IR 1161; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-5) to the Office of the Lieutenant Governor (16 IAC 2-2-5) by P.L.4-2005, SECTION 150, effective February 9, 2005.

16 IAC 2-2-6 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-6; filed Mar 28, 1984, 9:07 am: 7 IR 1166; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-6) to the Office of the Lieutenant Governor (16 IAC 2-2-6) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-7 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-7; filed Mar 28, 1984, 9:07 am: 7 IR 1166; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-7) to the Office of the Lieutenant Governor (16 IAC 2-2-7) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-8 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-8; filed Mar 28, 1984, 9:07 am: 7 IR 1167; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-8) to the Office of the Lieutenant Governor (16 IAC 2-2-8) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-9 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
_____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)
IN RCSP/DOC APRIL 83(02)

(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 nondiscriminatory 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 APPLCATION *[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)

(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-9; filed Mar 28, 1984, 9:07 am: 7 IR 1168; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-9) to the Office of the Lieutenant Governor (16 IAC 2-2-9) by P.L.4-2005, SECTION 150, effective February 9, 2005.

16 IAC 2-2-10 Complaint processing and redress procedures

Authority: IC 4-4-3-21
Affected: IC 33-30; IC 33-34

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 *[IC 33-4, IC 33-5, IC 33-10.5, and IC 33-11-6 were repealed by P.L.98-2004, SECTION 164, effective July 1, 2004.]*.

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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-10; filed Mar 28, 1984, 9:07 am: 7 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-10) to the Office of the Lieutenant Governor (16 IAC 2-2-10) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-11 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-11; filed Mar 28, 1984, 9:07 am: 7 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-11) to the Office of the Lieutenant Governor (16 IAC 2-2-11) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-12 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)

(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-12; filed Mar 28, 1984, 9:07 am: 7 IR 1172; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-12) to the Office of the Lieutenant Governor (16 IAC 2-2-12) by P.L.4-2005, SECTION 150, effective February 9, 2005.

16 IAC 2-2-13 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-13; filed Mar 28, 1984, 9:07 am: 7 IR 1173; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-13) to the Office of the Lieutenant Governor (16 IAC 2-2-13) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-14 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-14; filed Mar 28, 1984, 9:07 am: 7 IR 1173; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-14) to the Office of the Lieutenant Governor (16 IAC 2-2-14) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-2-15 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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-2-15; filed Mar 28, 1984, 9:07 am: 7 IR 1173; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-2-15) to the Office of the Lieutenant Governor (16 IAC 2-2-15) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

Rule 3. Material Standards

16 IAC 2-3-1 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 insulting 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^2-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^2-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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-3-1; filed Mar 28, 1984, 9:07 am: 7 IR 1174; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-3-1) to the Office of the Lieutenant Governor (16 IAC 2-3-1) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-3-2 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 requiremenets *[sic.]* of HH-I-515D.

(2) For moisture absorption, the material mission 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.

(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^2 (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:
Attic:				
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.
Sidewalls:				
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)

To obtain thermal Resistance (R-value) of*	Minimum number of bags per 1,000 ft^2 (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:
Attic:				
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.
Sidewalls:				
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 pakaging *[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^3 (5.5 lb/ft^3) 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^3 (8 lb/ft^3), when tested in accordance with ASTM C 520.

(3) Particle size of perlite insulation shall be graced *[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 fluxural 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^3/s for each linear meter (2.0 ft^3/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^3/s for each linear meter (0.5 ft^3/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^2 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^3/s for each linear meter (0.5 ft^3/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.

(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-3-2; filed Mar 28, 1984, 9:07 am: 7 IR 1175; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-3-2) to the Office of the Lieutenant Governor (16 IAC 2-3-2) by P.L.4-2005, SECTION 150, effective February 9, 2005.

Rule 4. Installation Standards

16 IAC 2-4-1 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 pressue *[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. *(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-4-1; filed Mar 28, 1984, 9:07 am: 7 IR 1181; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-4-1) to the Office of the Lieutenant Governor (16 IAC 2-4-1) by P.L.4-2005, SECTION 150, effective February 9, 2005.*

16 IAC 2-4-2 References

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

Sec.2. (a) This section includes reference to several technical publicationtions *[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."

(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-4-2; filed Mar 28, 1984, 9:07 am: 7 IR 1182; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-4-2) to the Office of the Lieutenant Governor (16 IAC 2-4-2) by P.L.4-2005, SECTION 150, effective February 9, 2005.

