

CHAPTER 4150
DEPARTMENT OF ENERGY, PLANNING AND
DEVELOPMENT
ENERGY DIVISION
RESIDENTIAL CONSERVATION PROGRAM

NOTE: Under Laws of Minnesota 1983, chapter 289, section 40, this chapter of Minnesota Rules shall be administered by the Department of Energy and Economic Development. Thus, references to the Department of Energy, Planning and Development, or to its divisions, should be read as intending the Department of Energy and Economic Development.

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4150.0100 DEFINITIONS.

Subpart 1. **Scope.** For the purpose of this chapter, the following definitions apply.

Subp. 2. **Agency.** "Agency" means the Energy Division of the Department of Energy, Planning and Development.

Subp. 3. **Arranged installation.** "Arranged installation" means any installation of MECS program measures, coordinated pursuant to parts 4150.2100 to 4150.2500 by a participating utility or heating supplier, which is initiated using a standardized MECS bid form.

Subp. 4. **City of the first class.** "City of the first class" means a city, pursuant to Minnesota Statutes 1978, section 410.01, which has a population of 100,000 inhabitants or more.

Subp. 5. **Covered utility.** "Covered utilities" shall be determined on a yearly basis. The definition includes all public utilities that, during the second preceding calendar year had either sales of natural gas for purposes other than resale that exceed 10,000,000,000 cubic feet, or sales of electric energy for purposes other than resale that exceed 750,000,000 kilowatt-hours.

Subp. 6. **Customer.** For the purposes of this chapter, a "customer" is any person who owns or occupies a residential building, and who receives a fuel bill from a participating utility or home heating supplier for fuel used in such residential building.

Subp. 7. **DOE.** "DOE" means the Department of Energy.

Subp. 8. **Heating supplier.** "Heating supplier" means a person who sells or supplies home heating fuel (including and not limited to No. 2 heating oil, kerosene, butane, and propane) to a customer for consumption in a residential building and who has elected to participate in MECS, pursuant to part 4150.6100.

Subp. 9. **Installation standards.** "Installation standards" means DOE installation standards pursuant to Code of Federal Regulations 1979, title 10, section 456, subparts G and I.

Subp. 10. **Material standards.** "Material standards" means DOE material standards pursuant to Code of Federal Regulations 1979, title 10, section 456, subparts G and H.

Subp. 11. **Measures warranty.** "Measures warranty" means a warranty in writing, by the manufacturer of the program measure, that the residential customer for whom the measure is installed, the contractor who installs the measure, and the supplier of the measure shall at a minimum be entitled to obtain, at no charge, appropriate replacement parts and materials for those measures found within one year from the date of installation or purchase to be defective due to materials, manufacture, or design. The warranty shall also provide that the defect shall be corrected, within two weeks after it is reported to the manufacturer.

Subp. 12. **MECS.** "MECS" means Minnesota Energy Conservation Service.

Subp. 13. **New customer.** "New customer" means a person who first becomes a customer after initial distribution of the program announcement but before January 1, 1985.

Subp. 14. **Nonregulated utility.** "Nonregulated utility" means a public utility whose rates are not within the jurisdiction of the Minnesota Public Utilities Commission's ratemaking authority.

Subp. 15. **OCS.** "OCS" means Minnesota Office of Consumer Service.

Subp. 16. **Participating utility.** "Participating utility" means a covered utility or a nonregulated utility which voluntarily participates in the Minnesota Energy Conservation Service.

Subp. 17. **Program announcement.** "Program announcement" means the MECS program information bulletin and utility offer of service to each customer.

Subp. 18. **Program measures.** "Program measures" means all energy conservation measures and renewable resource measures to be included in an MECS audit.

Subp. 19. **Regulated utility.** "Regulated utility" means a public utility whose rates are within the jurisdiction of the Minnesota Public Utilities Commission's ratemaking authority.

Subp. 20. **Renewable resource measures.** "Renewable resource measures" means the following measures installed in or connected to a residential building:

A. Solar domestic hot water systems (DHW): equipment designed to absorb the sun's energy and to use this energy to heat water for use in a residential building other than for space heating, including thermosiphon hot water heaters.

B. Passive solar space heating and cooling system: systems that make efficient use of, or enhance the use of, natural forces -- including solar insulation, winds, nighttime coolness and opportunity to lose heat by radiation to the night sky -- to heat or cool living space by the use of conductive, convective, or radiant energy transfer. Passive solar systems include only:

(1) Direct gain glazing systems: the use of south-facing (plus or minus 45 degrees of true south) panels of insulated glass, fiberglass, or other similar transparent substances that admit the sun's rays into the living space

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where the heat is retained; glazing is either double-paned, or single-paned equipped with movable insulation.

(2) Indirect gain systems: the use of panels of insulated glass, fiberglass, or other transparent substances that direct the sun's rays onto specially constructed thermal walls, ceilings, rockbeds, or containers of water or other fluids where heat is stored and radiated.

(3) Solaria/sunspace systems: a structure of glass, fiberglass, or similar transparent material that is attached to the south-facing (plus or minus 45 degrees of true south) wall of a structure that allows for air circulation to bring heat into the residence, and which is able to be closed off from the residential structure during periods of low solar insolation.

(4) Window heat gain and/or loss: those mechanisms that significantly reduce summer heat gain or wintertime heat loss through windows by the use of devices such as awnings, insulated rollup shades (external or internal), metal or plastic solar screens, or movable rigid insulation.

C. Wind energy devices: equipment that uses wind energy to produce energy in any form for personal residential purposes.

D. Replacement solar swimming pool heaters: devices that are used solely for the purposes of using the sun energy to heat swimming pool water and which replace a swimming pool heater using electricity, gas, or another fossil fuel.

E. Active solar space heating: equipment designed to absorb the sun's energy and to use this energy to heat living space by use of mechanically forced energy transfer such as fans or pumps.

Subp. 21. **Residential building.** "Residential building" means any structure used for residential occupancy including any building containing at least one, but not more than four, dwelling units, and, has a system for either heating or cooling living spaces. However, this definition does not include: new buildings to which final standards under sections 304(a) and 305 of the Energy Conservation and Production Act (United States Code, title 42, section 6801 et seq.) apply.

Statutory Authority: *MS s 116J.31*

4150.0110 DEFINITION OF ENERGY CONSERVATION MEASURES.

Subpart 1. **Residential.** "Energy conservation measures" means any of the measures in subparts 2 to 16 in a residential building.

Subp. 2. **Caulking.** "Caulking" means pliable materials used to reduce the passage of air and moisture by filling small gaps located at fixed joints on a building, underneath 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."

Subp. 3. **Weatherstripping.** "Weatherstripping" includes narrow strips of material placed over or in movable joints of windows and doors to reduce the passage of air and moisture.

Subp. 4. **Furnace efficiency modifications.** "Furnace "efficiency modifications" includes:

A. Replacement furnace or boiler: a furnace or boiler, including a heat pump, which replaces an existing furnace or boiler of the same fuel type and which reduces the amount of fuel consumed due to an increase in combustion efficiency, improved heat generation, or reduced heat losses.

B. Furnace replacement burner (oil): a device which atomizes 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, and uses less oil than the device it replaces.

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

D. **Electrical or mechanical ignition system:** a device which, when installed in a gas-fired furnace or boiler, automatically ignites the gas burner and replaces a gas pilot light.

Subp. 5. **Replacement central air conditioner.** A replacement central air conditioner is a central air conditioner that replaces an existing central air conditioner of the same fuel type and that reduces the amount of fuel consumed due to an increase in efficiency.

Subp. 6. **Ceiling insulation.** Ceiling insulation is a material primarily designed to resist heat flow that is installed between the conditioned area of a building and an unconditioned attic. Where the conditioned area of a building extends to the roofs, the term "ceiling insulation" also applies to such material used between the underside and upperside of the roof.

Subp. 7. **Wall insulation.** Wall insulation is a material primarily designed to resist heat flow that is installed within or on the walls between conditioned areas of a building and unconditioned areas of a building or the outside.

Subp. 8. **Floor insulation.** Floor insulation is a 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 ground 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.

Subp. 9. **Duct insulation.** Duct insulation is a material primarily designed to resist heat flow, which is installed on a heating or cooling duct in an unconditioned area of a building.

Subp. 10. **Pipe insulation.** Pipe insulation is a material primarily designed to resist heat flow, which is installed on a heating, cooling, or hot water pipe in an unconditioned area of a building.

Subp. 11. **Water heater insulation.** Water heater insulation is a material primarily designed to resist heat flow, which is suitable for wrapping around the exterior surface of the water heater casing.

Subp. 12. **Storm or thermal window.** A storm or thermal window includes:

A. 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; or

B. 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.

Subp. 13. **Storm or thermal door.** A storm or thermal door is a second door, installed outside or inside a prime door, creating an insulating air space; or a door with enhanced resistance to heat flow through the glass area created by affixing two or more sheets or glazing materials; or a primary exterior door with an R-value of at least two.

Subp. 14. **Heat reflective or absorbing window or door.** A heat reflective and heat absorbing window or door material is a window or door glazing material with exceptional heat-absorbing or heat-reflecting properties; or reflective or absorptive films and coatings applied to an existing window or door that thereby result in exceptional heat-absorbing or heat-reflecting properties.

