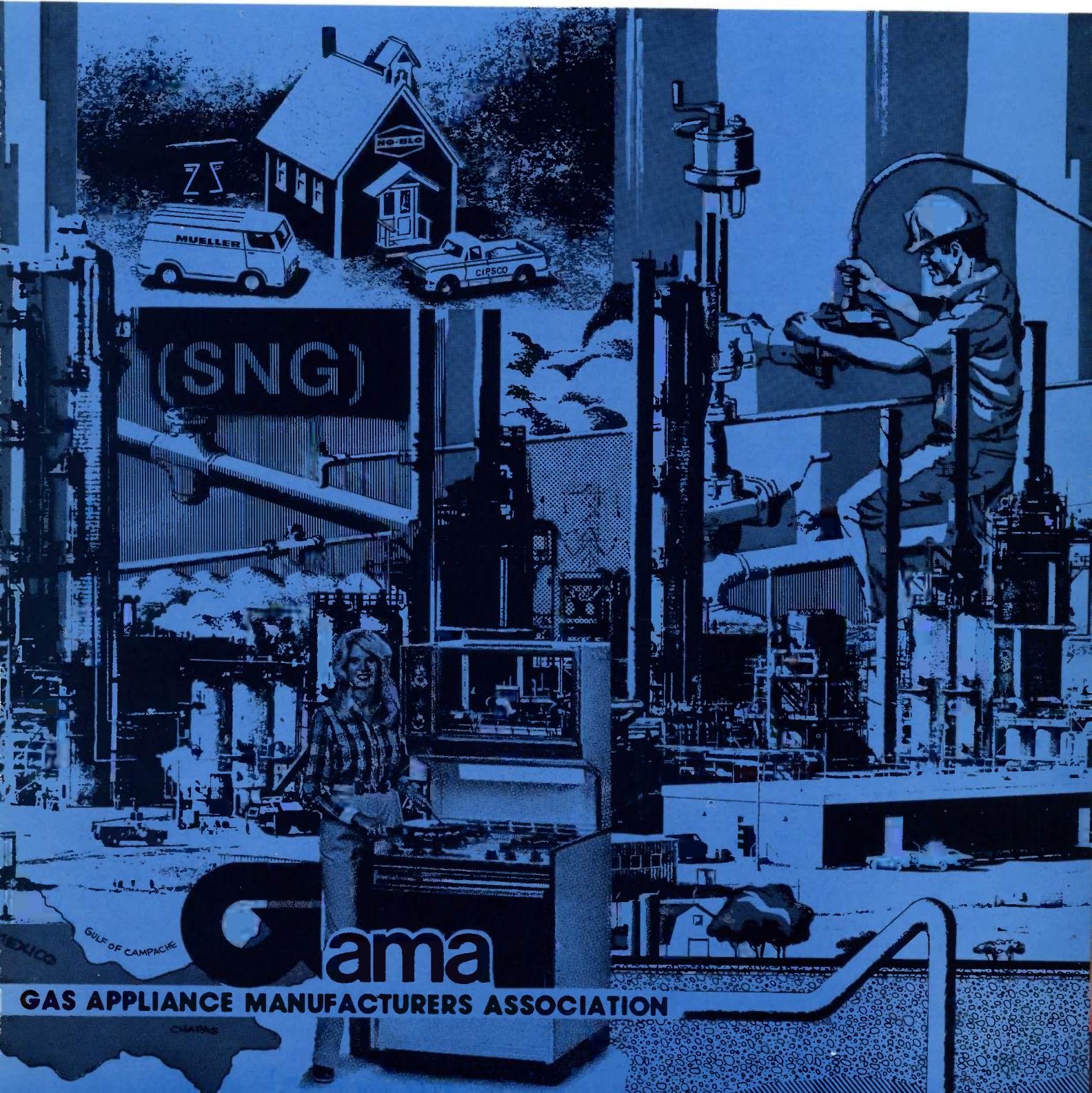


MUELLER® Record

SPRING/SUMMER 1978



Gama
GAS APPLIANCE MANUFACTURERS ASSOCIATION

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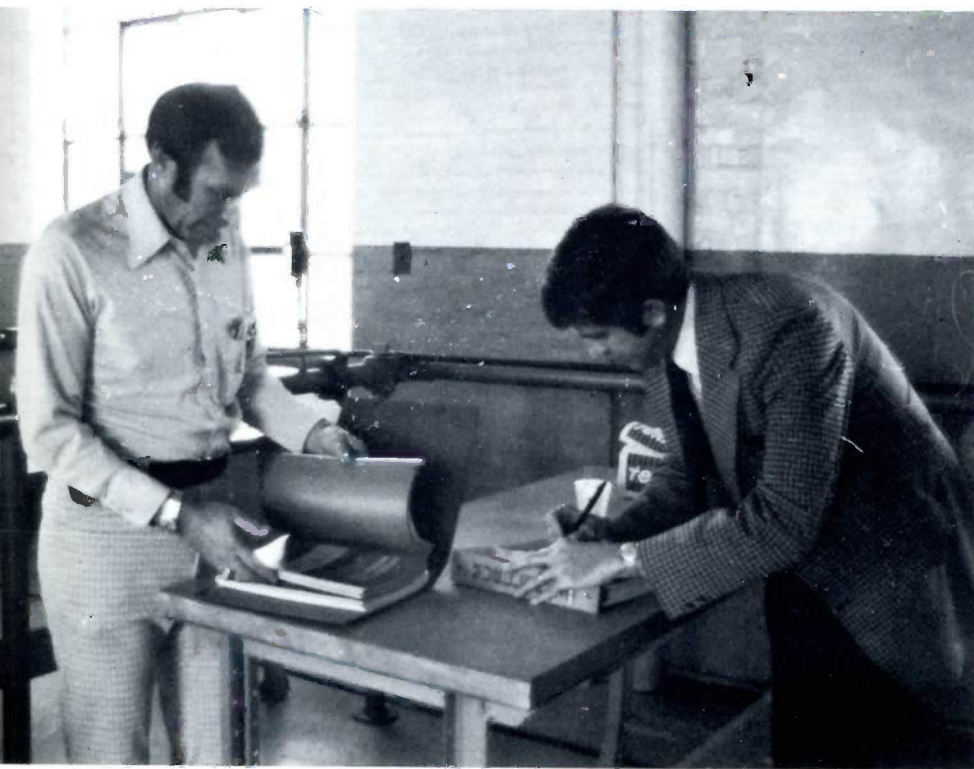
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About the cover

Gas industry in action:
Shows the diversity of the gas
industry. We are in a constantly
progressing picture.

Gas utility sends men back to school



Doing it by the book was stressed throughout the demonstration. Consulting the Mueller machine equipment operation manuals for specifications is Willard Bohlman (left), CIPSCO Gas Engineer from Beardstown, Illinois. Noting specifications is Bill Coffey, Sales Representative for Mueller Co.

What happens if you fill a gas meter testing lab with gas service and installation equipment, add a trained instructor, demonstrations and a group of interested gas company utility men?

The Western Division of CIPSCO (Central Illinois Public Service Company) did just that and found it to be a successful formula for an ongoing training program for its employees. (CIPSCO also has schools in Mattoon and Carbondale, Illinois.)

The "Gas School" is located in the CIPSCO building in Quincy, Illinois. It was added to their existing training program in March, 1977. The program provides information and training in all aspects of installing and servicing gas lines. CIPSCO gas engineers and representatives from companies that supply equipment and services to CIPSCO conduct the sessions. One such supplier is Mueller Co.

Western Division's foremen have already completed the program. The 60 utility men for this division are in the process of going through the program in groups of 12. One reason for keeping the classes small is to give each man the opportunity to participate. Each group will attend for approximately seven weeks.

