

**STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS
FOR THE MINNESOTA DEPARTMENT OF PUBLIC SERVICE**

**Proposed Rules of Department of
Public Service Relating to the
Energy Code, Minn. Rule Chapters
7670 to 7678.**

**REPORT OF THE
ADMINISTRATIVE
LAW JUDGE**

The above-entitled matter came on for hearing before Administrative Law Judge (ALJ) Richard C. Luis on December 19, 1997 at the Minnesota State Capitol (Room 123); on January 27, 1998 at the Minnesota Department of Agriculture; and on January 28, February 2 and February 20, 1998 at the Minnesota Department of Public Service.

This report is part of a rulemaking proceeding held pursuant to Minn. Stat. §§ 14.131 to 14.20 (1997 Supp.) to hear public comment, to determine whether the Department of Public Service (DPS, Department) has fulfilled all relevant substantive and procedural requirements of law applicable to the adoption of the rules, whether the proposed rules are needed and reasonable and whether any modifications to the rules proposed by the Department after initial publication are substantially different.

The Department was represented at the hearings by Julia E. Anderson, Assistant Attorney General, 1200 NCL Tower, 445 Minnesota Street, St. Paul, MN 55101. The Agency Staff's Panel was Michael Blacik, Assistant Commissioner for Energy; Bruce Nelson, registered mechanical engineer; Janet Streff and Phil Smith. On December 19, 1997, approximately 80 people attended the hearing, and 56 signed the hearing register. On January 27, 1998, approximately 60 people attended the hearing and 43 signed the hearing register. On January 28, 1998, approximately 40 people attended the hearing and 19 signed the hearing register. On February 2, 1998, approximately 30 people attended the hearing and 24 signed the hearing register and on February 20, 1998, approximately 30 people attended the hearing and 24 signed the hearing register. The hearing continued until all interested persons, groups or associations had an opportunity to be heard.

The record remained open for the submission of written comments for 20 calendar days following the last day of hearing, through March 12, 1998. Pursuant to Minn. Stat. § 14.15, subd. 1, five working days were allowed for the filing of responsive comments. At the close of business on March 19, 1998, the rulemaking record closed for all purposes. On April 20, 1998, pursuant to Minn. Stat. § 14.15, subd. 2, the Chief Administrative Law Judge granted an extension of time, through May 12 1998, for completion of this Report.

NOTICE

This Report must be available for review to all affected individuals upon request for at least five working days before the agency takes any further action on the rules. The agency may then adopt a final rule or modify or withdraw its proposed rules. If the Department makes changes in the rules other than those recommended in this Report, it must submit the rules with the complete hearing record to the Chief Administrative Law Judge for a review of the changes prior to final adoption. Upon adoption of final rules, the Department must submit them to the Revisor of Statutes for a review of the form of the rules. The Department must also give notice to all persons who requested to be informed when the rules are adopted and filed with the Secretary of State.

Based upon all the testimony, exhibits and written comments, the Administrative Law Judge makes the following:

FINDINGS OF FACT

Procedural Requirements

On October 24, 1997, the Department requested the scheduling of a hearing and the prior approval of the Additional Notice Plan. The Department filed the following documents with the Chief Administrative Law Judge:

- A. A copy of the proposed rules certified by the Revisor of Statutes.
- B. The Notice of Hearing proposed to be issued.
- C. A draft of the Statement of Need and Reasonableness (SONAR).
- D. A supplemental letter containing the Department's Additional Notice Plan

On November 3, 1997, the Department's Additional Notice Plan was approved.

On November 17, 1997, a Notice of Hearing and a copy of the proposed rules were published at 22 State Register 771. (DPS Ex. 4)

On November 12, 1997, the Department mailed the Notice of Hearing to all persons and associations who had registered their names with the Department for the purpose of receiving such notice. (DPS Ex. 5)

At the hearing, the Department placed the following additional documents in the record:

- A. The Department's Request for Comments published in the State Register on December 2, 1996 at 21 State Register 813. (DPS Ex. 1)

- B. The Department's proposed rules, dated November 4, 1997, including the approval of the Revisor of Statutes. (DPS Ex. 2)
- C. The Statement of Need and Reasonableness. (DPS Ex. 3)
- D. The Notice of Hearing as mailed and as published in the State Register. (DPS Ex. 4)
- E. The Certificate of Mailing the Notice of Hearing. (DPS Ex. 5)
- F. The Certificate of Mailing List certifying that the rulemaking mailing list is accurate, complete, and current. (DPS Ex. 6)
- G. The Certificate of Faxing Additional Notice. Certifying the Department faxed a press release to an attached list of media. (DPS Ex. 7)
- H. The Certificate of Faxing Additional Notice. Certifying the Department faxed a press release to 27 associations. (DPS Ex. 8)
- I. The Certificate of Mailing the Supplemental Notice of Hearing. Certifying that a copy of the Notice of Hearing was mailed to the Department's supplemental mailing list. (DPS Ex. 9)
- J. The Certificate of Additional Notice. Certifying that the proposed rules and Notice of Hearing were available on the Department's website. The Statement of Need and Reasonableness was not available on the website as approved in the Additional Notice Plan. (DPS Ex. 10)
- K. A copy of the transmittal letter showing that the Department sent a copy of the SONAR to the State Legislative Reference Library. (DPS Ex. 11)
- L. Copies of written comments received by the agency after publication of the Notice of Hearing and two comments which were dated prior to the publication of the Notice of Hearing. (DPS Ex. 12)
- M. List of energy code definitions. (DPS Ex. 13)
- N. Summary sheet of the proposed modifications to the rules as published and rules showing the modifications. (DPS Ex. 14)
- O. Minutes or agendas, and attendance sheets of energy code rulemaking committee meetings. (DPS Ex. 15)
- P. List of additional persons who received a copy of the proposed rules and/or the SONAR. (DPS Ex. 16)
- Q. Star Tribune Articles published from October 12 through October 15, 1997. (DPS Ex. 17)
- R. A copy of Minn. Stat. § 16B.165. (DPS Ex. 19)

- S. A copy of the Testimony of John Crouch, Director of Government Affairs, Hearth Products Association, dated December 19, 1997. (DPS Ex. 20)
- T. The Certificate of Mailing the Notice of Hearing for the January 27, 1998 hearing. (DPS Ex. 28)
- U. The Certificate of Faxing a Notice of Continuation of Hearing for the January 27, 1998 hearing. (DPS Ex. 29)
- V. The Certificate of Faxing a Notice of Continuation of Hearing for the January 27, 1998 hearing. (DPS Ex. 30)
- W. Copies of Minutes of the MNBO Energy Committee Meeting. (DPS Ex. 31)
- X. Copies of 21 written comments. (DPS Ex. 32)
- Y. Copies of 5 written comments. (DPS Ex. 54)
- Z. The Certificate of Mailing the Notice of Continuation of Hearing for the February 20, 1998 hearing. (DPS Ex. 58)
- AA. A copy of a comment from Lloyd West. (DPS Ex. 60)

6. The following exhibits were inadvertently omitted from admission to the record during the course of the hearing and are hereby admitted: Public Ex. 45, Comments of the Residential Ventilation Standards Task Force; Public Ex. 57, Comment from Robert A. Dilks, CEO/President of Boss Aire, dated February 2, 1998; and DPS Ex. 59, The Certificate of Mailing the Notice of Continuation of Hearing for the February 20, 1998 hearing. In addition, the Department submitted the following post-hearing exhibits for inclusion into the rule record:

Exhibit 63 - The Notice and Proposed Rule published in the State Register (S.R.) on October 13, 1997; the December 2, 1997, letter from Administrative Law Judge George A. Beck approving the rescission of the January 1, 1998 effective date for the R-2000 program in Minn. Rule part 7670.1115; and a copy of the December 22, 1997 S.R. where the adopted rule was published;

Exhibit 64 - copies of 12 written comments received by the Department since February 20, 1998;

Exhibit 65 - copies of the following documents:

“The Vapor Chase - Paper or Plastic?” and “The Vapor Chase,” Remodeling magazine, January, 1988;

“Beauty of Category I houses is more than just skin deep,” St. Paul Pioneer Press, March 10, 1998;

“Deaths From Unintentional Carbon Monoxide Poisoning and Potential for Prevention With Carbon Monoxide Detectors,” The Journal of the American Medical Association (JAMA), March 4, 1998, pages 685-687;

“Can Moisture Beat Housewrap?” Journal of Light Construction (JLC), June, 1997, pages 9 and 14;

"The Effectiveness of Housewrap," Energy Design Update, August 1995;

"Head Scratcher of the Month -- Housewrap - Induced Moisture Problems," Energy Design Update, August, 1995, pages 5 - 8;

"Taping for Tightness -- Some Astonishing Results," Energy Design Update, April, 1987, pages 5 and 6; and

1995 Building Code of Canada, section 9.32.3, Heating Season (Mechanical) Ventilation.

Department Exhibits 63, 64, and 65 are admitted to the record.

7. The Department made the following procedural errors in the rulemaking process:

The SONAR was dated November 14, 1997, and the Notice of Hearing was dated November 3, 1997. Minnesota Statutes § 14.131 requires that before the agency orders the publication of a rulemaking notice required by section 14.14, subdivision 1a, the agency shall prepare, review, and make available for public review a statement of the need for and reasonableness of the rule. In this case, the SONAR should have been dated or finalized before the date of the Notice of Hearing, at least by November 2, 1997.