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Subp. 15. **Electric load management.** Devices associated with electric load management techniques are customer-owned or leased devices that reduce the maximum kilowatt demand on an electric utility and that are any of the following:

- A. part of a radio, ripple, or other utility controlled load switching system located on the customer's premises;
- B. clock-controlled load switching devices;
- C. interlocks, and other load-actuated, load-limiting devices; or
- D. energy storage devices with control systems.

Subp. 16. **Clock thermostat.** A clock thermostat is a device that is designed to reduce energy consumption by regulating the demand on the heating or cooling system in which it is installed, and 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.

Statutory Authority: *MS s 116J.31*

4150.0120 DEFINITIONS OF ENERGY CONSERVING PRACTICES.

Subpart 1. **Residential use.** Energy conserving practices means any of the following measures in a residential building.

Subp. 2. **Furnace efficiency maintenance.** "Furnace efficiency maintenance and adjustments" means 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 degrees Fahrenheit on a gas or oil forced-air furnace, and turning off the pilot light on a gas furnace during the summer.

Subp. 3. **Nighttime temperature setback.** "Nighttime temperature setback" means manually lowering the thermostat control setting for the furnace during the heating season to a maximum of 55 degrees Fahrenheit during sleeping hours.

Subp. 4. **Reducing thermostat settings in winter.** "Reducing thermostat settings in winter" means limiting the maximum thermostat control setting for the furnace to 68 degrees Fahrenheit during the heating season.

Subp. 5. **Raising thermostat setting in summer.** "Raising thermostat setting in summer" means setting the thermostat control for an air conditioner to 78 degrees Fahrenheit or higher during the cooling season.

Subp. 6. **Water flow reduction.** "Water flow reduction" in showers and faucets means placing 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.

Subp. 7. **Reducing hot water temperature.** "Reducing hot water temperature" means manually setting back the water heater thermostat setting to 120 degrees Fahrenheit; and reducing the use of heated water for clothes washing.

Subp. 8. **Reducing energy use when home unoccupied.** "Reducing energy use when a home is unoccupied" means reducing the thermostat setting to 55 degrees Fahrenheit 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 lowering the thermostat setting of the water heater when a home is vacant for two days or longer.

Subp. 9. **Plugging leaks.** "Plugging leaks" in attics, basements, and fireplaces means installing scrap insulation or other pliable materials in gap

around pipes, ducts, fans, or other items which enter the attic or basement from a heated space, installing fireproof material to plug any holes around any damper in a fireplace, and adding insulation to an attic or basement door.

Subp. 10. **Sealing leaks.** "Sealing leaks" in pipes and ducts means installing caulking in any leak in a heating or cooling duct, tightening or plugging any leaking joints in hot water or steam pipes, and replacement of washers in leaking water valves.

Subp. 11. **Efficient use of shading.** "Efficient use of shading" means using 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.

Statutory Authority: *MS s 116J.31*

4150.0200 AUTHORITY AND PURPOSE.

Subpart 1. **Authority.** The agency's authority to promulgate these parts is contained in Laws of Minnesota 1980, chapter 579, section 12 (codified as Minnesota Statutes, section 116H.17), as well as Minnesota Statutes 1978, sections 116H.08, clause (a), and 116H.07, clause (i).

Subp. 2. **Purpose.** The purpose of these parts is to establish a program requiring major regulated utilities to offer their residential utility customers services related to the promotion of energy conservation. The most important of these services include: conducting home energy audits to determine areas of major heat loss and other energy inefficiencies in the home; distributing lists of approved contractors, suppliers, and lenders from whom home energy improvements and financing services may be obtained; arranging for the installation of home energy improvements; and arranging for the financing of supply and installation of home energy improvements. The rules establish requirements for the inclusion in the lists, and training and certification procedures, procedures for the billing of energy improvement loans on customer utility bills, and postinstallation inspection and consumer grievance procedures. The program also includes provisions for voluntary participation of home heating suppliers and nonregulated utilities.

Statutory Authority: *MS s 116J.31*

4150.0300 UTILITY SUPPLY, INSTALLATION, AND FINANCING.

Subpart 1. **Survey of utilities.** Survey of utilities:

A. Each covered utility that supplies or installs any program resource measure:

(1) shall be listed as a supplier or contractor pursuant to parts 4150.3100 to 4150.3300, in the same manner and subject to the same requirements as any other supplier or contractor;

(2) shall charge fair and reasonable prices for the supply or installation of program measures; and

(3) shall not discriminate unfairly among eligible customers in undertaking the above described activities.

B. Beginning in June 1981, the agency shall conduct an annual survey of prices charged for the supply or installation of goods and services comparable to those the covered utilities supply or install. If the agency determines that the prices charged by covered utilities for the supply and installation of program measures are significantly different from the typical local prices and interest rates disclosed in the agency's survey, or the agency receives complaints from contractors or suppliers regarding the prices, the agency shall notify the covered utility of disparity in prices and request a written justification with supporting documentation. This documentation with copies of the survey shall then be sent to the Minnesota Attorney General's Office, Antitrust Division.

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Subp. 2. **Financing.** Whenever a covered utility undertakes to finance its own lending program for program measures through financial institutions, the utility shall seek such funds from institutions located in the area covered by the lending program.

However, if the covered utility determines that this limitation is disadvantageous to its customers, or not feasible, the limitation shall not apply.

Statutory Authority: *MS s 116J.31*

4150.0400 REPORTING AND RECORD KEEPING.

Subpart 1. **Annual report.** Each covered utility and heating supplier shall submit to the agency by May 15 of each year up to and including May 15, 1986, a report containing the following information for the 12-month period ending the preceding April:

A. the approximate number of customers in its system and, if available, the percentage of that number for whom the covered utility or heating supplier provides the primary heating fuel;

B. a copy of the program announcement;

C. the number of requests for each of the following services as well as the number of requests fulfilled:

(1) program audit;

(2) installation arrangement;

(3) financing arrangement; and

(4) billing service for repayment of loans.

D. the number of installations of program measures installed by, supplied by, or financed by the covered utility or heating supplier;

E. the number and results of postinstallation inspections, including description of violations;

F. the number and function of employees assigned to the program; and

G. the costs incurred, including that portion of the cost paid by individual customers for services received and that portion paid by all ratepayers, in providing each type of the following services:

(1) the program audit;

(2) installation arrangement;

(3) loan arrangement; and

(4) postinstallation inspections.

Subp. 2. **Record keeping requirements.** Each covered utility and heating supplier shall keep the following records, which shall be kept for the periods indicated:

A. for five years from the date of the program audit, the name and address of each customer who receives a program audit;

B. for five years from the date of the program audit, a copy of the data collected and the estimated cost and savings information for each customer who receives a program audit;

C. for five years from the date of the request, each request for a furnace audit;

D. for five years from the date of the arrangement, the name and address of each customer for whom installation or financing of measures was arranged; and

E. for two years from the date of the program audit, the total amount and cost of fuel purchased for the period of 12 months prior to and 12 months following each audit. This information is only required for those utilities and heating suppliers which supply the primary heating fuel to the customer.

This information shall be made available to the agency upon request.

Statutory Authority: *MS s 116J.31*

4150.0500 PROGRAM PROMOTION.

Subpart 1. **Distribution.** Each covered utility shall send to all their customers a program announcement by June 15, 1981, and thereafter at least once every two years until January 1, 1985.

Each covered utility shall send a program announcement to each of its new customers within 60 days after the date that the new customer first receives service.

Program announcements shall be submitted to the agency for approval one month prior to the date that the utility intends to print the announcement. The agency shall approve the distribution of program announcements only if:

- A. the criteria of subpart 2 have been met; and
- B. the information contained in the program announcement is presented in simple language.

Subp. 2. **Content.** The program announcement shall contain the following elements, at a minimum:

- A. a list of all program measures with an estimate of the savings in energy costs, expressed in percentages, which are likely to be produced by each measure in one year;

- B. a list of all energy conserving practices with an estimate of the savings in energy costs, expressed in percentages, which are likely to be produced by each practice in one year, and a statement that the practices are of low or no cost;

- C. an offer by the covered utility to provide the following services with a description of each:

- (1) a program audit, in accordance with parts 4150.1100 to 4150.1600;

- (2) installation arrangement services, in accordance with part 4150.2200;

- (3) financing arrangement services, in accordance with part 4150.2100;

- (4) contractor, lender, and supplier lists in accordance with parts 4150.3100 to 4150.3300;

The description of each service shall include information on how a customer may obtain these services, and the direct cost to the customer of obtaining these services;

- D. an offer to provide to each new customer upon request a copy of any program audit performed previously on the customer's present residence;

- E. the following disclosure: "Energy savings depend on many factors. The estimates contained in the announcement are based on estimates for typical houses. Your costs and savings will be different if your house is a different size or if your energy using habits are different from those we assumed. The energy audit that we offer will provide more specific estimates for your house.";

- F. an explanation of the benefits of applicable federal and state energy tax credits;

- G. a description of the benefits and eligibility requirements of the Weatherization Assistance Program for Low Income Persons, Code of Federal Regulations 1980, title 10, section 440 including the following statement: "Landlords may be eligible for these benefits under certain circumstances.";

- H. the following statement: "The results of this audit may be used by renters to see if their residence complies with existing state standards for rental

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property. Call the Minnesota Energy Agency at 296-5175 or toll-free 800-652-9747 for more information and what you can do to get your residence brought up to these standards."

