

Minnesota Attorney General: Administrative Rules Proceedings

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Version 3
August 20, 2018

Our File 661

ADMIN 1000 (Rev. 1/78)
SF-00006-01

STATE OF MINNESOTA

Office Memorandum

DEPARTMENT ATTORNEY GENERAL

TO : MARK MASON, Director
Minnesota Energy Agency

DATE: 12/31/80

Attn: JAMES E. LACKNER
Special Assistant
Attorney General

FROM : H. THEODORE GRINDAL
Special Assistant
Attorney General

PHONE: 7-3471

SUBJECT: In the Matter of the Proposed Adoption of Temporary Rules of the Minnesota Energy Agency Governing the Minnesota Energy Conservation Service Program, 6 MCAR 2.2300-2.2313.

The above-captioned temporary rules have been approved by this office.

While the statute does not require it, this office recommends that an Order of Adoption and a copy of the Rules as Adopted be filed with the Secretary of State. It is the department's responsibility to comply with the Notice provisions of Minn. Stat. § 15.0412, Subd. 5.

If you have any questions, do not hesitate to contact me.

HTG/bw
cc: Duane Harves
Susan Robertson

RECEIVED
DEC 23 1980
ATTORNEY GENERAL
ADMINISTRATIVE AGENCIES

STATE OF MINNESOTA
OFFICE OF THE ATTORNEY GENERAL
ST. PAUL 55155

WARREN SPANNAUS
ATTORNEY GENERAL

ADDRESS REPLY TO:
720 AMERICAN CENTER BLDG.
150 EAST KELLOGG BOULEVARD
ST. PAUL, MN 55101
TELEPHONE: (612) 296-6030

December 19, 1980

Office of the Attorney General
Rules Review Division
G-25 Administration Building
55 Sherburne Avenue
St. Paul, Minnesota 55155

Re: In the Matter of the Proposed Adoption of Rules of the Minnesota Energy Agency Governing the Minnesota Energy Conservation Service Program, 6 MCAR § 2.2300-2.2313.

To Whom It May Concern:

Enclosed for your review are the proposed temporary rules in the above captioned matter. These rules are required pursuant to federal law 92 U.S.C. § 3206 et. seq. (1978) and rules, 10 C.F.R. 456 et. seq. (1978) which mandate that the states have a conservation service program in place and functioning by April 9, 1981.

The state legislature has given the Minnesota Energy Agency authority to promulgate this program in Minn. Stat. § 116H.17 (1980), and other authority exists in Minn. Stat. § 116H.07(1) and Minn. Stat. § 116H.08(a). The Agency has already begun to undertake the permanent rulemaking process on these rules, a rulehearing having been held on December 16, 1980.

Pursuant to Minn. Stat. § 15.042 subd. 5 the proposed temporary rules were published in the November 3, 1980 State Register. No written comments were received. If you have any questions please feel free to contact me.

Very truly yours,

JAMES E. LACKNER
Special Assistant
Attorney General

JEL/dw

Enclosure(s)

AN EQUAL OPPORTUNITY EMPLOYER

ADMIN 1000 (Rev. 1/78)
SF-00006-01

STATE OF MINNESOTA

DEPARTMENT ATTORNEY GENERAL

Office Memorandum

TO : Ted Grindal
Special Assistant Attorney General
G-25 Administration Building

DATE: 12/30/80

FROM : James E. Lackner JEL
Special Assistant Attorney General
720 American Center Building

PHONE: 6-0151

SUBJECT: MECS Proposed Temporary Rules

By this memorandum I hereby authorize you to make changes in the above-captioned proposed temporary rules for any typographical errors which you find. As stated in our telephone conversation of this date, you have found the following typographical errors:

1. 6 MCAR § 2.2300 B.(on the first line) - extablish should be changed to establish.

2. 6 MCAR § 2.2302 A.1.c.(2) (page 2-1) - represented should be changed to is presented.

3. 6 MCAR § 2.2303 D.2.h. (page 3-6) - evices should be changed to Devices.

4. 6 MCAR § 2.2305 C.1.c. (page 5-5) - line 7, permenent should be changed to permanent.

5. 6 MCAR § 2.2309 B.2.a. (page 9-1) - lees should be changed to less.

Thank you for your help on this.

JEL:cl

RECEIVED
JAN 2 1981
ADMINISTRATIVE AGENCIES

STATE OF MINNESOTA

ENERGY AGENCY

In the Matter of the Proposed Adoption of Temporary Rules for the Minnesota Energy Conservation Service 6 MCAR §§ 2.2300-2.2313.

FINDINGS OF FACT AND CONCLUSIONS

The above-entitled proposed temporary rules were published on the 3rd of November, 1980, in the State Register, as required by Minn. Stat. § 15.0412, subd. 5 (1978).

After affording all interested persons an opportunity to submit data and views on the proposed temporary rules in writing, having considered all of the evidence adduced upon the records herein, I find the following changes necessary from the original proposed temporary rules:

1. 6 MCAR § 2.2301 U.2.

   "Passive ~~p~~solar space heating."

   I find that this change is needed to correct a typographical error. The measure defined in this section is passive solar space heating. Passive polar space heating does not exist.

2. 6 MCAR § 2.2301 W.3.

   ". . . fireplace stove is not operating."

   I find that this change is needed to correct a typographical error. A positive fireplace shutoff prevents air from entering the chimney when a fireplace is not being used. If the fireplace was operating with the shutoff closed, smoke and flames would enter the living space.

3. 6 MCAR § 2.2303 A.1.

   ". . . The alternative audit shall be approved if its results are within ≠ 20% . . ."

   I find this change is needed to ensure the expected accuracy of the alternative audits. Under the proposed rules, a utility may devise its own audit and use that

instead of the model audit designed by the Energy Agency, if the alternate audit meets certain specified standards. As presently written, the standards set out in this section would allow the use of an alternative audit even if there is a 40% variance in the results of the alternative audit compared to the Agency model. The rule was intended to allow only for a 20% variance in results between an alternative audit and the Agency's model. However, by using the ± sign in the rule, the standard now allows for twice that variation. The use of this sign was not intended to produce that result. This wide variance would allow audits to be used in the program which offer significantly different results and would lead to customer confusion.

Reducing the variance in this rule will not result in a substantial change. Its effect on the utilities involved will be minimal for two reasons: One, most all the utilities affected by this change were involved in a series of meetings on this proposed rule, before the rules were drafted. At those meetings the Agency's decision to use a total variance of 20% was discussed and made known. Second, as a practical matter most alternative audits will use the same or similar calculation procedures as the Agency's model, and therefore should easily meet even the 20% variation limit.

4. 6 MCAR § 2.2303 A.1.

" . . . ~~All alternative audits shall be submitted to the agency for validation by January 5, 1981.~~"

I find that this statement is not needed for the temporary rules. Because the utilities will not be required to offer audits until April, 1981,

there is no need for a requirement for submitting alternative audits at such an early date. Moreover, if a utility which has initially used the Agency's model audit decides to change to an alternative audit, rules governing that change will be needed. By dropping the date from this paragraph, the rule will meet that need because it will apply to all alternative audits.

5. 6 MCAR § 2.2305 B.1.

"To be eligible for listing, contractors, lenders and suppliers . . ."

I find that this change is needed to correct an omission in the rule. This will not be a substantial change because the other paragraphs in that section clearly include eligibility requirements for lenders. Thus lenders had notice that they were included in this section, and this change will not result in applying the rule to a new group of people. It was only through inadvertant error that the word lenders was not included in the opening sentence of the section. That sentence should be amended to make it consistent with the rest of the section.

6. 6 MCAR § 2.2306 A.1.

". . . By ~~Dec. 15, 1980~~ February 15, 1981 each covered utility shall submit to the Agency, for approval, its plans for conducting the inspections and for coordinating these inspections . . ."

I find that this change is needed to allow the utilities sufficient time to meet this requirement and to assure that the date has not passed before the rules are adopted by the Agency. Many utilities have requested that the Agency postpone this date. The Agency has determined that these procedures can be submitted later than Dec. 15 without delaying the implementation of the program.

7. 6 MCAR § 2.2306 B.

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

I find that this change is needed to correct an omission in the rule and to provide for serious safety considerations. Without this change, Section B is meaningless; it would just contain a list of measures. This section covers mandatory inspections and this sentence is needed to provide for inspections of items with potential health and safety hazards. For example, without this sentence there would be no requirement to inspect vent dampers, which if uninspected could dispense poisonous fumes in homes. The addition of this sentence should not be an unfair surprise to anyone; other sections of the proposed temporary rules refer to mandatory inspections and the above change merely differentiates mandatory from random inspections.

8. 6 MCAR § 2.2306 C.1.

" . . .

b. Floor insulation; and

c. Wall insulation~~; and~~.

~~d. Solar domestic hot water systems~~

I find that this change is needed to clarify the status of solar domestic hot water systems as a mandatory measure. The proposed temporary rules are mandated by federal statute and rules; the DOE recently revised the federal rule governing this specific section, 10 C.F.R. § 456.314(b-d), published September 24, 1980, by moving solar domestic hot water systems from the random inspection category to the mandatory category. Reacting to this change, the Agency added solar hot water to the mandatory section, but failed to delete it from the above cited random inspection category. It is clear that if solar hot water systems are all to be inspected, random inspections are meaningless.

9. 6 MCAR § 2.2306 C.3.

" . . .

g. Replacement burner (oil); and

~~h.~~ Solar domestic hot water systems

~~i.~~ h. Replacement solar swimming pool heaters.

I find that this change is needed for the same reasons as item 8 above.

10. 7 MCAR § 2.2307 B.1.c.

"with the ~~homeowner~~ customer."

I find that this change is needed to use consistent language within the rule. Customer is defined in the rule and homeowner is not. In addition, the use of the word homeowner implies that specific skills are needed for homeowners and not tenants. This was not the intent of the rule.

11. 6 MCAR § 2.2307 C.1.c.

"Each covered utility shall submit to the agency for approval a plan for the training of general inspectors . . . by ~~January 15, 1980~~ February 15, 1981."

I find that this change is needed to provide for sufficient time for the utilities to devise the required plan. The original date was incorrectly submitted as 1980 instead of 1981. Since these rules contain all new material, it is clear that the 1980 was inaccurate. This change will then give an additional month for submitting this plan. It will also be consistent with the requirement for submittal of a plan regarding how the inspections will take place. In addition, this change will not delay the implementation of the program.

12. 6 MCAR § 2.2307 C.2.c.

"Each covered utility shall submit to the agency for approval a plan for the training of specialized inspectors . . . by ~~January 15, 1980~~ February 15, 1981."

I find that this change is needed for the same reasons as item 11.

Date: 12/28/80

MARK MASON
Director

Energy Agency
Conservation Division

Proposed Temporary Rules for the Establishment of the Minnesota Energy Conservation Service Program

Request for Public Comment

Notice is hereby given that pursuant to Minn. Stat. § 15.0412, subd. 5 (1978), the Energy Agency proposes to adopt temporary rules establishing the Minnesota Energy Conservation Service Program. To meet the deadlines established by the U.S. Department of Energy requiring the establishment of the Residential Conservation Service Program, the Minnesota Energy Agency intends to adopt temporary rules regarding this program until the permanent rules have been promulgated.

The proposed temporary rules which are the subject of this notice are exactly the same as the Minnesota Energy Agency's proposed permanent rules establishing the Minnesota Energy Conservation Service Program, 6 MCAR §§ 2.2300-2.2313. These proposed permanent rules are published in this same issue of the *State Register* and can be found immediately preceding this notice.

All interested or affected persons may submit written material containing data and their views on the proposed temporary rules to the Minnesota Energy Agency, Attention: Alan Lessik, 980 American Center Building, 150 East Kellogg Boulevard, St. Paul, Minnesota 55101, telephone (612) 297-2117, within twenty (20) days after the publication of this notice. The temporary rules may be revised on the basis of comments received. Any written material received shall become part of the record in the final adoption of the temporary rules.

October 20, 1980

Mark Mason, Director
Energy Agency

Department of Transportation

Proposed Amendment of Rules Governing Weight Limitations on Interstate Highways and Designated Routes

Notice of Hearing

Notice is hereby given that a public hearing in the above entitled matter will be held pursuant to Minn. Stat. § 15.0412, subd. 4 (1978), as amended, in Room 81, State Office Building (between Aurora and Fuller), St. Paul, Minnesota on December 5, 1980, at 10:00 a.m.