Clarence Reither, CIPSCO Gas Engineer, Western Division H.Q., Beardstown, Illinois, explained, "The beauty of this school is that the men get to put their hands on it . . . and get the feel of the machinery. The school doesn't stop when the demonstrations are over. The guys get into discussions about methods and problems they may encounter on the job. There's a lot of sharing of knowledge and experience."

Mueller® No-Blo® instruction

Mueller No-Blo equipment is used in the school for employee training. Bill Knorr, Sales Training Manager for Mueller Co., was invited to instruct the school for one day. He gave demonstrations using Mueller gas distribution products and Mueller No-Blo methods and equipment.

Bill is Mueller's No-Blo specialist. He has given demonstrations across the country for several years.

"This is a service we at Mueller provide," Bill explained. "People know about the Mueller No-Blo demonstrations and request them. Customers write to us or call us and ask us to come out and show them how to use our equipment. Sometimes our sales representatives will set up demonstrations for customers." This explains, according to Bill, how his time gets to be so heavily scheduled with demonstrations all over the country, as well as in Decatur, Illinois, where Mueller has its own No-Blo school.

The demonstration for the Quincy Gas School, as well as most of the others Bill does, is a simulated field operations type. Gas pressure is simulated by hooking up air pressure to the demonstration models. This puts the products under similar stress conditions as found in the field.

Using No-Blo methods and tools, Bill systematically goes through each setup situation, demonstrating proper operating procedures and proper installation of Mueller No-Blo products. He also uses charts and drawings to help the men visualize the steps.