Subp. 3. Noninclusion. The program announcement shall not contain advertising for sale, installation, or financing of any program measure or energy conserving practice by a particular person or company, listed or not, nor information regarding any product that is not a program measure or an energy conserving practice.

Subp. 4. Financing. If a covered utility or participating heating supplier finances the sale or installation of program measures and energy conserving practices, it may describe its financial services.

Subp. 5. Calculations. The covered utility or participating heating supplier shall use the calculation procedures in part 4150.9910 for the estimates contained in the program announcement. All estimates shall be based upon recent prices and appropriate climatological data for the customer's location. The price data will be taken from the survey conducted pursuant to subparts 2 and 3.

Statutory Authority: *MS s 116J.31*

4150.0700 CONSUMER GRIEVANCE PROCEDURES.

Subpart 1. Conciliation conference. Conciliation conference:

A. OCS shall be responsible for the mediation of customer complaints against lenders, suppliers, contractors, and participating utilities and heating suppliers which are acting as lenders, suppliers, or contractors under the MECS program.

B. Before utilizing the OCS mediation service, customers shall be directed by the participating utilities and heating suppliers or OCS to first bring their complaint to the attention of the contractor, supplier, lender, or participating utility or heating supplier that is acting as a lender, supplier, or contractor.

C. Within three working days of receipt of a written MECS customer complaint, an OCS mediator will contact the customer and the party complained against to ascertain their positions in regard to the complaint. If necessary, the OCS mediator shall conduct a conciliation conference between the parties in person or by phone.

D. OCS shall report to the agency, the name of any lender, supplier, or contractor which, after two weeks' notice from OCS, has failed:

(1) to respond to attempts to contact it; or

(2) to actively participate in good faith in the mediation process within 30 days of initial contact; or

(3) to correct program violations or take remedial measures agreed to in mediation within two weeks after agreement.

Subp. 2. Annual report. The Office of Consumer Services shall submit to the agency by May 15 each year, up to and including May 15, 1986, a report containing the following information for the 12-month period ending the preceding April:

A. the number and nature of complaints against suppliers, contractors, and lenders which have been handled through the conciliation conference; and

B. the number and function of employees within OCS assigned to the MECS program.

Statutory Authority: *MS s 116J.31*

4150.0800 CUSTOMER PAYMENTS.

Subpart 1. **Customer billing.** Each covered utility and heating supplier, when billing the customer for any costs it incurred under the MECS, including arranged loans, shall identify and list the charges separately on the billing for the charges. The customer shall be allowed to include payment for those charges with payment for the utility bill.

When receiving a payment from a customer that includes payment for utility service or fuel and payment for any MECS service, the covered utility and heating supplier shall credit the payment to utility service or fuel first, and to credit the remainder to MECS program charges, unless the customer specifies otherwise.

Subp. 2. **Loan payments.** If the lender agrees, a loan arranged by a covered utility pursuant to part 4150.2100 may be repaid by the customer as part of the periodic utility bill. The utility may recover from the lender the cost incurred by the utility in carrying out this repayment.

If the lender agrees, any loan for the purchase or installation of program measures made or arranged by a heating supplier shall be subject to the following requirements:

A. The heating supplier shall allow the customer to repay the loan over a period of not less than three years, unless the customer chooses a shorter repayment schedule. The heating supplier may impose a minimum periodic payment of five dollars.

B. A lump-sum payment of outstanding principal and interest may be required by the lender upon default in payment by the customer.

C. No penalty shall be imposed by a heating supplier or a lender for payment of all or any portion of an outstanding loan prior to the date that such payment would be due.

Subp. 3. **Termination of service.** No participating utility or heating supplier shall terminate or restrict utility or fuel service upon customer default or nonpayment of any MECS program charges and loans.

Statutory Authority: *MS s 116J.31*

ENERGY AUDITS**4150.1100 VALIDATION OF AUDIT PROCEDURES.**

Subpart 1. **Alternative audits.** The agency shall develop a model program audit based on the calculation procedures in part 4150.9910 for use by participating utilities and heating suppliers in the MECS. A participating utility or heating supplier may use an alternative audit if the alternative has been approved by the agency. The alternative audit will be approved if its results are within ± 20 percent of the results provided by the MECS audit. To determine this, the agency shall conduct five field tests of the alternative audit on five representative residences of different sizes and ages. The results of these audits shall be reviewed by the agency and compared to the results achieved by the MECS audit. If the alternative audit does not meet this test, any necessary changes may be made in the audits procedures and five additional audits may be conducted and reviewed.

Subp. 2. **Price information.** On a semiannual basis each covered utility shall survey local fuel prices and prices for materials and installation of program measures for use in audit calculations on a form provided by the agency. The results shall be sent to the agency for verification on the 15th day of January and July, starting on July 15, 1981.

Subp. 3. **Subcontracting audits.** Contracting audits:

A. Participating utilities and heating suppliers may subcontract with any auditor who has passed the certification exam pursuant to parts 4150.5100 to 4150.5300, to perform the audits required by these parts. The subcontract may

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include an indemnification clause concerning liability incurred by the utility from the subcontractor's actions or the audit performed.

B. Whenever possible covered utilities shall, instead of performing the required audits with their own employees, subcontract with local auditors who:

(1) have passed the certification exam pursuant to parts 4150.5100 to 4150.5300; and

(2) have (or whose sponsoring organization has) a demonstrated community involvement, or capacity to generate customer participation, in the area where the audits are to be performed. The criteria used to determine whether an auditor (or his or her sponsoring organization) has a demonstrated community involvement shall be whether the person, organization or group has a history of energy or related community service in the area where the audits are to be performed.

Notwithstanding the above, no covered utility shall be required to enter into a subcontract with an auditor if it reasonably believes that the quality of the auditor's work would not be equivalent to what the covered utility could perform or if the charge for performance by the auditor is not competitive with other auditors in the area, or comparable areas, with whom the utility has subcontracted, or with the cost of performance by the covered utility itself.

C. An auditor proposing to subcontract pursuant to item B may dispute a covered utility's refusal to subcontract by filing a complaint with the agency. After reviewing the complaint and receiving comments from both parties, the agency shall determine whether the refusal was proper under the criteria and requirements of item B.

D. Any customer of a covered utility may request to have an audit performed by any auditor with whom the covered utility has subcontracted to perform audit services in the area in which the customer lives, pursuant to item B. The covered utility may refuse the request only if the auditor refuses to accept the work, or the covered utility has reason to believe that the auditor would be unable to complete the audit in accordance with the MECS rules or subcontract terms.

Statutory Authority: *MS s 116J.31*

4150.1200 SCHEDULING OF PROGRAM AUDITS.

Subpart 1. Requirements for agency approval of schedule. Upon prior approval by the agency, a program audit may be offered in the program announcement by a participating utility or heating supplier on a geographically limited but otherwise nondiscriminating basis. Approval will be granted if the audit offer schedule allows every customer within the respective utility or heating supplier's service area an equal opportunity to receive a program audit, and if the audit offer schedule is consistent with parts 4150.1100 to 4150.1700. In no case shall an expiration date be attached to a participating utility's audit offer. However, any covered utility which serves a city of the first class and offers audits on a geographic basis in that city must first offer the audits to customers in those neighborhoods that contain the largest number of people below the federal poverty guideline. If two or more covered utilities provide service to the same city of the first class, upon approval by the agency those utilities may enter into an agreement which provides that only one utility will offer the audits on the above priority basis. This agreement will not relieve either utility from responsibilities of offering audits to all eligible customers.

Subp. 2. Deadlines for providing audit. Each covered utility shall provide a program audit to a customer:

A. within 30 days of the customer's request if the audit offer is made on a geographically limited basis; or

B. within 60 days of the customer's request if the audit offer is not made on a geographically limited basis.

Subp. 3. **Deadline for submitting schedule.** Each participating utility and heating supplier shall submit to the agency, 45 days prior to the first offer of a program audit, a schedule which states when program audits will be offered and completed throughout the state.

Subp. 4. **Preconditions.** Participating utilities and heating suppliers are prohibited from preconditioning a program audit upon the purchase or performance of any other audit.

Statutory Authority: *MS s 116J.31*

4150.1300 CONDUCTING THE AUDIT.

Subpart 1. **Contents of audit.** Each participating utility and heating supplier shall, upon request, provide to each customer a program audit which covers all energy conserving practices and all program measures. In each program audit, a state-certified auditor shall determine which of the energy-conserving practices would save energy in the residence, explain and emphasize the importance of such practices, and recommend that they be performed before the installation of any program measure. The auditor shall then determine the applicability of each program measure pursuant to subpart 2, in that residence.