16 IAC 2-4-3 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 sectiontion *[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^2 (0.1 m^2) minimum of free ventilation area per 150 ft^2 (15 m^2) of attic floor area if no vapor barrier exists in the attic;

(b) 1 ft^2 (0.1 m^2) minimum of free ventilation area per 300 ft^2 (30 m^2) of attic floor area if a vapor barrier does exist;

(c) 1 ft^2 (0.1 m^2) minimum of free ventilation area per 300 ft^2 (30 m^2) 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) Defection 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 suface 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) Gypsum board ceiling thickness	(2) Frame spacing	(3) Suggested load[1]
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.

[1]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 sheething *[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^2 (0.1 m^2) minimum of free ventilation area per 150 ft^2 (15 m^2) of attic floor area if no vapor barrier exists in the attic;

(b) 1 ft^2 (0.1 m^2) minimum of free ventilation area per 300 ft^2 (30 m^2) of attic floor area if a vapor barrier does exist;

(c) 1 ft^2 (0.1 m^2) minimum of free ventilation area per 300 ft^2 (30 m^2) 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^2);

(b) Homes with less than 250 square feet (23 m^2) 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^2) for every 1500 square feet (150 m^2) 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.

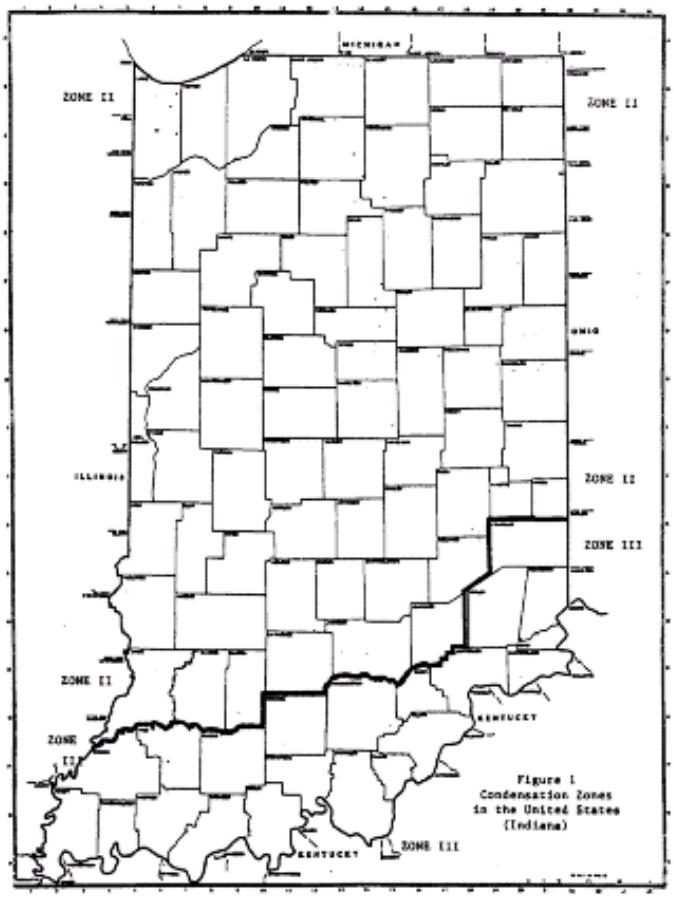
(M) Post-installation Procedures.

(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.

FIGURE I



(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 of less than 1 in the thickness in which the board will be installed)	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
	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^2 (0.1 m^2) minimum of free ventilation area per 300 ft^2 (30 m^2) 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^2) for every 1500 square feet (150 m^2) 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 bwtween 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 preventd 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.

FIGURE III

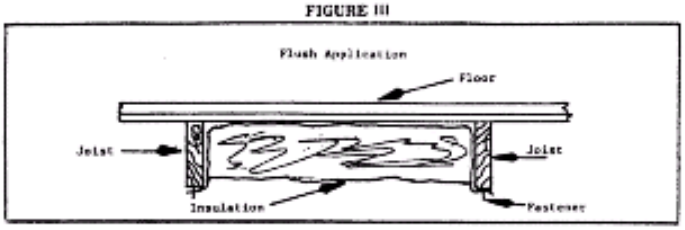
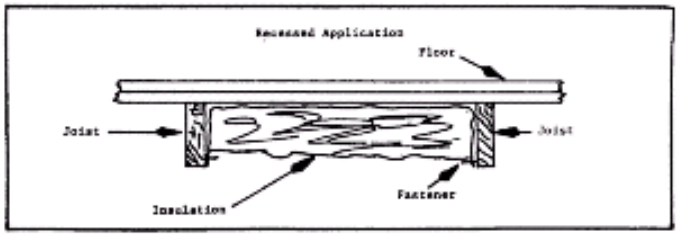


FIGURE IV



(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: _____ _____ _____

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.