The Statement of Need and Reasonableness did not contain information on the probable costs to other agencies and any anticipated effect of the rules on state revenues as required by Minn. Stat. § 14.131, clause 2.

The agency sent a copy of the SONAR to the Legislative Coordinating Commission instead of the legislative reference library as required by Minn. Stat. § 14.131.

The agency did not include a copy of the SONAR on the agency's website as approved in the November 3, 1997 Additional Notice Plan

It is found that the procedural errors did not deprive any person or entity of an opportunity to participate meaningfully in the rulemaking process. Therefore, the Administrative Law Judge disregards the agency's failure to comply with the above procedural requirements and finds the agency's errors to be harmless errors under Minn. Stat. §14.14, subd. 5.

8. The documents were available for inspection at the Office of Administrative Hearings from the date of their filing.

Authority to Adopt Rules

9. The Department contends that it has the statutory authority to adopt these rules under Minn. Stat. § 216C. 19, subd. 8, which provides:

In recognition of the compelling need for energy conservation in order to safeguard the public health, safety, and welfare, it is necessary to provide building design and construction standards consistent with the

most efficient use of energy. Therefore, the commissioner shall, pursuant to chapter 14, adopt rules governing building design and construction standards regarding heat loss control, illumination and climate control. To the maximum extent practicable, the rules providing for the energy portions of the building code shall be based on and conform to model codes generally accepted throughout the United States. The rules shall apply to all new buildings and remodeling affecting heat loss control, illumination and climate control. The rules shall be economically feasible in that the resultant savings in energy procurement shall exceed the cost of the energy conserving requirements amortized over the life of the building. The rules adopted pursuant to this subdivision shall be part of the state building code. Notwithstanding the provisions of this subdivision, all applications for approval of building specifications and plans may be submitted to the state building inspector as provided in section 16B.66.

The Department also cites Minn. Stat. §§ 216C.195, 216C.27, subd. 8 and 16B.165 as additional statutory authority for the adoption of the rules. Section 216C.195 provides that the commissioner of public service, not later than September 1, 1992, shall adopt amendments to the energy code to implement energy-efficient standards for new commercial buildings. With the 1992 rule deadline, this section would have been applicable for earlier amendments to the energy code, but is not applicable to the amendments that are under consideration in this proceeding.

Minn. Stat. § 216C.27, subd. 8 mandates conditions that the standards concerning heat loss, illumination, and climate control adopted under section 216C.19, subd. 8 must meet, but the statute itself does not give the agency authority to adopt the rules. That authority is contained in section 216C. 19, subd. 8.

The remaining statutory authority cited by the Department is Minn. Stat. § 16B.165. That statute provides:

Subdivision 1. **Energy efficiency.** By August 1, 1991, the commissioner of public service, in consultation with the commissioner of administration, shall solicit outside information under section 14.10, on proposed amendments to the Minnesota building code. The commissioner shall begin rulemaking to adopt the amendments by February 1, 1993. So far as is compatible with interests of public health and safety, the amendments must be designed to equal or exceed the most energy-conserving codes adopted by any other state. To the extent practicable, the codes must equal or exceed the model conservation standards proposed by the Pacific Northwest Power Planning Council for climate zones having 8,000 to 10,000 heating degree days.

Subd. 2. **Energy efficiency; commercial heating, ventilation, and air conditioning.** By August 1, 1991, the commissioner of public service shall solicit outside information

under Minnesota Statutes, section 14.10, on proposed codes or standards for commercial heating, ventilation, and air conditioning systems and installations to assure that new and remodeled commercial development in Minnesota is as energy efficient as practicable and compatible with public health and safety. The commissioner shall begin rulemaking to adopt the codes by February 1, 1993.

10. The Builders Association of Minnesota (BAM) requests that the rules proposed by the Department be rejected as being beyond the agency's rulemaking authority. BAM argues that the Department is limited under Minn. Stat. § 216C.19 subd. 8, only to propose rules which are "based on and conform to model codes generally accepted throughout the United States." BAM contends that the Department of Public Service is wrong to rely on Minn. Stat. § 16B.165 as a mandate by the legislature to develop an energy code that must meet or exceed the most stringent code in the nation. (SONAR p. 19).

BAM argues that under Minn. Stat. § 16B.165 it is the Commissioner of Administration, not the Commissioner of Public Service that has the rule making authority to develop the stringent energy code and it is only the role of the Commissioner of Public Service to solicit outside information on the code. BAM states that Minn. Stat. § 16B.01, subd. 3 defines the word "commissioner" as "the commissioner of administration." Therefore, the use of the word "commissioner" in subd. 1 means "commissioner of administration" and not the commissioner of public service.

BAM maintains that the two different agencies have been given different mandates. The Department of Public Service has the authority to adopt an energy code which is generally accepted throughout the United States and the Commissioner of Administration has the authority to develop an energy code "which is at least as conservation minded as any in the nation..." (BAM Memorandum 12/17/97.)

11. The Department asserts that it has the authority under Minn. Stat. § 16B.165, subd. 1 to promulgate the energy code. In reviewing the legislative history, the DPS argues that when the statute was originally drafted, the commissioner of administration had the authority for rulemaking. The legislative history shows that the bill was later amended in both subdivisions to provide that the commissioner of public service, in consultation with the commissioner of administration, shall solicit outside information. In reference as to why the change was made, the legislative history submitted by the Department states that testimony was given by Representative Andy Dawkins that the amendment was a technical amendment requested by the two Departments "to switch which of the two will be the lead agency in developing the proposed changes to our building code." (DPS Memorandum 3/12/98, citing Legislative Hearing Tapes of the House Commission on Energy, March 25, 1991.)

12. The legislature did not make any amendment to the word "commissioner" in either of the subdivisions. The Department disagrees with

BAM's interpretation that commissioner can only be defined as "commissioner of administration." The Department points out that the definition of commissioner under Minn. Stat. § 16B.01, subd. 1 contains a qualifier, that "commissioner" means the commissioner of administration "unless the context clearly indicates otherwise."

The Department maintains that the "context" of the statute, in light of the legislative history, leads to the conclusion that the term "commissioner" refers to the Commissioner of Public Service and that the Department of Public Service has the authority for the rulemaking with the Department of Administration in a consulting role. In addition, the Department states that since 1991, the Department has used Minn. Stat. § 16B.165 as a basis for rulemaking by the Department to amend the energy code. Until this rulemaking, the Department notes that their authority to adopt amendments to the energy code under either Minn. Stat. §§ 216C.19, subd. 8 and 16B.165 has not been challenged by BAM or any other interested party.

13. The Administrative Law Judge finds that the DPS has statutory authority under both Minn. Stat. §§ 216C.19, subd. 8 and 16B.165 to adopt the rule amendments. The Department clearly has the statutory authority under Minn. Stat. § 216C.19, subd. 8 to "adopt rules governing building design and construction standards regarding heat loss control, illumination and climate control." The Administrative Law Judge disagrees that this statute should be read as narrowly as BAM contends - that the Department must adopt an energy code that is "generally accepted throughout the United States." (BAM Memorandum, 12/17/98.)

Subdivision 8 does not dictate that the building design and construction standards adopted by the Department cannot be more stringent than the model codes generally accepted. Rather, the statute states: "to the maximum extent practicable, the rules providing for the energy portions of the building code shall be based on and conform to model codes generally accepted throughout the United States." The Department is given some leeway by the use of the phrase "to the maximum extent practicable" as to how its rule amendments must conform to model codes. The Administrative Law Judge concludes that the legislature built flexibility into the statute to allow the Department to use the model codes as a basis for the rule, but also provided the Department the authority to depart from model codes, of the United States or other countries, where appropriate.

14. The Administrative Law Judge finds also that the Department has statutory authority to adopt these rules under Minn. Stat. § 16B.165. A review of the record, including the legislative history, shows the intent of the legislature to give the Department additional authority to adopt parts of the Minnesota building code. The Administrative Law Judge is persuaded by the legislative history and the argument of the Department that the Department of Administration was given the authority originally to adopt the energy rules, but that after an agreement between the two agencies, the authority was changed by the legislature from the Department of Administration to the Department of Public Service. (DPS

Memorandum, 3/12/98, citing Legislative Hearing Tapes of the House Commission on Energy, March 25, 1991.) In addition, the Administrative Law Judge concludes that in the context of the entire statute, the term “commissioner,” at this location in the statute, means the Commissioner of Public Service. (Minn. Stat. § 16B.01, subd. 1) With the roles of the agencies having changed, the meaning of the word “commissioner” would also change to conform to the change of Department roles.

The Department has used Minn. Stat. § 16B.165 as its statutory authority since 1991 for the adoption of the energy code amendments, and there has been no objection to the use of that authority by the interested parties or by the legislature itself. In addition, in the Department of Administration’s publication of the Request for Comments on Planned Rules and Amendment to Rules Governing the Minnesota State Building Code, 22 S. R. 201, that department does not cite Minn. Stat. § 16B.165 as authority for the rulemaking. (T. 94-95.) This is further evidence that the Department of Administration does not consider Minn. Stat. § 16B.165 to be its rulemaking authority for the adoption of the building code amendments.