Subp. 2. **Energy savings.** The auditor shall estimate energy savings and installation costs of each program measure using the calculation procedures in part 4150.9910 or procedures approved pursuant to parts 4150.1100 to 4150.1700. Furthermore, the auditor shall perform each of the following:

A. take actual measurements or inspections of the building shell and of the space heating, space cooling, and water heating equipment;

B. base economic calculations on the survey conducted pursuant to part 4150.1100, subpart 2 for local fuel prices, and local prices for materials and installation of program measures, and also, include in the calculations typical local climate data for the customer's location;

C. base calculation procedures for active solar domestic hot water and space heating systems on those contained in the HUD Intermediate Minimum Property Standards Supplement, Solar Heating and Domestic Hot Water Systems 4930.2, 1977 edition; and

D. base any cost and savings estimate for any applicable furnace efficiency modification to a gas or oil furnace or boiler on an evaluation of the seasonal efficiency of such furnace or boiler; this seasonal efficiency shall be calculated on an estimated peak (tuned-up) steady state efficiency corrected for cycling losses; this shall be done as follows:

(1) for oil furnaces or boilers, the steady state efficiency shall be derived by a flue gas analysis of measured flue gas temperature and carbon dioxide content;

(2) for gas furnaces or boilers, the steady state efficiency shall be derived from manufacturer's design data; if the manufacturer's design data does not exist, then a flue gas analysis, as described in this subitem shall be done.

Subp. 3. **Energy index.** The auditor shall calculate the energy index for the residence using the procedures in part 4150.9910.

Subp. 4. **Release form.** Each customer shall be required to sign a release form prior to an audit of a furnace which uses as its primary source of energy any fuel other than the fuel source sold by the participating utility or heating supplier which employs the auditor. The release shall include the following statement:

"Since your home is heated by a source of fuel other than (identify the type of fuel supplier), you must sign this release form to allow us to audit your furnace. It will allow us to give you estimates of energy savings that may be

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available from making your heating appliances more efficient.”

Statutory Authority: *MS s 116J.31*

4150.1400 TECHNICAL CRITERIA FOR CALCULATING ENERGY SAVINGS.

Subpart 1. R-values. The following R-values shall be recommended during the program audit and be used during the calculation procedure: ceiling insulation R-44, wall insulation R-11, foundation insulation R-11, floor insulation R-19, and rim joist insulation R-19.

Subp. 2. Estimates of cost and savings. The following criteria shall be used to determine if an estimate of cost and savings must be given for the particular program measure:

Measure = Criteria

A. replacement furnaces or boilers: the furnace is five years or older and has a seasonal efficiency of less than 80 percent;

B. flue opening modifications: the furnace combustion air is taken from a conditioned space;

C. replacement central air conditioner: the building has a central air conditioner that is five years or older;

D. ceiling insulation: the present level of ceiling insulation is R-30 or less;

E. wall insulation: there is no insulation in a substantial portion of the exterior walls and the building is not a mobile home;

F. floor insulation: floor: there is no insulation in the floor over an unconditioned space; rim joist insulation: the rim joist is accessible;

G. water heater insulation: the remaining useful life of the heater appears to be three years or greater and space is available around the water heater to install insulation;

H. electric load management devices: the electric utility offers a residential rate which reflects any differences in the utility cost of service between peak and off-peak periods;

I. clock thermostat: the residence has a thermostat or the existing furnace or central air conditioner is compatible with a clock thermostat;

J. solar domestic hot water system: a site exists on or near the residence, which is free of major obstruction to solar radiation;

K. passive solar direct or indirect gain glazing systems: the living space of the residence has either a south-facing (plus or minus 45 degrees of true south) wall or an integral south-facing (plus or minus 45 degrees of true south) roof, which is free of a major obstruction to solar radiation;

L. heat reflecting and heat absorbing window or door material: the affected rooms of the residence are air conditioned and the cooling degree days for the region exceed 700;

M. passive solar solarium/sunspace systems: the living space of the residence has a south-facing ground level wall, which is free of major obstruction to solar radiation;

N. passive solar window heat gain retardants: the living space of the residence has south-facing (plus or minus 45 degrees of true south) window that is not shaded from summer sunshine;

O. wind energy systems: the site has an estimated wind speed of greater than ten mph and there is sufficient unrestricted access to the wind; and

P. active solar space heating: a site exists on or near the residence which is free of major obstruction to solar radiation.

Subp. 3. Required information on some solar systems. Every program audit addressing solar domestic hot water and active solar space heating systems shall include the following information:

- A. the square feet of the solar collector;
- B. the solar collector characteristics, including glazing materials and other solar collector materials;
- C. any storage system needed, including the capacity of storage;
- D. any freeze protection needed;
- E. the estimated percent of the water heating load to be met by solar energy;
- F. any physical connections needed with existing heating system;
- G. any site preparation needed; and
- H. if the results are based on a simulation, the following disclosure or its equivalent:

"The energy cost savings estimates you receive are based on systems that may be different from the ones you purchase. Also, these estimates were not determined using actual conditions but by using simulated measurements. Therefore, the cost savings we have estimated may be different from the savings that actually occur."

Subp. 4. **Passive solar space heating.** Every program audit addressing passive solar space heating systems shall include the following information:

- A. a general description and an illustration of the system;
- B. the estimated percent of the maximum heating requirements of the residence that could be met by the system;
- C. the approximate dimensions of the system;
- D. the method employed by the system to store heat, including the heat capacity for heat storage; and
- E. the disclosure provided in subpart 3, item H.

Subp. 5. **Wind energy device.** Every program audit addressing wind energy device shall include the following information:

- A. installation cost estimates, based on the installation costs of a commercially available device with kilowatt ratings appropriate to the level of electricity consumed in the customer's residence;
- B. the auditor's estimate of the average windspeed at the residence based on data available at the nearest wind measurement station;
- C. the specifications of the device under consideration; and
- D. estimates of energy cost savings, based on average yearly wind speeds and the specification of the selected wind device.

Statutory Authority: *MS s 116J.31*

4150.1500 PRESENTATION OF AUDIT RESULTS.

Subpart 1. **On site, in person, in writing.** Upon completion of the program audit the auditor shall provide all the following information on site, in person, in writing to each customer:

- A. an estimate of the total cost (materials and labor) of installation by a contractor expressed in a range of dollars, with a 20 percent maximum range, of each applicable program measure addressed in the program audit;
- B. an estimate of the total cost of installation by the customer expressed in a range of dollars, with a 20 percent maximum range, of each applicable program measure, addressed in the program audit (however, the auditor shall not provide an estimate to a customer of the cost of installation by the customer of replacement central air conditioners, wall insulation, furnace efficiency modifications, devices associated with load management techniques, or wind energy devices);
- C. an estimate of the savings in energy costs expressed in a range of dollars, with a 20 percent maximum range, which occur during the first year from installation of each applicable program measure addressed by the program audit;

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D. an estimate of the payback period, measured in years, for the cost savings of each of the measures installed individually;

E. the following disclosure:

"The procedures used to make these estimates are consistent with the Minnesota Energy Agency criteria for residential energy audits. However, the actual installation costs you incur and energy savings you realize from installing these measures may be different from the estimates contained in this audit report. Although the estimates are based on measurements of your house, they are also based on assumptions which may not be totally correct for your household";

F. an estimate of the annual normal maintenance costs, if any, of each applicable program measure; and

G. sample calculations of the effect of the federal and state energy tax incentives on the cost to the customer of installing one applicable energy conservation program measure and one applicable renewable resource program measure.

Subp. 2. **Other information.** The auditor shall also present the following information to the customer during, or upon completion of, the program audit:

A. an explanation of the arrangement services, post-installation inspection requirement and consumer grievance procedures as established in parts 4150.0700, 4150.2100 to 4150.2500, and 4150.4100 to 4150.4400, with a brief description of how the customer can qualify for and use such services;

B. a copy of the most recent master list of contractors, lenders, and suppliers for the region, as issued by the agency;

C. an explanation of the benefits of and eligibility requirements for the Weatherization Assistance Program for Low Income Persons, Code of Federal Regulations, title 10, section 440, 1980;

D. if the audit is of a rental property, a separate list of those improvements necessary to bring the residence in compliance with Minnesota Statutes 1978, section 116H.129, subdivision 3 and a statement describing remedies available to tenants for violations of those standards. If the presentation is not made to the tenant, the auditor shall give or mail a copy of this information to the tenant.

Subp. 3. **If customer is away.** If the eligible customer is not at his or her residence at the time scheduled for presentation of the audit results or otherwise declines an in-person presentation, the auditor is relieved of any obligation to deliver the results in person. In this case, the results shall be mailed to the customer.

Statutory Authority: *MS s 116J.31*

4150.1600 PROHIBITIONS.

An auditor shall not recommend or discuss any supplier, contractor, or lender to any customer. The auditor may state whether the participating utility or heating supplier by whom he or she is employed installs or finances the sale or installation of the program measures, but shall not recommend that service.

The auditor shall not exclude any applicable program measures in the presentation of the audit to the customer.

An auditor shall not estimate or discuss with the customer the costs or energy cost savings of installing any product which is not defined as an energy conserving practice or a program measure.

The auditor shall not recommend fuel switching.