The Commissioner of Transportation has been provided the statutory authority to promulgate rules governing weight limitations on interstate highways and designated routes in Minn. Stat. § 169.832, (1978). The proposed amended rules, if adopted, would modify or newly designate certain streets or highway routes, or segment of a route, to carry the gross weights permitted under Minn. Stat. § 169.832 which are generally 20,000 pounds per single axle, 34,000 pounds per tandem axle, and a total gross weight of 80,000 pounds. Certain streets and highway routes heretofore designated by the commissioner in calendar year 1980 are proposed for continued designation. Other routes are proposed to be added, deleted or modified in length.

A copy of the rules is attached. Additional copies of the proposed rules are now available and one free copy may be obtained by writing to:

F. C. Marshall
Assistant Commissioner for Technical Services
Minnesota Department of Transportation
413 Transportation Building
St. Paul, Minnesota 55155

The rules will be available at the door on the date of the hearing.

Notice is hereby given that twenty-five (25) days prior to the hearing a Statement of Need and Reasonableness will be

KEY: PROPOSED RULES SECTION — Underlining indicates additions to existing rule language. ~~Strike outs~~ indicate deletions from existing rule language. If a proposed rule is totally new, it is designated "all new material." ADOPTED RULES SECTION — Underlining indicates additions to proposed rule language. ~~Strike outs~~ indicate deletions from proposed rule language.

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.

21. Install positive shut-off's for all fireplaces or fireplace stoves.

Equation #23 $\Delta H = 1.08 (Q_0 - Q_1) A$

Where

Q_0 = The infiltration value in cubic feet per minute per square foot for the existing condition before improvement.
Q_1 = The infiltration value after improvement with a positive shut-off.
A = The cross sectional area of the flue or connector in square feet.

22. Install thermal shutters, shades, or draperies on exterior windows and glass doors.

Equation #14 will be used.

B. Energy conserving practices.

1. Furnace efficiency maintenance and adjustments.

a. Periodic cleaning and combustion efficiency adjustments. Savings for gas conversion units will be estimated at up to 15%. Savings for gas-designed systems will be estimated at up to 5%. Savings for oil heating systems will be estimated at 5% to 15%.

b. Periodic cleaning or replacing of filters in forced air systems. Savings will be estimated at 5% to 10%.

c. Fan setting on forced air furnaces reduced to 80°F if possible. Savings will be estimated at up to 5%.

d. Increase fan speed. Savings will be estimated at up to 5%.

e. Reduce aquastat setting to 140°F between December 1 and March 1 and 120°F between March 2 and November 30 or other reduction as approriate to individual boiler. Savings will be estimated at 5% to 10%.

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

3. Reducing thermostat settings in winter. Savings will be estimated at 3% per °F reduction for 24 hours per day.

4. Raising thermostat settings in summer. Savings will be estimated at 5% per °F increase for 24 hours per day.

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

6. Reducing hot water temperatures. Savings will be estimated at about 10% for reducing temperature from 140°F to 120°F.

7. Reducing energy use when a home is unoccupied.

a. Reducing thermostat setting to 55°F when home is unoccupied for four hours or more. Use equation #16b.

b. Turning an air conditioner off when no one is home. Savings will be estimated at up to 25% of energy used for air conditioning.

c. Turning a water heater off when a home is vacant for 2 or more days. Savings will be estimated at 1/365 of water heater jacket losses for each day the heater is turned off.

8. Plugging leaks in attics, basements, and fireplaces. Savings will be estimated at up to 30%.

9. Sealing leaks in pipes and ducts. Savings will be estimated at 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 at up to 15% of the energy used for space heating.

10. Efficient use of shading.

Use Equation #14.

C. 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 (Nov. 1 thru April 30) to the number of degree days for the heating season preceding the calculation.

17. Solar domestic hot water.

Equation #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 Btus.

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 insluation: (ΔE is given as a range)

Equation #18 $\Delta E = \frac{10 \times PSF \times F_0}{N}$ High estimate

$\Delta E = .6 \times$ High estimate Low estimate

b. Indirect gain-thermosiphon air panel

Energy savings for 100 square feet of panels:

Equation #19 $\Delta E = \frac{3.5 \times PSF \times F_0}{N}$ High estimate

$\Delta E = .7 \times$ high estimate Low estimate

c. Sunspace systems. Energy savings for 100 square feet of vertical double glazing:

Equation #20 $\Delta E = \frac{5 \times PSF \times F_0}{N}$ High estimate

$\Delta E = .6 \times$ High estimate 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 seasonal efficiency

d. Window heat gain retardants.

Same as equation #14

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 #21a Low estimate of $\Delta E = .8$ AWSO
High estimate of $\Delta E = 1.2$ 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 #21b Low estimate of $\Delta E = .8$ AWSO
High estimate of $\Delta E = 1.2$ AWSO

Where

AWSO = Annual Wind System Output in kwh

20. Replacement solar swimming pool heaters.

Equation #22 $\Delta E = SSF \times E_{sp}$

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L = Length of uninsulated pipes in unconditioned space.
HRS = Number of hours per year the heating system operated in a heating season.
N = Seasonal operating efficiency of the heating system.
V = The heating value of the fuel in Btu per unit of fuel.

11. Water heater insulation.

a. If water heater is in an unconditioned space.

Equation #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 #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 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°F.

12. Storm and thermal windows.

Equation #14. $\Delta H = (U_0 - U_1) \times A$

Where

U_0 = The U-value of the existing window assembly.
U_1 = The U-value of the proposed window assembly.
A = The area of the window assembly.

13. Storm and thermal doors.

Use equation #14 where:

U_0 = The U-value of the existing door assembly.
U_1 = The U-value of the proposed door assembly.
A = The area of the door assembly.

14. Heat reflective and heat absorbing window or door material.

Equation #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.

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

16. Clock thermostats.

Energy savings will be given for a single 8 hour night setback.

Equation #16a $\Delta E = .07E_h$ for 5°F setback
Equation #16b $\Delta E = .10E_h$ for 10°F setback
Equation #16c $\Delta E = .11E_h$ for 15°F setback

Where

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

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

Equation #7. $\Delta E = \frac{7300F}{V}_p$

Where

E_h = Total annual energy used for space heating, in units of fuel.
N_o = 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 per hours. (Typically 800 to 1000 Btu per hour).
V = Heating value of the fuel type in Btu per unit of fuel.

5. Replacement central air conditioner.

Equation #8. $\Delta E = E_c (1 - \frac{PSE}{NSE})$

Where

E_c = Annual energy used by existing central air conditioner, in units of fuel.
PSE = Present seasonal efficiency.
NSE = New (proposed) seasonal efficiency.

6. Ceiling insulation.

Equation #9. $\Delta H = (\frac{1}{R_o} - \frac{1}{R_1}) A$

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.

7. Wall insulation.
Use equation #9 for above grade walls.

8. Floor insulation.
Use equation #9.

9. Duct insulation.

Equation #10. $\Delta E = \frac{(\frac{1}{R_o} - \frac{1}{R_1}) (T_2 - T_1) A \times HRS}{NV}$

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.

10. Pipe insulation.

Equation # 11. $\Delta E = \frac{(Q_1 - Q_0) L \times HRS}{NV}$

Where

Q_1 = Heat loss in Btu/hr. ft. before improvement
Q_o = Heat loss in Btu/hr. ft. after improvement

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E. Any participating non-regulated utility may voluntarily withdraw from this program after completing all outstanding services offered to its customers.

F. A participating non-regulated utility which does not comply with the requirements listed in 6 MCAR § 2.2312 C. shall be excluded by the agency from participating in the MECS Program.

Appendix A

Procedures for Calculating Energy Savings
for Program Measures and Practices

The following procedures shall be the basis for calculating energy savings for program measures and practices for the program announcements.

A. Energy conserving measures.

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 #1. $\Delta E = \frac{\Delta H \times D \times 20.4}{N \times V}$

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.

2. Caulking.

Equation #2. $\Delta H = .018 \times I \times Vol$

Where

I = change in infiltration rate in air changes per hour

Vol= volume of heated space in cubic feet

3. Weatherstripping.

Use equation # 2

4. Furnace efficiency modifications.

a. Replacement furnaces or boilers.

Equation #3. $\Delta E = E_h \left(1 - \frac{N_o}{N_1}\right)$

b. Furnace replacement burner. (ΔE is given as a range)

Equation #4. Low estimate of $\Delta E = .10E_h$
High estimates of $\Delta E = .18E_h$

c. Flue opening modifications. (ΔE is given as a range)

Equation #5. Low estimate of $\Delta E = .07E_h$
High estimate of $\Delta E = .10E_h$

d. Install electronic ignition system

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

Equation #6. $\Delta E = \frac{3600F}{V}\ p$

c. For five (5) years from the date of the request, each request for a furnace audit;

d. For five (5) 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 (2) years from the date of the program audit, the total amount and cost of fuel purchased for the period of twelve months prior to and twelve months following each audit. This information is only required for those utilities and heating suppliers which supply the primary heating fuel to the customer.

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

6 MCAR § 2.2312 Heating suppliers.

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

B. 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 6 MCAR § 2.2312 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.

C. The following requirements of these rules shall not be waived:

1. The calculation procedures in Appendix A and the ban on advertising in program announcements offered, as established in 6 MCAR § 2.2302 A.2.b.

2. The reporting and recordkeeping requirements, pursuant to 6 MCAR § 2.2311.

3. The on-site energy audit, pursuant to 6 MCAR § 2.2303.

4. The arrangement service for the financing of program measures, pursuant to 6 MCAR § 2.2304 A., C., and D.

5. The distribution of Master Lists developed, pursuant to 6 MCAR § 2.2305.

6. The offer of the consumer complaint process, pursuant to 6 MCAR § 2.2308, and

7. The exclusive use of certified auditors, pursuant to 6 MCAR § 2.2307.

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

E. A participating heating supplier which does not provide MECS services or does not comply with the requirements listed in 6 MCAR § 2.2312 C., shall be excluded by the agency from participating in the MECS Program.

6 MCAR § 2.2313 Non-regulated utility program.

A. Any non-regulated utility may apply to the Agency for inclusion in the MECS Program.

B. A non-regulated utility or an association of non-regulated utilities may apply for a waiver of any requirement in this rule, except as noted in 6 MCAR § 2.2313 C. All waivers that do not substantially limit either the delivery of services listed or the conservation potential of the program shall be approved.

C. The following requirements of these rules shall not be waived:

1. The on-site program audit, pursuant to 6 MCAR § 2.2303.

2. The arrangement services for the financing of program measures, pursuant to 6 MCAR § 2.2304 A., C., and D.

3. The distribution Master Lists developed pursuant to 6 MCAR § 2.2305.

4. The offer of the consumer complaint process, excluding post-installation inspections, pursuant to 6 MCAR § 2.2308.

5. The exclusive use of certified auditors, pursuant to 6 MCAR § 2.2307.

D. The following requirements of this rule shall not be required for non-regulated utilities:

1. Program Promotion, pursuant to 6 MCAR § 2.2302.

2. Post-installation Inspection Services, pursuant to 6 MCAR § 2.2306.

3. Customer Payments, 6 MCAR § 2.2309 A. and B.

4. Reporting and Recordkeeping, pursuant to 6 MCAR § 2.2311.

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6 MCAR § 2.2310 Utility supply, installation and financing.

A. Survey of utilities.

1. Each covered utility which supplies or installs any program resource measure:

a. Shall be listed as a supplier or contractor pursuant to 6 MCAR § 2.2305, in the same manner and subject to the same requirements as any other supplier or contractor;

b. Shall charge fair and reasonable prices for the supply or installation of program measures;

c. Shall not discriminate unfairly among eligible customers in undertaking the above described activities.

2. Beginning in April, 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, Anti-Trust Division.

B. 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.

6 MCAR § 2.2311 Reporting and recordkeeping.

A. 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 twelve (12) month period ending the preceeding April:

1. 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;

2. A copy of the program announcement;

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

a. Program audit,

b. Installation arrangement,

c. Financing arrangement, and

d. Billing service for repayment of loans;

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

5. The number and results of post-installation inspections, including description of violations;

6. The number and function of employees assigned to the program; and

7. 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:

a. the program audit,

b. installation arrangement,

c. loan arrangement, and

d. post-installation inspections.