15. It is found that the Department of Public Service has the statutory authority to adopt the proposed rules.

Legal Considerations

16. Under Minn. Stat. § 14.14, subd. 2, and Minn. Rule 1400.2100, one of the determinations which must be made in a rulemaking proceeding is whether the agency has established the need for and reasonableness of the proposed rule by an affirmative presentation of the facts. In support of a rule, an agency may rely on legislative facts, namely general facts concerning questions of law, policy and discretion, or it may simply rely on interpretation of a statute, or stated policy preferences. Manufactured Housing Institute v. Petterson, 347 N.W.2d 238, 244 (Minn. 1984); Mammenga v. Department of Human Services, 442 N.W.2d 786 (Minn. 1989). The Department has prepared a Statement of Need and Reasonableness (“SONAR”) in support of the proposed rules. At the hearing, the Department primarily relied upon the SONAR as its affirmative presentation of the need and reasonableness for the amendments. The SONAR was supplemented by the comments made by the Department at the public hearing (including written comments on the staff’s proposed changes) and in its written post-hearing submissions dated March 12 and March 19, 1998.

The question of whether a rule has been shown to be reasonable focuses on whether it has been shown to have a rational basis, or whether it is arbitrary. Minnesota case law has equated an unreasonable rule with an arbitrary rule. In re Hanson, 275 N.W.2d 790 (Minn. 1978); Hurley v. Chaffee, 231 Minn. 362, 367, 43 N.W.2d 281, 284 (1950). Arbitrary or unreasonable agency action is action without consideration and in disregard of the facts and circumstances of the case. Greenhill v. Bailey, 519 F.2d 5, 10 (8th Cir. 1975). A rule is generally found to be reasonable if it is related rationally to the end sought to be achieved by the governing statute. Mammenga v. Dept. of Human Services, 442 N.W.2d

786, 789-90 (Minn. 1989); Broen Memorial Home v. Minnesota Dept. of Human Services, 364 N.W.2d 436, 444 (Minn. App. 1985). The Minnesota Supreme Court has further defined an agency's burden in adopting rules by requiring it to "explain on what evidence it is relying and how the evidence connects rationally with the agency's choice of action to be taken." Manufactured Housing Institute v. Pettersen, 347 N.W.2d 238, 244 (Minn. 1984). An agency is entitled to make choices between possible approaches as long as the choice it makes is rational. Generally, it is not the proper role of the Administrative Law Judge to determine which policy alternative presents the "best" approach since this would invade the policy-making discretion of the agency. A rule cannot be said to be unreasonable simply because a more reasonable alternative exists, or a better job of drafting might have been done. The question is rather whether the choice made by the agency is one a rational person could have made. Federal Security Administrator v. Quaker Oats Company, 318 U.S. 218, 233 (1943).

17. In addition to need and reasonableness, the Administrative Law Judge must assess whether the legislature has granted statutory authority to the agency, whether the agency has complied with proper rule adoption procedures, whether the rule grants impermissible discretion to agency personnel, whether the rule is unconstitutional or illegal, whether the rule constitutes an improper delegation of authority to another entity, or whether the proposed language is impermissibly vague. Minn. Rule 1400.2100.

18. Where the Department has proposed changes to the rules after publication in the State Register, the Administrative Law Judge must determine if the new language is substantially different from that which was proposed originally. Minn. Stat. § 14.15, subd. 3 (1996). The standards to determine if the new language is substantially different are found in Minn. Stat. § 14.05, subd. 2 (1996).

Analysis and Overview of the Proposed Rules

19. This Report is limited generally to discussion of the portions of the proposed rules that received significant critical comment or otherwise require examination. Accordingly, this Report will not discuss each proposed rule, nor will it respond to each comment which was submitted. Persons or groups who do not find their particular comments referenced in this Report should know that each and every submission has been read and considered. Moreover, because many of the proposed rules were not opposed, and were adequately supported by the SONAR, a detailed discussion of each section of the proposed rule is unnecessary.

In this rule proceeding, there were many comments from interested persons which suggested changes in the rules with respect to the issues of mechanical ventilation, depressurization and other issues. A number of the comments reflected different approaches to building construction that resulted in alternative specific proposals. The Department, in an exercise of its discretion, has not incorporated many of these suggestions into the rules as finally proposed. The Administrative Law Judge has read all the proposals as well. In

those instances where the Department has not agreed with or endorsed a commentator's proposal not mentioned specifically in this Report, it is found that the DPS had a rational basis for its decision.

The Administrative Law Judge finds specifically that the Department has demonstrated the need for and reasonableness of provisions of the rules that are not discussed in this Report, that such provisions are within the Department's statutory authority noted above, and that there are no other problems that prevent their adoption. Where changes were made to the rule after publication in the State Register, the Administrative Law Judge must determine if the new language is substantially different from that which was proposed originally. Minn. Stat. § 14.15, subd. 3 (1996). Unless mentioned specifically, any language proposed by the Department which differs from the rule as published in the State Register and is not discussed in this Report is found not to be substantially different.

20. In addition to the specific changes proposed for provisions of the current Energy Code (Minn. Rule Ch. 7670), and the amendments of and additions to the published proposals at various stages of the hearing process, it is noted that a major change is proposed for the organization of the rules. Chapter 7670 is to be repealed ultimately, and its provisions repositioned and expanded, where necessary, among new Chapters 7672 (one – and two – family residential housing), 7674 (multifamily residential buildings of three stories or less) and 7676 (all other buildings). An additional new Chapter (7678) is proposed to provide tables and calculations for determining compliance with Chapters 7670 (until repealed), 7672, 7674 and 7676.

21. Many of the definitions, compliance standards and tables in the rules are applicable to all types of buildings, with the greatest duplication found when comparing Chapters 7672 and 7674 (the two types of "low-rise" residential housing). The Department proposes that each chapter repeat the applicable rules, even if they are duplicative of rules stated already in earlier chapters, so that the readers (homeowners, builders and inspectors) can access the applicable standards within the discreet rule chapters that apply to the type of building that concerns them at the time. This general reorganization is found to be necessary and reasonable and does not constitute a defect due to duplication.

22. Since the initial publication of the proposed rule changes in the State Register on November 4, 1997, the Department has proposed additional changes on three occasions – at the hearing on the first day of the proceedings (the "December 18, 1997 amendments"), at the end of the Comment period on March 12, 1998, and finally at the end of the "Response to Comments" period on March 19, 1998. Unless the context indicates otherwise, the version commented upon in this Report is the rules as proposed finally on March 19, 1998.

Need for and Reasonableness of Specific Rule Proposals

23. Most of the comments (and controversy), both oral and written, centered on the proposals for parts 7672.0900 (Mechanical Systems), particularly 7672.0900, subpart 9 (Protection against depressurization) and

7672.1000 (Residential Ventilation System). Many of the changes proposed for parts of Chapter 7672 are repeated in other chapters, particularly in Chapter 7674, which applies particularly to another type of residential housing (low-rise apartments). Unless stated otherwise, or where the context implies clearly otherwise, any Findings in this Report regarding specific proposals for Chapter 7672 apply as well to the comparable proposals in Chapters 7674 and/or 7676.

24. Minn. Stat. § 14.131 requires an agency seeking to adopt or amend its rules to explain, in writing, the facts establishing the reasonableness of any proposed rules. "Reasonableness" means that there is a rational basis for the Department's proposed action. The agency must set forth reasons which are not arbitrary or capricious, and which establish that the solution proposed by the Department is appropriate. Pursuant to § 14.131, the Statement of Need and Reasonableness must include certain areas of explanation to the extent that the agency, through reasonable effort, can ascertain the information. They are:

- (1) A description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule;
- (2) The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rules and any anticipated effect on state revenues;
- (3) A determination of whether there are less costly or less intrusive methods for achieving the purpose of the proposals;
- (4) A description of any alternative methods for achieving the purpose of the proposed rule that were considered seriously by the agency and the reasons why they were rejected in favor of the proposals advanced;
- (5) The probable costs of complying with the proposed rules; and
- (6) An assessment of any differences between the proposed rules and existing federal regulations and a specific analysis of the need for and reasonableness of each difference.

The Statement of Need and Reasonableness must also describe the agency's efforts to provide additional notification to persons or classes or persons who may be affected by the proposed rules or must explain why these efforts were not made.

It is found that the Department of Public Service has complied with the above-noted statutory requirements in its Statement of Need and Reasonableness filed on November 17, 1997, as detailed below.

25. With respect to statutory standards (1) through (6), as noted in the preceding Finding, the Statement of Need and Reasonableness meets the statutory standards, as specified below.

The classes of persons who will probably be affected by the rules are citizens of the state who build new homes, remodel existing homes, build new multi-family and commercial buildings (or remodel them) and the persons who occupy the spaces or own the buildings. Contractors and subcontractors performing construction work will be affected by the rules as will architects, engineers and building officials (particularly inspectors). Manufacturers of gas appliances and persons who conduct business in the hearth products industry (fireplaces, etc.) will be affected, as will manufacturers of windows.

The most prominent additional costs are those incurred through implementing the installation of newly-required residential ventilation systems in 1-2 family residences. New homeowners will bear the additional costs to add a residential ventilation system, but they will also be the ones who benefit from its installation, according to the Department. Additional costs may also be borne by appliance manufacturers who will be required to add or streamline their power-vented and sealed combustion appliances, and by contractors who initially may expend more labor learning to install the required residential ventilation systems.