Statutory Authority: *MS s 116J.31*

4150.1700 REQUIRED DISCLOSURE.

The auditor shall provide the customer with a written statement of any substantial interest which the auditor or the auditor's employer has, directly or indirectly, in the sale or installation of any program measure.

Statutory Authority: *MS s 116J.31*

ARRANGEMENT SERVICES

4150.2100 FINANCING ARRANGEMENT SERVICE.

Each participating utility and heating supplier shall provide an arrangement service for financing the supply or installation of any program measure, upon request of a customer. This financing arrangement service shall consist of all the following:

- A. providing the customer with the most recent master list of lenders, and an agency compiled list of other financial programs offered by federal, state, or local governments, and explaining these financing programs to the customer;
- B. providing the customer with a standard credit application and offering to assist the customer with a standard credit application; and
- C. providing a service in order to further assist and answer any additional questions of the customer.

Statutory Authority: *MS s 116J.31*

4150.2200 INSTALLATION ARRANGEMENT SERVICE.

Each covered utility shall provide an arrangement service for the installation of any program measure, upon request of a customer.

A. For audited homes this installation arrangement service shall consist of:

- (1) providing a choice to the customer of either the most recent master list of contractors willing to install measures within the price range that the auditor specifies, or providing the most recent master list of contractors; and
- (2) providing up to three standard bid forms per measure recommended by the auditor and providing the customer with a choice of having the form filled in by either the customer or the auditor; and
- (3) supplying the customer with written information on recommended measures to be installed; and
- (4) providing a service in order to further assist and answer any additional questions of the customer regarding the arrangement process or the actual bids, when received.

B. For nonaudited homes, this installation arrangement service shall consist of all the following:

- (1) providing the master list of contractors;
- (2) providing up to three standard bid forms to the customer;
- (3) an offer to supply the customer with written information on various measures; and
- (4) providing a service in order to further assist and answer any additional questions of the customer regarding the arrangement process or actual bids, when received.

Statutory Authority: *MS s 116J.31*

4150.2300 RESPONSE TIME FOR SERVICES.

The participating utilities and heating suppliers shall provide the services described in parts 4150.2100 and 4150.2200 at the time of the energy audit, for a customer requesting an energy audit. If an audit is not performed, the service shall be provided within 20 days of a customer's request.

Statutory Authority: *MS s 116J.31*

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4150.2400 PROHIBITIONS.

Participating utilities, heating suppliers, and audit subcontractors shall not recommend any particular contractor, lender, supplier, or program measure although participating utilities, heating suppliers, and audit subcontractors may inform customers of their own installation and supply services if they are on the most recent master list.

Participating utilities and heating suppliers shall not arrange for financing or installation with any contractor, lender, or supplier not on the most recent master list.

Participating utilities and heating suppliers shall not provide arrangement services for measures which are not approved program measures.

Statutory Authority: *MS s 116J.31*

4150.2500 STANDARDIZED BID FORMS.

The agency shall develop a standardized bid form for use pursuant to parts 4150.2100 to 4150.2400. This form shall be the only one used by the participating utilities and heating suppliers for arranging installation under MECS.

Statutory Authority: *MS s 116J.31*

MASTER LIST OF CONTRACTORS, LENDERS, AND SUPPLIERS

4150.3100 ISSUANCE OF LISTS.

Subpart 1. **Agency to maintain lists.** The agency shall prepare and maintain the master list of the MECS suppliers, contractors, and lenders. The agency shall provide notice through trade organizations to suppliers, contractors, and lenders of the procedures for inclusion on the master list for the MECS program.

Subp. 2. **Application for listing.** Application forms and listing criteria for businesses wishing to be on the master list shall be available from the agency, participating utilities, and heating suppliers. These forms and listing criteria shall be made available at the time of publication of notice of procedures for inclusion on the master list.

Subp. 3. **Agency review of applications.** Within 60 days following the receipt of an application for inclusion on the master list, the agency shall evaluate the application pursuant to part 4150.3200 and either place the business on the master list or inform the business, in writing, of the reasons for its exclusion from the list.

Subp. 4. **Revised lists.** Every 30 days after the publication of the first master list, the agency shall issue revisions to the master list which include any additions, deletions, or information changes. These revisions shall be issued to all participating utilities and heating suppliers. Every six months, a new master list shall be published.

Statutory Authority: *MS s 116J.31*

4150.3200 ELIGIBILITY REQUIREMENTS.

Subpart 1. **Written agreement.** To be eligible for listing, contractors, lenders, and suppliers must enter into a written agreement with the agency.

Subp. 2. **Contents of written agreement; contractors.** Contractors shall agree in writing with the agency to meet the following requirements for each arranged installation:

A. comply with the applicable DOE installation standards found in Code of Federal Regulations, title 10, section 456, subparts G, I and install only measures that are labeled as meeting DOE material standards;

B. install only measures that are covered by the measures warranty (except for caulking and weatherstripping);

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C. enter into a written contract with each customer detailing the job to be performed, its costs, and a statement that the installation will be in compliance with all applicable DOE material and installation standards; this contract shall be in simple language;

D. warrant in the contract that any defect in design or manufacture of materials or installation found within one year from the date of installation shall be remedied without charge and within two weeks, except that where the defect is in a manufactured item a remedy shall be within two weeks after the manufactured item is available to the contractor or supplier;

E. maintain comprehensive general liability insurance covering:

(1) bodily injury: \$100,000 per person, \$300,000 per occurrence;

(2) property damage: \$50,000 each occurrence, \$100,000 aggregate;

F. comply with all applicable federal, state, and local laws;

G. participate in good faith in the conciliation conference when a complaint is made by a customer;

H. hold harmless from liability the participating utility or heating supplier in any contract between contractor and customer when the contractor is not a participating utility or a heating supplier; however, this hold harmless agreement shall apply only where any loss occurs due to the negligence of the contractor or supplier and/or materials supplied by the contractor or supplier and shall not apply to any loss resulting from the negligence of or the materials supplied by the participating utility or heating supplier; and

I. agree to notify the MECS inspection agency at the completion of the installation pursuant to parts 4150.4100 to 4150.4400.

Subp. 3. Contents; suppliers. Suppliers shall agree in writing with the agency to meet the following requirements for each customer:

A. supply program measures which meet applicable DOE material standards;

B. provide, at a minimum, to any person who purchases a measure from the supplier, a warranty in writing that the person shall be entitled to obtain, within a two-week period after notice by the customer to the supplier and at no charge, appropriate replacement parts or materials for those measures found to be defective within one year from the date of purchase due to a defect in materials, manufacture, or design;

C. comply with all applicable federal, state, and local laws;

D. have a method for informing customers that the supplier carries products which are program measures, that these products have a measures warranty and are labeled as meeting the DOE material standards; and

E. participate in good faith in the conciliation conference when a complaint is made by a customer.

Subp. 4. Contents; lenders. Lenders shall agree in writing to meet the following requirements for each arranged financing:

A. not to take a security interest in real property that is used as a residence unless the customer acknowledges in writing that he or she is aware of the consequence of default on the loan;

B. permit a rebate on unearned finance charges and impose no penalties if a customer prepays a loan (either voluntarily or as a result of default). When prepayment is the result of default, the rebate shall be computed from the day of acceleration;

C. comply with all applicable federal, state, and local laws; and

D. participate in good faith in the conciliation conference when a complaint is made by a customer.

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Subp. 5. Disclosure of unresolved complaints. All businesses must inform the agency in their application for listing of the existence of any unresolved complaints against that business on file with the Consumer Division of the Minnesota Attorney General's Office or the Office of Consumer Services. Failure to report this information will result in exclusion from the master list. The existence of three or more unresolved complaints against an applicant on file with the above agencies involving, but not limited to, the following subject matter shall result in exclusion from the master list:

- A. misrepresentation of materials used in installation;
- B. improper installation of materials, based on manufacturer's or other standard installation procedure; or
- C. false or misleading claims concerning energy savings to be produced by the measure.

Statutory Authority: *MS s 116J.31*

4150.3300 REMOVAL FROM MASTER LIST.

Subpart 1. Removal. Any supplier, lender, or contractor shall be removed from the master list for violation of either the eligibility requirements in part 4150.3200 or the contract between the lender, contractor, or supplier and agency as required in the same part.

Subp. 2. Report of violations to agency. Violations shall be reported to the agency by the postinstallation inspectors and the mediators of consumer complaints. The postinstallation inspectors and mediators shall also report to the agency whether the violation has been corrected or not, two weeks after the initial report of this violation.

Subp. 3. Notice to violator; correction; review. Within one week after the agency receives a report of violation, the agency shall send written notice to the contractor, lender, or supplier notifying the business of the reported violation. The contractor, lender, and supplier shall correct the violation within two weeks of mailing of the notice or within one week, send to the agency a written explanation as to why it is not a violation. The agency shall review the letter and the report of the inspector and will notify the contractor of its decision.

Subp. 4. Temporary delisting; second notice. If the contractor, lender, or supplier fails to correct the violation within two weeks after it has received notice of the agency's decision that a violation exists, it shall be temporarily delisted. This temporary delisting shall be in effect for 30 days. The agency shall then send a second notice to the contractor, lender, or supplier explaining the temporary and permanent delisting procedures and invite a written response from the business prior to the end of the 30-day period. A copy of this notice shall be sent to all participating utilities and heating suppliers. If the violation concerns a contractor, the contractor may see the records of the reported violation. If no resolution is made within 30 days of mailing of the notice, the contractor, lender, or supplier will be permanently delisted.