B. Recordkeeping requirements.

1. Each covered utilities and heating supplier shall keep the following records and shall be kept for the periods indicated:

a. For five (5) years from the date of the program audit, the name and address of each customer who receives a program audit;

b. For five (5) 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.

1. 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.

2. 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 which is acting as a lender, supplier or contractor. If the complaint is not resolved, the customer shall fill out a MECS customer complaint form supplied by OCS.

3. 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.

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

a. To respond to attempts to contact it; or

b. To actively participate in good faith in the mediation process within 30 days of initial contact; or

c. To correct program violations or take remedial measures agreed to in mediation within two (2) weeks after agreement.

B. 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 twelve (12) month period ending the preceeding April:

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

2. The number and function of employees within OCS assigned to the MECS Program.

6 MCAR § 2.2309 Customer payments.

A. Customer billing.

1. 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.

2. 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 then credit the remainder to MECS Program charges, unless the customer specifies otherwise.

B. Loan payments.

1. If the lender agrees, a loan arranged by a covered utility pursuant to 6 MCAR § 2.2304 A. 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.

2. 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 ($5).

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.

C. Termination of service. No participating utility or heating supplier shall terminate or restrict utility or fuel service upon customer default or non-payment of any MECS Program charges and loans.

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become qualified each person must first take training courses which have been approved by the agency. Each person shall only be qualified to inspect those measures for which that person has been trained.

b. The training courses shall cover:

(1) The following subject matter concerning flue opening modifications and electrical or mechanical ignition systems:

(a) Applicable state and federal codes and regulations;

(b) 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;

(c) An understanding of gas appliance controls and safety controls, including automatic gas valves, limit switches, and thermostats;

(d) An understanding of basic furnace and boiler circuitry, including electrical components, and the use of appropriate meters for testing gas appliance circuitry;

(e) 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;

(f) 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;

(g) 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;

(h) An understanding of proper combustion and proper flame characteristics and gas piping procedures; and

(i) An understanding of the methodology to evaluate whether the installation of the measures conform with DOE installation standards.

(2) The following subject matter concerning wind energy devices:

(a) An understanding of the structural characteristics of wind energy devices;

(b) 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

(c) Methodology to evaluate whether the installation of a wind energy device conforms with DOE installation standards.

(3) The following subject matter concerning solar domestic hot water systems:

(a) The residential construction methods employed in the region and the characteristics of structures that would preclude a safe and enduring solar installation;

(b) The applicable provisions of the HUD (*Intermediate Minimum Property Standards Supplement*), Solar Heating and Domestic Hot Water Systems 4930.2, 1977 Edition.

(c) The design, operation, installation and degradation of residential hot water and heating systems with which the solar devices will interconnect; and

(d) 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.

(e) Methodology to evaluate whether the installation of a solar domestic hot water system conforms with DOE installation standards.

c. Each covered utility shall submit to the agency for approval a plan for the training of specialized inspectors as required in 6 MCAR § 2.2307 C.2.a. by January 15, 1980. The agency shall approve a plan if it ensures coverage of the subject matter pursuant to 6 MCAR § 2.2307 C.2.b.

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

6 MCAR § 2.2308 Consumer grievance procedures.

A. Conciliation conference.

(a) Insulation,

(b) Shading,

(c) Heat capture and transport, and

(d) Heat transfer for hot water;

(8) An understanding of the nature of wind energy and its residential applications including:

(a) Wind availability,

(b) Effects of obstruction,

(c) Wind capture,

(d) Power generation,

(e) Interfaces with residential and utility power lines; and

(9) A working knowledge of building and fire codes related to the installation and safety of wood burning appliances.

c. These examinations shall be conducted by the agency and offered at the following times:

(1) Within two (2) days after the completion of each state-sponsored training course or orientation session, or

(2) Once a month, until February 1982, with a minimum of two examinations per year afterward.

d. Certification shall be valid for one year.

e. After one year, each auditor must be recertified. Recertification procedures shall be as follows:

(1) 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.

(2) 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.

(3) This recertification shall occur annually, for the life of the program.

f. 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 6 MCAR § 2.2307 B.1., but shall be required to pass the Minnesota certification examination.

C. Inspectors.

1. Qualifications to conduct random inspections.

a. 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.

b. The training course shall cover the following subject matters:

(1) The measures listed in 6 MCAR § 2.2306 C.3.;

(2) Methodology to evaluate whether the installation of a measure conforms to DOE installation standards;

(3) The MECS recommended standards for R-values for each insulation measure, pursuant to 6 MCAR § 2.2303 D.1.

c. Each covered utility shall submit to the agency for approval a plan for the training of general inspectors, as required in 6 MCAR § 2.2307 C.1.a., by January 15, 1980. The agency shall approve a plan if it ensures coverage of the subject matter pursuant to 6 MCAR § 2.2307 C.1.b.

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

2. Qualifications to conduct mandatory inspections.

a. No person shall participate in the MECS Program as a specialized inspector unless he or she has been qualified. To

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h. Solar domestic hot water systems; and

i. 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 rules. This review shall be done annually thereafter.

D. Inspections as a result of consumer complaints.

1. Within two (2) weeks of the receipt by the Office of Consumer Services of any customer complaint concerning arranged installation of the measures listed in 6 MCAR § 2.2306 B.1. and C.3., an inspection shall be conducted to determine the existence of any violations of these rules. Within five (5) days after the inspection, a copy of the inspection report shall be sent to the Office of Consumer Services.

2. All inspections conducted as a result of a consumer complaint shall be counted toward the fulfillment of the inspection requirements in 6 MCAR § 2.2306 C.1., 2. and 3.

6 MCAR § 2.2307 Qualification procedures for auditors and inspectors.

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

B. Auditors.

1. Training

a. No person shall be eligible for certification pursuant to 6 MCAR § 2.2307 B.2., unless he or she has first participated in a training course which has been approved by the agency and which covers the subject matter tested in the auditors' certification examination.

b. Any present auditor with six (6) months experience who has completed twenty-five (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 6 MCAR § 2.2307 B.1.a.

c. 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 continued education of certified auditors. The agency shall approve a plan if it reviews and updates the material listed in 6 MCAR § 2.2307 B.2.b., 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 homeowner.

2. Certification.

a. No person shall participate in the MECS Program as an auditors, unless he or she has first passed a certification examination conducted by the agency.

b. The certification examination shall test for the following qualifications:

(1) A general understanding of the three types of heat transfer and the effects of temperature and humidity on heat transfer;

(2) A general understanding of residential construction terminology and components;

(3) A general knowledge of the operation of the heating and cooling systems used in residential buildings, including the need and provision for combustion air;

(4) 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;

(5) The capability to conduct the MECS energy audit including:

(a) A working knowledge of the energy conserving practices defined in this plan,

(b) The ability to determine the applicability of each of the program measures, and

(c) A proficiency in the auditing procedures for each applicable program measure established in 6 MCAR § 2.2303.

(6) A working ability to calculate the steady state efficiency of furnaces or boilers;

(7) An understanding of the nature of solar energy and its residential applications including:

6 MCAR § 2.2306 Post-installation inspections.

A. Inspection procedures.

1. Each covered utility shall arrange to conduct the post-installation inspections of its customers required in this section. By Dec. 15, 1980 each covered utility shall submit to the agency, for approval, its plans for conducting the inspections and for coordinating these inspection with the agency and the Office of Consumer Services.

2. No person shall conduct or perform an inspection unless he or she has been qualified by the agency, pursuant to 6 MCAR § 2.2307 C.

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

4. During the inspection, the inspector shall determine whether:

a. The installation conforms with DOE installation standards; and

b. In the case of a consumer complaint, the complaint is justified.

5. An inspection report shall be developed by the agency. The inspector shall use this report to certify that the installation meets all DOE installations standards.

Within five (5) 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 (2) weeks of receipt of the report and shall arrange for a reinspection of the installation within one week after correction.

B. Mandatory inspections.

1. Flue opening modifications;

2. Electric or mechanical ignition systems;

3. Wind energy devices; and

4. Solar domestic hot water systems.

C. Random inspections.

1. Four of the first ten arranged installations made by each contractor of each of the following program measures shall be inspected:

a. Ceiling insulation;

b. Floor insulation;

c. Wall insulation; and

d. Solar domestic hot water systems.

2. Ten percent of all utility arranged installations of each program measure listed in 6 MCAR § 2.2306 C.1. shall be inspected each year. The inspections required in 6 MCAR § 2.2306 C.1. shall count toward the fulfillment of this requirement.

3. 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);

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(9) Agree to notify the MECS inspection agency at the completion of the installation pursuant to 6 MCAR § 2.2306.

b. Suppliers shall agree in writing with the agency to meet the following requirements for each customer:

(1) Supply program measures which meet applicable DOE material standards;

(2) 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.

(3) Comply with all applicable federal, state and local laws;

(4) 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;

(5) Participate in good faith in the conciliation conference when a complaint is made by a customer.

c. Lenders shall agree in writing to meet the following requirements for each arranged financing.

(1) 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;

(2) 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;

(3) Comply with all applicable federal, state and local laws; and

(4) Participate in good faith in the conciliation conference when a complaint is made by a customer.

2. Disclosure of unresolved complaints. All businessses 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.

C. Removal from the master list.

1. Any supplier, lender or contractor shall be removed from the Master List for violation of either the eligibility requirements in 6 MCAR § 2.2305B or the contract between the lender, contractor or supplier and agency as required in the same section.

a. Violations shall be reported to the agency by the post-installation inspectors and the mediators of consumer complaints. The post-installation 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.

b. Within one (1) 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.

c. 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 thirty (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 thirty (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 thirty (30) days of mailing of the notice the contractor, lender or supplier will be permanently de-listed.

2. Any supplier, lender or contractor permanently removed from the Master List shall not be relisted for at least six (6) months after being so de-listed. To be relisted, all violations under the program must be corrected and inspected and all other listing requirements must be met.

program measure although participating utilities and heating suppliers may inform customers of their own installation and supply services if they are on the most recent Master List.

2. 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.

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

E. Standardized bid forms. The agency shall develop a standardized bid form for use pursuant to 6 MCAR § 2.2304. This form shall be the only one used by the participating utilities and heating suppliers for arranging installation under MECS.

6 MCAR § 2.2305 Master list of contractors, lenders and suppliers.

A. Issuance of lists.

1. 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.

2. 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.

3. Within sixty (60) days following the receipt of an application for inclusion on the Master List, the agency shall evaluate the application pursuant to 6 MCAR § 2.2305 B. and either place the business on the Master List or inform the business, in writing, of the reasons for its exclusion from the list.

4. Every thirty (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 (6) months, a new Master List shall be published.

B. Eligibility requirements.

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

a. Contractors shall agree in writing with the agency to meet the following requirements for each arranged installation:

(1) Comply with the applicable DOE installation standards found in 10 CFR 456 subparts G, I and install only measures that are labeled as meeting DOE material standards;

(2) Install only measures that are covered by the measures warranty (except for caulking and weatherstripping);

(3) 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;

(4) Warrant in the contract that any defect in materials manufacture, design or installation found within one year from the date of installation shall be remedied without charge and within two weeks;

(5) Maintain comprehensive general liability insurance covering:

(a) bodily injury; $100,000 per person
$300,000 per occurrence
(b) Property damage; $50,000 each occurrence
$100,000 aggregate; and

(6) Comply with all applicable federal, state and local laws;

(7) Participate in good faith in the conciliation conference when a complaint is made by a customer;

(8) 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 heating supplier; and

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d. If the audit is of a rental property, a separate list of those improvements necessary to bring the residence in compliance with Minn. Stat. § 116H.129, subd. 3. (1978) and a statement describing remedies available to tenants for violations of those standards.

3. 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.

F. Prohibitions.

1. 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 program measures, but shall not recommend that service.

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

3. 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.

