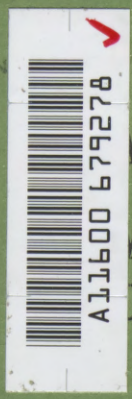
Y4
.J 89/2
V 88/2/
PT.3
GOVERNMENT
Storage

1042

# VOLUNTARY INDUSTRIAL STANDARDS—1976

DEC 1 1976
DEC 1 1976




## HEARINGS

BEFORE THE

## SUBCOMMITTEE ON ANTITRUST AND MONOPOLY

OF THE

## COMMITTEE ON THE JUDICIARY UNITED STATES SENATE

NINETY-FOURTH CONGRESS

SECOND SESSION

ON

VOLUNTARY INDUSTRIAL STANDARDS

AUGUST 26, 1976

**PART 2**

Printed for the use of the Committee on the Judiciary

(Pursuant to S. Res. 375, Sec. 4)

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

# VOLUNTARY INDUSTRIAL STANDARDS—1976

# HEARINGS

BEFORE THE

## SUBCOMMITTEE ON ANTITRUST AND MONOPOLY

OF THE

## COMMITTEE ON THE JUDICIARY UNITED STATES SENATE

NINETY-FOURTH CONGRESS

SECOND SESSION

ON

VOLUNTARY INDUSTRIAL STANDARDS

---

AUGUST 26, 1976

---

**PART 2**

---

Printed for the use of the Committee on the Judiciary

(Pursuant to S. Res. 375, Sec. 4)

U.S. GOVERNMENT PRINTING OFFICE

77-979 WASHINGTON : 1976

COMMITTEE ON THE JUDICIARY

JAMES O. EASTLAND, Mississippi, *Chairman*

JOHN L. McCLELLAN, Akansas
PHILIP A. HART, Michigan
EDWARD M. KENNEDY, Massachusetts
BIRCH BAYH, Indiana
QUENTIN N. BURDICK, North Dakota
ROBERT C. BYRD, West Virginia
JOHN V. TUNNEY, California
JAMES ABOUREZK, South Dakota

ROMAN L. HRUSKA, Nebraska
HIRAM L. FONG, Hawaii
HUGH SCOTT, Pennsylvania
STROM THURMOND, South Carolina
CHARLES McC. MATHIAS, JR., Maryland
WILLIAM L. SCOTT, Virginia

FRANCIS ROSENBERGER, *Chief Counsel and Staff Director*

---

SUBCOMMITTEE ON ANTITRUST AND MONOPOLY

PHILIP A. HART, Michigan, *Chairman*

JOHN L. McCLELLAN, Arkansas
EDWARD M. KENNEDY, Massachusetts
JOHN V. TUNNEY, California
BIRCH BAYH, Indiana
JAMES ABOUREZK, South Dakota

ROMAN L. HRUSKA, Nebraska
HIRAM L. FONG, Hawaii
STROM THURMOND, South Carolina
CHARLES McC. MATHIAS, JR., Maryland

HOWARD E. O'LEARY, *Chief Counsel and Staff Director*

# CONTENTS

## DATE OF HEARING



## ORAL TESTIMONY OF WITNESSES

# VOLUNTARY INDUSTRIAL STANDARDS

THURSDAY, AUGUST 26, 1976

U.S. SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
OF THE COMMITTEE ON THE JUDICIARY,
*Washington, D.C.*

The subcommittee met at 9:35 a.m., in room 2228, Dirksen Senate Office Building, Hon. James Abourezk presiding.

Staff present: John Ray, assistant counsel; Catherine M. McCarthy, chief clerk; Peter N. Chumbris, chief minority counsel; Garrett Vaughn, minority economist and John Napier, assistant minority counsel.

Senator ABOUREZK. The hearing will come to order.

This hearing is a continuation of the hearings on the general subject of standards and certification and, in particular this morning, on the Vent-O-Matic gas damper.

The first witness this morning will be S. John Byington, Chairman of the Consumer Product Safety Commission.

Mr. Byington, we would like to welcome you to the subcommittee hearings and if you are ready to proceed with your statement, we are ready to hear it.

## STATEMENT OF S. JOHN BYINGTON, CHAIRMAN, CONSUMER PRODUCT SAFETY COMMISSION, WASHINGTON, D.C.; ACCOMPANIED BY ALBERT DIMCOFF, ASSOCIATE EXECUTIVE DIRECTOR FOR REGULATORY DEVELOPMENT; JULES L. BIGIO, DIRECTOR, SPECIAL ENGINEERING STUDIES DIVISION; AND EDWARD HEIDEN, SPECIAL ASSISTANT TO THE CHAIRMAN

Mr. BYINGTON. Thank you, Senator. It is a pleasure for me to be here with you this morning. I am particularly happy to be here to testify regarding the safety characteristics of the energy-saving retrofit devices for gas-fired furnaces and, in particular, the device manufactured by Save-Fuel Corp. which is the subject of this hearing.

I am here today to discuss not only the specific issues connected with our examination of the safety of this device, but to talk as well about some of the broader issues raised by our specific testing of its safety characteristics.

If I may, I would like to first summarize the role our agency played in the actual work regarding this particular device. And in that regard, Senator, I have with me Mr. Al Dimcoff and Jules Bigio, members of our staff who worked on this particular project and were involved in the contracts for the testing of this device. They will be

happy to elaborate on any aspect of the testimony you might wish to pursue in further detail. Also, with me is Dr. Edward Heiden, a member of my staff and an economist who particularly is involved with me in the whole area of the antitrust implications and the other implications of voluntary standards.

Late in 1975 the Consumer Product Safety Commission was contacted by the Federal Energy Administration and by staff members of this subcommittee in regard to the safety of automatic vent damper devices. Interest had developed in these devices because of their potential for energy savings. There was a need to know if their general adoption by the public would present safety problems. Further, it appeared that the voluntary standards organizations had considered this matter for some time. They had seemingly refused to certify such devices for retrofit on existing furnaces, although there was apparent agreement that vent dampers could be certified for use with new installations, if appropriately tested with a specific furnace model.

The question was posed as to whether the refusal to certify these devices for retrofit was fully supported by the facts.

The agency undertook a brief engineering review of the existing literature, including some information on the European experience with vent dampers. This brief initial review revealed that there was insufficient information available to provide definite answers. It further appeared that the European experience was not directly applicable to the U.S. situation because of differences in design and conditions of use.

As part of our ongoing work on furnaces and related energy-saving devices, the agency conducted an engineering analysis, including testing, on the specific device which had aroused the interest of the FEA and the committee, the Vent-O-Matic Automatic Draft Control, manufactured by Save-Fuel Corp., Vilonia, Ark.

Although the manufacturer was no longer producing these dampers, he provided us with samples. On April 20, 1976, a contract was awarded to Value Engineering Co. of Alexandria, Va., to test and analyze the vent damper.

The contractor was asked to determine the intrinsic safety of the device itself, including electrical, thermal, and mechanical integrity, by performing disassembly, construction examination, and analysis. Also to evaluate system safety considerations by performing the following: Analysis of the ways failure could occur and the effects of faulty installation; analysis of interfaces of this device with common boiler and furnace designs; common control systems—24 volt and 115 volt; and intermittent ignition systems; evaluation of the device in relation to applicable existing standards; and testing of at least one such device for operating characteristics in a working furnace.

The work was completed and a final report received on July 8, 1976—report No. 66–RD–76, Value Engineering Laboratory. A copy of this report has been provided to the staff of this subcommittee and our analysis of the results has been discussed briefly with them. These results are summarized at pages 33 and 34 of the report.

The basic testing conclusion of the contractor was that the Vent-O-Matic was a well-designed device. Its overall system safety was good, assuming reasonably careful workmanship, and if properly installed, could work safely and reliably as a device for furnaces already in

place. However, there were two possible dangers to the consumer associated with the device. First was a question of design; and the second was related to installation.

In one respect, the design violated good engineering practice; that is, it was closed when the power was off. Now, a failure in this mode could conceivably result in products of combustion being vented into the living space. Although suitable interlocks were provided which made it unlikely that this hazard would occur, it would appear preferable from a pure safety standpoint, to design a failsafe condition; namely, damper open in case of power failure.

Second, there was one potentially dangerous installation mistake which could occur in systems where several appliances share a single flue. If the vent damper for the furnace is erroneously installed in such an arrangement, it can cause the combustion products of the other appliance, typically a hot water heater, to exhaust into the living space when the vent damper is responding to the off cycle of the furnace.

Despite these two potential safety problems, the tests demonstrated to the contractor that, in a great majority of cases, improper installation would most likely result in the inconvenience of an inoperative furnace, and not in a safety hazard.

In general, there would appear to be no reason why intrinsically safe vent dampers could not be manufactured and safely installed in compatible furnaces. However, the absolute safety of such a product would require a case-by-case analysis by qualified personnel, of the unit to be retrofitted to insure compatibility. And, further, to insure compatibility, the installation should be undertaken by trained and experienced personnel.

In a larger sense, though, Senator, this overall testing effort for this particular device, important as it is, represents only one small part of what is a much broader problem with which our agency must come to grips; and that is, fulfilling our basic mandate to protect the American consumer against the unreasonable risks of injury associated with unsafe products, while at the same time minimizing negative impacts on other important social objectives.