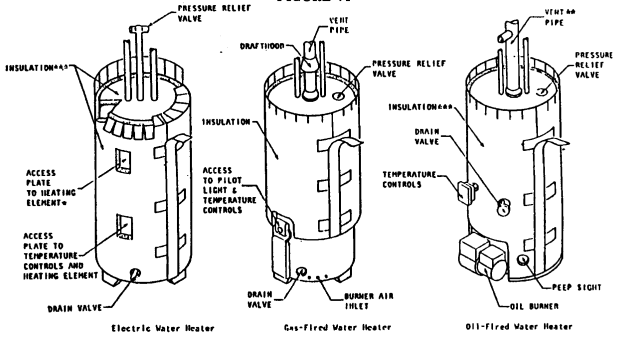
(C) Post-installation Procedures.

(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.

FIGURE VI



* 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_2 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_2 concentration.

FIGURE VII

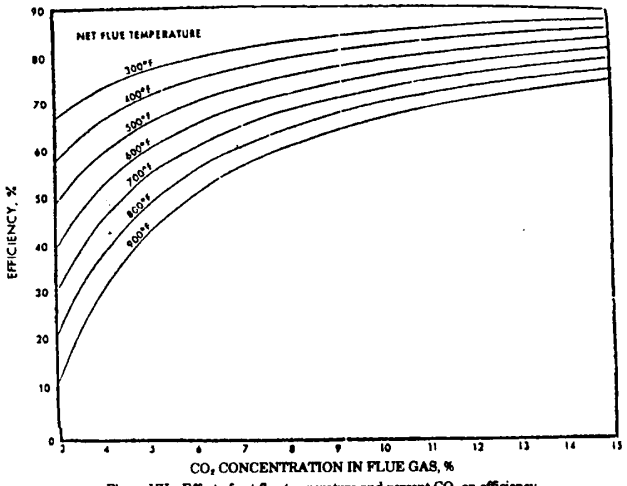


Figure VII Effect of net flue temperature and percent CO_2 on efficiency for furnaces operating on No. 1 heating oil.

FIGURE VIII

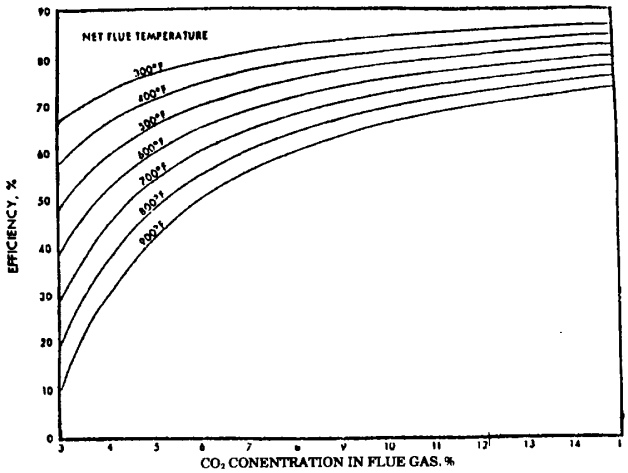


Figure VIII Effect of net flue temperature and percent CO_2 on efficiency for furnaces operating on No. 2 heating oil.

(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:

$$N_{SS} = 100 - L_{L,A}\, L_{S,SS,A}$$

$$R_{T,F} = A + \frac{B}{X_{CO_2},S}$$

$$L_{S,SS,A} = \frac{100}{HHV_A} \sum_{i=I}^{5} ((1 + A/F\,(CF\,(i) + (A/F)\,(R_{T,F}-1)\,(CA(i))) \times ((TF,SS + 460)^i - (TRA + 460)^i)$$

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_2 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)	$-1.3619019 \times 10^{-12}$	$-1.3094378 \times 1^{-12}$
CF (5)	$-1.4367410 \times 10^{-16}$	$-1.5029209 \times 1^{-16}$
		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_2 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_2 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_2 and 500°F (72 percent efficiency) and the manufacturer of the replacement burner stated that 12 percent CO_2 was obtainable with his burner, the assumed new conditions with the replacement burner installed would be 12 percent CO_2 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 × 5 = $55.50. If the desired payback

period were seven years, the total savings justifying burner replacement would be $55.50 × 7 = $338.50.

(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 temperture *[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_2 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 othe 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 determine *[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 tha 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 applicance *[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.

(Office of the Lieutenant Governor; Division of Energy; 16 IAC 2-4-3; filed Mar 28, 1984, 9:07 am: 7 IR 1183; readopted filed Dec 2, 2001, 12:30 p.m.: 25 IR 1267) NOTE: Transferred from the Department of Commerce (55 IAC 3.1-4-3) to the Office of the Lieutenant Governor (16 IAC 2-4-3) by P.L.4-2005, SECTION 150, effective February 9, 2005.

*