4. The auditor shall not recommend fuel switching.

G. 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.

6 MCAR § 2.2304 Arrangement services.

A. 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:

1. Providing the customer with the most recent Master List of lenders and an agency compiled list of other financing programs offered by federal, state or local governments and explaining these financing programs to the customer;

2. Providing the customer with a standard credit application and offering to assist the customer with a standard credit application; and

3. Providing a service in order to further assist and answer any additional questions of the customer.

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

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

a. 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

b. All the following:

(1) Providing up to three (3) 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.

(2) Supplying the customer with written information on recommended measures to be installed; and

(3) 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.

2. For non-audited homes, this installation arrangement service shall consist of all the following:

a. Providing the Master List of contractors;

b. Providing up to three (3) standard bid forms to the customer;

c. An offer to supply the customer with written information on the various measures; and

d. 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.

C. Response time for services. The participating utilities and heating suppliers shall provide the services described in 6 MCAR § 2.2304 A. and B. 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 twenty (20) days of a customer's request.

D. Prohibitions.

1. Participating utilities and heating suppliers shall not recommend any particular contractor, lender, supplier or

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 6 MCAR § 2.2303 D.3.h.

5. 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.

E. Presentation of audit results.

1. 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 twenty (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 twenty (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 twenty (20) percent maximum range, which occur during the first year from installation of each applicable program measure addressed by the program audit.

d. An estimate of the payback period, measured in years, for the cost of installation of each program measure addressed by the audit.

e. A clear disclosure to the customer, through the use of sample calculations, that the total energy cost savings from the installation of more than one program measure may be less than the sum of energy cost savings of each of the measures installed individually;

f. 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.";

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

h. 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.

2. 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 6 MCAR §§ 2.2304, 2.2306, and 2.2308, 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 Person 10 C.F.R. § 440 (1980);

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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	
(1) Floor	— There is no insulation in the floor over an unconditioned space.
(2) 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's 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 (+ or −45° of True South) wall or an integral South facing (+ or −45° of True South) roof, which is free of 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 solaria/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 (+ or −45° 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 10 mph and there is sufficient unrestricted access to the wind.

3. Every program audit addressing solar domestic hot water system 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 systems:

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 which 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 which actually occur."

4. 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;

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 6 MCAR § 2.2303 D.2 in that residence.

2. The auditor shall estimate energy savings and installation costs of each program measure using the calculation procedures in Appendix A or procedures approved pursuant to 6 MCAR § 2.2303 A. 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 6 MCAR § 2.2303 A.2. for local fuel prices, and local prices for materials and installation of program measures, and also, included in the calculations typical local climate data for the customer's location;

c. Base calculation procedures for active solar domestic hot water 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 manufacture's design data does not exist, then a flue gas analysis, as described in 6 MCAR § 2.2303 C.2.d. shall be done.

3. The auditor shall calculate the energy index for the residence using the procedures in Appendix A.

4. 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 available from making your heating appliances more efficient."

D. Technical criteria for calculating energy savings.

1. The following R-Values shall be recommended during the program audit and be used during the calculation procedure:

a. Ceiling insulation	R-44
b. (1) Wall insulation	R-11
(2) Foundation insulation	R-11
c. (1) Floor insulation	R-19
(2) Rim joist insulation	R-19

2. 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 (5) years or older and has a seasonal efficiency of less than 80%.
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 (5) years or older.

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(6) An explanation of the benefits of applicable federal and state energy tax credits;

(7) A description of the benefits and eligibility requirements of the Weatherization Assistance Program for Low Income Persons, 10 C.F.R. 440; (1980);

(8) The following statement: "The results of this audit may be used by renters to see if their residence complies with existing state energy standards for rental 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."

b. The Program Announcement shall not contain:

(1) Advertising for sale, installation, or financing of any program measure or energy conserving practice by a particular person or company, listed or not; or

(2) Information regarding any product which is not a program measure or an energy conserving practice.

c. 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.

d. The covered utility or participating heating supplier shall use the calculation procedures in Appendix A 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 6 MCAR § 2.2303 A.2.

6 MCAR § 2.2303 Energy audits.

A. Validation of audit procedures.

1. Alternative audits. The agency shall develop a model program audit based on the calculation procedures in Appendix A 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% 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. All alternative audits shall be submitted to the agency for validation by January 5, 1981.

2. Price information. On a semi-annual 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 15 day of January and July, starting on January 15, 1981.

B. Scheduling of program audits.

1. 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 geographic or other conditional, non-discriminating 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 6 MCAR § 2.2303. 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.

2. Each covered utility shall provide a program audit to a customer:

a. Within thirty (30) days of the customer's request if a conditional offer is made; or

b. Within sixty (60) days of the customer's request if an unconditional offer is made.

3. 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.

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

C. Conducting the audit.

1. 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

include: new buildings to which final standards under Sections 304(a) and 305 of the Energy Conservation and Production Act (42 U.S.C. 6801 et seq) apply.

W. State measures. State measures are the following measures in or with respect to a residential building:

1. Insulated window and glass coverings. A device with a minimum R-value of 2 which is designed to reduce heat losses through windows and doors.

2. Vent damper for waterheaters. A mechanical or thermally operated damper installed in a gas fired waterheater which:

a. Is installed when a vent damper is installed in a furnace and the two appliances share a common chimney.

b. Conserves energy by substantially reducing the flow of heated air through the chimney when the waterheater is not in operation.

3. Positive fireplace shutoffs. A manual shutoff device which can be utilized to produce a seal to inhibit the flow of air when a fireplace or fireplace stove is operating.

6 MCAR § 2.2302 Program promotion.

A. Program announcements.

1. Distribution.

a. Each covered utility shall send to all their customers a Program Announcement by April 9, 1981, and thereafter at least once every two years until January 1, 1985.

b. Each covered utility shall send a Program Announcement to each of its new customers within sixty (60) days after the date that the new customer first receives service.

c. 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:

(1) The criteria of 6 MCAR § 2.2302 A.2. have been met; and

(2) The information contained in the program announcement represented in simple language.

2. Content.

a. The Program Announcement shall contain the following elements, at a minimum:

(1) 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;

(2) 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;

(3) An offer by the covered utility to provide the following services with a description of each:

(a) A program audit, in accordance with 6 MCAR § 2.2303.

(b) Installation arrangement services, in accordance with 6 MCAR § 2.2304 B.

(c) Financing arrangement services, in accordance with 6 MCAR § 2.2304 A.

(d) Contractor, lender and supplier lists in accordance with 6 MCAR § 2.2305.

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;

(4) An offer to provide to each new customer upon request a copy of any program audit performed previously on the customer's present residence;

(5) 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 which we offer will provide more specific estimates for your house.":

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I. Heating supplier. 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 6 MCAR § 2.2312.

J. Installation standards. DOE Installation Standards pursuant to 10 CFR § 456 subparts G and I (1979).

K. Material standards. DOE Material Standards pursuant to 10 CFR § 456 subparts G and H (1979)

L. Measures warranty. 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.

M. MECS. Minnesota Energy Conservation Service.

N. New customer. A person who first becomes a customer after initial distribution of the Program Announcement but before January 1, 1985.

O. Non-regulated utility. A public utility whose rates are not within the jurisdiction of the Minnesota Public Utilities Commission's ratemaking authority.

P. OCS: Minnesota Office of Consumer Services.

Q. Participating utility. A covered utility or a non-regulated utility which voluntarily participates in the Minnesota Energy Conservation Service.

R. Program announcement. The MECS program information bulletin and utility offer of service to each customer.

S. Program measures. All energy conservation measures, renewable resource measures and state measures to be included in an MECS audit.

T. Regulated utility. A public utility whose rates are within the jurisdiction of the Minnesota Public Utilities Commission's ratemaking authority.

U. Renewable resource measures. Renewable resource measures means the following measures installed in or connected to a residential building:

1. 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.

2. Passive polar space heating and cooling systems. Systems that make efficient use of, or enchance the use of, natural forces—including solar insolation, winds, night time 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:

a. Direct gain glazing systems. The use of south-facing (+ or −45° of True South) panels of insulated glass, fiberglass, or other similar transparent substances that admit the sun's rays into the living space where the heat is retained. Glazing is either double-paned, or single-paned equipped with movable insulation.

b. 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.

c. Solaria/sunspace systems. A structure of glass, fiberglass or similar transparent material which is attached to the South-facing (+ or −45° of True South) wall of a structure which 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.

d. Window heat gain retardants. Those mechanisms which significantly reduce summer heat gain through South-facing (+ or −45° of True South) windows by use of devices such as awnings, insulated rollup shades (external or internal), metal or plastic solar screens, or moveable rigid insulation.

3. Wind energy devices. Equipment that uses wind energy to produce energy in any form for pesonal residential purposes.

4. Replacement solar swimming pool heaters. Devices which are used solely for the purposes of using the sun's energy to heat swimming pool water and which replace a swimming pool heater using electricity, gas or another fossil fuel.

V. Residential building. 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

12. Storm or thermal door:

a. A second door, installed outside or inside a prime door, creating an insulating air space; or

b. A door with enhanced resistance to heat flow through the glass area created by affixing two or more sheets or glazing materials; or

c. A primary exterior door with a R-value of at least two.

13. Heat reflective and heat absorbing window or door material. 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 which thereby result in exceptional heat-absorbing or heat-reflecting properties.

14. Devices associated with electric load management techniques. Customer-owned or leased devices that reduce the maximum kilowatt demand on an electric utility and which 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.

15. Clock thermostat. A device which is designed to reduce energy consumption by regulating the demand on the heating or cooling system in which it is installed, and uses:

a. A temperature control device for interior spaces incorporating more than one temperature control level, and

b. A clock or other automatic mechanism for switching from one control level to another.

H. Energy conserving practices. Energy Conserving Practices means any of the following measures in a residential building:

1. Furnace efficiency maintenance and adjustments, which 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°F on a gas or oil forced-air furnace, and turning off the pilot light on a gas furnace during the summer.

2. Nighttime temperature setback, which means manually lowering the thermostat control setting for the furnace during the heating season to a maximum of 55°F during sleeping hours.

3. Reducing thermostat settings in winter, which means limiting the maximum thermostat control setting for the furnace to 68°F during the heating season.

4. Raising thermostat setting in summer, which means setting the thermostat control for an air conditioner to 78°F or higher during the cooling season.

5. Water flow reduction in showers and faucets, which 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.

6. Reducing hot water temperatures, which means manually setting back the water heater thermostat setting to 120°F; and reducing the use of heated water for clothes washing.

7. Reducing energy use when a home is unoccupied, which means reducing the thermostat setting to 55° F when a home is empty for four hours or longer in the heating season, turning an air conditioner off in the cooling season when no one is home, and lowering the thermostat setting of the water heater when a home is vacant for two days or longer.

8. Plugging leaks in attics, basements, and fireplaces, which means installing scrap insulation or other pliable materials in gaps 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.

9. Sealing leaks in pipes and ducts, which 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.

10. Efficient use of shading, which 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.

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E. Customer. For the purposes of this rule, a customer is any person who:

1. Owns or occupies a residential building; and

2. Receives a fuel bill from a participating utility or home heating supplier for fuel used in such residential building.

F. DOE: Department of Energy.

G. Energy conservation measures. Energy Conservation Measures means any of the following measures in a residential building:

1. Caulking. 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."

2. Weatherstripping. Narrow strips of material placed over or in movable joints of windows and doors to reduce the passage of air and moisture.

3. Furnace efficiency modifications.

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) which:

(1) Is installed downstream from the drafthood; and

(2) 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.

4. Replacement central air conditioner. A central air conditioner which replaces an existing central air conditioner of the same fuel type and which reduces the amount of fuel consumed due to an increase in efficiency.

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

6. Wall insulation. A material primarily designed to resist heat flow which is installed within or on the walls between conditioned areas of a building and unconditioned areas of a building or the outside.

7. Floor insulation. 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.

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

9. Pipe insulation. 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.

10. Water heater insulation. A material primarily designed to resist heat flow which is suitable for wrapping around the exterior surface of the water heater casing.

11. Storm or thermal window:

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.

(b) Who spends more than $250, not including his own traveling expenses and membership dues, in any year for the purpose of attempting to influence legislative or administrative action by communicating or urging others to communicate with public officials.

The statute provides certain exceptions. Questions should be directed to the Ethical Practices Board, 41 State Office Building, Saint Paul, Minnesota 55155, telephone (612) 296-5615.