Our Commission, as a collegial body, must constantly balance the human gain in the form of lives saved or injuries prevented against any significant adverse impacts our action might have on the cost, utility, or availability of the products we regulate. Such balancing requires complex judgments about the differing merits of important, yet competing, social and economic objectives. Nowhere is this more important than in the case of safety associated with energy technologies and the institutions which support them.

Realizing energy savings, reducing fuel costs, and establishing and promoting a competitive economic environment to assure that these savings are passed on to the consumer through maximum encouragement of new technologies and energy-saving devices are absolutely crucial goals for our society, the average family now spends well over $500 per year on fuel and utilities. Savings and the promotion of mechanisms to achieve them, mean literally billions of dollars.

Our Commission, in discharging its basic mandate on behalf of the American consumer for the safety of these new energy-saving devices

and technologies, has before it the vitally important task of carefully weighing basic safety concerns against key energy concerns.

Specifically, the Commission must make special efforts to see that, in assuring the safety of energy-saving devices and technologies, it interferes as little as possible with their moving freely and in a timely fashion into the competitive marketplace.

With this in mind, the Commission will undertake as a new priority initiative in fiscal 1977, starting next month, a major effort in the area of safety problems associated with furnaces and other energy-consuming durables. This effort will be designed to move toward some innovative recommendations to accomplish two basic goals. The first goal, Senator, would be protecting the consumer from safety problems by identifying potential hazards and working for corrective action before these new energy-saving systems or devices come into general use; and, second, reducing the impediments to development of safety-worthy products and devices in the energy-saving area, and their free and open movement into the competitive marketplace.

Our effort will focus primarily on two issues: First, the nature and magnitude of the actual and potential hazards associated with a number of devices being specifically considered for energy-saving potential in gas appliances, as well as other energy intensive consumer products; and, second, methods of addressing potential hazards through Commission action, including thorough examination of our role relative to that of voluntary standards and certification organizations.

This second area merits more specific elaboration, if I may. While I cannot address the specific merits of the refusal of the American Gas Association to certify the particular fuel damper of the Save-Fuel Corp. for retrofit use, I think some general comments are in order.

It seems to me that as a general principle, the Commission, to the extent that it may work with the voluntary sector on this issue, must start with the key premise that the voluntary standards community has a responsibility in its evaluation of products to take a view that is much broader than purely technical answers to whether or not a product deserves certification in a retrofit market. Voluntary approaches need not, and must not, be purely technical ones. They can, and should, include creative suggestions and initiatives on how retrofit technology can be marketed to assure not only that the consumer is protected, but also that creative ideas are allowed to reach the marketplace and the consumer. They can, and should, include forward-looking proposals for overcoming installation problems, rather than rejecting devices for certification on the somewhat narrow grounds that such installation problems may exist.

A number of potential approaches for creative problem solving should be explored. For example, gas companies might be encouraged to develop specific built-in plans to check installation and certify to the consumer that the installation is adequate. Likewise, State or local governments or other Federal agencies might be enlisted in a cooperative effort to deal with installation problems.

In its study, the Commission will examine closely the issue of whether safety certification mechanisms for energy-saving devices are sufficiently responsive to these concerns, and what, if anything, can be done to make them more so. Specifically, we will be examining the

feasibility of being a catalyst for making things happen through voluntary industry cooperation.

We will work cooperatively with other Federal agencies, such as FEA and ERDA, and with State and local authorities in solving the problems of installation and repair, while at the same time, protecting the consumer against unreasonable safety hazards.

We will also be looking at specific ways in which safety certification of fuel-saving devices and energy-efficiency mechanisms can be made adequately responsive to considerations of competition and encouragement of new technology.

We, as an agency, must do all we can to prevent dependence on a consensus principle for safety standards-making and certification in this area from becoming an arbitrary exercise in the self-interest of certain participants. Such reliance on consensus serves to discourage entry into the marketplace and puts an undue burden on smaller firms. We must take care that voluntary efforts be timely and that they carry with them a constant review process that allows maximum design freedom and innovation.

In this connection, I am aware that this subcommittee is considering legislation to bring uniform procedures to the standardization process, designed to foster competition and consumer protection policies in all phases of private standardization. I cannot speak at this time to the overall need for and merit of this legislation. However, I can assure you that our agency, under my chairmanship, will be particularly sensitive to the competitive and consumer concerns which form the basis for this legislation.

I have gone on record quite frequently—in fact, my very first speech I made as chairman was relevant to this problem—in stressing the importance to competition of assuring that voluntary standardization activities, involving our agency, remain as free, open, and nonrestrictive as possible. I intend to strengthen our in-house capability to deal with these issues, as they relate to the voluntary standards initiatives that this Commission, the Consumer Product Safety Commission, might undertake.

Let me close by saying that I do not wish to oversimplify the difficulty of achieving the goals of maximum safety and maximum energy-saving, while at the same time protecting competition in the marketplace and stimulating new technologies. But I would be remiss if I did not also express my firm conviction that these safety problems can be solved. A joint, good faith, creative effort between Federal, State, and local governments, and the private sector, must be made a matter of high priority. The Consumer Product Safety Commission stands willing and eager to participate fully in such an effort.

I thank you, Senator, and I would be happy to answer any questions you have.

Senator ABOUREZK. First of all, Mr. Chairman, I would like to express the subcommittee's appreciation, as well as my own personal appreciation, for the cooperation that your agency has given us. In particular, we are grateful for the help and courtesy that Mr. Dimcoff has extended to the staff, Mr. Ray, over the last several months. It has been a refreshing experience for an agency to work with us like that.

Mr. BYINGTON. You are very welcome, Senator, and I assure you that it will continue in the future.

Senator ABOUREZK. Now, in your prepared statement, you note that the installation of vent dampers should be undertaken by trained, experienced personnel. Are you referring to a heating contractor, for example, or are you referring to someone who might be even more knowledgeable than a heating contractor?

Mr. BYINGTON. One of the problems that was addressed in this whole area is the problem of installation, and the flexibility or variance of the skills available in the marketplace in terms of installation.

So, the basic point that we are addressing here is—as we discussed a little later on, as well—the need for some mechanism to certify that whoever it was that installed it did it well. And that is why we recommended that one of the creative approaches that could be used would be an involvement with the gas companies, who could then come in, and, regardless of who had done the installation, they could do the certification that you had adequate installation.

Senator ABOUREZK. Now, I asked that question because one of the reasons put forth by the American Gas Association for not certifying Vent-O-Matic as a retrofit unit is the possibility that it may be installed by an unqualified local maintenance man.

Personally, I have problems with that because we have to rely upon the local maintenance men to install all kinds of dangerous devices.

And this fact was testified to by Mr. Frank Thorn, who is a former chief gas inspector for the city of Memphis, Tenn.

Now, do you feel that this is a sufficient reason for barring the Vent-O-Matic gas damper from the market?

Mr. BYINGTON. Well, on the broader question, not only on Vent-O-Matic but on anything else, we have a concern about the installation problem. And whether the installation is going to take place by the local maintenance man or by a contractor or whomever, we do think that there is some need, from the safety point of view, to provide a mechanism for certification. In this way, the consumer can be assured that whoever did the work, it was done in accordance with the standards and the particular unique characteristics of these particular furnaces.

So, we think that instead of just saying that because there may be an installation problem we should not have these devices on the market, we think we can solve that problem; or the problem can be solved by addressing innovative mechanisms to provide that, regardless of the fact that you may have an installation problem, we can solve that by having some kind of inspection or certification process to deal with that.

If you would like, I can have Mr. Bigio also address some of the specific certification problems of this particular product.

Senator ABOUREZK. Well, if he would like. But, also, I just want to go a little bit further by saying it seems strange that the gas people have been able to overcome problems presented by the field installation of other dangerous products; they have had no difficulty in overcoming installation problems where they agreed with the product.

Now, they do not agree with this product, so they have an installation problem. Does that seem strange to you?

Mr. BIGIO. I believe that the installation problems of this particular device can relate not only to the local maintenance man, but to the do-it-yourself problems. Is that of particular concern? I mean, this is a

device on the scale that, perhaps, you might attempt to install yourself. Although, in the case at hand, when we tested these samples, even a trained engineer had some problems reading the circuit diagrams supplied with the device and following the instructions.

So, this has to be a matter of concern, if something comes into a broad and general use. Now, as the chairman was saying, this can be overcome. Any energy-conversion device, such as a furnace, which has potentially lethal combustion products could obviously be a hazard if it were installed improperly.

I believe there is quite a good system of checks and balances in the marketplace, inspections and so forth. Furnaces, typically, are installed by well-qualified people. I am not saying that is absolutely true in every case.

Senator ABOUREZK. Well, you can buy a gas furnace out of the Montgomery Ward catalog?

Mr. BIGIO. You can, but I believe in most jurisdictions, if you install it yourself it is a code violation.

Senator ABOUREZK. All right. Would not the same thing be true with a Vent-O-Matic.

Mr. BIGIO. Yes; it would be.