He names each piece of equipment he uses and points out its specific advantages. Cutaways of Mueller products are passed around for the men to see what the inside of the equipment they use looks like.

During the demonstration, Bill stresses safety. "Safety is one reason Mueller is here," he tells the group.

Bill also explains, "Mueller does a lot of things to make its products easy to use and dependable in the field. For example, Mueller casts a 'V' on valve tees because valve tees and service tees look alike and may be confused."

Bill Knorr has the gift of a good teacher — the ability to communicate with his audience. His fast pace keeps the demonstration highly animated and keeps the audience's attention. After completing one step, he may stop, flash a knowing grin at the men and call out, "What do I do next?"

Bill and the men toss questions about in a give and take discussion. The men answer each other at times and may stop Bill to question him or relate situations they may have encountered.

"I think it's a great idea. All of us could use refresher courses."
Bob McIntire, Quincy, Illinois.

Depending upon the region in which the demonstration is held, the appropriate Mueller Sales Representative is present. In this case it is Bill Coffey, Sales Representative for the Central District. He keeps the new Mueller gas catalog on hand for reference so no question goes unanswered. He points out various pieces of equipment and tools the men could use for different conditions, especially those that best fit situations faced by people in this particular school. He also helps Bill Knorr stress the importance of using proper methods with No-Blo equipment.

"I'm not directly involved with a lot of this equipment, but sooner or later I may have to use it and will need to know proper procedure."
Wendell Howard, Virginia, Illinois.

"I've had people try to tell me that they have a problem with a piece of equipment. So I ask them to take me out and show me. When I got there, I discovered that they were only using one-half of the proper installation procedure. I can't emphasize enough the importance of doing things by the book," Bill Coffey tells the men.

To further impress on the men that they must use proper methods and equipment, Bill Knorr recalls how a crew on a line stopping job, failed to follow the step by step instructions. They used a standard-sized line stopper fitting but used a shell cutter meant for thin-wall pipe. The cutter was too large for the fitting. It cut through the threads inside the fitting so the completion plug, which provides a seal, couldn't be screwed in. Their solution was to use two more fittings to remove the damaged control valve fitting. That's a costly way to remedy a careless mistake.



Bill Knorr explains the steps he will follow for a line stopper demonstration.

This mistake could have been avoided by reading the instruction manual. The men laugh when Bill Knorr assures them that reading the instruction manual does not threaten their manhood. The directions have been simplified, he tells them. "It doesn't take an engineer to figure out how the equipment works."

He explains the hazards of using quick "non-standard" methods that may save time but could cause damage to equipment or injure workers.

After demonstrating line stops and small and large drilling equipment, Bill Knorr invites the men to use the equipment themselves. All the while, Bill Coffey notes any technical or special questions to take back to Decatur. There, Mueller Co. has one of the largest engineering departments of any company that manufactures drilling and stopping equipment for distribution systems.

continued

"All of us need this. We learn from each other." Gary Quinn, Quincy, Illinois.



After consulting the book, Bill Knorr and Ron Bright prepare to check the travel required for the E-5 drilling machine in order to drill the correct distance.



To seal off the line stopper fitting in part of a No-Blo demonstration, Bill Knorr connects an insertion tool to a completion plug.



Bill Knorr demonstrates how Mueller machines can be power operated.

What do the men think?

Ron Bright, CIPSCO utility man from Petersburg, captured the feeling of the whole demonstration and for the gas school itself, "Running through various problem situations helps. They can give you books, but to learn, you really have to do it yourself. Some guys have had to learn the hard way. Training like this is what everyone needs."

The general attitude among the 12 utility men was that the Mueller demonstration was quite helpful. "I think we all learned something," observed Erick Krieg, Greensfield, Illinois.

"Even if you think you know all about the equipment, it helps to talk about it. It's good to get direct answers to our questions," added Don Ghrist from Canton, Illinois.

Other aspects of the school.

The Quincy program includes sessions in the field, using welding and air equipment, learning how to spot corrosion and handle it, demonstrations by other companies that supply CIPSCO, and an extensive safety course.

The safety course emphasizes fire protection. "This part of the school is to help the men gain confidence in using fire fighting equipment," explains CIPSCO's Clarence Reither, one of the school's instructors. "They practice putting out gas fires, ground fires and we even set an underground meter on fire for them to put out."

The Quincy Gas School not only shows the men proper equipment uses, procedures and safety, it reacquaints them with other important aspects of their jobs.

As Jay Cobb, CIPSCO utility man from Quincy, put it, "There is so much involved with our jobs, so many different aspects, we need schools like this to keep us on top of it all."