Notice: Any person may request notification of the date on which the Hearing Examiner's Report will be available, after which date the agency may not take any final action on the rules for a period of five working days. Any person may request notification of the date of which the hearing record has been submitted (or resubmitted) to the Attorney General by the agency. If you desire to be so notified, you may so indicate at the hearing. After the hearing, you may request notification by sending a written request to the hearing examiner (in the case of the Hearing Examiner's Report), or to the agency (in the case of the agency's submission or resubmission to the Attorney General).

Notice is hereby given that 25 days prior to the hearing, a Statement of Need and Reasonableness will be available for review at the agency and at the Office of Administrative Hearings. This Statement of Need and Reasonableness will include a summary of all the evidence and argument which the agency anticipates presenting at the hearing justifying both the need for and the reasonableness of the proposed rule or rules. Copies of the Statement of Need and Reasonableness may be obtained from the Office of Administrative Hearings at a minimal charge.

The rule hearing procedure is governed by Minn. Stat. §§ 15.0411-15.417, § 15.052 and by 9 MCAR §§ 2.101-2.113. Any questions concerning the procedures may be directed to the hearing examiner.

October 20, 1980

Mark Mason, Director

Rules as Proposed (all new material)

6 MCAR § 2.2300 Authority and purpose.

A. Authority. The agency's authority to promulgate the proposed rules is contained in 1980 Minn. Laws, ch. 579, § 12 (to be codified as Minn. Stat. § 116H.17), as well as §§ 116.08(a)(1978), 116H.07(i)(1978).

B. Purpose. The purpose of these rules 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 of home energy improvements. The rules establish requirements for inclusion in the lists, audit training and certification procedures, procedures for the billing of energy improvement loans on customer utility bills, and post-installation inspection and consumer grievance procedures. This program also includes provisions for voluntary participation of home heating suppliers and nonregulated utilities.

6 MCAR § 2.2301 Definitions.

For purposes of these rules, the following definitions apply:

A. Agency: The Minnesota Energy Agency.

B. Arranged installation. Any installation of MECS Program Measures, coordinated pursuant to 6 MCAR § 2.2304 by a participating utility or heating supplier, which is initiated using a standardized MECS Bid Form.

C. City of the first class: A city, pursuant to Minn. Stat. § 410.01(1978), which has a population of 100,000 inhabitants or more.

D. Covered utility. Covered utilities shall be determined on a yearly basis. The definition includes all public utilities which during the second preceding calendar year had either:

1. Sales of natural gas for purposes other than resale which exceed 10 billion cubic feet; or

2. Sales of electric energy for purposes other than resale which exceed 750 million kilowatt-hours.

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withheld from the employee's wages. Notwithstanding the foregoing, the employee remains liable for the employee's share of the tax on all wages received by the employee not in excess of the maximum reportable wages as provided in Title II of the Federal Social Security Act per calendar year.

6. If any reporting unit fails to make the social security contribution payments required by law and these rules, the delinquent payments due with interest thereon at the rate of six percent per annum or the minimum penalty as established by these rules, whichever is greater, may be recovered in an action by the state agency in a court of competent jurisdiction against each and every political subdivision liable therefor or may, at the request of the state agency, be deducted from any other moneys payable to such political subdivision by any department or agency of the state.

7. The state or a political subdivision is not authorized to begin making deductions for social security taxes from the earnings of employees until after the State Agreement has been approved on behalf of the federal government by the Secretary of Health, Education and Welfare. However, as soon as the State Agreement has been fully executed and has been approved, the political subdivision shall make the necessary deductions from earnings, retroactive to effective date of said agreement or modification thereof, so that the total contribution payments required from the effective date of the State Agreement are transmitted to the state agency along with initial reports before the initial deadline as determined by the state agency. The exact method and time of deducting retroactive contributions from employees are matters to be determined by each political subdivision individually.

8. The responsibility of each reporting unit to make the required deductions from earnings of all covered employees shall not be affected by the fact that some employees may, while employed, be receiving social security benefits.

Energy Agency
Conservation Division

Proposed Rules for the Establishment of the Minnesota Energy Conservation Service Program

Notice is hereby given that the public hearing in the above-entitled matter will be held in the Large Hearing Room, 83 State Office Building, 435 Park Street, St. Paul, Minnesota on December 16, 1980, commencing at 9:30 a.m. and continuing until all persons have had an opportunity to be heard.

All interested or affected persons will have an opportunity to participate. Statements may be made orally and written material may be submitted at the hearing. In addition, written material may be submitted and recorded in the hearing record by mailing the material to the Hearing Examiner Allan Klein, Hearing Examiners Office, 1745 University Ave., Room 300, St. Paul, Minnesota 55104—telephone (612) 296-8104, either before the hearing or within five working days after the close of the hearing unless the hearing examiner orders a longer period of time not to exceed 20 calendar days. The proposed rules are subject to change as a result of the rules hearing process. The agency therefore strongly urges those who may be affected in any matter by the substance of the proposed rules applicable to this hearing to participate in the rules hearing process.

If adopted, the proposed rules would 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 Master 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 or supply of home energy improvements. The rules establish requirements for inclusion in the Master lists, audit training and certification procedures. This program also includes provisions for voluntary participation of home heating suppliers and nonregulated utilities.

The agency's authority to promulgate the proposed rules is contained in 1980 Minn. Laws, ch. 579, § 12 (to be codified as Minn. Stat. § 116H.17), as well as §§ 116H.08(a)(1978), 116H.07(i)(1978).

Copies of the proposed rules are now available and one free copy may be obtained by writing to the Minnesota Energy Agency, Attention: Alan Lessik, 980 American Center Building, 150 E. Kellogg Boulevard, St. Paul, Minnesota 55101—(612) 297-2117. Copies will also be available at the door on the date of the hearing.

Minn. Stat. ch. 10A requires each lobbyist to register with the State Ethical Practices Board within five days after he or she commences lobbying. A lobbyist is defined in Minn. Stat. § 10A.01, subd. 11 (1979 Supp.) as any individual:

(a) Engaged for pay or other consideration, or authorized by another individual or association to spend money, who spends more than five hours in any month or more than $250, not including his own travel expenses and membership dues, in any year, for the purpose of attempting to influence legislative or administrative action by communicating or urging others to communicate with public officials; or

STATEMENT OF COMPLIANCE WITH

RULEMAKING PROCEDURES

I, Special Assistant Attorney General James E. Lackner, do hereby declare that I have examined the proposed rules and all related documents and that, based on my examination and my personal familiarity with the applicable procedures, the Administrative Procedure Act, the rules of the Office of Administrative Hearings, and the rules of the Attorney General have been followed. Any exceptions are noted below.

James Lackner

Special Assistant
Attorney General

Dated: 12/18/00

Our File No. 661

RULE REVIEW CHECKLIST

DATE RULE RECEIVED 12/23
DATE FOR REVIEW _____
DATE DUE 12/31

Adopted w/a hearing _____
Adopted w/o a hearing _____
Temporary rule X

Approved ✓ 12/30 Disapproved _____ Returned to Agency _____

Resubmitted _____ Due _____
Approved _____ Disapproved _____ Returned to Agency _____

Date filed w/Secretary of State _____

- -

____ Rule as Adopted

____ Rule as Proposed

____ Order Adopting

____ Notice of Intent to Solicit Outside Opinion

____ Order for rulemaking
_____ Date of Hearing

____ Certificate of Board's Authorizing Resolution

____ Notice of rulemaking
_____ Sufficiency

____ Affidavit of Mailing Notice of rulemaking
_____ At least 30 days prior to hearing/adoption

____ Mailing list Certificate

____ Publication in State Register
_____ At least 30/20 days prior to hearing/adoption

____ Hearing Examiner's Report

____ Chief Hearing Examiner's Report(s)
_____ Approving H.E.'s Report
_____ Approving agency action

____ Agency's Findings of Fact

____ LCRAR Report or agency Affidavit

____ Certificate of Board's Resolution Adopting Rules

____ Order Approving Incorporation by Reference

____ Statement of Need and Reasonableness

____ Petition for Adoption of a Rule

____ Record (includes transcript or tape, exhibits, comments received by agency, requests for a hearing, and other relevant materials)

____ Certificate of Compliance w/Rulemaking Procedures

____ Affidavit of Mailing Notice of Submission to Attorney General

____ Notice of Submission to the Attorney General

STATE OF MINNESOTA

ENERGY AGENCY

In the Matter of the Proposed Adoption of Rules of the Minnesota Energy Agency Governing the Minnesota Energy Conservation Service Program, 6 MCAR §§ 2.2300-2.2313.

ORDER ADOPTING TEMPORARY RULES

The above-entitled matter was published in the State Register on November 3, 1980, as proposed temporary rule pursuant to Minnesota Statutes section 15.0412, subdivision 5. After affording interested and affected persons an opportunity to submit written data and views within 20 days of the publication date, reviewing and considering the data and views, and determining that the above-captioned rules are needed and reasonable,

NOW, THEREFORE, IT IS ORDERED that these rules identified as the Minnesota Energy Conservation Service Rules 6 MCAR §§ 2.2300-2.2313 are adopted this 23 day of December, 1980, pursuant to authority vested in me by Minn. Stat. § 116H.17 (1980) as well as Minn. Stat. §§ 116.08(a) and 116H.07(i) (1978).

MARK MASON
Director

AG Copy

MINNESOTA ENERGY CONSERVATION SERVICE RULES

6 MCAR §2.2300. Authority and Purpose

6 MCAR §2.2301. Definitions

6 MCAR §2.2302. Program Promotion

6 MCAR §2.2303. Energy Audit

6 MCAR §2.2304. Arrangement Services

6 MCAR §2.2305. Listing Services

6 MCAR §2.2306. Post-Installation Inspection Services

6 MCAR §2.2307. Qualification of Auditors and Inspectors

6 MCAR §2.2308. Consumer Grievance Procedures

6 MCAR §2.2309. Customer Payments

6 MCAR §2.2310. Utility Supply, Installation and Financing

6 MCAR §2.2311. Reporting and Recordkeeping

6 MCAR §2.2312. Heating Supplier Program

6 MCAR §2.2313. Non-Regulated Utility Program

6 MCAR §2.2300 Authority and purpose.

A. Authority

The Agency's authority to promulgate the proposed rules is contained in 1980 Minn. Laws, Chapter 579, Section 12 (to be codified as Minn. Stat. § 116H.17), as well as §§ 116.08(a) (1978), 116H.07(i)(1978).

B. Purpose

The purpose of these rules 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 of home energy improvements. The rules establish requirements for inclusion in the lists, audit training and certification procedures, procedures for the billing of energy improvement loans on customer utility bills, and post-installation inspection and consumer grievance procedures. This program also includes provisions for voluntary participation of home heating suppliers and nonregulated utilities.

6 MCAR §2.2301. Definitions.

For purposes of these rules, the following definitions apply:

A. Agency.

The Minnesota Energy Agency

B. Arranged installation.

Any installation of MECS Program Measures, coordinated pursuant to 6 MCAR §2.2304 by a participating utility or heating supplier, which is initiated using a standardized MECS Bid Form.

C. City of the first class.

A city, pursuant to Minn. Stat. §410.01(1978), which has a population of 100,000 inhabitants or more.

D. Covered utility.

Covered utilities shall be determined on a yearly basis. The definition includes all public utilities which during the second preceding calendar year had either:

1. Sales of natural gas for purposes other than resale which exceed 10 billion cubic feet; or
2. Sales of electric energy for purposes other than resale which exceed 750 million kilowatt-hours.

E. Customer.

For the purposes of this rule, a customer is any person who:

1. Owns or occupies a residential building; and
2. Receives a fuel bill from a participating utility or home heating supplier for fuel used in such residential building.

F. DOE.

Department of Energy

G. Energy conservation measures.

Energy Conservation Measures means any of the following measures in a residential building:

1. Caulking.

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."

2. Weatherstripping.

Narrow strips of material placed over or in movable joints of windows and doors to reduce the passage of air and moisture.

3. Furnace efficiency modifications.

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 intergral 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) which:

(1) Is installed downstream from the drafthood; and

(2) 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.