26. Regarding the probable costs to the Department and other agencies of implementing and enforcing the rules, or any anticipated effect of the rules on state revenues, the DPS notes that it will expend the remainder of a federal grant to start the implementation of the new code revisions. After those monies are spent, implementation will predominantly be performed through the use of the Energy Information Center staff at the Department and through enforcement by building officials. The Department estimates that building inspection times will be increased by only approximately ten minutes to complete all the inspections necessitated by implementation of the proposals. The DPS believes that the additional costs to building inspection jurisdictions to increase energy inspections resulting from the new proposals is negligible.

27. With regard to less costly or less intrusive methods for achieving the purpose of the proposals, one influential factor is the price of energy. If the price of energy increases significantly, the use of the commodity by the homeowners is likely to decrease and, in part, to achieve a stated purpose (less energy consumption) of the proposed rules. Of course, fuel price changes are beyond the authority of the Department.

The providing of information to designers, builders, code officials and homeowners will also help achieve the purpose of the proposed rules. The Department notes that it already devotes substantial resources to that end.

The purpose of the proposed rules could also be served if new technology were made available to the Minnesota building industry. Development of new technology is another area that is beyond the capability and authority of the DPS.

With respect to specific proposed building code changes, the Department investigated a number of alternatives to achieve the purpose of its proposals. The details of several of these alternatives regarding residential buildings are discussed in the Statement of Need and Reasonableness. The DPS maintains it

has kept the costs of compliance to a minimum, meeting the need to update the Energy Code, consistent with the goals of public health and safety.

28. The Department considered seriously a number of alternative approaches to several of the proposed rule provisions. The SONAR details the approaches that were considered in each of these several areas, and lays out the reasons why they were rejected in favor of the proposed rules.

29. Where the Department has deemed it appropriate, individual costs for complying with specific items are analyzed under each applicable subpart in the SONAR. In its general Statement of Need and Reasonableness, the Department presents a broad analysis covering all types of buildings and how the adoption of the proposed rules will affect the costs of design, enforcement, construction and the operation of future buildings.

The DPS expects that proposed rules will reduce the cost of buildings to building owners and the state as a whole. Some of these savings will be due to energy savings. More significantly, savings will result because of significant improvement in long-term durability of buildings. Other significant savings, though difficult to quantify, incur from the improved health of the occupants of buildings constructed to the new standards.

30. There are no differences between the proposed rules and existing federal regulations, but the SONAR notes that there are two major interrelationships between the Department and federal agencies. It notes that the appliance and equipment efficiencies listed in proposed chapter 7678 are identical to federal requirements in the National Appliance Energy Conservation Act and the Energy Policy Act of 1992. Also, the Energy Policy Act of 1992 contains requirements for state energy codes. For residential buildings, the Act provides that all states must make a determination and submit a certification to the U.S. Department of Energy stating whether it is appropriate for the state energy code to be not less stringent than the Model Energy Code (1995 Edition). The Department has submitted such certification, and contends that Minnesota has in fact achieved that status.

31. The Department has made an effort to inform persons who may be affected by the proposed rule changes through a variety of methods. In addition to publication in the State Register and the mailing of notice to all on the Department's general list of persons requesting rulemaking notices, additional notice of the rule proposals and the hearing was made by mailing to all persons on the Energy Code Advancement Project (ECAP) mailing list. This is a list of 300 individuals, associations and corporations which include building inspectors, home builders, consumer groups and other affected parties, including all members of the committees which helped in the development of the proposed rules. The Department also issued a press release prior to publication of the notice of hearing in the State Register, which release discussed the nature of the proposed rules, gave the time and location of the public hearing, and explained how persons can receive a copy of the notice and proposed rules. The release was distributed to a list of general media, including all daily newspapers in the

state, the Associated Press and other wire services, and certain television and radio stations. A separate press release was distributed to a list of 27 associations whose members have special interest in the subject matter of this rulemaking.

32. Adoption of the proposed rules will affect design, construction and operation of future buildings. The DPS anticipates also that the new standards ultimately will reduce inspection (enforcement) costs in a manner that will offset the extra time involved for inspectors to learn the new rules initially.

The Department maintains that several of the proposed rule amendments simplify designs which could result in lower costs. For instance, U-value tables at proposed part 7678.0500 will simplify many designs using that procedure for envelope components. The Department proposes also several simplified compliance tools in chapters 7672, 7674 and 7676 that it maintains will save design time, such as "cookbook" procedures proposed for residential buildings at proposed part 7672.0800 and the simplified computerized design tools proposed for adoption by reference for each building type. Code requirements for heating, ventilating and air conditioning (HVAC) and service water heating for each building type are simplified also. The Department maintains that the design savings that result can lower considerably design costs, which typically account for 3-10% of total building costs.

33. As with design, the Department maintains the simplification and removal of ambiguities in the rules proposed will result in cost savings for enforcement. The new proposals feature a specification of details as minimum standards in parts 7672.0600, 7674.0400 and 7676.0600 regarding Minimum Envelope Criteria. The Department has received information from building officials to the effect that energy inspections are adding only an average of ten minutes to all other inspections, and maintains that the addition of the tools noted in this Finding serve to reduce that extra time.

34. The proposed changes will mean that some elements of construction will be more costly. The Department recognizes that first cost is a critical element for all building types, but it contends that any increase in cost will be recovered in time by other cost reductions. It is expected that the considerable cost of repairs will be saved significantly by "building right" in the first instance. One of the major purposes of the proposed amendment is to increase building durability. Since much of remodeling expenses are the correction of problems that might have been avoided with proper construction practices, such as those required in the proposed rule, the Department expects that savings will result on balance.

The proposed revisions for one- and two-family residential buildings (Chapter 7672) are more significant than for the other building types, and construction costs will be more significantly affected. Requirements for protection of the exterior envelope are expanded significantly in part 7672.0600. Overall, the Department expects that costs of walls will increase slightly, and the cost for ceilings will also increase slightly.

35. The most significant change affecting costs are new requirements for residential ventilation systems and provisions of make-up air as protection against depressurization. Both of these provisions are new and mean additional costs. The Department maintains that these new requirements will, however, provide long range savings benefits in building durability and occupant health. The Department urges the affected public to consider the costs for installing residential ventilation systems in conjunction with the energy "liability" associated with providing currently required levels of ventilation and then to estimate the energy savings associated with tightening the building envelope while providing mechanical ventilation for indoor air quality. The Department points to a study which used various alternative scenarios to reduce the infiltration rate (by "tightening" the house envelope) while providing ventilation, which study yielded a methodology advanced in the proposed rules. Average annual cost savings of \$550 paid for the initial costs of compliance in a period of less than five years, when the savings were projected out over the total cost of air tightening efforts plus mechanical ventilation. Several other studies detailed in the SONAR showed that the Department's proposals are economically beneficial in the long run.

The SONAR acknowledges that the initial outlay of money is considerable to meet the minimum proposed code in certain situations. The largest costs noted are for installation of a sealed combustion furnace, a power-vented hot water heater and an air-to-air heat exchanger. These costs are \$3,900 for a 3,000 square foot home and \$4,420 for a 3,750 square foot home. However, the Department expects that these numbers will fall dramatically once the appliances become those most commonly used, as has been the case since the adoption of a similar code in Canada.

In summary, the Department maintains that investing money in energy efficient construction makes fiscal sense. While the additional costs of the proposed amendments for one- and two-family residential buildings are offset directly by energy savings, there are also the less tangible and more long-range benefits of increased building durability and health benefits to occupants.

36. Many of the affected stakeholders and interest groups that have participated heavily in this proceeding have argued for a delay in time, both in the conduct of the hearing and the implementation of the proposed rules. The Residential Ventilation Standards Task Force (RVSTF) initially recommended a delay in the hearing of 60 days beyond the date for convening of the first hearing (December 19, 1997). Since the hearing did not finish on December 19, and could not be reconvened until January 27, 1998 because of the vagaries of the Administrative Law Judge's schedule, a 39-day "delay" was created by simple default. The delay was prolonged because of the extensive oral presentations made by interested parties who waited patiently through four more days of hearings, such that the testimonial portion of this proceeding did not close until February 20, 1998. As a result, the 60-day delay requested by the Task Force was accomplished.

Certain members of the task force and other interest groups, particularly the Builders Association of Minnesota (BAM) argue that the standards proposed are unproven and require more time and study before the agency can adopt its rules. The Administrative Law Judge will not intervene to impose such a delay. It is within the agency's discretion to delay adoption of the rules until six months after the issuance of the Administrative Law Judge's Report. It is assumed that follow-up studies in certain "experimental" houses where the proposed standards are being applied and observed in practice, will be available to the Department during that interim.

It is noted further that the legislature, in Minn. Laws 1998, Ch. 366, Sec. 88 provided that none of the rules proposed in this proceeding can take effect before May 1, 1999. This session law from the 1998 legislature builds in what appears to be an appropriate amount of time for education of the affected public on the impact of the new proposals, should the Department decide ultimately to adopt them. In that connection, it is found that amendment of the "Effective date" provisions of any of the proposed rules to conform with the 1998 legislation is necessary, reasonable and does not constitute a substantial change.