Subp. 5. Relisting. Any supplier, lender, or contractor permanently removed from the master list shall not be relisted for at least six months after being so delisted. To be relisted, all violations under the program must be corrected and inspected and all other listing requirements must be met.

Statutory Authority: *MS s 116J.31*

POSTINSTALLATION INSPECTIONS

4150.4100 INSPECTION PROCEDURES.

Subpart 1. Plans. Each covered utility shall arrange to conduct the postinstallation inspections of its customers required in this part. By June 15, 1981, each covered utility shall submit to the agency, for approval, its plans for conducting the inspections and for coordinating these inspections with the agency and the Office of Consumer Services.

Subp. 2. **Prohibitions on inspectors.** No person shall conduct or perform an inspection unless he or she has been qualified by the agency, pursuant to part 4150.4300.

No inspector shall conduct an inspection if he or she has financial interest in the contractor whose work is to be inspected.

Subp. 3. **Required determinations.** During the inspection, the inspector shall determine whether the installation conforms with DOE installation standards, and in the case of a consumer complaint, the complaint is justified.

Subp. 4. **Inspection report; correcting violations.** An inspection report shall be developed by the agency. The inspector shall use this report to certify that the installation meets all DOE installation standards. Within five days of the inspection, the inspector shall report to the customer, the contractor, and the agency whether or not any violations of the installation standards were found. If the agency determines that a violation exists, the contractor shall correct any violation within two weeks of receipt of the report and shall arrange for a reinspection of the installation within one week after correction.

Statutory Authority: *MS s 116J.31*

4150.4200 MANDATORY INSPECTIONS.

All installations of the following arranged measures shall be inspected within one week of installation:

- A. flue opening modifications;
- B. electric or mechanical ignition systems;
- C. wind energy devices;
- D. solar domestic hot water systems; and
- E. active solar space heating systems.

Statutory Authority: *MS s 116J.31*

4150.4300 RANDOM INSPECTIONS.

Subpart 1. **First ten inspections.** Four of the first ten arranged installations made by each contractor of each of the following program measures shall be inspected: ceiling insulation; floor insulation; and wall insulation.

Subp. 2. **Ten percent a year.** Ten percent of all utility arranged installations of each program measure listed in subpart 1 shall be inspected each year. The inspections required under subpart 1 shall count toward the fulfillment of this requirement.

Subp. 3. **One a year.** At least one inspection shall be conducted each year of the arranged installations of the following measures for each contractor on the master list:

- A. ceiling insulation;
- B. floor insulation;
- C. wall insulation;
- D. water heater insulation;
- E. storm or thermal windows;
- F. storm or thermal doors;
- G. replacement burner (oil); and
- H. replacement solar swimming pool heaters.

Before April 1, 1982, the utility, or its designated inspection agency, shall determine whether all listed contractors have been inspected at least once by that date. Any contractor whose work has not been inspected by that time shall then be inspected. An additional inspection shall be required for any contractor whose installation has been found in violation of these parts. This review shall be done annually thereafter.

Statutory Authority: *MS s 116J.31*

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4150.4400 INSPECTIONS AS RESULT OF CONSUMER COMPLAINTS.

Within two weeks of the receipt by the Office of Consumer Services of any customer complaint concerning arranged installation of the measures listed in parts 4150.4200 and 4150.4300, an inspection shall be conducted to determine the existence of any violations of these parts. Within five days after the inspection, a copy of the inspection report shall be sent to the Office of Consumer Services.

All inspections conducted as a result of a consumer complaint shall be counted toward the fulfillment of the inspection requirement in part 4150.4300.

Statutory Authority: *MS s 116J.31*

QUALIFICATION PROCEDURES FOR AUDITORS AND INSPECTORS

4150.5100 PROHIBITION OF DISCRIMINATION.

No person shall be denied the right to become an auditor or inspector on the basis of race, religion, nationality, creed, sex, age, or sexual preference.

Statutory Authority: *MS s 116J.31*

4150.5200 AUDITORS.

Subpart 1. Training. No person shall be eligible for certification pursuant to subpart 4 unless he or she has first participated in a training course that has been approved by the agency and that covers the subject matter tested in the auditors' certification examination.

Subp. 2. Orientation for experienced auditors. Any present auditor with six months experience who has completed 25 audits, or any registered engineer or any architect, shall be permitted to take an agency-approved orientation session in lieu of the requirements of subpart 1.

Subp. 3. Continuing education. Two months prior to the first public offer of the audit, the participating utility and heating supplier shall submit to the agency for approval a plan to develop and administer a program of in-service training for the continuing education of certified auditors. The agency shall approve a plan if it reviews and updates the material listed in subpart 4, provides the auditors with additional technical information and the program measures and audit techniques, and reviews the communications skills needed for the interaction with the customer.

Subp. 4. Certification. No person shall participate in the MECS program as an auditor, unless he or she has first passed a certification examination conducted by the agency. The certification examination shall test for the following qualifications:

A. a general understanding of the three types of heat transfer and the effects of temperature and humidity on heat transfer;

B. a general understanding of residential construction terminology and components;

C. a general knowledge of the operation of the heating and cooling systems used in residential buildings, including the need and provision for combustion air;

D. a general knowledge of the different types of each applicable program measure, of the advantages and disadvantages and applications of each, and of the DOE installation standards;

E. the capability to conduct the MECS energy audit including:

(1) a working knowledge of the energy conserving practices defined in this plan;

(2) the ability to determine the applicability of each of the program measures; and

(3) a proficiency in the auditing procedures for each applicable program measure established in parts 4150.1100 to 4150.1700;

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F. a working ability to calculate the steady state efficiency of furnaces or boilers;

G. an understanding of the nature of solar energy and its residential applications including: insulation, shading, heat capture and transport, and heat transfer for hot water;

H. an understanding of the nature of wind energy and its residential applications including: wind availability, effects of obstruction, wind capture, power generation, and interfaces with residential and utility power line; and

I. a working knowledge of building and fire codes related to the installation and safety of wood burning appliances.

Subp. 5. **Examination schedule.** These examinations shall be conducted by the agency and offered at the following times:

A. within two days after the completion of each state-sponsored training course or orientation session;

B. once a month, until February 1982, with a minimum of two examinations per year afterward.

Subp. 6. **Recertification.** Certification shall be valid for one year. After one year, each auditor must be recertified. Recertification procedures shall be as follows:

A. One month prior to the date of certificate expiration, the auditor shall attend a recertification course, as required by the agency. Attendance in this course shall recertify the auditor for the next year.

B. The recertification course requirement for auditors shall be eliminated for any particular year, if the agency determines that no changes were made in the MECS program that year. Certification shall then be automatically renewed.

C. This recertification shall occur annually, for the life of the program.

Subp. 7. **Persons certified in other states.** Any person who is certified to conduct residential conservation service audits in another state shall not be required to take the training course established in subparts 1 to 3, but shall be required to pass the Minnesota certification examination.

Statutory Authority: *MS s 116J.31*

4150.5300 INSPECTORS.

Subpart 1. **Qualifications to conduct random inspections.** No person shall participate in the MECS program as a general inspector unless he or she has been qualified. To become qualified each person must first take a training course which has been approved by the agency. The training course shall cover the following subject matter:

A. the measures listed in part 4150.4300, subpart 3;

B. methodology to evaluate whether the installation of a measure conforms to DOE installation standards; and

C. the MECS recommended standards for R-values for each insulation measure, pursuant to part 4150.1400, subpart 1.

Subp. 2. **Training plan; notice of persons qualified.** Each covered utility shall submit to the agency for approval a plan for the training of general inspectors, as required in subpart 1, by June 15, 1981. The agency shall approve a plan if it ensures coverage of the subject matter pursuant to subpart 1.

Each covered utility shall notify the agency of each person qualified as a general inspector within two weeks after that person has been qualified.