Senator ABOUREZK. OK. What I am saying is there is not a bit of difference, it is just that they happen to agree with furnaces because they use gas, and the gas people do not agree with Vent-O-Matic because it saves gas. That is the point I am trying to get across.

So, therefore, this great barrier has been placed up around the Vent-O-Matic and its retrofit capability.

Mr. BIGIO. Well, I think it is not—in my opinion, it would be directed at any similar device.

There is the point, obviously, that the furnace, or some device for heating the home, is an absolute necessity. This vent damper is an option and I think there is some tendency on the part of the people involved, and I cannot speak for them.

Senator ABOUREZK. You mean the gas people?

Mr. BIGIO. Well, whomever; the whole voluntary standards community that we are dealing with.

Senator ABOUREZK. Yes.

Mr. BIGIO. I believe they feel that they exercise a great deal of caution through the building codes, installation codes and so forth, to insure safety compliance.

Senator ABOUREZK. Caution is one thing, which I have no argument with, but do you think that caution could reasonably run into a several-year period, where they even refuse to set a standard as to how automatic dampers might be installed? Is that caution or is that just obstruction?

Mr. BIGIO. I really cannot address that.

Senator ABOUREZK. Let me say, it's obstruction. I do not necessarily ask you to say it, but I would.

The second reason and the main reason put forth by the American Gas Association is the possibility that the homeowner might attempt to install this device on his own.

Mr. Thorn pointed out that the possibility of a homeowner attempting to install a vent damper always exists as it does with many other dangerous devices, as I said a little earlier.

And Mr. Thorn noted, for example, that the homeowner could install the combustion chamber, the gas valve, the safety pilot, or the limit control.

Now, again, do you feel that vent dampers ought to be barred from the market because of this possibility?

Mr. BYINGTON. I think that we are right back to the point that we refer to in my statement, Senator. I think that it expresses our feeling in this whole area, where we say, in general, there would appear to be no reason why intrinsically safe vent dampers—in general, now; generically, not particularly—intrinsically safe vent dampers could not be manufactured and safely installed for compatible purposes.

And the absolute safety of such a product may require the case-by-case analysis and the certification, but we think that they can be made and they can be installed.

Senator ABOUREZK. The staff of the subcommittee had the National Fire Protection Association send them the number of gas-fired furnace accidents during the period 1971 through 1975.

There were 352 accidents, 35 fatalities, 208 injuries, and well over $28 million in damages.

These were furnaces without vent dampers, and I should emphasize that these were only the recorded accidents. As I understand it, Save-Fuel Co., which has well over 5,000 Vent-O-Matics on the market, has not had one fatality reported.

Now, what would you say that indicates in terms of safety?

Mr. DIMCOFF. Those statistics were what really started us on an examination of furnaces in general, Senator. That is why we began our study into furnaces generally.

The data on explosions and fires related to furnaces are a very, very difficult thing to deal with, because, basically, it is sometimes underreported. In the event that the home is totally destroyed, it is sometimes impossible to really determine the exact cause of what has occurred.

So you must be very, very careful when trying to reach conclusions on data as it relates to these kinds of incidents.

One of the things that we will do early in 1977 is try to develop more definitive data, up front, so that we can, maybe in 6 months, come back to this kind of a hearing and be able to give you a more definitive statement on what those kind of figures actually mean.

But it is almost impossible to answer whether or not those kind of statistics indicate that the product is safe or the product is hazardous without examining it further.

Senator ABOUREZK. Well, but do you think you might be able to go so far as to say that, with 5,000 Vent-O-Matic devices installed with no accidents reported as a result of it, that it might be fairly safe?

Mr. DIMCOFF. As the chairman said in his statement, if the device is installed adequately by a qualified person, it is intrinsically safe, and you would not expect to have any serious circumstance or accident occur.

Senator ABOUREZK. The ANSI Z–21 Committee voted not to allow automatic vent dampers to be installed as retrofit units.

As I understand the jurisdiction of the Z–21 Committee, at the time it was considering automatic dampers, it was concerned with promulgating a standard relative to the device itself.

The question of whether or not the device could be installed safely as a retrofit unit seems to be an installation question.

Would you agree or disagree with that?

Mr. DIMCOFF. Yes. I think it is an installation problem, Senator.

Senator ABOUREZK. Now, that is the Z–223 Committee.

Mr. BYINGTON. Were there not two problems that were raised? We were not part of the whole committee deliberations and considerations, but there were two problems that we discussed; one is the lack of a fail-safe mechanism, for example, the damper open with power off problem, which is an engineering problem, or the other, an installation certification problem.

Now, those were the two that we raised. We felt that both could be solved, and a fail-safe mechanism could be installed, and it could be engineered correctly, and then we also thought the certification of installation would be possible.

Do you have additional information on the committee's work?

Senator ABOUREZK. Well, if I recall the hearings, correctly, that we held earlier this year, the chairman of the task force that developed the proposed standard came up with a new committee that we had never heard of before, Z–223, which is the Installation Committee. When he finally agreed that there was nothing intrinsically wrong with the Vent-O-Matic unit, which, with a couple of minor exceptions, you agree with that, he indicated that the problem is that there are no installation standards set. Installation standards are set by the Z–223 Committee, which has not even made a determination on the matter.

I think that is where the problem lies on this; it does seem to be an installation question, not a functional question of the device itself.

Mr. BYINGTON. That is right; primarily an installation question.

Senator ABOUREZK. Now, in your statement, you note two potential safety problems of the Vent-O-Matic, but you go on to note that improper installation would most likely result in the inconvenience of an inoperative furnace and not in a safety hazard.

Would you elaborate a little bit on that?

Mr. BYINGTON. Yes.

Mr. DIMCOFF. In the power-off position, the vent damper is closed, but the furnace would be off. And, in that situation, the house would get quite cold, but there would be no combustion products going into living space, because the furnance would not be working.

The potential hazard is that, if it is off and the damper is constructed so that the water heater would be venting into the same flue, there is a potential for those products to be vented into the living space, and the hazard occurs there.

I am informed by our engineering staff that it is possible to design a similar device in a fail-safe mode, where, when the power would be off, the vent would remain open, and any products of combustion could be vented outside of the house. And so those two things working together do have to be recognized as a potential safety hazard.

Senator ABOUREZK. Well, if the Z–223 Committee ever gets around to setting a standard, could they not include that requirement as part of their standard? Would that not be very easy to do?

Mr. DIMCOFF. I really think that is the thrust of the chairman's comments, Senator. Technically, there may be reasons to say that it is

unsafe, but if you encourage or treat it as a marketing problem, you deal with what might happen in a marketing program for a product such as this. It appears that the safety problems inherent in vent dampers generally could be overcome. That is why it is an installation situation.

Senator ABOUREZK. Regarding the device failing in the open position when the power is off, I am advised by Mr. John Ray of the staff that Mr. Woolfolk, of the Save-Fuel Co., designed a device that would do exactly that; but the Z–21 Committee would not consider it.

Mr. DIMCOFF. We have no knowledge of that or why they would have done that, Senator.

Senator ABOUREZK. Mr. Woolfolk, who is here today, has that device with him, so you might want to take it along with you.

Mr. BYINGTON. I would be happy to take a look at it, Senator. Our tests and our examination by a contractor was done on the earlier device.

Senator ABOUREZK. Well, in summary, could you agree that the design of the Save-Fuel automatic vent damper makes it a safe device? I am talking about the design.

Mr. BIGIO. With the one exception that was pointed out. Now, that would be a design which had a non-fail-safe condition. If that were overcome, I think we would agree with that. But I should emphasize one aspect of our work.

In looking at any product, we would have to speak about this question generally. The Vent-O-Matic units we looked at were essentially hand-assembled, early production devices. And, as I pointed out—I believe the staff has a copy of this memorandum I wrote—we would have to see certain things, such as the quality assurance program and other aspects of the manufacturing plant, to know that general production of this device would be good. We could not necessarily extrapolate the results of this test to future production without some other assurances.

But, with the one exception of the non-fail-safe design, of the earlier devices we looked at, it was a well-made, well-put-together device which functioned well when properly installed.

Senator ABOUREZK. Now, from the testing you have done regarding the safety of this device, would you say that this is the kind of energy-saving device that the appropriate ANSI Committee should be writing standards for?

Mr. DIMCOFF. It is certainly one of a number of energy-saving devices that need to be looked at, if one understands that the energy crisis facing the country is as serious as we think it is. Our Commission has never dictated to any voluntary standards group what they should work on, and I do not think we have the authority to do it. But it certainly is one of a number of devices, Senator, that should be looked at.

Senator ABOUREZK. Well, let me phrase the question another way. Do you know of any reason why they should not write a standard for this device?

Mr. BYINGTON. Do we know of any reason?

Senator ABOUREZK. Yes.

Mr. BYINGTON. No, sir. In fact, toward the end of the testimony, that was our whole point of saying that we would like to act as a catalyst and hope that we could make some things happen in this whole area. If not, then, of course, we would end up having to take a look at it through our mandatory mechanism.

Senator ABOUREZK. Could this device be used for commercial use, for example, hotels, office buildings, government buildings and so on?

Mr. BYINGTON. I would have to ask our engineer on that.