4. Replacement central air conditioner.

A central air conditioner which replaces an existing central air conditioner of the same fuel type and which reduces the amount of fuel consumed due to an increase in efficiency.

5. Ceiling insulation.

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

6. Wall insulation.

A material primarily designed to resist heat flow which is installed within or on the walls between conditioned areas of a building and unconditioned areas of a building or the outside.

7. Floor insulation.

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.

8. Duct insulation.

   A material primarily designed to resist heat flow which is installed on a heating or cooling duct in an unconditioned area of a building.

9. Pipe insulation.

   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.

10. Water heater insulation.

    A material primarily designed to resist heat flow which is suitable for wrapping around the exterior surface of the water heater casing.

11. Storm or thermal window.

    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.

12. Storm or thermal door.

    a. A second door, installed outside or inside a prime door, creating an insulating air space; or

    b. A door with enhanced resistance to heat flow through the glass area created by affixing two or more sheets or glazing materials; or

    c. A primary exterior door with a R-value of at least two.

13. Heat reflective and heat absorbing window or door material.

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 which thereby result in exceptional heat-absorbing or heat-reflecting properties.

14. Devices associated with electric load management techniques.

Customer-owned or leased devices that reduce the maximum kilowatt demand on an electric utility and which 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.

15. Clock thermostat.

A device which is designed to reduce energy consumption by regulating the demand on the heating or cooling system in which it is installed, and uses:

a. A temperature control device for interior spaces incorporating more than one temperature control level, and

b. A clock or other automatic mechanism for switching from one control level to another.

H. Energy conserving practices.

Energy Conserving Practices means any of the following measures in a residential building:

1. Furnace efficiency maintenance and adjustments, which 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°F on a gas or oil forced-air furnace, and turning off the pilot light on a gas furnace during the summer.

2. Nighttime temperature setback, which means manually lowering the thermostat control setting for the furnace during the heating season to a maximum of 55°F during sleeping hours.
3. Reducing thermostat settings in winter, which means limiting the maximum thermostat control setting for the furnace to 68°F during the heating season.
4. Raising thermostat setting in summer, which means setting the thermostat control for an air conditioner to 78°F or higher during the cooling season.
5. Water flow reduction in showers and faucets, which 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.
6. Reducing hot water temperatures, which means manually setting back the water heater thermostat setting to 120°F; and reducing the use of heated water for clothes washing.
7. Reducing energy use when a home is unoccupied, which means reducing the thermostat setting to 55°F when a home is empty for four hours or longer in the heating season, turning an air conditioner off in the cooling season when no one is home, and lowering the thermostat setting of the water heater when a home is vacant for two days or longer.
8. Plugging leaks in attics, basements, and fireplaces, which means installing scrap insulation or other pliable

materials in gaps 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.

9. Sealing leaks in pipes and ducts, which 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.

10. Efficient use of shading, which 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.

I. Heating supplier.

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 6MCAR §2.2312.

J. Installation standards.

DOE Installation Standards pursuant to 10 CFR §456 subparts G and I(197

K. Material standards.

DOE Material Standards pursuant to 10 CFR §456 subparts G and H (1979)

L. Measures Warranty.

A warranty in writing, by the manufacturer of the program measure, that the residential customer for whom the measure in 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.

M. MECS.

Minnesota Energy Conservation Service

N. New customer.

A person who first becomes a customer after intial distribution of the Program Announcement but before January 1, 1985.

O. Non-regulated utility.

A public utility whose rates are not within the jurisdiction of the Minnesota Public Utilities Commission's ratemaking authority.

P. OCS.

Minnesota Office of Consumer Services

Q. Participating utility.

A covered utility or a non-regulated utility which voluntarily participates in the Minnesota Energy Conservation Service.

R. Program announcement.

The MECS program information bulletin and utility offer of service to each customer.

S. Program measures.

All energy conservation measures, renewable resource measures and state measures to be included in an MECS audit.

T. Regulated utility.

A public utility whose rates are within the jurisdiction of the Minnesota Public Utilities Commission's ratemaking authority.

U. Renewable resource measures.

Renewable resource measures means the following measures installed in or connected to a residential building:

1. 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.

2. Passive solar space heating and cooling systems.

Systems that make efficient use of, or enhance the use of, natural forces - including solar insolation, winds, night time 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:

a. Direct gain glazing systems.

The use of south-facing (+ or -45° of True South) panels of insulated glass, fiberglass, or other similar transparent substances that admit the sun's rays into the livng space where the heat is retained. Glazing is either double-paned, or single-paned equipped with movable insulation.

b. 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.

c. Solaria/sunspace systems.

A structure of glass, fiberglass or similar transparent material which is attached to the South-facing (+ or -45° of True South) wall of a structure which 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.

d. Window heat gain retardants.

Those mechanisms which significantly reduce summer heat gain through South-facing (+ or -45° of True South) windows

by use of devices such as awnings, insulated rollup shades (external or internal), metal or plastic solar screens, or moveable rigid insulation.

3. Wind energy sevices.

Equipment that uses wind energy to produce energy in any form for personal residential purposes.

4. Replacement solar swimming pool heaters.

Devices which are used solely for the purposes of using the sun's energy to heat swimming pool water and which replace a swimming pool heater using electricity, gas or another fossil fuel.

V. Residential building.

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 (42 U.S.C. 6801 et seq) apply.

W. State measures.

State Measures are the following measures in or with respect to a residential building:

1. Insulated window and glass coverings.

A device with a minimum R-value of 2 which is designed to reduce heat losses through windows and doors.

2. Vent damper for waterheaters.

A mechanical or thermally operated damper installed in a gas fired waterheater which:

a. Is installed when a vent damper is installed in a furnace and the two appliances share a commen chimney.

b. Conserves energy by substantially reducing the flow of

heated air through the chimney when the waterheater is not in operation.

3. Positive fireplace shutoffs.

   A manual shutoff device which can be utilized to produce a seal to inhibit the flow of air when a fireplace or fireplace stove is not operating.

6 MCAR §2.2302. Program promotion.

A. Program announcements.

1. Distribution.

a. Each covered utility shall send to all their customers a Program Announcement by April 9, 1981, and thereafter at least once every two years until January 1, 1985.

b. Each covered utility shall send a Program Announcement to each of its new customers within sixty (60) days after the date that the new customer first receives service.

c. 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:

(1) The criteria of 6MCAR §2.2302A.2. have been met; and

(2) The information contained in the program announcement is represented in simple language.

2. Content.

a. The Program Announcement shall contain the following elements, at a minimum:

(1) 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;

(2) 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;

(3) An offer by the covered utility to provide the following services with a description of each:

(a) A program audit in accordance with 6 MCAR §2.230

(b) Installation arrangement services, in accordance with 6 MCAR §2.2304B.

(c) Financing arrangement services, in accordance with 6 MCAR §2.2304A.

(d) Contractor, lender and supplier lists in accordance with 6 MCAR §2.2305.

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;

(4) An offer to provide to each new customer upon request a copy of any program audit performed previously on the customer's present residence;

(5) 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 which we offer will provide more specific estimates for your house.";

(6) An explanation of the benefits of applicable federal and state energy tax credits;

(7) A description of the benefits and eligibility requirements of the Weatherization Assistance Program For Low Income Persons, 10 C.F.R. 440; (1980);

(8) The following statement:

"The results of this audit may be used by renters to see if their residence complies with existing state energy standards for rental 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."

b. The Program Announcement shall not contain:

(1) Advertising for sale, installation, or financing of any program measure or energy conserving practice by a particular person or company, listed or not; or

(2) Information regarding any product which is not a program measure or an energy conserving practice.

c. 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.

d. The covered utility or participating heating supplier shall use the calculation procedures in Appendix A 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 6MCAR §2.2303A.2.

6 MCAR §2.2303. Energy audits.

A. Validation of audit procedures.

1. Alternative audits.

The Agency shall develop a model program audit based on the calculation procedures in Appendix A 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% 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. ~~All alternative audits shall be submitted to the Agency for validation by January 5, 1981.~~

2. Price information.

On a semi-annual 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 15 day of January and July, starting on January 15, 1981.

3. Subcontracting audits.

Participating utilities and heating suppliers are permitted to subcontract audits with third parties. All such audits must be approved pursuant to 6 MCAR § 2.2303A.1. and all auditors must be approved pursuant to 6 MCAR § 2.2307A.

B. Scheduling of program audits.

1. 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 geographic or other conditional, non-discriminating 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 6 MCAR §2.2303. 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.

2. Each covered utility shall provide a program audit to a customer:

   a. Within thirty (30) days of the customer's request if a conditional offer is made; or

   b. Within sixty (60) days of the customer's request if an unconditional offer is made.

3. 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.

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

C. Conducting the audit.

1. 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 6 MCAR §2.2303D.2 in that residence.

2. The auditor shall estimate energy savings and installation costs of each program measure using the calculation procedures in Appendix A or procedures approved pursuant to 6 MCAR §2.2303A. 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 6 MCAR §2.2303A.2, for local fuel prices, and local prices for materials and installation of program measures, and also, included in the calculations typical local climate data for the customer's location;

c. Base calculation procedures for active solar domestic hot water 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 manufacture's design data does not exist, then a flue gas analysis, as described in 6 MCAR s2.2303C.2.d shall be done.

3. The auditor shall calculate the energy index for the residence using the procedures in Appendix A.

4. 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 available from making your heating appliances more efficient."

D. Technical criteria for calculating energy savings.

1. The following R-Values shall be recommended during the program audit and be used during the calculation procedure:

a.	Ceiling insulation	R-44
b.	(1) Wall insulation	R-11
	(2) Foundation insulation	R-11
c.	(1) Floor insulation	R-19
	(2) Rim joist insulation	R-19

2. 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 (5) years or older and has a seasonal efficiency of less than 80%.
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 (5) 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

(1) Floor - There is no insulation in the floor over an unconditioned space.

(2) 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's 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 (+ or -45° of True South) wall or an integral South facing (+ or -45° of True South) roof, which is free of 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 solaria/ 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 (+ or -45° 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 10 mph and there is sufficient unrestricted access to the wind.

3. Every program audit addressing solar domestic hot water system 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 systems;

   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 which 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 which actually occur."

4. 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 6MCAR §2.2303D.3.h. .

5. 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 [illegible] 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.

E. Presentation of audit results.

1. 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 twenty (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 twenty (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 twenty (20) percent maximum range, which occur during the first year from installation of each applicable program measure addressed by the program audit.

d. An estimate of the payback period, measured in years, for the cost of installation of each program measure addressed by the audit.

e. A clear disclosure to the customer, through the use of sample calculations, that the total energy cost savings from the installation of more than one program measure may be less than the sum of energy cost savings of each of the measures installed individually;

f. 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.";

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

h. 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.

2. 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 6 MCAR §2.2304, §2.2306, and §2.2308, 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 Person 10 C.F.R. §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 Minn. Stat. §116H.129, subd.3. (1978) and a statement describing remedies available to tenants for violations of those standards.

3. 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.

F. Prohibitions.

1. 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 program measures, but shall not recommend that service.

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

3. 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.

4. The auditor shall not recommend fuel switching.

G. 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.

6 MCAR §2.2304. Arrangement services.

A. 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:

1. Providing the customer with the most recent Master List of lenders and an Agency compiled list of other financing programs offered by federal, state or local governments and explaining these financing programs to the customer;
2. Providing the customer with a standard credit application and offering to assist the customer with a standard credit application; and
3. Providing a service in order to further assist and answer any additional questions of the customer.

B. Installation arrangement service.

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

1. For audited homes this installation arrangement service shall consist of:
   a. 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; a
   b. All the following:
      (1) Providing up to three (3) standard bid forms per measure recommended by the auditor and providing the customer with a choice of having the form filled in b either the customer or the auditor.
      (2) Supplying the customer with written information on recommended measures to be installed; and

(3) 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.

2. For non-audited homes, this installation arrangement service shall consist of all the following:

   a. Providing the Master List of contractors;

   b. Providing up to three (3) standard bid forms to the customer;

   c. An offer to supply the customer with written information on the various measures; and

   d. 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.

C. Response time for services.

The participating utilities and heating suppliers shall provide the services described in 6 MCAR §2.2304A and B 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 twenty (20) days of a customer's request.