"This is especially good for me. I've only been with CIPSCO for a year so I haven't had experience with all the equipment yet."
J. C. Barnard, Canton, Illinois.

Clifford Ahern, CIPSCO utility man from Jerseyville, Illinois, practices using a stop changer. The advantage of the stop changer is that he can change a stop without letting gas escape.



Utility men look on as Bill Knorr prepares to assemble an insertion machine to a small line stopper fitting. Later the men will use the equipment themselves.



Mueller[®] NO-BLO[®] ... a leader

Since the introduction of high-pressure natural gas systems — and with the trend toward new materials and methods — Mueller Co. has continued to lead in the development and manufacture of new products and methods for the gas industry.

Mueller Co. produces a complete system of proven equipment, products and operating procedures called Mueller No-Blo. This complete system permits crews to work safely on gas mains and service lines under pressure without interrupting service. It virtually eliminates the hazard of blowing gas.

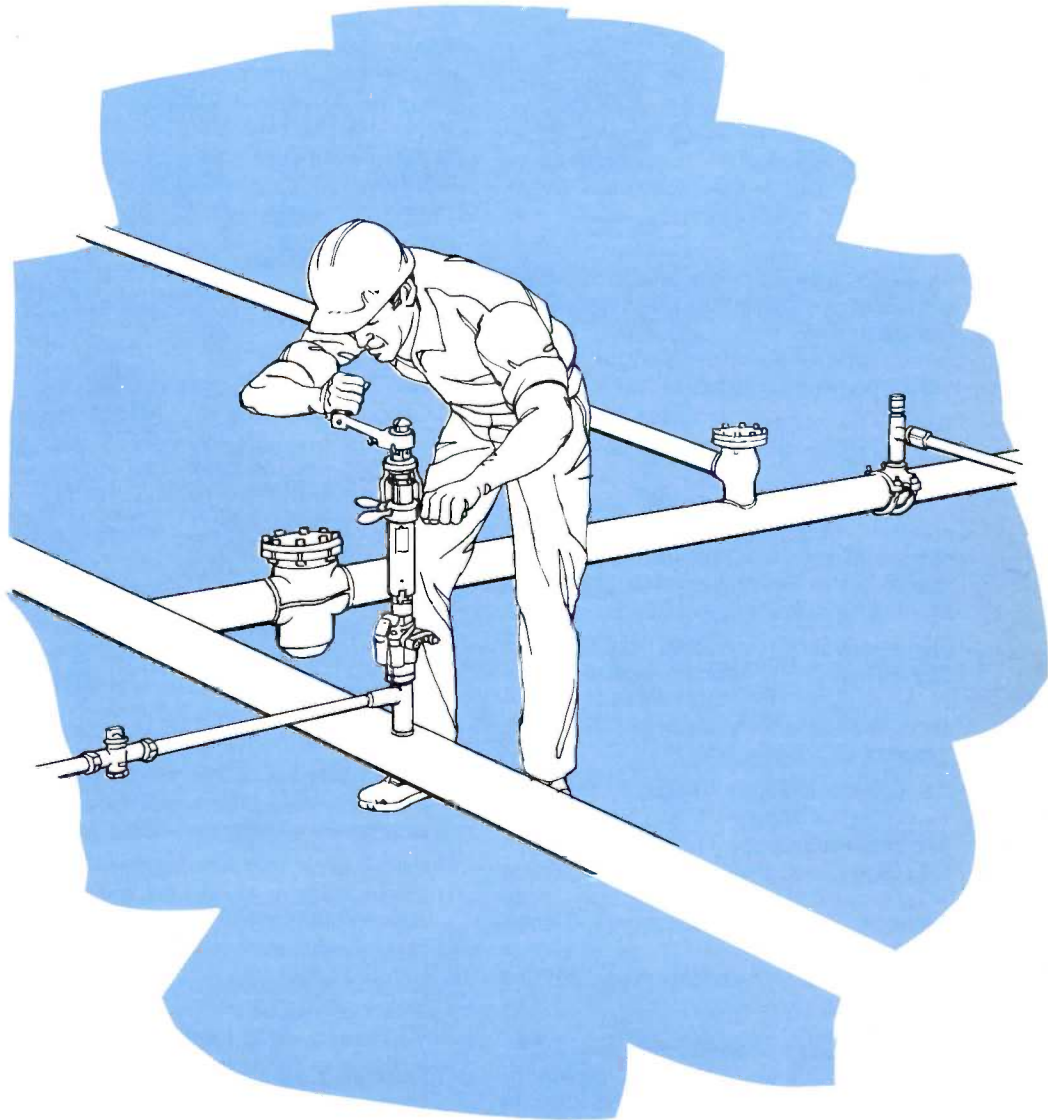
Mueller Co. has No-Blo methods and equipment to fit nearly every gas distribution and service line maintenance, repair and installation job. No-Blo products and methods provide total control, ease of operation and safety.