Mr. BIGIO. Conceivably, something like this could be used, although it would have to be scaled quite differently in design for commercial units. However, recognize that what you are doing here, essentially, is plugging one small opening in the dwelling. Now, when you scale that up to something like a commercial building, that energy loss through this one essentially small opening would probably become insignificant in the total energy balance of the building.

Senator ABOUREZK. So it is more valuable in a private home?

Mr. BIGIO. It would be more valuable in the private home and, of course, in any private home, it would depend on the circumstances of the dwelling—how tight or loose it was, and so forth. And I believe studies have been done by others about the potential energy savings of these devices.

Of course, as was pointed out a moment ago by Mr. Dimcoff, this is just one of several ideas as to how to save energy in typical home-heating installations.

Senator ABOUREZK. Now, when we first took the Vent-O-Matic complaint under consideration, Mr. Woolfolk pointed out to us that one of the problems was that flues and chimneys were too large and that furnaces were oversized.

I read the same thing in the Michigan Consolidated statement. I find it hard to believe that the standards developers did not realize that these furnaces and flues were oversized.

Mr. Diehl, the inventor of the Vent-O-Matic damper, told the staff of the subcommittee that gas appliance manufacturers have built appliances so as to pacify the gas companies. For example, they build appliances which use a lot of fuel.

I welcome any comments you might have on that aspect of it.

Mr. BYINGTON. Senator, our jurisdiction really relates to whether we have safety, and not to energy consumption and, basically, our tests have been run in that direction. I am not sure that we are the proper or the competent ones to deal in that area, as Mr. Bigio indicated. Other agencies have been dealing with the energy-saving potential of appliances.

We are committed to being helpful in this whole area of energy savings by making sure that the devices that are ready to come onto the market, or that potentially go on the market, do not provide unreasonable risk of injury to the consumer.

Our agency will have to limit itself to the safety aspects, though; not as to whether one device would be, percentagewise, an energy-saving point better than another one.

We are not competent at this point in time to address that type of question.

Senator ABOUREZK. Does the Consumer Product Safety Commission have any representatives on the AGA Z–21 Committee or other subcommittees?

Mr. BYINGTON. We do not take a voting part on any of the voluntary committees, but we do actively participate within the committees, and have worked with that particular committee.

Senator ABOUREZK. Now, you note in your statement that the Commission will undertake a study next year, in the area of safety problems associated with furnaces and other energy-saving devices.

You also note that you will work with other Federal agencies, such as FEA and ERDA. I am considering at this time asking the Congress to join me in a resolution asking ERDA to look at vent dampers and other energy-saving devices to see if we cannot get these devices on the market and start conserving our shrinking energy supplies.

Given your study and contemplated work with ERDA, would you urge that kind of thing to go forward or do you think your effort is sufficient?

Mr. BYINGTON. We urge you to go forward and we will be happy to cooperate.

Senator ABOUREZK. In your statement, you touch upon some matters that I have introduced legislation to deal with. You recognize this and go on to state that you cannot speak at this time to the overall need for and the merit of this legislation.

As you will recall, Chairman Byington, I extended an invitation to you earlier this year to testify on this legislation, and my understanding is that you declined because you had not yet had the opportunity to study the bill.

I appreciate the fact that you want to look at it carefully before making your views known. So I will not ask you any specific questions on that bill today, however, it will be reintroduced next Congress, and I would like to know if you will be in a position early next year to present your views on this legislation?

Mr. BYINGTON. Yes, Senator. I will be most pleased to testify on that bill next year and our staff will be most pleased to work with yours.

Senator ABOUREZK. Great. I have no more questions. If you have anything else you might want to say, please feel free.

Mr. BYINGTON. No, sir. We are pleased to have this opportunity to testify and we would like to show you and the subcommittee that we are interested in seeing this problem solved, and that we will commit the necessary resources at the Product Safety Commission to do our share.

Senator ABOUREZK. Well, then, once again, I want to express my thanks to you and your staff for appearing and for your testimony today. We appreciate it.

Mr. BYINGTON. Thank you, Senator, very much.

Senator ABOUREZK. The next witness is Mr. Charles R. Montgomery, president of Michigan Consolidated Gas Co. We would like to welcome you and your staff to the subcommittee hearings. You may begin when you are ready.

**STATEMENT OF CHARLES R. MONTGOMERY, PRESIDENT OF MICHIGAN CONSOLIDATED GAS CO., DETROIT, MICH.; ACCOMPANIED BY JOHN TURKO, DIRECTOR OF SPECIAL PROJECTS, AND JERRY KABEL, VICE PRESIDENT, PUBLIC AFFAIRS, AMERICAN NATURAL GAS SERVICE CO., DETROIT, MICH.**

Mr. MONTGOMERY. Thank you very much.

My name is Charles Montgomery and I am president of Michigan Consolidated Gas Co., a natural gas distribution company headquartered in Detroit, Mich.

I am here at your request to review with you the furnace testing program my company has embarked on in the hope and expectation of reducing the volume of natural gas used by consumers each year to heat their homes.

With me today is Mr. Kabel who is vice president, public affairs of the American Natural Gas Service Co., which is the parent company of Michigan Consolidated Gas Co., and Mr. Turko who is our director of special projects in our company's engineering department, and the man primarily responsible for developing the test program I will describe.

Before I discuss the details of the program which involve the testing of five energy-saving furnace devices, I believe it would be useful for me to give you a brief summary of why Michigan Consolidated embarked upon this project.

Like consumers across the Nation, Michigan residents have been faced in recent years with rising natural gas prices. I have seen no evidence that this rise in price will stop. To the contrary, every indication is that natural gas prices will continue to increase because the cost of exploration, production, and transportation continue to increase.

As a natural gas distribution company, there is little, if anything, we can do about these price increases. But we hope there is something we can do to help our customers use fewer units of gas each year and thereby keep their annual bills down.

Reduction of annual gas consumption is desirable for several reasons. First, if our customers are able to remain comfortable in their homes while using fewer units of gas, then their gas bills can be kept lower. Second, a reduction in natural gas consumption extends our gas supply and enables us to serve more customers.

These are very basic concerns to us, especially in view of the fact that about 40 percent of our customers in our Detroit service area are living on fixed incomes or very low incomes and receive assistance from Government aid programs, including general welfare, aid to dependent children, and social security.

Recognizing these problems, our company was the pioneer in initiating a home insulation program designed to enable consumers to install adequate ceiling insulation as a relatively simple and inexpensive way to reduce heat loss and fuel consumption. Our program, which began in 1973, included an agreement by the company to finance insulation programs for customers desiring such financing and provided infor-

mation and assistance in the installation. And I have a copy of the kind of do-it-yourself handbook that we made available to our customers and to other companies throughout the country who would want to follow the program. This program became a model for many other utilities across the country, and today we consider the project an unqualified success. To date, our program has resulted in the insulation of some 112,000 homes in our service area, representing an annual savings of 3.3 billion cubic feet of gas, enough to heat an additional 16,300 homes a year.

In addition, we also instituted a "dial down" program in our service area, urging our customers to turn down their thermostats a few degrees as an effective method of saving energy and keeping their gas bills down.

We initially concentrated our efforts on home insulation because substantial heat loss in a home occurs through uninsulated ceilings. Once the insulation program was in full operation, we began to look for other ways home heating systems could be improved so that energy consumption could be reduced.

Our attention focused on the furnace, flue pipes, and chimneys of homes, since we knew that a furnace is the one home appliance that consumes the most fuel annually.

In the summer of 1975 we embarked on a test project to determine the effectiveness of several different devices designed to improve the efficiency of furnaces and reduce heat loss through furnace chimneys.

Obviously, this project demands greater sophistication on our part and a greater amount of time spent in engineering and gathering test data than did preliminary steps leading to our home insulation program.

Prior to beginning actual field tests of energy-saving devices on furnaces, we conducted theoretical studies of heat loss and energy waste on hypothetical heating systems.

Utilizing the expertise of our own engineers and employing computer models, we determined that significant amounts of warm air were lost through flues and up chimneys and also concluded that the furnaces, themselves, were not operating as efficiently as possible. This served as a model against which we then did our actual field test.

After analyzing these hypothetical cases, we turned our attention to what might actually be happening in terms of furnace operation in our service area. We found that most furnaces were oversized for the homes they heat and that a majority of chimneys are likewise oversized, thus, allowing excessive amounts of warm air to escape.

The oversizing of chimneys is explained by the fact that building codes specifying chimney and flue sizes were adopted when most homes were heated by coal-fired furnaces. Large chimneys and flues provided better combustion of coal while also assuring strong drafts to eliminate soot buildup and the possibility of chimney fires. Today, of course, very few homes are heated with coal but, unfortunately, we are still living with building codes that require these larger than necessary chimneys and flues.

Furnaces were oversized, related to the size of the homes, simply because energy was cheap and plentiful, and builders wanted to avoid the possibility of complaints that the house was not adequately heated. As long as gas and fuel oil sold at bargain basement rates, there was

little incentive to critically evaluate the efficiency of either furnaces or chimneys and flues.