D. Prohibitions.

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

2. 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.

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

E. Standardized bid forms.

The Agency shall develop a standardized bid form for use pursuant to 6 MCAR §2.2304. This form shall be the only one used by the participating utilities and heating suppliers for arranging installation under MECS.

6 MCAR §2.2305. Master list of contractors, lenders and suppliers.

A. Issuance of lists.

1. 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.

2. 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.

3. Within sixty (60) days following the receipt of an application for inclusion on the Master List, the Agency shall evaluate the application pursuant to 6 MCAR §2.2305B and either place the business on the Master List or inform the business, in writing, of the reasons for its exclusion from the list.

4. Every thirty (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 (6) months, a new Master List shall be published.

B. Eligibility requirements.

1. To be eligible for listing, contractors, lenders and suppliers enter into a written agreement with the Agency.

a. Contractors shall agree in writing with the Agency to meet the following requirements for each arranged installation:

(1) Comply with the applicable DOE installation standards found in 10 CFR 456 subparts G,I and install only measures that are labeled as meeting DOE material

standards;

(2) Install only measures that are covered by the measures warranty (except for caulking and weatherstripping);

(3) 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;

(4) Warrant in the contract that any defect in materials manufacture, design or installation found within one year from the date of installation shall be remedied without charge and within two weeks;

(5) Maintain comprehensive general liability insurance covering:

(a) bodily injury - $100,000 per person
- $300,000 per occurance

(b) Property damage- $ 50,000 each occurance
- $100,000 aggregate; and

(6) Comply with all applicable federal, state and local laws;

(7) Participate in good faith in the conciliation conference when a complaint is made by a customer;

(8) 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 heating supplier; and

(9) Agree to notify the MECS inspection agency at the completion of the installation pursuant to 6 MCAR §2.2306.

b. Suppliers shall agree in writing with the Agency to meet the following requirements for each customer:

(1) Supply program measures which meet applicable DOE material standards;

(2) 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.

(3) Comply with all applicable federal, state and local laws;

(4) 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;

(5) Participate in good faith in the conciliation conference when a complaint is made by a customer.

c. Lenders shall agree in writing to meet the following requirements for each arranged financing.

(1) 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;

(2) 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;

(3) Comply with all applicable federal, state and local laws; and

(4) Participate in good faith in the conciliation conference when a complaint is made by a customer.

2. 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 Generals'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.

C. Removal from the master list.

1. Any supplier, lender or contractor shall be removed from the Master List for violation of either the eligibility requirements in 6 MCAR §2.2305B or the contract between the lender, contractor or supplier and Agency as required in the same section.

a. Violations shall be reported to the Agency by the post-installation inspectors and the mediators of consumer complaints. The post-installation 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.

b. Within one (1) 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.

c. 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 thirty (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 thirty (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 thirty (30) days of mailing of the notice the contractor, lender or supplier will be permanently de-listed.

2. Any supplier, lender or contractor permanently removed from the Master List shall not be relisted for at least six (6) months after being so de-listed. To be relisted, all violations under the program must be corrected and inspected and all other listing requirements must be met.

6 MCAR §2.2306. Post-installation inspections.

A. Inspection procedures.

1. Each covered utility shall arrange to conduct the post-installation inspections of its customers required in this section. By ~~Dec. 15, 1980~~ February 15, 1981 each covered utility shall submit to the Agency, for approval, its plans for conducting the inspections and for coordinating these inspection with the Agency and the Office of Consumer Services.

2. No person shall conduct or perform an inspection unless he or she has been qualified by the Agency, pursuant to 6 MCAR §2.2307

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

4. During the inspection, the inspector shall determine whether:

   a. The installation conforms with DOE installation standards; and

   b. In the case of a consumer complaint, the complaint is justified.

5. An inspection report shall be developed by the Agency. The inspector shall use this report to certify that the installation meets all DOE installations standards.

   Within five (5) 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 (2) weeks of receipt of the report and shall arrange for a reinspection of the installation within one week after correction.

B. 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; and

d. Solar domestic hot water systems.

C. Random inspections.

1. Four of the first ten arranged installations made by each contractor of each of the following program measures shall be inspected:

a. Ceiling insulation;

b. Floor insulation; and

c. Wall insulation; ~~and~~

~~d. Solar domestic hot water systems.~~

2. Ten percent of all utility arranged installations of each program measure listed in 6 MCAR §2.2306C.1 shall be inspected each year. The inspections required in 6 MCAR §2.2306C.1 shall count toward the fulfillment of this requirement.

3. 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. Solar domestic hot water systems; and~~

~~i.~~ 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 rules. This review shall be done annually thereafter.

D. Inspections as a result of consumer complaints.

1. Within two (2) weeks of the receipt by the Office of Consumer Services of any customer complaint concerning arranged installation of the measures listed in 6 MCAR §2.2306 B.1 and C.3, an inspection shall be conducted to determine the existence of any violations of these rules. Within five (5) days after the inspection, a copy of the inspection report shall be sent to the Office of Consumer Services.

2. All inspections conducted as a result of a consumer complaint shall be counted toward the fulfillment of the inspection requirements in 6 MCAR §2.2306C.1, 2 and 3.

6 MCAR §2.2307. Qualification procedures for auditors and inspectors.

A. Prohibition of discrimination.

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

B. Auditors.

1. Training

a. No person shall be eligible for certification pursuant to 6 MCAR §2.2307B.2, unless he or she has first participated in a training course which has been approved by the Agency and which covers the subject matter tested in the auditors' certification examination.

b. Any present auditor with six (6) months experience who has completed twenty-five (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 6 MCAR §2.2307B.1.a.

c. 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 continue education of certified auditors. The Agency shall approve a pla if it reviews and updates the material listed in 6 MCAR §2.2307E 2.b., provides the auditors with additional technical informatic and the program measures and audit techniques and reviews the cc munications skills needed for the interaction with the homeowner customer.

2. Certification

a. No person shall participate in the MECS Program as an auditors, unless he or she has first passed a certification examination conducted by the Agency.

b. The certification examination shall test for the following qualifications:

(1) A general understanding of the three types of heat

transfer and the effects of temperature and humidity on heat transfer;

(2) A general understanding of residential construction terminology and components;

(3) A general knowledge of the operation of the heating and cooling systems used in residential buildings, including the need and provision for combustion air;

(4) 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;

(5) The capability to conduct the MECS energy audit including:

(a) A working knowledge of the energy conserving practices defined in this plan,

(b) The ability to determine the applicability of each of the program measures, and

(c) A proficiency in the auditing procedures for each applicable program measure established in 6 MCAR §2.2303.

(6) A working ability to calculate the steady state efficiency of furnaces or boilers;

(7) An understanding of the nature of solar energy and its residential applications including:

(a) Insulation,

(b) Shading,

(c) Heat capture and transport, and

(d) Heat transfer for hot water;

(8) An understanding of the nature of wind energy and its residential applications including:

(a) Wind availability,

(b) Effects of obstruction,

(c) Wind capture,

(d) Power generation,

(e) Interfaces with residential and utility power lines; and

(9) A working knowledge of building and fire codes related to the installation and safety of wood burning appliances.

c. These examinations shall be conducted by the Agency and offered at the following times:

(1) Within two (2) days after the completion of each state-sponsored training course or orientation session, or

(2) Once a month, until February, 1982, with a minimum of two examinations per year afterward.

d. Certification shall be valid for one year.

e. After one year , each auditor must be recertified. Re-certification procedures shall be as follows:

(1) 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.

(2) 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.

(3) This recertification shall occur annually, for the life of the program.

f. 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 6 MCAR §2.2307B.1,

but shall be required to pass the Minnesota certification examination.

C. Inspectors.

1. Qualifications to conduct random inspections.

a. 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.

b. The training course shall cover the following subject matters:

(1) The measures listed in 6 MCAR §2.2306C.3;

(2) Methodology to evaluate whether the installation of a measure conforms to DOE installation standards;

(3) The MECS recommended standards for R-values for each insulation measure, pursuant to 6 MCAR §2.2303D.1

c. Each covered utility shall submit to the Agency for approval a plan for the training of general inspectors, as required in 6 MCAR §2.2307C.1.a., by ~~January 15, 1980.~~ February 15, 1981. The Agency shall approve a plan if it ensures coverage of the subject matter pursuant to 6 MCAR §2.2307C.1.b.

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

2. Qualifications to conduct mandatory inspections

a. 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 which have been approved by the Agency. Each person shall only be qualified to inspect those measures for which that person has been trained.

b. The training courses shall cover:

(1) The following subject matter concerning flue opening modifications and electrical or mechanical ignition systems:

(a) Applicable State and Federal codes and regulations;

(b) 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;

(c) An understanding of gas appliance controls and safety controls, including automatic gas valves, limit switches, and thermostats;

(d) An understanding of basic furnace and boiler circuitry, including electrical components, and the use of appropriate meters for testing gas appliance circuitry;

(e) 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;

(f) 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 sche-

matic diagrams and potential malfunctions of the system ;

(g) 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;

(h) An understanding of proper combustion and proper flame characteristics and gas piping procedures; and

(i) An understanding of the methodology to evaluate whether the installation of the measures conform with DOE installation standards.

(2) The following subject matter concerning wind energy devices:

(a) An understanding of the structural characteristics of wind energy devices;

(b) 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

(c) Methodology to evaluate whether the installation of a wind energy device conforms with DOE installation standards.

(3) The following subject matter concerning solar domestic hot water systems:

(a) The residential construction methods employed in the region and the characteristics of structures that would preclude a safe and enduring solar installation;

(b) The applicable provisions of the HUD Intermediate Minimum Property Standards Supplement, Solar Heating and Domestic Hot Water Systems 4930.2, 1977 Edition.

(c) The design, operation, installation and degradation of residential hot water and heating systems with which the solar devices will interconnect; and

(d) 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.

(e) Methodology to evaluate whether the installation of a solar domestic hot water system conforms with DOE installation standards.

c. Each covered utility shall submit to the Agency for approval a plan for the training of specialized ispectors as require in 6 MCAR §2.2307C.2.a. by ~~January 15, 1980~~. February 15, 1981. The Agency shall approve a plan if it ensures coverage of the subject matter pursuant to 6 MCAR §2.2307C.2.b.

d. Each covered utility shall notify the Agency of each person qualified as a specialized inspector, within two weeks after that person has been qualified.

6 MCAR §2.2308. Consumer grievance procedures.

A. Conciliation conference.

1. 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.

2. 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 which is acting as a lender, supplier or contractor. If the complaint is not resolved, the customer shall fill out a MECS customer complaint form supplied by OCS.

3. 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.

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

a. To respond to attempts to contact it; or

b. To actively participate in good faith in the mediation process within 30 days of initial contact; or

c. To correct program violations or take remedial measures agreed to in mediation within two (2) weeks after agreement.

B. 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 twelve (12) month period ending the preceeding April:

1. The number and nature of complaints against suppliers, contractors and lenders which have been handled through the conciliation conference; and
2. The number and function of employees within OCS assigned to the MECS Program.

6 MCAR §2.2309. Customer payments.

A. Customer billing.

1. 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.

2. 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 then credit the remainder to MECS Program charges, unless the customer specifies otherwise.

B. Loan payments.

1. If the lender agrees, a loan arranged by a covered utility pursuant to 6 MCAR §2.2304A. 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.

2. 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 ($5).

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.

C. Termination of service.

No participating utility or heating supplier shall terminate or restrict utility or fuel service upon customer default or non-payment of any MECS Program charges and loans.

6 MCAR §2.2310. Utility supply, installation and financing.

A. Survey of utilities.

1. Each covered utility which supplies or installs any program resource measure:

a. Shall be listed as a supplier or contractor pursuant to 6 MCAR §2.2305, in the same manner and subject to the same requirements as any other supplier or contractor;

b. Shall charge fair and reasonable prices for the supply or installation of program measures;

c. Shall not discriminate unfairly among eligible customers in undertaking the above described activities.

2. Beginning in April, 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 charges 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, Anti-Trust Division.

B. 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 disadvantagous to its customers, or not feasible, the limitation shall not apply.