Mechanical Systems and Residential Ventilation Requirements

37. The proposed Energy Code revisions change the minimum requirements for 1-2 family residential buildings from Category 2 construction to Category 1 construction, requiring increased envelope protection in the form of air sealing for building components and the installation of a residential ventilation system. The Department maintains that the change from Category 2 to Category 1 construction requirements further its efforts to promote energy efficient building design and construction standards, and are responsive to problems and concerns about current building practices reported by builders, building officials, building occupants and researchers. The rules adopted in 1994 established two categories of residential construction for new homes – Category 2 standards were established as minimum requirements, and Category 1 standards provided for a voluntary increase in energy efficient construction. The Department's intent at that time was to provide a voluntary phase-in period for the industry to improve construction practice significantly. Category 2 buildings provide minimum code requirements that rely on operable windows and doors to meet ventilation standards year around.

38. The 1994 code required a conversion to R2000 construction on July 1, 1998. In the interim, the Department realized that Minnesota's building industry is not prepared to comply with the R2000 requirements for all new housing. A need exists to revise the rules to mandate requirements that correspond to the realistic capabilities of the industry while assuring that buildings built to the new requirements will meet health and safety standards. The Department maintains that the necessary level of understanding and aptitude is met by imposing now Category 1 construction requirements, which have become increasingly familiar to Minnesotans through the implementation of the present code.

39. With the energy crisis of the 1970s, air tightening of the building envelope increased and mechanical systems also changed as furnace efficiencies improved. These two changes resulted in exhausting less house air up chimneys and reduced air changes dramatically, causing potential backdraft problems while increasing moisture levels in the house, a combination that can lead to decreased indoor air quality and a possible loss of building durability. Moisture problems, backdrafting and leaky ducts lead to higher energy costs and create problems for health, safety and building durability which the Department attempts to address by making Category 1 construction practices the minimum standard.

40. The Department is persuaded by the number of moisture problems in Minnesota homes that residents do not use operable windows as intended for ventilation in the winter, when it becomes too cold, or in the summer, when the weather becomes hot and persons rely on internal air conditioning. The presence of excess moisture in homes causes problems ranging from mold and mildew, condensation on windows and walls, poor air quality inside, decreased thermal value of insulation, deterioration of building materials and possible structural damage. While moisture is considered a major cause of structural damage and can reduce a building's durability, the molds created by excess moisture may also create health issues for occupants of buildings. The Department believes that mechanical ventilation will be used by occupants to provide the necessary year-round ventilation that operable windows were intended to provide, but do not. Residential ventilation systems will assure ventilation in lower relative humidities to help eliminate mold growth on windowsills and other window components. Additional air tightening will prevent condensation from deteriorating the structure by providing a tighter building envelope and will also help to prevent or reduce the formation of ice dams.

Category 1 construction practices proposed by the Department will require the sealing of ducts, which it maintains will help prevent problems such as the backdrafting of furnaces or depressurization of basements that causes moisture or soil gasses to be drawn into houses when heating ducts are leaking. Leaks in supply ducts can also pressurize floor or ceiling cavities and can force warm, moist air into wall cavities and cause damage to building siding.

41. Backdrafting can occur when there is insufficient make-up air for exhaust appliances, which include kitchen fans, bathroom fans, clothes dryers, fireplaces and other exhaust fans. When insufficient make-up air is available, the exhausting appliances produce pressures that can exceed the ability of buoyancy-vented appliances to establish draft of their combustion byproducts, including carbon monoxide. These results make backdrafting a health and safety (as well as comfort) concern. Due to the trend to build tighter houses, that reduce air infiltration to prevent moisture from getting into the wall cavity, natural ventilation through uncontrolled air leaks in the building envelope cannot be relied upon to balance the "exhales" from a powerful stove top, bathroom or dryer exhaust fan. The trend in home construction is to build ever larger overhead range hoods, and some downdraft cooktops require as much as 1,000 cubic feet

of air per minute to replace what they pull out of a room. Such fans are effective at removing odors and humidity, but also pose significant risks of inducing furnace backdrafting due to house depressurization caused by their capacity.

42. Exhaust only ventilation systems pose a backdrafting threat, the Department maintains. Because the widespread use of larger exhaust ventilation systems do not mesh well with tighter houses, exhaust only ventilation has led to increased potential for combustion gas spillage due to greater negative pressurization of the home. Problem levels of depressurization occur when the suction created by exhaust devices is sufficient to overcome the natural draft of a chimney during the off-cycle of a furnace. If the exhaust demand comes from more than one appliance that displaces a significant amount of air, excessive depressurization can be deadly. The depressurization can speed the entrance of radon and other soil gasses into the house and can increase air filtration through the building shell, through which mold spores may be drawn from the structural cavities during such periods of negative pressure, exacerbating or causing allergy problems. It is accepted generally that a depressurization of a negative 5 Pascals can cause problems for "natural draft" appliances.

43. The proposed code revisions are an attempt to address the issues of backdrafting and depressurization by requiring sealed combustion or power-vented appliances to reduce the possibility of backdrafting. In addition, tests for combustion safety are required when additions to existing homes are built. Airtight construction techniques implemented without the provision of adequate ventilation can contribute to high concentrations of airborne contaminants emanating from building materials and generated from household activities. The Department is concerned also that the byproducts of combustion, if not vented properly, can cause eye, nose and throat irritation, impair lung functions and increase respiratory infections. Specifically, carbon monoxide can cause fatigue and chest pain at low levels, and at higher concentrations may impair vision and coordination, and cause headaches, dizziness, confusion and nausea.

44. Increased insulation and weatherstripping has made homes much tighter. In the past, homes had considerable air exchange through natural infiltration. Natural infiltration allowed reasonable air quality by continuous dilution of stale indoor air with outside air, and likely played a significant role in providing make-up air for exhaust appliances. The Department is concerned also about the air quality issue arising from air leakage into houses through garages. In homes where that is a problem and exhaust-only ventilation is relied upon, sealing the wall between garage and house may cause vent failure of ventilation appliances and result in backdrafting and spillage of combustion products into the home. The Department is convinced that in such situations, adequate make-up air must be supplied through balanced mechanical ventilation rather than through air leakage. And, mechanical ventilation through an exhaust-only mode system can result in unhealthy pollutants entering the living space of a home due to the backdrafting and spillage of combustion products from home appliances.

45. One approach to achieving a balance of exhaust and intake air is to use exhaust fans to remove stale indoor air. This approach exerts a negative pressure on the house, resulting in outside air coming in through any intentional or unintentional openings in the building envelope. Intentional openings are the more desirable way to minimize negative pressure and ensure proper distribution of the fresh air. This type of ventilation (exhaust only) can be used in Minnesota's climate but because exhaust systems can create sizable negative pressures in a home, the Department maintains it is advisable not to use such systems with atmospherically vented appliances. It is noted that the negative pressure produced by that method can also increase radon entry into a house. The Department recommended (in its SONAR) using sealed combustion, power-vented or electric appliances with the exhaust-only method.

46. Another approach is the "balanced system". That system provides for both exhaust and supply fans in the house and attempts to provide minimal pressure differences between inside and outside air by matching or balancing the airflow of the two types of fans. It is critical that such systems be planned properly and installed to assure equal flow, minimize pressure differences and provide good distribution of the air. The Department's SONAR maintains that the Energy Code revision proposed here reflects a need for residential ventilation systems that will provide the required intake and exhaust ventilation rates while allowing Minnesota homeowners several installation avenues. Those the Department considered viable were (1) using an exhaust-only system, (2) using a balanced system, and (3) using a combination of balanced and exhaust-only systems.

In its SONAR, the Department maintains that with its proposed amendments to the energy code, a builder using sealed or power-vented appliances can install an inexpensive exhaust-only ventilation system. Because of the negative pressures induced by an exhaust ventilation system, that type of system cannot be installed unless all vented combustion appliances are sealed or power vented. If exhaust air exceeds a certain critical rate, make-up air must be supplied by powered or passive intakes to limit the negative pressure induced to a tolerable value.

According to the Department's SONAR, if any vented combustion appliances installed are not sealed or power vented, then the ventilation system must be balanced, using a heat recovery ventilator or a less expensive non-heat recovery mixing box. The Department amended its provision in that regard on March 12 to allow energy recovery ventilators as an alternative.

47. It is found that the Department of Public Service, through the publication of its Statement of Need and Reasonableness (portions of which are summarized in the preceding Findings 37-46), has established the need for the adoption of the rules proposed regarding Mechanical Systems, Protection Against Depressurization and Residential Ventilation Systems.

48. At the hearing on December 19, 1997, the Department proposed to add a subitem (G.(3)) of part 7672.0900 to require the installation of a carbon

monoxide (CO) detector in homes designed to meet the code requirements for protection against depressurization by meeting a "performance path" standard. The CO detector requirement for such homes was not mentioned in the State Register publication of the proposed rules on November 17, 1997.

49. In the State Register – published version of the Department's proposals, a carbon monoxide detector was required to be installed, in conjunction with powered make-up air systems, for all mechanical exhausting devices that exhausted air in excess of 150 cubic feet per minute, to provide protection against depressurization for atmospherically vented gas or oil fueled appliances and any solid fuel appliances (such as wood-fueled stoves and fireplaces) that were neither direct nor power vented. As used at Subitem 9.F.(2), the requirement for installation of a CO detector is part of a prescriptive standard. The distinction between "prescriptive" and "performance" standards is detailed in Findings 55-57.