Having made the determination that most furnaces are oversized for the homes they heat and that most chimneys are too large, we began field tests of five different devices on heating systems of 225 of our employees who volunteered their homes.

We tested these various devices either singly or in various combinations during the past year. Before I show the committee each of these devices, let me explain that they are designed to do one of two things; either to improve the efficiency of the furnace itself or else to reduce the amount of warm air escaping the home through the chimney.

Let me start with the two devices which reduce the amount of warm air escaping through the chimneys. Attached as exhibit A [1] to my statement is a diagram of a typical home-heating system.

The first of the devices is called the flue restrictor or blastgate. As you can see, this is a relatively simple instrument which has a window that can be adjusted to reduce the size of the flue and chimney, to allow only the amount of draft that is necessary to make that furnace operate most efficiently.

Now, that very simple device fits at the point of the flue entering the chimney, and, through a mathematical computation of the size of the home, the amount of air needed to heat that home, you reduce the size of the chimney to the need of the furnace for its maximum operating efficiency.

Now, this gadget we estimate costs something less than $10. It is also sometimes referred to as a blastgate.

Now, the second is the automatic damper, which is presently under review by this subcommittee, which is an electronically controlled device that opens and closes the flue to allow the flue gases to flow at the time of the furnace being on and closes when the furnace is off, so as to hold the heated air in the home. This device works, as I am sure the committee knows, off of the thermostat in the home. It is energized by the electricity that is called for at the time the home is below the temperature desired for the comfort of the family. It then energizes the valve in the furnace, and it starts the furnace. That device is presently about $85, which is the price that we have obtained for it.

The remaining three devices are installed on the furnace and are designed to improve the operating efficiency of the furnace. The first device is a two-step input valve attached to the gasline leading into the furnace burner. This valve can be manually operated by the homeowner to allow the amount of gas to be adjusted whether or not it is colder weather or warmer weather, so that we can reduce the flow depending upon the demands of the home for hot air. It can be turned, as Mr. Turko has indicated here, by the operator of the home. It is installed, as he has indicated, on the line leading into the burner. And it costs about $43.

The next device is a small diameter burner orifice. As you can see, this is somewhat like a screw that has a hole in it, and the size of the hole controls the amount of gas that flows into the burner. And that is drilled to the size that makes that furnace operate to the demands of that particular home. That little device fits directly into the burner tip itself. That costs something less than a dollar.

---

[1] See p. 714.

The last device is the electronic pilot light which replaces the constantly burning pilot. As you can see, as Mr. Turko has demonstrated here, it fits into the furnace and serves as the igniter of the gas when the gas meets the oxygen and then becomes combustible.

Senator ABOUREZK. It looks like an automobile spark plug. Is that what it is?

Mr. MONTGOMERY. Exactly; that is the exact principle of it.

Now, that device costs about $53.

A summary of the results of our testing program to date is attached to my statement as exhibit B.[2] We have a copy on display here for the chairman and staff.

Mr. CHUMBRIS. Mr. Montgomery?

Mr. MONTGOMERY. Yes, sir.

Mr. CHUMBRIS. Would you explain why the three gadgets are so close to the furnace and the other two gadgets are over near the chimney? What is the advantage of that?

Mr. MONTGOMERY. Yes. See, we are dealing with two basic problems.

We are trying to get the furnace size to the need of the home. So those are the devices that do the job on the furnace; in effect, derate the furnace to the size of the home demands.

Now, the other two gadgets are dealing with the escape of warm air, and we are trying to hold into the home the warm air. So we are dealing with the flue and the chimney.

Mr. CHUMBRIS. Yes; well, why would those two not be closer to the furnace to keep it within the furnace? That was my point.

Mr. MONTGOMERY. Well, basically, you see, every flue has to have a damper in it in order that, during a period when the furnace is on or the gas is being burned, it permits the drawing out of the gases from the fuels that are not burned; carbon monoxide or whatever it might be.

So there is a damper in the flue. Now, what we have to do is go down the other side of that damper, because if the flue is left open the chimney is left open, and you get the draft. It will pull warm air through that damper and up the stack.

So we are putting the two devices that we have demonstrated here on the downstream side of the flue damper before the chimney.

Mr. CHUMBRIS. Thank you.

Mr. MONTGOMERY. Now, as you can see, the results reflect gas consumption during a winter period when the weather in the test area was warmer than normal; the percentage of savings indicated may be slightly exaggerated because of that.

As you can see, by using two of the devices in combination, the flue restrictor, which is the window, the gate, and the small diameter burning orifice, we have found an average reduction in fuel consumption of more than 26 percent. A slightly higher average fuel saving was accomplished by using the automatic damper and the flue restrictor in combination, but the materials cost for the automatic damper is about $85 versus $10 for the flue restrictor. Therefore, in terms of cost efficiency, our preliminary view is that the flue restrictor-reduced orifice combination is the one making the most economic sense while achieving considerable fuel savings. In addition, the use of the fixed-flue restrictor reduces the problems of safety and reliability necessarily involved in using any automatic damper device.

---

[2] See p. 715

These preliminary test results are very encouraging, and we realize the implications in terms of energy savings not only for our customers but for consumers across the nation. But we are not in a position to say that these early test results are definitive. In addition, we have not yet established the complete reliability and safety of the devices. This makes it imperative that we proceed in accordance with sound scientific procedures, so that when our test program is completed, it will produce results that we can stand behind.

Accordingly, we will continue testing these devices in homes in our service area through the 1976–77 winter heating season.

The purpose of further testing is to confirm our preliminary data and to identify any engineering or safety problems with the devices.

Because we have concluded that it was essential to have the test results verified by nationally recognized independent engineering organizations, we have retained the Battelle Memorial Institute of Columbus, Ohio, and the Environmental Research Institute of Michigan, located in Ann Arbor, to advise us concerning the test procedures to be used and to monitor and evaluate the results.

I should emphasize that two of the devices we are testing restrict the size of the flue pipes and, under existing local building codes in virtually all Michigan communities, flue obstructions of any kind are not allowed. Therefore, in order to provide sufficient information for evaluation by local officials prior to adoption of any code changes, we must furnish firm evidence of the safety and reliability of these devices. The recognized expertise and independent status of Battelle and the Environmental Research Institute should provide the basis for obtaining the necessary changes in codes.

As soon as we and our consultants are convinced that we have done sufficient testing and developed sufficient facts to establish the safety, reliability and fuel-saving potential of these devices, we will, of course, announce the results. And we will then move ahead promptly to make them available to our customers and to consumers generally at the lowest possible cost. Meanwhile, we are keeping the Michigan Public Service Commission fully advised of the progress of our testing program.

Let me emphasize that Michigan Consolidated has no proprietary interest in any of these devices. Our goal is to determine which device or combination of devices has the potential for the greatest fuel savings at the least cost and with the highest degree of safety and maintenance-free operation.

We will be developing plans during the coming heating season to train our own technicians in the proper installation of these devices and will make our expertise available to private heating contractors and repairmen to assure that the devices are installed and serviced in a proper fashion.

This concludes my statement, Mr. Chairman. If the subcommittee has questions concerning my remarks, I would be more than happy to answer them.

I would hope that any questions of a technical nature might also be addressed by Mr. Turko.

Thank you.

[Exhibits A and B to Mr. Byington's statement follows. Testimony resumes on p. 716.]

EXHIBIT A

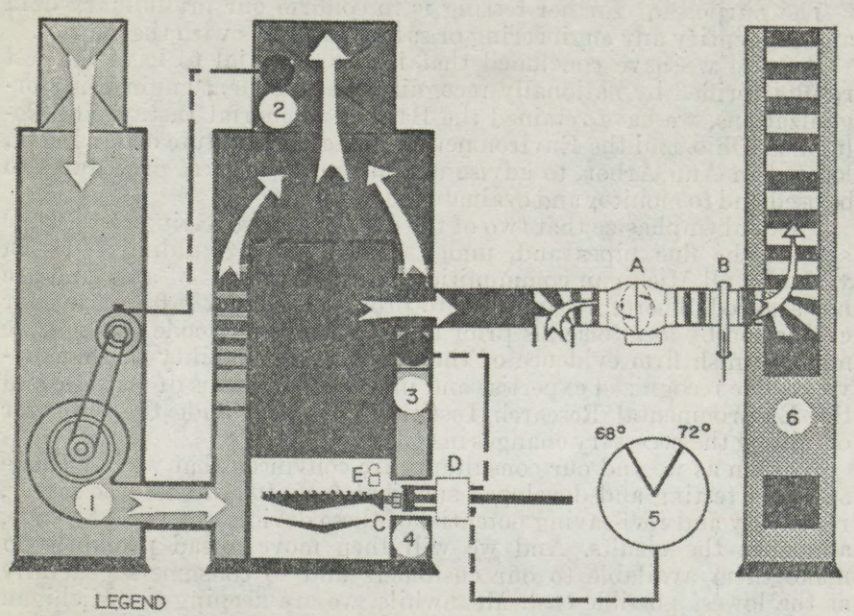
FORCED WARM AIR SYSTEM:

SOURCES OF INEFFICIENCY

ENERGY EXHAUSTED WITH THE FLUE PRODUCTS

STACK DRAW OF ROOM AIR

HEAT EMITTED FROM EXCHANGER SURFACE




LEGEND

1. BLOWER
2. LIMIT SWITCH
3. SAFETY SWITCH
4. REGULATOR-VALVE
5. WALL THERMOSTAT
6. CHIMNEY

| | |
|---|---|
| A. | AUTOMATIC DAMPER |
| B. | FLUE RESTRICTOR |
| C. | BURNER ORIFICE |
| D. | TWO-STEP INPUT VALVE |
| E. | ELECTRONIC IGNITION |

PRELIMINARY TEST RESULTS
TOTAL CONSERVATION BY CATEGORY
SEPTEMBER THROUGH MARCH

MICHIGAN CONSOLIDATED GAS COMPANY

| | METERED SPACE HEATING LOAD | PERCENT CONSERVED OF SPACE HEATING LOAD* | APPROXIMATE COST OF EQUIPMENT AND INSTALLATION |
|---|---|---|---|
| SINGLE DEVICE | | | |
| A. DAMPER | 811.97 ccf | 23.64% | $100.00 |
| B. REDUCED ORIFICE | 895.02 | 9.99 | 17.00 |
| C. 2 STAGE VALVE | 774.71 | 10.61 | 60.00 |
| D. FLUE RESTRICTOR | 803.16 | 20.94 | 18.00 |
| E. ELECTRONIC IGNITION | 900.84 | 3.58 | 72.00 |
| DOUBLE DEVICE | | | |
| A. DAMPER & REDUCED ORIFICE | 829.53 | 21.32 | 117.00 |
| B. REDUCED ORIFICE & 2 STAGE VALVE | 929.34 | 8.90 | 77.00 |
| C. REDUCED ORIFICE & FLUE RESTRICTOR | 858.11 | 26.46 | 35.00 |
| D. DAMPER & 2 STAGE VALVE | 817.19 | 21.09 | 160.00 |
| E. DAMPER & FLUE RESTRICTOR | 876.54 | 27.85 | 118.00 |
| F. 2 STAGE VALVE & FLUE RESTRICTOR | 794.68 | 19.34 | 78.00 |
| TRIPLE DEVICE | | | |
| A. DAMPER, REDUCED ORIFICE & FLUE RESTRICTOR | 782.18 | 25.81 | 135.00 |
| B. REDUCED ORIFICE, FLUE RESTRICTOR & 2 STAGE VALVE | 803.11 | 25.01 | 95.00 |
| C. DAMPER, REDUCED ORIFICE & 2 STAGE VALVE | 1069.24 | 10.70 | 177.00 |
| D. DAMPER, 2 STAGE VALVE & FLUE RESTRICTOR | 865.94 | 22.22 | 178.00 |
| ALL 5 DEVICES | 1266.70 | 14.86 | $267.00 |
| TOTAL POPULATION | 868.44 ccf | 22.21% | |

*SPACE HEATING LOAD HERE TAKEN TO INDICATE THE VOLUME WHICH WOULD HAVE BEEN CONSUMED GIVEN NO MODIFICATION.

EXHIBIT B

715

Senator ABOUREZK. Thank you, Mr. Montgomery. First of all, I want to commend you and your company for taking the lead in trying to devise a program for energy conservation. I applaud that undertaking. Also, I want to say that I am pleased to learn that there are other energy-saving devices available because competition in the marketplace is the goal of this subcommittee.

Now, if some of my questions appear that I might be pointing the finger, I want to say that I am not. I am merely trying to elicit information from you, so I hope you take the questions in that vein.

In your statement, you state that, and I quote:

> We have found that most furnaces were oversized for the homes they heated and that a majority of chimneys were likwise.

Has not the situation that you describe here existed for years?

Mr. MONTGOMERY. Yes, sir, that is correct. As I indicate, most of the codes were designed or written at a time when most homes were heated with coal.

Senator ABOUREZK. All right. Now, most of the local codes with respect to furnace size and chimney size are based upon standards which are developed by the so-called voluntary standards organizations. Am I to understand that the standards organizations who are experts in the field did not, and apparently still do not, realize that the chimneys and furnaces are being overdesigned?

Mr. MONTGOMERY. Yes; I believe that they are. You have described the current situation and as I tried to point out in my statement, I believe the rationale for that initially was the cheapness of our energy. But as a result of the present situation, I believe the pressure is being brought about not only by energy supply and cost, but by companies such as mine, which will change that situation.

Senator ABOUREZK. It has not really changed yet, though.

Mr. MONTGOMERY. No; it has not.

Senator ABOUREZK. In spite of the fact that the energy supply and cost picture has changed.

Mr. MONTGOMERY. Relatively recently, I believe, Senator.

Senator ABOUREZK. But in the last 3 or 4 years when that energy picture has changed, there has been no change in design standards, has there?

Mr. MONTGOMERY. Not to my knowledge.

Senator ABOUREZK. I realize that your test results are preliminary. However, the interesting thing about your findings is that they are very similar to the findings of others—that is, except for the American Gas Association.

Now, as I read the chart showing the amount of savings achieved by the five devices tested, the vent damper showed the highest savings and the flue restrictor the second highest, is that accurate?

Mr. MONTGOMERY. As a single device, that is correct, sir; yes.

Senator ABOUREZK. Now, according to your statement, the reduced orifice and flue restrictors combined, showed a 26.46 percent savings when used in combination, and that the vent damper and flue restrictor in combination showed savings slightly higher. What is that figure?

Mr. TURKO. 27.85.

Senator ABOUREZK. Now, the Washington Gas Light Co. here in Washington ran some tests on the Vent-O-Matic damper in 1969, and found that on a 5-inch vent the savings would be about $5 a month.

And on an average-size vent, assuming furnace operation during 30 percent of each day at 70 percent efficiency, savings of $7.20 per month.

Now, translated into dollars, is that roughly comparable to what your tests reveal?

Mr. MONTGOMERY. Well, let me just try to clarify, Mr. Chairman. It would depend upon the cost of gas in the particular area. In my company's area, and we do have and enjoy one of the lowest rates in the country, the 25 percent would produce presently about $100 a year savings for the average customer. So, it is slightly more than what the Washington Gas Light's is.

Senator ABOUREZK. Now, if I read your statement correctly, you plan to encourage the installation of the combination reduced orifice and flue restrictor because it is most economic for your customers in terms of fuel savings and cost, is that correct?

Mr. MONTGOMERY. That is correct, though I want to make it clear because, as the chairman has rightfully pointed out, we need all the devices that we can muster in the marketplace to get the best utilization of our energy.

While we would, perhaps, make all the information known that we have, we certainly would recommend the one that fit our marketplace the best. And as I pointed out, we do have demographics which indicate that the economic situation is one that would be very critical to our people. And, therefore, we would look to try to at least inform them of their alternatives, so that they could select what would be best for them.

Senator ABOUREZK. Well, I, personally, would agree that that is the best way because if, for example, one device costs more, but saves more fuel, perhaps the company manufacturing it might, by virtue of the marketplace, find a cheaper way to manufacture it and bring the price down. And that, in my view, is the best way to go.

Mr. MONTGOMERY. Yes, sir.

Senator ABOUREZK. In your statement, you state that the oversizing of chimneys can be explained because most flue sizes were adopted when homes were heated by coal-fired furnaces. Am I correct in assuming that modern homes do not have these oversized chimneys or do they continue to build the same size chimney in modern homes?

Mr. MONTGOMERY. The code has been unchanged, so you would have to continue to meet the code.

Senator ABOUREZK. Unchanged? So, they are still building oversize chimneys and flues?

Mr. MONTGOMERY. That is correct.

Senator ABOUREZK. Are there any homes that are being built today which do not have oversized chimneys?

Mr. MONTGOMERY. The larger the home, the more square feet to heat, the closer you would get to meeting the kind of chimneys that the code now requires that you put in a home.

Senator ABOUREZK. But do you know of any homes with what could be called efficient-sized chimney being built today?

Mr. MONTGOMERY. There is a complete match of the chimney and the furnace. I would like for Mr. Turko to respond to that.

Mr. TURKO. Yes, sir. There are a number of homes constructed in Detroit each year where they do not incorporate a masonry type of chimney. But they take the flue and extend it to where it is more closely sized to what is required.

Senator ABOUREZK. What is the percentage of homes being built like that?

Mr. TURKO. I can only speak, sir, of those in Detroit and I would say it would be less than 5 percent.

Senator ABOUREZK. Now, am I to understand that Michigan Consolidated did not realize that chimneys and furnaces were oversized before it began this testing program?

Mr. MONTGOMERY. I would say that I am sure our engineers and our people who went through the period of conversion from coal to gas, at the time, realized it. The problem of the imbalance between the amount of air you were drawing out of housing and needed to draw out, I'm sure was not identified as a problem critical to our end consideration.

Senator ABOUREZK. Do you know whether or not the standards developers knew that they were overdesigning chimneys all these years?

Mr. MONTGOMERY. I do not.

Senator ABOUREZK. Now, if a chimney is not oversized and you cannot use the flue restrictor, would a device like the vent damper still conserve energy?