6 MCAR §2.2311. Reporting and recordkeeping.

A. 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 twelve (12) month period ending the preceeding April:

1. 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;
2. A copy of the program announcement;
3. The number of requests for each of the following services as well as the number of requests fulfilled:
   a. Program audit,
   b. Installation arrangement,
   c. Financing arrangement, and
   d. Billing service for repayment of loans;
4. The number of installations of program measures installed by, supplied by, or financed by the covered utility or heating supplier;
5. The number and results of post-installation inspections, including description of violations;
6. The number and function of employees assigned to the program; and
7. 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:
   a. the program audit,
   b. installation arrangement,
   c. loan arrangement, and
   d. post-installation inspections.

B. Recordkeeping requirements.

1. Each covered utilities and heating supplier shall keep the following records and shall be kept for the periods indicated:

   a. For five (5) years from the date of the program audit, the name and address of each customer who receives a program audit;

   b. For five (5) 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 (5) years from the date of the request, each request for a furnace audit;

   d. For five (5) 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 (2) years from the date of the program audit, the total amount and cost of fuel purchased for the period of twelve months prior to and twelve months following each audit. This information is only required for those utilities and heating suppliers which supply the primary heating fuel to the customer.

2. This information shall be made available to the Agency upon request.

6 MCAR §2.2312. Heating suppliers.

A. Any heating supplier may apply to the Agency to participate in the MECS Program.

B. 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 6 MCAR §2.2312.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.

C. The following requirements of these rules shall not be waived:

1. The calculation procedures in Appendix A and the ban on advertising in program announcements offered, as established in 6 MCAR §2.2302A.2.b.
2. The reporting and recordkeeping requirements, pursuant to 6 MCAR §2.2311.
3. The on-site energy audit, pursuant to 6 MCAR §2.2303.
4. The arrangement service for the financing of program measures, pursuant to 6 MCAR §2.2304A,C,and D.
5. The distribution of Master Lists developed, pursuant to 6 MCAR §2.2305.
6. The offer of the consumer complaint process, pursuant to 6 MCAR §2.2308, and
7. The exclusive use of certified auditors, pursuant to 6 MCAR §2.2307

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

E. A participating heating supplier which does not provide MECS services or does not comply with the requirements listed in 6 MCAR §2.2312.C., shall be excluded by the Agency from participating in the MECS Program.

6 MCAR §2.2313. Non-regulated utility program.

A. Any non-regulated utility may apply to the Agency for inclusion in the MECS Program.

B. A non-regulated utility or an association of non-regulated utilities may apply for a waiver of any requirement in this rule, except as noted in 6 MCAR §2.2313C. All waivers that do not substantially limit either the delivery of services listed or the conservation potential of the program shall be approved.

C. The following requirements of these rules shall not be waived:

1. The on-site program audit, pursant to 6 MCAR §2.2303.
2. The arrangement services for the financing of program measures, pursuant to 6 MCAR §2.2304A,C and D.
3. The distribution Master Lists developed pursuant to 6 MCAR §2.2305.
4. The offer of the consumer complaint process, excluding post-installation inspections, pursuant to 6 MCAR §2.2308.
5. The exclusive use of certified auditors, pursuant to 6 MCAR §2.2307.

D. The following requirements of this rule shall not be required for non-regulated utilities;

1. Program Promotion, pursuant to 6 MCAR §2.2302.
2. Post-installation Inspection Services, pursuant to 6 MCAR §2.2306.
3. Customer Payments, MCAR §2.2309A and B.
4. Reporting and Recordkeeping, pursuant to 6 MCAR §2.2311.

E. Any participating non-regulated utility may voluntarily withdraw from this program after completing all outstanding services offered to its customers.

F. A participating non-regulated utility which does not comply with the requirements listed in 6 MCAR §2.2312C shall be excluded by the Agency from participating in the MECS Program.

Appendix A

Procedures for Calculating Energy Savings for Program Measures and Practices

The following procedures shall be the basis for calculating energy savings for program measures and practices for the program announcements.

A. Energy conserving measures.

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 #1. $$\Delta E = \frac{\Delta H \times D \times 20.4}{N \times V}$$

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.

2. Caulking.

Equation #2. $\Delta H = .018 \times I \times Vol$

Where

I = change in infiltration rate in air changes per hour

Vol = volume of heated space in cubic feet

3. Weatherstripping.
Use equation #2

4. Furnace efficiency modifications.

a. Replacement furnaces or boilers.

Equation #3. $$\Delta E = E_h \left(1 - \frac{N_o}{N_1}\right)$$

b. Furnace replacement burner. (ΔE is given as a range)

Equation #4. Low estimate of $\Delta E = .10E_h$

High estimates of $\Delta E = .18E_h$

c. Flue opening modifications. (ΔE is given as a range)

Equation #5. Low estimate of $\Delta E = .07E_h$
High estimate of $\Delta E = .10 E_h$

d. Install electronic ignition system

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

Equation #6. $\Delta E = \frac{3600F_p}{V}$

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

Equation #7. $\Delta E = \frac{7300F_p}{V}$

Where

E_h = Total annual energy used for space heating, in units of fuel.
N_o = 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 per hours. (Typically 800 to 1000 Btu per hour).
V = Heating value of the fuel type in Btu per unit of fuel.

5. Replacement central air conditioner.

Equation #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.

6. Ceiling insulation.

Equation #9. $\Delta H = \left(\frac{1}{R_o} - \frac{1}{R_1}\right) A$

Where

R_o = Total R-value in present condition.
R_1 = Total R-value of proposed condition.
A = Area for which additional insulation is being propsed.

7. Wall insulation.
Use equation #9 for above grade walls.

8. Floor insulation.
Use equation #9.

9. Duct insulation.

Equation #10. $\Delta E = \frac{\left(\frac{1}{R_o} - \frac{1}{R_1}\right)(T_2 - T_1)\ A \times HRS}{N\ V}$

Where
R_o = 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.

10. Pipe insulation.

Equation #11. $$\Delta E = \frac{(Q_1 - Q_o)\ L \times HRS}{NV}$$

Where
Q_1 = Heat loss in Btu/hr. ft. before improvement
Q_o = Heat loss in Btu/hr. ft. after improvement
L = Length of uninsulated pipes in unconditioned space.
HRS = Number of hours per year the heating system operated in a heating season.
N = Seasonal operating efficiency of the heating system.
V = The heating value of the fuel in Btu per unit of fuel.

11. Water heater insulation.

a. If water heater is in an unconditioned space.

Equation #12. $$\Delta E = \frac{8760A\ (\frac{1}{R_o} - \frac{1}{R_1})\ (T_w - T_a)}{N_r V}$$

b. If water heater is in a conditioned space.

Equation #13. $$\Delta E = \frac{H \times A \times (\frac{1}{R_o} - \frac{1}{R_1})\ (T_w - T_a)}{N_r V}$$

Where
R_o = 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 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^oF.

12. Storm and thermal windows.

Equation #14. $$\Delta H = (U_o - U_1) \times A$$

Where
U_o = The U-value of the existing window assembly.
U_1 = The U-value of the proposed window assembly.
A = The area of the window assembly.

13. Storm and thermal doors.
Use equation #14 where:
U_o = The U-value of the existing door assembly.
U_1 = The U-value of the propsed door assembly.
A = The area of the door assembly.

14. Heat reflective and heat absorbin window or door material.

Equation #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.

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

16. Clock thermostats.
Energy savings will be given for a single 8 hour night setback.
Equation #16a $\Delta E = .07E_h$ for 5^oF setback
Equation #16b $\Delta E = .10E_h$ for 10^oF setback
Equation #16c $\Delta E = .11E_h$ for 15^oF setback

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

17. Solar domestic hot water.

Equation #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 Btus,

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 #18 $$\Delta E = \frac{10 \times PSF \times F_o}{N}$$ High estimate

$\Delta E = .6 \times$ High estimate Low estimate

b. Indirect gain-thermosiphon air panel

Energy savings for 100 square feet of panels:

Equation #19 $\Delta E = \frac{3.5 \times PSF \times F_o}{N}$ High estimate

$\Delta E = .7 \times$ high estimate Low estimate

c. Sunspace systems.

Energy savings for 100 square feet of vertical double glazing:

Equation #20 $\Delta E = \frac{5 \times PSF \times F_o}{N}$ High estimate

$\Delta E = .6 \times$ High estimate 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 seasonal efficiency

d. Window heat gain retardants

Same as equation #14

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 #21a Low estimate of $\Delta E = .8$ AWSO

High estimate of $\Delta E = 1.2$ 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 #21b Low estimate of $\Delta E = .8$ AWSO

High estimate of $\Delta E = 1.2$ AWSO

Where
AWSO = Annual Wind System Output in kwh

20. Replacement solar swimming pool heaters.

Equation #22 $\Delta E = SSF \times E_{sp}$

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.

21. Install positive shut-off's for all fireplaces or fireplace stoves.

Equation #23 $\Delta H = 1.08 (Q_o - Q_1) A$

Where

Q_o = The infiltration value in cubic feet per minute per square foot for the existing condition before improvement.
Q_1 = The infiltration value after improvement with a positive shut-off.
A = The cross sectional area of the flue or connector in square feet.

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

B. Energy conserving practices.

1. Furnace efficiency maintenance and adjustments
   a. Periodic cleaning and combustion efficiency adjustments.
   Savings for gas conversion units will be estimated at up to 15%.
   Savings for gas-designed systems will be estimated at up to 5%.
   Savings for oil heating systems will be estimated at 5% to 15%.

   b. Periodic cleaning or replacing of filters in forced air systems.
   Savings will be estimated at 5% to 10%.

   c. Fan setting on forced air furnaces reduced to 80°F if possible.
   Savings will be estimated at up to 5%.

   d. Increase fan speed,
   Savings will be estimated at up to 5%.

   e. Reduce aquastat setting to 140°F between December 1 and March 1 and 120°F between March 2 and November 30 or other reduction as appropriate to individual boiler. Savings will be estimated at 5% to 10%.

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

3. Reducing thermostat settings in winter.
Savings will be estimated at 3% per °F reduction for 24 hours per day.

4. Raising thermostat settings in summer.
Savings will be estimated at 5% per °F increase for 24 hours per day.

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

6. Reducing hot water temperatures.
Savings will be estimated at about 10% for reducing temperature from 140°F to 120°F.

7. Reducing energy use when a home is unoccupied.

a. Reducing thermostat setting to 55°F when home is unoccupied for four hours or more. Use equation #16b.

b. Turning an air conditioner off when no one is home. Savings will be estimated as up to 25% of energy used for air conditioning.

c. Turning a water heater off when a home is vacant for 2 or more days. Savings will be estimated as 1/365 of water heater jacket losses for each day the heater is turned off.

8. Plugging leaks in attics, basements, and fireplaces. Savings will be estimated as up to 30%.

9. Sealing leaks in pipes and ducts. Savings will be estimated as up to $6 per month for fixing a dripping hot water peipe or faucet. Savings for patching leaks in ducts in unconditioned spaces will be estimated as up to 15% of the energy used for space heating.

10. Efficient use of shading.
Use Equation #14.

C. 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.

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

APPROVED AS TO FORM AND LEGALITY

Dec 30 19 80

WARREN SPANNAUS, ATTORNEY GENERAL

BY H Theodore Grild

SPECIAL ASSISTANT ATTORNEY GENERAL

STATE OF MINNESOTA

ENERGY AGENCY

In the Matter of the Proposed Adoption of Rules of the Minnesota Energy Agency Governing the Minnesota Energy Conservation Service Program, 6 MCAR §§ 2.2300-2.2313.

ORDER ADOPTING TEMPORARY RULES

The above-entitled matter was published in the State Register on November 3, 1980, as proposed temporary rule pursuant to Minnesota Statutes section 15.0412, subdivision 5. After affording interested and affected persons an opportunity to submit written data and views within 20 days of the publication date, reviewing and considering the data and views, and determining that the above-captioned rules are needed and reasonable,

NOW, THEREFORE, IT IS ORDERED that these rules identified as the Minnesota Energy Conservation Service Rules 6 MCAR §§ 2.2300-2.2313 are adopted this 23 day of December, 1980, pursuant to authority vested in me by Minn. Stat. § 116H.17 (1980) as well as Minn. Stat. §§ 116.08(a) and 116H.07(i) (1978).

MARK MASON
Director