50. A number of commentators, including the Residential Ventilation Standards Task Force (RVSTF) and individual members thereof, and the Minnesota Carbon Monoxide Task Force, encourage or recommend the installation of CO detectors, but believe that such installation (which costs \$25 to \$50) should not be required. The main objections focus on the shortage of trained first responders who know how to respond appropriately to carbon monoxide alarm calls, the poor equipment quality of certain detectors (especially a lack of equipment that reacts appropriately in situations of long-term low level exposure) and the fact that the applicable proposed standard for equipment quality (UL 2034) is undergoing a revision at this time. The commentators object also that the proposal to require installation of CO detectors in homes following any of the prescriptive paths is a substantial change.

The DPS notes that carbon monoxide detectors are not required in all new dwellings, but only in those that have solid-fuel burning appliances and where atmospherically vented appliances are installed. It maintains that the percentage of atmospherically-vented furnaces and water heaters installed in new homes will be reduced significantly when the revised code takes effect. This fact should mitigate the present shortage of qualified first responders. The Department notes also that the latest revision of the UL 2034 standard will result in fewer alarms. The goal of the Department is to mandate CO detectors only in situations where their installation could possibly save lives.

51. Since the State Register version of the proposed rules included a provision for requiring installation of a CO detector in order to meet a prescriptive requirement, it is found that the Department's proposal to require installation of carbon monoxide detectors in homes using atmospherically vented appliances to attempt, in part, to meet the standards of prescriptive paths two and three is not a substantial change. It is found further that the proposal to require CO detectors be installed when any atmospherically vented appliance is present in homes to meet prescriptive requirements is necessary and reasonable.

52. Strong objection is taken by the Residential Ventilation Standards Task Force and a number of its individual members to the Department's decision to follow the recommendation of the North Central Hearth Products Association (NCHPA) to eliminate exhaust-only ventilation appliances as a means to meet the "people ventilation" standards in Prescriptive Path 1 and Prescriptive Path 2. They maintain that the Department's position, announced in its comments of March 12, 1998, is neither necessary nor reasonable and constitutes a substantial change.

53. The Department notes that the prohibition of exhaust-only appliances under most circumstances in order to meet the prescriptive path standards is not a substantial change, since it proposed in the rules published in the State Register on November 17, 1997 to prohibit exhaust-only appliances under most circumstances. It notes that the issue of the safety of exhaust-only appliances was discussed at length by the Department and members of the building community, both before and after publication of the proposed rules, including during the hearings. Because it could be expected reasonably that the Department would not alter the substance of the rules as proposed initially, the DPS maintains that this is not a substantial change. The Administrative Law Judge agrees. It is found that a proposal to ban exhaust-only appliances in most situations is a foreseeable outcome of the originally-proposed rules and does not constitute a substantial change.

54. The strongest objection on the part of the RVSTF to the ban of exhaust-only appliance ventilation is in connection with Prescriptive Path 1. The equivalent of Prescriptive Path 1 was proposed initially by the Department at part 7672.0900, subparts 9.B. and 9.C., which provided that in dwelling units where vented combustion appliances are either direct vented (B.) or power vented only or power and direct vented (C.), protection against excessive depressurization must be provided by a "balanced" system using powered make-up air for total exhaust capacity for all mechanical exhausting devices in excess of 650 (B.) or 425 (C.) cubic feet per minute. The published proposal does not include replacement air resulting from operating an exhaust-only system as an option that can be used to provide make-up air when the limits are exceeded. The restriction is found to be reasonable because appliances that exhaust in excess of 650 cubic feet per minute (or 425) can be susceptible to backdrafting at depressurization values in the range of 50 (or 15) Pascals. Atmospherically vented (exhaust-only) gas or oil-fueled appliances were provided for at other items, which provided, in limited circumstances, for the use of exhaust-only appliances to meet the requirements of a particular performance path option. And, exhaust-only people ventilation was allowed if the exhaust levels were within the limits stated at subparts 9.B. and 9.C. The Department's final proposal, to remove the option for exhaust-only people ventilation, reflects its adoption of the position taken by other commentators at the hearing and during the comment period (see Finding 61). The issue was raised in the rules as published, debated and deliberated, so a removal of exhaust-only as an option for people ventilation at Prescriptive Paths 1 and 2 is found not to be a

substantial change. For reasons detailed below, it is found also to be necessary and reasonable.

55. When the Department's proposals were published initially in the State Register, the methodologies for achieving compliance with the rules governing mechanical and ventilation systems and protection against depressurization were organized into various "prescriptive" paths and "performance" paths for protection against depressurization and ventilation. Compliance with prescriptive paths varied according to the type and capabilities of the equipment to be installed and were laid out largely in a narrative format. Compliance with the code along a prescriptive path can be achieved by installing equipment that has been certified as able to achieve a certain standard or level of capability. The proposed prescriptive paths lay out what sort of equipment can be installed in combination with others in order to comply.

56. Prescriptive paths to compliance are favored by most of the public affected by these rule proposals, especially builders and building officials (inspectors), who appreciate the simplicity and certainty that result from advance knowledge that the proper installation of specific equipment will result in compliance. It is especially crucial to builders that they not have to wait until the house is built and all systems are operating to learn whether the home was "built to code", as determined by performance testing (see next paragraph) of the combined systems within the house as a whole or a test of, for instance, an entire ventilation system consisting of a variety of parts.

The proposed rules allow also for compliance by following "performance" paths. Under such methodology, a newly constructed house is tested for whether appliances can perform under certain specified testing conditions (when testing for replacement ventilation) or, when testing for protection against excessive depressurization, whether the depressurization exceeds certain levels, given the nature of the appliances installed in the house. If the system "passes" (for example, if sufficient replacement air is provided and the appliances operate as specified), the house complies with the performance path(s) in the code. It is considered performance testing as well if the same "macro" examination is done to analyze the performance of a large, multi-component system in a house, such as the ventilation system.

57. Confusion can arise when an item is required to have met, or to be certified as capable of meeting, certain "performance" standards in order to fit in along a particular "prescriptive" path. The issue arises in interpretation of the rules and ascertaining the methodologies to follow in order to comply along the particular paths, particularly on the part of builders and building officials (inspectors) who are involved with meeting or determining compliance with the rule provisions. The Department maintains that persons who work with the code will be able to discern which of the "paths" is being followed or tested, especially as they acquire education and experience over time. The organizations concerned particularly are the Builders Association of Minnesota (BAM), the International Association of Mechanical and Plumbing Officials (IAMPO) and the Minnesota Building Officials (MNBO).

58. The Residential Ventilation Standards Task Force proposed (in an oral presentation and at Ex. 45) to address what they thought was undue complexity and difficulty in following Minn. Rule 7672.0900, subp. 9 (Protection against depressurization) as published in the State Register. The RVSTF's proposal deletes much of the narrative formatted language in the proposal as published and, without changing the meaning and intent of subpart 9 as published originally, consolidates many of its provisions into a table that is designed to show how to achieve compliance through three prescriptive paths and a performance path. The Task Force proposal incorporated also some additional recommendations it made in connection with subpart 9. In its Comments of March 12, 1998, the Department adopted the format proposed by the RVSTF (a grid labeled "Options for Compliance") but did not adopt all of the Task Force's recommendations, most notably regarding exhaust-only ventilation and carbon monoxide detectors. It is found that the format change in Minn. Rule 7672.0900, subp. 9 is organizational in nature, necessary and reasonable, and does not constitute a substantial change.

59. A number of commentators, including the Builders Association of Minnesota, Associate Professor Patrick Huelman of the Department of Wood & Paper Science (College of Natural Resources) at the University of Minnesota, Advanced Certified Thermography (Stephen Klossner), MNBO's Energy Code Committee (Merwyn Larson), Commercial Energy Services (Jay Jacobson) and the Energy Conservatory (Gary Nelson) join the Residential Ventilation Standards Task Force in opposing the elimination of exhaust-only people ventilation from Prescriptive Paths 1 and 2 at subpart 9 of Minn. Rule 7672.0900. A major argument among these commentators, filed in March 19 Responses to the Department's March 12 filing, is that eliminating exhaust-only ventilation from Prescriptive Path 1 will restrict unduly the building industry's choices on ventilation and will increase costs needlessly. They emphasize that the Prescriptive Paths proposed in and developed for Ex. 45 represented a consensus of representatives from the building industry, building code officials, equipment suppliers, mechanical contractors and building scientists. Specifically, the commentators stress that there are few, if any open combustion appliances that can be influenced by the slight negative pressure that exhaust-only people ventilation would create. They charge that the Department's position eliminates all of the benefits of installing sealed combustion equipment, and would eliminate any incentive for installing such appliances. These comments maintain that there is no technical justification for the removal of the exhaust-only option from Prescriptive Path 1. They take issue with the Department's contention that the option was removed from Prescriptive Path 1 in an effort to address concerns about excessive complexity in the proposed rule. The opponents to this change believe that the requirement for a balanced ventilation system for people ventilation under Prescriptive Path 1 is more complex than an exhaust-only system and usually will cost more. The opponents discount the Department's justifications for elimination of exhaust-only ventilation regarding concern over an increase in entrance of radon and other soil gasses into the building if such systems are utilized and the concern with the backdrafting problem. They argue

that backdraft-susceptible appliances are not allowed in Prescriptive Path 1 and that the concern regarding the entrance of radon and other soil gasses arises because of factors other than the use of exhaust-only versus balanced ventilation. Mr. Jacobson argues that a "Path 1 house . . . has no potential for products of combustion backdrafting into the structure." Mr. Larson, on behalf of the MNBO Energy Code Committee argues that ". . . there are no open combustion appliances that can be influenced by the slight negative pressure that exhaust-only people ventilation would create." Like other commentators, Mr. Larson stresses that one of the primary benefits of sealed combustion equipment is isolation of the combustion process from the indoor environment, which results in the ability to use less expensive and sophisticated means of ventilation. He argues that by not permitting the less costly exhaust-only option, the Department eliminated the incentive to install the technologically superior and safer sealed combustion heating systems.