Subp. 3. **Qualifications to conduct mandatory inspections.** No person shall participate in the MECS program as a specialized inspector unless he or she has been qualified. To become qualified each person must first take training courses

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that have been approved by the agency. Each person shall only be qualified to inspect those measures for which that person has been trained. The training courses shall cover:

A. the following subject matter concerning flue opening modifications and electrical or mechanical ignition systems:

- (1) applicable state and federal codes, rules, and regulations;
- (2) an understanding of gas appliances used in residential buildings, including basic system requirements, components, and operation, and an understanding of potential malfunctions of gas appliances;
- (3) an understanding of gas appliance controls and safety controls, including automatic gas valves, limit switches, and thermostats;
- (4) an understanding of basic furnace and boiler circuitry, including electrical components, and the use of appropriate meters for testing gas appliance circuitry;
- (5) an understanding of the purpose, general structure, and operational systems of vent dampers including the advantages and disadvantages of each type; an ability to service and install electrical, mechanical, and thermal vent dampers;
- (6) an understanding of the purpose, basic system requirements and components, and operation of electrical or mechanical ignition systems; an ability to service and install the system, an understanding of schematic diagrams and potential malfunctions of the system;
- (7) an understanding of the types of vents, draft diverters, and heat transfer components; an understanding of venting theory including ventilation air, dilution air, vent sizing, and venting installation procedures; an ability to perform leak and spillage checks, and to use instrumentation to measure carbon monoxide and carbon dioxide emissions from gas appliances;
- (8) an understanding of proper combustion and proper flame characteristics and gas piping procedures; and
- (9) an understanding of the methodology to evaluate whether the installation of the measures conform with DOE installation standards;

B. the following subject matter concerning wind energy devices:

- (1) an understanding of the structural characteristics of wind energy devices;
- (2) an understanding of national and local codes governing the electrical interconnection between the wind energy device and the residential and/or utility electrical system; and
- (3) methodology to evaluate whether the installation of a wind energy device conforms with DOE installation standards;

C. the following subject matter concerning solar domestic hot water and active solar space heating systems:

- (1) the residential construction methods employed in the region and the characteristics of structures that would preclude a safe and enduring solar installation;
- (2) the applicable provisions of the HUD (Intermediate Minimum Property Standards Supplement), Solar Heating and Domestic Hot Water Systems 4930.2, 1977 Edition;
- (3) the design, operation, installation, and degradation of residential hot water and heating systems with which the solar devices will interconnect;
- (4) the connection of the solar devices into the existing residential systems, including testing for satisfactory performance of the solar devices and the modified system, according to the requirements of the HUD (Intermediate Minimum Property Standards Supplement), Solar Heating and Domestic Hot Water Systems 4930.2, 1977 edition; and

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(5) methodology to evaluate whether the installation of a solar domestic hot water or active solar space heating system conforms with DOE installation standards.

Subp. 4. **Specialized inspections training plan; notice of persons qualified.** Each covered utility shall submit to the agency for approval a plan for the training of specialized inspectors as required in subpart 3 by June 15, 1981. The agency shall approve a plan if it ensures coverage of the subject matter pursuant to this part. Each covered utility shall notify the agency of each person qualified as a specialized inspector, within two weeks after that person has been qualified.

Statutory Authority: *MS s 116J.31*

4150.6100 HEATING SUPPLIERS.

Any heating supplier may apply to the agency to participate in the MECS program.

Any heating supplier or association of heating suppliers may apply to the agency for a waiver of any requirement of this plan, except those listed in item C. All waivers that do not substantially limit either the delivery of services described in this plan or the conservation potential of the program shall be approved by the agency.

The following requirements of these parts shall not be waived:

A. the calculation procedures in part 4150.9910 and the ban on advertising in program announcements offered, as established in part 4150.0500, subpart 3;

B. the reporting and recordkeeping requirements, pursuant to part 4150.0400;

C. the on-site energy audit, pursuant to parts 4150.1100 to 4150.1700;

D. the arrangement service for the financing of program measures, pursuant to parts 4150.2100, 4150.2300, and 4150.2400;

E. the distribution of master lists developed, pursuant to parts 4150.3100 to 4150.3300;

F. the offer of the consumer complaint process, pursuant to part 4150.0700; and

G. the exclusive use of certified auditors, pursuant to parts 4150.5100 to 4150.5300.

Any participating heating supplier may voluntarily withdraw from this program after completing all outstanding services offered to its customers.

A participating heating supplier that does not provide MECS services or does not comply with the requirements listed in item C shall be excluded by the agency from participating in the MECS program.

Statutory Authority: *MS s 116J.31*

4150.6200 NONREGULATED UTILITY PROGRAM.

Subpart 1. **Application to program.** Any nonregulated utility may apply to the agency for inclusion in the MECS program.

Subp. 2. **Application for waiver.** A nonregulated utility or an association of nonregulated utilities may apply for a waiver of any requirements in this part, except as noted in subpart 3. All waivers that do not substantially limit either the delivery of services listed or the conservation potential of the program shall be approved.

Subp. 3. **Requirements not to be waived.** The following requirements of these parts shall not be waived:

A. the on-site program audit, pursuant to parts 4150.1100 to 4150.1700;

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B. the arrangement services for the financing of program measures, pursuant to parts 4150.2100, 4150.2300, and 4150.2400;

C. the distribution of master lists developed pursuant to parts 4150.3100 to 4150.3300;

D. the offer of the consumer complaint process, excluding postinstallation inspections, pursuant to part 4150.0700; and

E. the exclusive use of certified auditors, pursuant to parts 4150.5100 to 4150.5300.

Subp. 4. **Exceptions to usual requirements.** The following requirements of this rule shall not be required for nonregulated utilities:

A. program promotion, pursuant to part 4150.0500;

B. postinstallation inspection services, pursuant to parts 4150.4100 to 4150.4400;

C. customer payments, under part 4150.0800, subparts 1 and 2; and

D. reporting and record keeping, pursuant to part 4150.0400.

Subp. 5. **Withdrawal from program.** Any participating nonregulated utility may voluntarily withdraw from this program after completing all outstanding services offered to its customers.

Subp. 6. **Exclusion from program.** A participating nonregulated utility that does not comply with the requirements listed in subpart 3 shall be excluded by the agency from participating in the MECS program.

Statutory Authority: *MS s 116J.31*

4150.9910 PROCEDURES FOR CALCULATING ENERGY SAVINGS FOR PROGRAM MEASURES AND PRACTICES.

The procedures in parts 4150.9920 to 4150.9940 shall be the basis for calculating energy savings for program measures and practices for the program announcements.

Statutory Authority: *MS s 116J.31*

4150.9920 ENERGY CONSERVING MEASURES.

Subpart 1. **General energy savings equation.** The following equation will be used to calculate energy savings for the practices and measures listed below, except for those that are already termed in E.

Equation number 1.

$$\Delta E = \frac{\Delta H \times D \times 20.4c}{N \times V}$$

where

ΔE = the quantity of annual energy savings in the appropriate energy units, e. g. hundreds of cubic feet of natural gas, gallons of fuel oil, or kilowatt hours of electricity.

ΔH = the difference in design heat loss per degree Fahrenheit between the improved condition and the existing condition for infiltration and/or thermal transmission. Equations for calculating H are listed in subsequent subsections.

D = the normalized annual degree days as published by the National Oceanic and Atmospheric Administration (NOAA).

N = the seasonal operating efficiency of the heating system.

V = the heating value of the fuel type, consistent with ΔE and ΔH .

Subp. 2. **Caulking.** Equation number 2.

$$\Delta H = .018 \times I \times \text{Vol}$$

where

I = change in infiltration rate in air changes per hour

Vol = volume of heated space in cubic feet

Subp. 3. **Weatherstripping.** Use equation number 2.

Subp. 4. **Furnace efficiency modifications.**

A. Replacement furnaces or boilers. Equation number 3.

$$\Delta E = E_h \left(1 - \frac{N_0}{N_1}\right)$$

B. Furnace replacement burner. (ΔE is given as a range) Equation number 4.

$$\text{Low estimate of } \Delta E = .10E_h$$

$$\text{High estimates of } \Delta E = .18E_h$$

C. Flue opening modifications. (ΔE is given as a range) Equation number 5.

$$\text{Low estimate of } \Delta E = .07E_h$$

$$\text{High estimate of } \Delta E = .10E_h$$

D. Install electronic ignition system

(1) If pilot is turned off during the summer. Equation number 6.

$$\Delta E = \frac{3600 F_p}{V}$$

(2) If pilot is left on in the summer. Equation number 7.

$$\Delta E = \frac{7300 F_p}{V}$$

where

E_h = total annual energy used for space heating, in units of fuel.

N_0 = the seasonal operating efficiency of the existing heating system.

N_1 = the seasonal operating efficiency of the proposed heating system.

F_p = rate at which pilot uses energy, in Btu hours. (Typically 800 to 1,000 Btu per hour).

V = heating value of the fuel type in Btu per unit of fuel.

Subp. 5. **Replacement central air conditioner.** Equation number 8.

$$\Delta E = E_c \left(1 - \frac{PSE}{NSE}\right)$$

where

E_c = annual energy used by existing central air conditioner, in units of fuel.

PSE = present seasonal efficiency.

NSE = new (proposed) seasonal efficiency.

Subp. 6. **Ceiling insulation.** Equation number 9.

$$\Delta H = \left(\frac{1}{R_0} - \frac{1}{R_1}\right)$$

where

R_0 = total R-value in present condition.

R_1 = total R-value of proposed condition.

A = area for which additional insulation is being proposed.

Subp. 7. **Wall insulation.** Use equation number 9 for above grade walls.

Subp. 8. **Floor insulation.** Use equation number 9.

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Subp. 9. **Duct insulation.** Equation number 10.

$$\Delta E = \frac{\left(\frac{1}{R_0} - \frac{1}{R_1}\right)(T_2 - T_1)A \times \text{HRS}}{N \quad V}$$

where

R_0 = the total R-value of the ducts before improvement.

R_1 = the total R-value of the ducts after improvement.

T_2 = average temperature of air inside ducts during an on cycle of the heating system.

T_1 = average temperature of the unconditioned space the ducts pass through.

A = duct area for which insulation is proposed.