Mr. MONTGOMERY. I am not an engineer, you understand, sir. But I would believe that you would save some energy on any type of installation that tended to keep heat into the home; that you would not be drawing it out by leaving the hole open, let us say. So, it would seem to me, that any type of device which closed the flue when the furnace was not operating, would produce some savings, whatever they might be.

Senator ABOUREZK. Now, the staff has talked with Mr. Turko by telephone and he has explained the advantages and disadvantages of the vent damper and the flue restrictor. Am I to understand that the vent damper saves during the furnace's down period, whereas the flue restrictor saves when the furnace is operating?

Mr. MONTGOMERY. Well, the flue restrictor saves both times, because when you reduce the size of the hole that is in the chimney from which you can lose heat, and when it reduces the opening, it saves. But it still leaves the hole so that you do lose even while the furnace is off.

Senator ABOUREZK. So, whatever savings either one provides is done sort of independent of each other?

Mr. MONTGOMERY. To a degree, yes, independent of each other.

Senator ABOUREZK. Now, you heard the testimony of the Consumer Products Safety Commission, that the automatic vent damper is safe when it is installed properly and even when installed improperly, in most cases it will only result in an inconvenience to the homeowner.

What was your experience with the Vent-O-Matic damper in terms of safety?

Mr. MONTGOMERY. Let me give you the general statement and then if you want to get into more detail, I would like to have Mr. Turko respond.

We had 81 installed in these 225 homes. We had nine service calls. They went in three categories. They were, first of all, the problem where they failed to operate and remained closed. Second, is the opportunity for it to fail to energize the furnace switch. The third, one, just offhand, I cannot come up with.

But those are basically the problems we encountered. Now, I will say, Mr. Chairman, we were in a test situation and we did design in our tests, a safety device that we were aware when we put the automatic flue damper in, one of our concerns was that the valve that had to be energized by the device might get dirt or something in it and would lock it open. And to protect against that, we put a dual valve on it so if one failed, we had another one that would go into action. and close off the furnace.

Senator ABOUREZK. Now, what was your experience with the other devices in terms of safety?

Mr. MONTGOMERY. In terms of safety, I would say that the service calls that we had on the other devices—we had service calls on all of them because we were metering and we were attempting to get factual data and we did not want our employees to try to interpret anything, only to give us information.

We did have service calls on most of them. My recollection is, we did not have any more service calls on the automatic damper than we had on some of the other devices.

Senator ABOUREZK. But, I mean, in terms of safety, they were all relatively safe, is that correct?

Mr. MONTGOMERY. Yes. Yes. Any device, however, that has to be energized to act, which cannot be put in place, locked in and has working parts, you know, is subject to having some failure. And we tried in our testing here to discover, as nearly as we could, what the risk involved, what the probabilities were by the way that we were installing and monitoring and so forth. So, we were ultrasensitive to anything that might fail in this test procedure.

I want to be sure that the chairman appreciates that we are not a company trying to set standards or trying to write a lot—what we are trying to do is test devices, in order that we can provide a service to our customers.

Senator ABOUREZK. Assuming that your preliminary figures hold up and one of these devices that saves approximately 25 percent was installed in most homes, have you calculated how much energy could be saved on a yearly basis, nationwide?

Mr. MONTGOMERY. I have not. Let me just give you some numbers from my own company, and I cannot tell you where we set as a part of the total industry, but our company presently sells about 120 billion cubic feet a year for heating purposes and that is what we are talking about here.

We serve a million customers, 850,000 of them are residential-type customers. Now, if we were to save 25 percent, which you can see, we are saving some 30 billion cubic feet of gas.

Senator ABOUREZK. Thirty billion?

Mr. MONTGOMERY. Yes. We sell 120 billion now, each year, for heating purposes.

Senator ABOUREZK. What is that in terms of dollars?

Mr. MONTGOMERY. We can figure right now that is about $1.50 per thousand cubic feet, so that would be—30 billion, would be about $45 million.

Senator ABOUREZK. $45 million, annually.

Mr. MONTGOMERY. Right.

Senator ABOUREZK. I have to say that is pretty good savings.

Mr. MONTGOMERY. It certainly is.

Senator ABOUREZK. Plus the equivalency in energy that you are conserving.

Mr. MONTGOMERY. As I mentioned in my statement, we are motivated or driven to bring about this result for basically two simple reasons. With that we can serve our marketplace. We are interested in serving that marketplace. We want people to have gas for heating purposes. We want essential industrial customers. We want jobs. So, we are committed to providing the energy, natural gas, in our marketplace that is going to be needed to continue the economy of our service area.

Now, the other very important drive that we have is the ability of people to pay. We have got to help them through this interim period when we are taking energy at such a cheap price and moving it in such a short time to a higher price.

People have to have some help to do that and we have got to be realists. And this is what we are trying to do, is to find the two answers that allow us to continue to meet our franchise obligation.

Senator ABOUREZK. Well, I have to say that is pretty commendable on your part.

Could any of these devices also be used efficiently and effectively in industrial buildings, office buildings and so on?

Mr. MONTGOMERY. Well, with respect to the heating facilities, and maybe Mr. Turko would be better qualified to answer this, but the design of a commercial building, a plant or other kinds of facilities I think that you have reference to, we have a little bit more attention paid to the requirements.

We know there is a sufficient amount of energy loss or heat loss in a plant, and we know in some of the facilities that are used, boilers and so forth, that some of the same principles apply. But we are working with our industrial and commercial customers on a little different basis in analyzing their situation as to how they can use the natural gas in the most efficient manner.

So, I would not hold out that these particular devices are the best opportunities for industrial and commercial customers to conserve energy and, particularly save gas.

Now, Mr. Turko, maybe you would want to respond for the record.

Mr. TURKO. Well, I would have to agree with Mr. Montgomery.

Mr. CHUMBRIS Mr. Montgomery, your headquarters are in Detroit, what area do you cover in the State of Michigan or do you go beyond Michigan?

Mr. MONTGOMERY. Yes; let me say that if you go to Michigan—in the shape of your hand—Detroit sits down here [indicating]. Michigan Consolidated serves going just almost across the State, diagonally; Ann Arbor, Grand Rapids, and Muskegon, and the kind of surrounding areas through there. And then if you drew another line across from Muskegon to east Tawas, which sits about here [indicating], we serve everything above that, up into the upper peninsula. We serve around Escanaba, Iron Mountain, in that area. We are the largest natural gas company in the State. As I indicated, we have a million customers. over a million customers.

Approximately 50 percent of our gas is presently used in the industrial commercial markets. We are a manufacturing State, highly labor

oriented, very dependent upon energy, greatly in need of natural gas for steelmaking, much processing is done in the auto plants and so forth.

Senator ABOUREZK. By the way, who do you think will win that Senate race up there this year? [Laughter.]

Mr. MONTGOMERY. Well, let me say, it is going to be a very interesting race, from the two colleagues down in the House, and I would not predict it at this time. I would say it will be a most interesting race.

Mr. CHUMBRIS. He has customers on both sides.

Mr. MONTGOMERY. Yes, sir. And I have got to deal with the Michigan legislature on both sides.

Senator ABOUREZK. I just wanted to see how you would handle that. [Laughter.]

Mr. CHUMBRIS. He did pretty well, Mr. Chairman.

Senator ABOUREZK. Does Michigan Consolidated have a representative on the ANSI Z–21 Committee?

Mr. MONTGOMERY. No; we do not.

Senator ABOUREZK. Is your company a dues-paying member of the American Gas Association?

Mr. MONTGOMERY. Yes, sir, we are.

Senator ABOUREZK. Have you talked to the AGA about your present program?

Mr. MONTGOMERY. Yes; I, personally, presented the program and results we obtained to the board of directors. I am presently taking a leadership role with the AGA in an expanded effort of the industry relative to this coming winter's testing program.

Senator ABOUREZK. Any response?

Mr. MONTGOMERY. A very positive response from the member companies.

Senator ABOUREZK. How about the leadership of the AGA?

Mr. MONTGOMERY. Well, you know, that is my responsibility to see that I get response from the leadership. And if they are not responding, then I need to do something about it.

Senator ABOUREZK. You have not had any yet, though?

Mr. MONTGOMERY. I have had good response from the arm of the AGA which is responsible for the particular programs that I am talking about. I am talking about not only the public affairs group, but also the so-called research group.

Senator ABOUREZK. Now, assuming that the Consumer Product Safety Commission is correct in the results of its safety tests, do you see any reason why automatic vent dampers should not be installed as retrofit units?

Mr. MONTGOMERY. No; I do not. I want to somewhat endorse what the chairman was saying. There are a number of ways this could be done to insure that they are installed properly. We now know that you have to have a building permit when you put a furnace in.

It may well be that one of the ways this should be done is to get a permit from the code people before you install any device. In fact, that probably is going to be the way they will revise their code.

So, you go to them to get a permit, they will have their safety engineers come out and inspect it and, certainly, I intend to have our people qualified when they are in the homes to observe what has happened in the home. We cannot accept the responsibility for everybody's word.

We can and will try to identify unsafe situations in any home we are working in.