Professor Huelman notes that the elimination of exhaust-only ventilation for people ventilation from Prescriptive Paths 1 and 2 is "unwarranted and unsubstantiated". Huelman acknowledges the need to guard against excessive depressurization and combustion backdrafting in homes, but maintains that there is no concern in Prescriptive Path 1 for combustion backdrafting, noting that people ventilation will exert only a small negative pressure (one to three Pascals for a 2,500 square foot airtight home). Huelman disputes also the Department's contention that the exhaust-only system is more complicated.

The Builders Association of Minnesota, through Roy Lund (Building & Energy Code Chair), Kathie Pugaczewski (Executive Vice President) and Lisa Peterson (Vice President of Government Relations) argues that the cumulative effect of accepting Exhibit 45, the elimination of an exhaust-only option in the Prescriptive Paths, and all of the modifications made by the Department, constitute collectively a rule that is substantially different from that published in the State Register on November 17, 1997. BAM believes also that adopting the code in such a "piecemeal" fashion, particularly in light of the complexity of the changes, demonstrates that the rules as finally proposed are unreasonable.

60. The Administrative Law Judge has considered the arguments of those who oppose the Department's decision to eliminate exhaust-only people ventilation systems as an option in Prescriptive Paths 1 and 2, and finds specifically that the rule as finally proposed by the Department is not substantially different from the rule proposed in the Notice of Hearing. The Department's position is clearly within the scope of the matter announced in the notice, it is a logical outgrowth of the contents of the notice, and the affected public was provided fair warning that the outcome of the rulemaking proceeding could be the rule in question. See Minn. Stat. § 14.05, subd. 2. The extent to which the effect of the rule differs from the effect of the proposed rule contained in the Notice of Hearing is a factor to be considered in deciding whether or not "fair warning" was provided. In this case, the extent to which the effects of the rule differ from the effects of the proposed rule not sufficient to constitute substantial change, when the other, above-noted, statutory factors are considered.

61. The Administrative Law Judge has found, at Finding 54, that the Department's decision to drop exhaust ventilation from Prescriptive Paths 1 and 2 is necessary and reasonable. He has considered all of the arguments laid out in Finding 59. It is not the function of the Administrative Law Judge to decide always on the "best" alternative, among various reasonable proposals, to meet the need presented. A rule generally is found to be reasonable if it is related rationally to the end sought to be achieved by the governing statute. Mammenga v. Dept. of Human Services, 442 N.W.2d 786, 789-90 (Minn. 1989); Broen Memorial Home v. Minnesota Department of Human Services, 364 N.W.2d 436, 444 (Minn. App. 1985). The Minnesota Supreme Court has stated that an agency's burden in adopting rules is met if it is able to "explain on what evidence it is relying and how the evidence connects rationally with the agency's choice of action to be taken." Manufactured Housing Institute v. Pettersen, 347 N.W.2d 238, 244 (Minn. 1984). At the hearing on December 19, 1997, the North Central Hearth Products Association (NCHPA) (John Crouch) testified orally and submitted Exhibit 20, which presentations argued for a prohibition of the exhaust-only ventilation option in the Prescriptive Path requirements, but no specific exclusion of exhaust-only ventilation in connection with a performance alternative. The Association noted that the Canadian National Building Code takes the same stance. The NCHPA made a presentation designed to show that the use of exhaust-only ventilating systems are unreasonable, hostile to woodburning fireplaces and stoves and not effective at ventilating houses. The NCHPA went into considerable detail to back its contention that provisions permitting exhaust-only ventilation are not reasonable, including the danger that the negative pressure increased by operating an exhaust-only ventilation increases the chance that a chimney vented system can spill smoke or backdraft. The Association referenced a study of houses built under the exhaust-only provisions of the Ontario Building Code, which found that the indoor air quality in such homes was poor compared to houses with balanced ventilation systems. Based partly on findings in Ontario, the National Building Code of Canada (1995) prohibits exhaust-only ventilation. The NCHPA's presentation also contended that subsequent research has confirmed that exhaust-only ventilation is not effective.

Exhibit 20 points out that exhaust-only systems can be dangerous because they promote the infiltration of potentially hazardous pollutants, referencing in part a Minnesota study that found that pollutants can be drawn into living spaces from attached garages. It is contended also that exhaust-only systems are a false economy because, while appearing to be inexpensive, they shift costs to other aspects of housing and energy use such as higher-cost windows, water heaters and fireplaces.

It is found that the evidence supplied by the North Central Hearth Products Association provides a rational basis for the Department's decision to exclude exhaust-only ventilation systems from consideration in Prescriptive Paths 1 and 2. The Administrative Law Judge notes also the receipt of a letter from Michael LeBeau, of Conservation Technologies in Duluth. Mr. LeBeau expressed great concern about the proposal to allow exhaust-only unbalanced ventilation systems

to meet the requirement for people ventilation. He points out recent studies showing the leakage of carbon monoxide into homes from attached garages, as well as the health risks of exposure to radon gas, both of which could be exacerbated in a situation where continuous (24-hour), exhaust-only ventilation results in depressurization of a house. LeBeau notes that the lack of control over what types of combustion appliances may get installed in a home in the future, along with the "undisputed" recognition of the "widespread scope" of the backdrafting problem should drive the Department's decision. LeBeau urges that balanced ventilation be mandated to avoid the pressure-induced problems that he points out. He is particularly concerned because of the trend toward building ever tighter homes, which will exacerbate depressurization in the absence of mechanical ventilation. LeBeau is concerned also with the possible tendency on the part of homeowners to block off passive air intake ports when the weather becomes colder. The concerns expressed by Mr. LeBeau provide further rational bases for the Department's decision in this regard. Together with the comments of the NCHPA, they constitute a sufficient factual basis for the removal of exhaust-only people ventilation from Prescriptive Paths 1 and 2. The rule as finally proposed is found to be necessary and reasonable.

62. In an effort to add clarity for readers of this Report, the final version of proposed Minn. Rules 7672.0900 (Mechanical Systems) and 7672.1000 (Residential Ventilation System), including the "Protection against depressurization" provisions of part 7672.0900, subp. 9 (now renumbered editorially to subpart 8) is appended to this Report and incorporated by reference herein. See Appendix A. The March 12, 1998 amendments are indicated by crossing out and underlining, except for those changes labeled specifically "12/19" or "3/19". Any material not so altered was proposed in the State Register publication on November 17, 1997.

Other Concerns

63. BossAire, Inc., a Minneapolis manufacturer of energy recovery equipment (air-to-air energy exchangers) and vendor of gas-fired heating and cooling equipment, was represented at the hearing by Bob Dilks, Norma Swanson and Lawrence Boeser.

They expressed great concern that if the rules as proposed were adopted, BossAire, a Minnesota company, would be in the ironic position of being able to market its products in every state but its home state of Minnesota. The Department disagrees, maintaining that it designed its proposals carefully, such that nothing would prevent any American manufacturers of residential ventilating equipment from selling their products in Minnesota.

BossAire believes the standard for its type of equipment should be different than the CSA-439 proposed in the rules. The Department defends that standard, even though it is Canadian in origin, because it is the best process known for testing total ventilation system performance, and does not confine its application to component parts only. The DPS notes specifically in its March 12 Comments that the higher fees for testing and certifying BossAire's equipment

can be avoided, and the required standard met, by manufacturers such as BossAire's certifying the air intake and exhaust flow rates and low temperature reduction factor as provided in the exception clause at 7672.1000, subp. 4.C.(1). The Administrative Law Judge is persuaded that the exception provision, as noted by the Department, satisfies the concern expressed.

64. BossAire also pointed out a perceived conflict between the requirement at 7672.1000, subp. 1.A. that ventilation air quantity be in accordance with ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers) Standard 62, which it believes requires a minimum ventilation rate of 0.35 air changes per hour (ACH), and proposed rules that seem to require less. The Department disagrees, and notes that while 0.35 ACH is a maximum standard, that an air flow rate of 15 cubic feet per minute per person is the minimum "people" ventilation required, with the difference between that and 0.35 ACH considered to be "supplemental" ventilation. The ALJ agrees with the Department and finds that its requirements in this regard are not in conflict.

It is noted that part 7672.1000, subp. 1.A. is the rule that provides specifically that "neither infiltration nor natural ventilation (operable doors and windows) satisfy the requirement for ventilation."