HRS = number of hours the heating system operates in a heating season.

N = seasonal operating efficiency of the heating system.

V = heating value of fuel in Btu per unit of fuel.

Subp. 10. **Pipe insulation.** Equation number 11.

$$\Delta E = \frac{(Q_1 - Q_0) L \times \text{HRS}}{NV}$$

where

Q_1 = heat loss in Btu/hr. ft. before improvement

Q_0 = heat loss in Btu/hr. ft. after improvement

L = length of uninsulated pipes in unconditioned space.

HRS = number of hours the heating system operates in a heating season.

N = seasonal operating efficiency of the heating system.

V = the heating value of fuel in Btu per unit of fuel.

Subp. 11. **Water heater insulation.**

A. If water heater is in an unconditioned space. Equation number 12.

$$\Delta E = \frac{8760A \left(\frac{1}{R_0} - \frac{1}{R_1}\right) (T_w - T_a)}{N_r V}$$

B. If water heater is in a conditioned space. Equation number 13.

$$\Delta E = \frac{H \times A \times \left(\frac{1}{R_0} - \frac{1}{R_1}\right) (T_w - T_a)}{N_r V}$$

where

R_0 = total R-value of the water heater before improvement.

R_1 = total R-value of the water heater after improvement.

T_w = hot water temperature.

T_a = average air temperature of area surrounding temperature of area surrounding water heater.

N_r = recovery efficiency of water heater.

V = heating value of fuel type in Btu per unit of fuel.

H = number of hours per year that the outside temperature is above 65 degrees Fahrenheit.

Subp. 12. **Storm and thermal windows.** Equation number 14.

$$\Delta H = (U_o - U_i) \times A$$

where

U_o = the U-value of the existing window assembly.

U_i = the U-value of the proposed window assembly.

A = the area of the window assembly.

Subp. 13. **Storm and thermal doors.** Use equation number 14 where:

U_o = the U-value of the existing door assembly.

U_i = the U-value of the proposed door assembly.

A = the area of the door assembly.

Subp. 14. **Heat reflective and heat absorbing window or door material.**
Equation number 15.

$$\Delta E = \frac{A \times F_{ss} \times F_{es}}{N_{ac}}$$

where

A = area of glazing

F_{ss} = summer shading factor

F_{es} = glazing orientation factor

N_{ac} = seasonal efficiency of the air conditioning system.

Subp. 15. **Load management.** Each utility offering such system will provide ΔE according to the particular system that the utility offers.

Subp. 16. **Clock thermostats.** Energy savings will be given for a single 8 hour night setback.

Equation # 16a. $\Delta E = .07E_h$ for five degrees Fahrenheit setback

Equation # 16b. $\Delta E = .10E_h$ for ten degrees Fahrenheit setback

Equation # 16c. $\Delta E = .11E_h$ for 15 degrees Fahrenheit setback

where

E_h = total annual energy used for space heating, in units of fuel.

Subp. 17. **Solar domestic hot water.** Equation number 17.

$$\Delta E = SSF \times E_{hw}$$

where

SSF = solar saving fraction = fraction of hot water supplied by the solar system. (Target SSF = .7)

E_{hw} = annual energy used for heating domestic hot water, in millions of Btu's.

Subp. 18. **Passive solar systems.**

A. **Direct gain glazing, indirect gain-water well storage, indirect gain -- trombe wall storage.** Energy savings for 100 square feet of double glazing with R-8 night insulation: (ΔE is given as a range) Equation number 18.

$$\Delta E = 10 \times PSF \times F_o \quad \text{High estimate}$$

$$\Delta E = \frac{N}{.6} \times \text{High estimate} \quad \text{Low estimate}$$

B. **Indirect gain-thermosiphon air panel.** Energy savings for 100 square feet of panels: Equation number 19.

$$\Delta E = 3.5 \times PSF \times F_o \quad \text{High estimate}$$

$$\Delta E = \frac{N}{.7} \times \text{high estimate} \quad \text{Low estimate}$$

C. **Sunspace systems.** Energy savings for 100 square feet of vertical double glazing: Equation number 20.

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$$\Delta E = 5 \times \text{PSF} \times F_o \quad \text{High estimate}$$

$$\Delta E = \frac{N}{.6} \times \text{high estimate} \quad \text{Low estimate}$$

where

ΔE is in million of Btu.

PSF = prime solar fraction, estimated by auditor.

F_o = orientation factor, from tables

N = heating system season efficiency

D. Window heat gain retardants. Same as equation number 14.

Subp. 19. Wind energy devices.

A. Systems providing utility grade power that can be sold to the electric utility when the system provides excess power. A system will be chosen with an Annual Wind System Output (AWSO) equal to one half the current annual electric use. Equation number 21a.

$$\text{Low estimate of } \Delta E = .8 \text{ AWSO}$$

$$\text{High estimate of } \Delta E = 1.2 \text{ AWSO}$$

B. Systems providing variable voltage power for heating use only.

A system will be chosen with an Annual Wind Systems Output (AWSO) equal to one-half of the annual heat supplied by the space heating system. Equation number 21b.

$$\text{Low estimate of } \Delta E = .8 \text{ AWSO}$$

$$\text{High estimate of } \Delta E = 1.2 \text{ AWSO}$$

where

AWSO = annual wind system output in kwh

Subp. 20. Replacement solar swimming pool heaters. Equation number 22.

$$\Delta E = \text{SSF} \times E_{sp}$$

where

SSF = solar saving fraction = fraction of swimming pool heat supplied by the solar system. (Target SSF = .5)

E_{sp} = energy used to heat the pool for the months of May through September.

Subp. 21. Install positive shut-off's for all fireplaces or fireplace stoves. Equation number 23.

$$\Delta H = 1.08 (Q_o - Q_i) A$$

where

Q_o = the infiltration value in cubic feet per minute per square foot for the existing condition before improvement.

Q_i = the infiltration value after improvement with a positive shut-off.

A = the cross sectional area of the flue or connector in square feet.

Subp. 22. Thermal shutters, shades, draperies. Install thermal shutters, shades, or draperies on exterior windows and glass doors. Equation number 14 will be used.

Statutory Authority: *MS s 116J.31*

4150.9930 ENERGY-CONSERVING PRACTICES.

Subpart 1. Furnace efficiency maintenance and adjustments. Furnace efficiency maintenance and adjustments:

A. Periodic cleaning and combustion efficiency adjustments: Savings for gas conversion units will be estimated at up to 15 percent. Savings for gas-designed systems will be estimated at up to five percent. Savings for oil heating systems will be estimated at five percent to 15 percent.

B. Periodic cleaning or replacing of filters in forced air systems: Savings will be estimated at five percent to ten percent.

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C. Fan setting on forced air furnaces reduced to 80 degrees Fahrenheit if possible: Savings will be estimated at up to five percent.

D. Increase fan speed: Savings will be estimated at up to five percent.

E. Reduce aquastat setting to 140 degrees Fahrenheit between December 1 and March 1 and 120 degrees Fahrenheit between March 2 and November 30 or other reduction as appropriate to individual boiler. Savings will be estimated at five percent to ten percent.

Subp. 2. **Nighttime temperature setback.** Savings estimates will be the same as for clock thermostats.

Subp. 3. **Reducing thermostat settings in winter.** Savings will be estimated at three percent per degree Fahrenheit reduction for 24 hours per day.

Subp. 4. **Raising thermostat settings in summer.** Savings will be estimated at five percent per degree Fahrenheit increase for 24 hours per day.

Subp. 5. **Water flow reduction in showers and faucets.** Savings will be estimated at up to 40 percent of total energy used for domestic hot water.

Subp. 6. **Reducing hot water temperatures.** Savings will be estimated at about ten percent for reducing temperature from 140 degrees Fahrenheit to 120 degrees Fahrenheit.

Subp. 7. **Reducing energy use when home is unoccupied.**

A. For reducing thermostat setting to 55 degrees Fahrenheit when home is unoccupied for four hours or more, use equation #16b in part 4150.9920, subpart 16.

B. For turning an air conditioner off when no one is home, savings will be estimated as up to 25 percent of energy used for air conditioning.

C. For turning a water heater off when a home is vacant for two or more days, savings will be estimated as 1/365 of water heater jacket losses for each day the heater is turned off.

Subp. 8. **Plugging leaks.** For plugging leaks in attics, basements, and fireplaces, savings will be estimated as up to 30 percent.

Subp. 9. **Sealing leaks.** For sealing leaks in pipes and ducts, savings will be estimated as up to \$6 per month for fixing a dripping hot water pipe or faucet. Savings for patching leaks in ducts in unconditioned spaces will be estimated as up to 15 percent of the energy used for space heating.

Subp. 10. **Efficient use of shading.** Use Equation #14 in part 4150.9920, subpart 12.

Statutory Authority: *MS s 116J.31*

4150.9940 ENERGY INDEX.

Energy Index = $E \times F_w$

where

E is energy content of all fuel (including electricity) used during the months of November thru April, in Btus.

F_w is a weather adjustment factor. It is the ratio of the number of degree days in an average heating season (November 1 thru April 30) to the number of degree days for the heating season preceding the calculation.

Statutory Authority: *MS s 116J.31*