Senator ABOUREZK. Now, you have given us a list of prices of all the products you have tested and that price includes installation costs. Now, frankly, as I said, we are not concerned with relative prices because where there is competition, the marketplace will be the ultimate decisionmaker.

However, the American price for the automatic damper does interest me. Now, they have mechanical and electric solenoid dampers in Germany that are in use and they retail for about $35 to $40. Why is there such a difference between the American price and the German price, if you know?

Mr. MONTGOMERY. I do not know, Senator. I would speculate with it, if you want me to, but I think it would be speculation on my part.

Senator ABOUREZK. Now, the inventor of the Vent-O-Matic damper, Mr. Diehl, has been advocating the use of an electronic ignition for some time. He also states that it takes about 3,000 Btu's to keep a pilot light burning. But if they were properly designed, it would take only about 600 Btu's. Perhaps Mr. Turko might like to comment on that, as he did on the electric pilot ignition.

Mr. TURKO. We monitored the amount of gas consumed by the pilot in the 225 homes that we modified and we paid specific attention to the pilot. The average amount of gas consumed by the pilot is about one cubic foot, 1,000 Btu's per hour, for the furnace. And the corresponding pilots under ranges and water heaters are smaller. But we do believe that even these pilot lights could be decreased. Yes, sir.

Senator ABOUREZK. If they were properly designed, they could be decreased and still do the same job.

Mr. TURKO. Yes, sir.

Senator ABOUREZK. Now, I have stated earlier that the local maintenance man undertakes many jobs which, if done improperly, could result in a fatality or an accident. I have also noted that it is almost impossible to stop a homeowner from attempting to do a job himself.

AGA's stated position for not approving the Vent-O-Matic as a retrofit unit, was that it might be installed by an unqualified maintenance man or by the homeowner. Now, in your opinion, are these valid reasons for keeping this product or any other products you display here, off the market?

Mr. MONTGOMERY. Let me make sure I understand your question.

Senator ABOUREZK. Well, let me rephrase it.

Mr. MONTGOMERY. Yes, please.

Senator ABOUREZK. The reason given by the AGA for not moving forward on certification of the gas damper is that it might be improperly installed by somebody. Now, is that reason, by itself, sufficient to keep this product off the market?

Mr. MONTGOMERY. Let me say, Senator, I do not understand the AGA's response to be as you have identified it. But if that were the condition, that the only thing that held you up was the ability to some way protect the public against faulty installation, I do not think you can ever completely insulate the public from a person who is going to do something on the premise that he does not do the right kind of job. Anytime you are dealing with the human element, you have got this kind of risk.

Now, we have to do all that we can possibly do, relative to codes, relative to whatever kinds of standards that we have devised, to try to minimize that risk for the customer. But I think we must not overlook the fact that the consumer, himself, has some responsibility when he undertakes to acquire a product or acquire a service from somebody. And he has to—it is the old "buyer beware"—though, where his safety is concerned, I think it is shared by a number of, "we," in the public.

But, nevertheless, he ought to deal with reputable people who, when they hold themselves outright, do do the right job.

Senator ABOUREZK. Well, the point of all this is that AGA has made no effort to make sure that the proper people install it. They just say, "We are not going to allow it because it cannot be installed properly by homeowners."

Mr. MONTGOMERY. If you would permit, I would like to talk about the future because that is really where I am. During this year of additional testing, I can assure you that we are going to review all of this kind of apparent obstacle, proper installation, what does the building code need, what do the people need to be able to do the thing we want to do.

We are going to deal with AGA very openly. We have been; we are participating with them in the larger group. We expect the Batelle Institute and the E.R.I.M. people to provide the kind of guidance that we will need to deal with all these kinds of agencies that have a very important part to play on behalf of the public with respect to whether or not we use any of these devices at all.

I am going to work awfully hard to make sure that we do not come up to the point where we have something for the public but because of something that we have overlooked, we cannot offer it to them.

That was my reason, initially, when you asked me to appear, for being concerned about appearing for fear that we build up hope before we had something that we could really offer the public. But I assure you, Senator, we will definitely look at all the areas so that we are not going to be at a point, somebody is going to stand in the road as an obstacle to us, at the time that the devices have been proven out.

Senator ABOUREZK. Well, I have no more questions.

I want to express my gratitude and the gratitude of the subcommittee for your appearance and the work that you have done on this question.

We want to thank you very much.

Mr. CHUMBRIS. Mr. Chairman, if I may state something for the record, Mr. Jerry Kabel, who is the vice president of the parent company, I believe, the American Natural Gas Service Co., was the press aide to Chairman Philip Hart for a number of years during the 1960's. Not only did he do a great job for Senator Hart from his office, but he was a great help to this subcommittee since Philip Hart was chairman a great deal of the time of Jerry Kabel's service to the Senate.

Mr. KABEL. Well, as usual, Pete, you are excessively kind.

Senator ABOUREZK. Thank you very much for coming.

Mr. MONTGOMERY. Thank you very much, gentlemen, for allowing us to come to the hearing.

Senator ABOUREZK. Our next witness will be Mr. Charles Woolfolk of the Save-Fuel Corp.

Mr. Woolfolk, I have just a couple of questions for you. I am sure you have read the report on your device, Vent-O-Matic, that was prepared by the Value Engineering Laboratory. They note that the vent damper did not comply with the proposed ANSI standard.

I wanted to give you the opportunity to comment on that.

## STATEMENT OF CHARLES WOOLFOLK, SAVE-FUEL CORP., HOUSTON, TEX.

Mr. WOOLFOLK. Thank you, sir.

When the request was made for me to present Vent-O-Matic to the Consumer Product Safety Commission, they called and said, "Send up four different sizes. Take them off the shelf and don't touch them."

Well, unfortunately, I had just about gotten to the end of my inventory so far as Vent-O-Matic is concerned, and those that I picked were some of the older models. They were manufactured back in 1968.

I thought all of the instructions had been changed, but they had been changed only in two boxes. Now, the Commission has noted it would be better, designwise, if the device failed in the open position. Had I known at the time that they were going to consider the ANSI standard, that has been, I might add, rejected, I would have sent this unit. This is a unit which I had made precisely to the proposed ANSI standards and if I might take a moment to demonstrate, does fail in the open position.

Mr. RAY. Now, Mr. Woolfolk, of course, that proposed standard never became an ANSI standard, did it?

Mr. WOOLFOLK. Well, that is my understanding, and it was for that reason that I sent the original Vent-O-Matic.

Mr. RAY. In fact, that standard was voted down.

Mr. WOOLFOLK. It was voted down; it was thrown out. And, to my knowledge, it does not exist today.

Mr. RAY. Thank you.

Senator ABOUREZK. Now, we have been talking a great deal this morning about the Vent-O-Matic, the device that you have there with you, and you have listened to all of the testimony. I wanted to provide you with this opportunity to respond to any statement that was made about it, which you might feel is unfair or inaccurate.

Mr. WOOLFOLK. Well, first, I would like to congratulate Consolidated Michigan on the steps it has taken to find fuel conservation devices. Its program is very similar to what we were trying to do in Memphis, Tenn. There, they had about 200 servicemen in a training school. Each serviceman was acquainted with how the Vent-O-Matic worked and how it should be installed. That was soon stopped, but, nevertheless, it is the way to go, because the utility companies can be on site where a Vent-O-Matic or any other type of gas device is to be installed. They have the expertise, they have the know-how, they can go in and see that the job is done properly. They would be a perfect liaison between the manufacturer and the product. I am not just saying Vent-O-Matic; I am saying any type of fuel-saving device.

I was particularly impressed with Mr. Montgomery's statement that he is not going to let anything stand in his way. That was the

attitude we had, but, unfortunately, we have had a very high wall to hurdle, and that wall was AGA.

We found that, without the AGA blue seal, we were unable to market this device on a national basis. Now, I could have sent this new device to the AGA lab, just as we did the others. It is very simple to have it fail in an open position.

Senator ABOUREZK. Well, I would not think that it made any difference since they never adopted the standard anyhow.

Mr. WOOLFOLK. That is correct Senator.

I might say this about whether the device should fail in the opened or closed position. The reason we decided on the closed position was because many times the electricity will go off in a home. When it goes off, the heat goes off. It may stay off, let us say, 4 or 5 hours. All right.

If the damper plate is closed, that house will remain warmer for a longer period of time than it would if it failed in the open position.

We felt too, as even the Commission's Report notes, that we have enough safety features to allow it to fail in the closed position and still be a fail-safe device.

That is all I have to say, Senator. I do appreciate the hearings and having the opportunity to bring this to the attention of the American people, because this is a need not only for the manufacturer of the Vent-O-Matic; this is a need for the American public.

When you are talking about saving one-half million barrels of oil per day, then we are getting into a position where we can do something about the energy crisis.

Senator ABOUREZK. Yes. Of course, we are especially grateful that you called the subcommittee's attention to your problems in marketing your device; it has made known a whole new area of anticompetitive practices which many people were not aware of. So you have provided a great service.

Thank you very much.

Mr. WOOLFOLK. Thank you, sir.

Senator ABOUREZK. The hearing is in recess until the call of the Chair.

[Whereupon, at 11:15 a.m., the hearings were recessed to reconvene at the call of the Chair.]

○