65. The Gas Appliance Manufacturers Association (GAMA), represented by Michael Calderera, expressed concern that the Department's proposals would create a bias against atmospherically-vented gas appliances. The Department maintains it has devised prescriptive methods that allow for installation of all gas appliances. Specifically, in response to GAMA's contention that the rules will prohibit installation of atmospherically-vented gas appliances or fireplaces, the Department notes that its proposed "Options for Compliance" table makes no such prohibition. GAMA urges a focus on whether the current Energy Code has, and the Department's proposals will, make buildings too tight. The Department replies that attempting to solve moisture and other problems by making houses less tight would be stepping backward because energy costs would increase and homes would become more drafty and less comfortable, in conflict with the DPS's energy efficiency mandate, as expressed at Minn. Stat. § 16B.165.

GAMA believes that if carbon monoxide detectors are going to be required, they should be required in every residence. As noted previously, the Department proposes to require CO detectors in residences where there is a higher likelihood of a problem, which will allow time for emergency response teams around the state to learn how to respond appropriately to CO alarms. The Association is concerned also that many builders will opt for installing exhaust-only ventilation systems if given the option. It believes that the use of such systems is counter to the concept of protecting against depressurization. It is noted that the Department will allow exhaust-only ventilation only for certain specific options for compliance that allow for safe limits on depressurization tolerance.

66. Ted Reiter represented Du Pont Corporation at the hearing, advocating a position (adopted by the Department in its March 12 Comments) to amend the originally-proposed definition (now numbered 7672.0500, subp. 29) for a "Wind wash barrier". Du Pont manufactures Tyvek, a rigid wind wash material used as a type of "house wrap" designed to keep outside air and moisture from penetrating the envelope of a building. The proposed amendments, which the Administrative Law Judge finds necessary and reasonable and not a substantial change, are to add the words "rigid and flexible" to the definition, to substitute the clarifying words "Wind wash barrier material" for "Acceptable materials" and to add a standard, which reads "Flexible wind wash barrier materials must meet ASTM E1677." A number of petitions supporting the last change were filed with the ALJ.

The Department declined to propose Mr. Reiter's recommendation (and that of 30 petitioners) to add a requirement for sealed, weather-resistive material to act as a weather-resistive barrier over exterior walls with wood-based sheathings. The concern addressed by Mr. Reiter is notable – bulk water penetration can lead to mold growth in wall cavities and a resultant inferior air quality. The Department is concerned that in some cases, to require a sealed, weather-resistive house wrap may actually exacerbate moisture-related problems. The Department's decision to study the issue further, to be considered in later rulemaking, is reasonable.

67. Mike Wilson of Shelter Supply Company believes that the above-noted exception for cold weather testing of heat exchangers (part 7672.1000, subp. 4 C. (1)) should be deleted and that all ventilation equipment should be certified by the Home Ventilating Institute (HVI). HVI dictates that the CSA 439 standard be followed for all provisions, which would require all testing to be done at the only laboratory approved currently, Ortech in Mississauga, Ontario. The exception is to parts 10.6 and 10.7 of CSA 439, which require cold weather performance testing. The Department notes that it spent considerable time weighing this issue, and has determined that it is prudent to allow a manufacturer (such as BossAire) to certify, in lieu of the testing required otherwise under parts 10.6 and 10.7, that outdoor air intake and exhaust flow rates, and low temperature reduction factors at continuous conditions, are not less stringent than the ventilation design conditions. The DPS contends that compliance with the exception constitutes a cold weather test and allows manufacturers to test within the state of Minnesota. All other requirements of the CSA 439 standard must be met.

Mr. Wilson believes also that fans should be certified by HVI. The Department has chosen to require that all fans be tested in accordance with HVI standards, which allows a company to provide documentation that will allow the equipment to meet code standards.

68. Joseph E. Fischer, Manager of Sales and Marketing for Quality Insulation, Inc. commented on a number of the Department's proposals and made suggestions regarding various proposed rule provisions. Fischer concentrates on the need to require that duct work be sealed to prevent leakage

that occurs when houses depressurize, or leakage that contributes to the depressurization itself. Fischer is concerned also with the different designations of multi-family buildings, and possible confusion as to air tightness and ventilation requirements for them. Fischer believes that multi-family buildings, such as attached single-family condominiums or townhomes, should have the same designation as 1-2 family dwellings and should be required to adhere to Category 1 standards. At this point, the Department has decided to propose Category 1 rules only for 1-2 family dwellings. The DPS reasons that implementing Category 1 standards in single family dwellings is a large challenge in itself, requiring its focused attention, but notes that the areas of requiring such standards in multi-family dwellings as well as in alterations to existing homes will be considered for future rulemaking.

69. In connection with applying Category 1 standards to alterations or additions to existing homes, the great concern of persons in the remodeling business is typified by the extensive testimony and filing by Steven Madole, owner of Architrave Design and Remodeling, Inc. in St. Paul. Mr. Madole contends that the Department's proposals will cost him several hundred thousand dollars in business because of the need to upgrade the additions that people desire put on their homes to Category 1 standards. The Department disputes this, and points Mr. Madole and other commentators in the remodeling industry to the provisions of proposed parts 7672.0200, subp. 3 (which provides that "Additions, alterations and repairs to existing . . . residential buildings must comply with part 7672.1200"), and subpart 1 of proposed 7672.1200, which was clarified further in the Department's Comments of March 12, 1998. As proposed finally, Minn. Rule 7672.1200, subp. 1 will read:

"Additions, alterations and repairs to existing buildings must comply with the requirements of this subpart only".

It is found that the language proposed above is an editorial clarification designed to make abundantly clear the fact that persons engaged in the remodeling business do not have to bring their additions up to Category 1 standards, nor do they have to remodel the entire house to meet those standards. It is suggested that the Department change the word "subpart" in the language finally proposed to "part", for purposes of accuracy and further clarification. It is found that the subpart as finally proposed is necessary and reasonable and does not constitute a substantial change.

70. In its final Response to Comments filed on March 19, the Department in several instances declared in the text of its Comments that it was "not adverse" to adding various language pursuant to suggestions made by commentators during the course of the proceedings. The rule text, as edited to include the March 19 changes, included the adoption by the Department of all such changes to which it was "not adverse" except for addition of the words "or equivalent" after "according to the National Fenestration Rating Council Standard 100-091 or 100 (1997 ed.)" at 7672.0700, subp. 3A. If the Department were to make this change in its final adoption of the rules, it is found that the change is necessary and reasonable, and does not constitute a substantial change because it is clarifying in nature due to the existence of an equivalent standard of which the Department was not aware until the time of the Comment Period.

71. Public Ex. 61 is a video presentation demonstrating the "before and after" conditions at two homes of the three involved in a tour taken by the Administrative Law Judge and Department staff, with sponsoring members of the Residential Ventilation Standards Task Force the morning of February 20, 1998. The trip was coordinated by Task Force members Matt Wilber and Shannon Nelson of Minnegasco. The group visited three homes, one in Eden Prairie (to demonstrate Prescriptive Path 2 as proposed by the RVSTF), one in Woodbury (to demonstrate Prescriptive Path 3) and one in Roseville (to demonstrate Prescriptive Path 1). The purpose of the site visit and accompanying videotape was an attempt to demonstrate through "field verification" the applicability of the Prescriptive Paths proposed by the Task Force in Public Ex. 45.

The afternoon hearing session on February 20 involved a review of the video and oral descriptions of the visit. Members of the affected public present at the hearing were free to comment and/or criticize, and the Administrative Law Judge has considered all testimony taken on February 20 and all remarks made during the Comment and Response Periods with respect to the Field Verification Site Visit and accompanying video in formulating the Findings in this Report.

Based upon the foregoing Findings of Fact, the Administrative Law Judge makes the following:

CONCLUSIONS

1. The Department gave proper notice of the hearing in this matter.
2. The Department has fulfilled the procedural requirements of Minn. Stat. §§ 14.14, except as noted in Finding 7. The procedural errors noted are "harmless errors" within the meaning of Minn. Stat. § 14.14, subd. 5.
3. The Department has documented its statutory authority to adopt the proposed rules, and has fulfilled all other substantive requirements of law or rule within the meaning of Minn. Stat. §§ 14.05, subd. 1, 14.15, subd. 3 and 14.50 (i) and (ii).
4. The Department has demonstrated the need for and reasonableness of the proposed rules by an affirmative presentation of facts in the record within the meaning of Minn. Stat. §§ 14.14, subd. 4 and 14.50 (iii).
5. The additions and amendments to the proposed rules which were suggested by the Department after publication of the proposed rules in the State Register do not result in rules which are substantially different from the proposed rules as published in the State Register within the meaning of Minn. Stat. §§ 14.05, subd. 2 and 14.15, subd. 3.
6. Any Findings which might properly be termed Conclusions are hereby adopted as such.
7. A finding or conclusion of need and reasonableness in regard to any particular rule subsection does not preclude and should not discourage the Commission from further modification of the rules based upon an examination of the public comments, provided that the rule finally adopted is based upon facts appearing in this rule hearing record.

Based upon the foregoing Conclusions, the Administrative Law Judge makes the following:

RECOMMENDATION

IT IS HEREBY RECOMMENDED that the proposed rules be adopted consistent with the Findings and Conclusions made above.

Dated this 12th day of May, 1998.

RICHARD C. LUIS
Administrative Law Judge

Reported: Angie Threlkeld and Deborah Foster
Shaddix and Associates
Transcript Prepared