The Mueller No-Blo school was designed to demonstrate proper, safe and economical use of the equipment. The demonstration details proper care and maintenance of equipment for the longest and most satisfactory service.

New gas distribution products and new uses and applications for No-Blo methods are explained. Individual requirements and problems are also discussed.

Mueller Co. wants to stress the importance of proper use and maintenance of all equipment. To help prove the point, Mueller has deliberately used some of the same equipment in demonstrations for almost 20 years. It still functions effectively due to proper care and attention to procedure.

Many gas companies, such as the one in Quincy, Illinois, have standardized on the Mueller No-Blo methods and equipment. The reason — their long-term economical values and safe, dependable operations.



GAMA new program says,

"New gas appliances are good for your economy."

"Let's tell customers about the better efficiency of the new gas appliances."

This is the idea behind the Gas Appliance Manufacturers Association's (GAMA) current marketing program.

And here is some of the good news that they are telling their customers. A new energy efficient gas heating system can heat the same amount of space as an older model does but uses up to 20% less gas to do it. That's enough to take care of household energy needs for cooking and drying clothes.

The new energy efficient gas water heater models use up to a third less gas than older models. New gas clothes dryers cut gas use for drying clothes by 25%.

And pilotless ignition makes it possible for new gas ranges to use up to 50% less gas for cooking.

GAMA represents manufacturers of nearly all the residential, commercial and industrial gas appliances and equipment produced in the United States. Its 500 members include makers of equipment used in the production, transmission and distribution of natural and synthetic gas.

In its 50 years, GAMA has grown into a leading spokesman in the natural gas industry. This organization is a strong force working toward solutions to the nation's energy problems.

A growing concern of GAMA has been the sharp drop in gas appliance sales due to the talk of gas shortages and curtailments. Sales of gas ranges decreased 29% over the last ten years. Gas clothes dryer sales dropped 33%. Gas water heater sales decreased 16% and gas heating plummeted 32%.

Because of these decreases, several manufacturers of gas appliances and equipment dropped out of business. GAMA feels the repetitive message about impending shortages is to blame.

To protect the gas appliance industry from further damage, GAMA has a new program underway. The purpose of the Gas Appliance Program is to establish a new marketing posture for gas appliances. As this meets with success, GAMA anticipates a broader impact and a change to a positive attitude toward natural gas nationally.

The program stresses that the NEW gas appliances are up to 50% more efficient than older models. It also aims to inform the public that there IS a dependable supply of gas for residential

use. The fact that gas is the BEST energy value helps emphasize these two points.

The overall goal of the program, as defined by GAMA, is "to protect and expand (where feasible) the residential market for gas, to sell more efficient gas appliances and to inform the public that the total electric society is not inevitable or even desirable."

To carry out these goals, GAMA and over 40 gas utilities all over the nation have launched an advertising campaign. T.V. and radio spots are exposing 60-70% of American families to the program's messages and its slogan — "New gas appliances are good for your economy."

Eighteen full-page ads are running in trade publications. Thirty-one full-page, 4-color ads are running in consumer magazines. Consumer readership is projected at some 60 million. The ads shown on the next page are examples of ads running in consumer magazines this fall.

This media campaign is funded by financial pledges from companies within the gas industry. Since these ads are generic for gas appliances, no manufacturer names are mentioned. GAMA encourages companies to run supportive ads using their own name and products.

GAMA offers promotion kits for companies to use which include slide presentations and ads. These all aim to convince consumers to buy or retain gas appliances.

The Gas Appliance Information Program, sponsored by GAMA, is encouraging gas companies to follow these recommendations to help customers conserve energy:

- Turn water heater thermostats to a lower setting and install a decal as a reminder to keep setting lower
- Recommend that heating/cooling thermostats be turned for lower consumption and install decals reminding customer to change filters
- Offer to turn off decorative or non-essential appliances for customers (i.e. gas lights in yard)
- Instruct customers how to light and turn off pilot in furnace so they can turn it off during the summer and turn it on for winter.

- Provide customers with literature that offers advice on insulation, weather stripping, etc. . . .
- Emphasize the resulting cost savings from following these recommendations.

While the administrative work of GAMA is carried on largely by its full-time professional staff, much of the detailed work is guided by more than 200 committees. Each committee, having specific responsibilities and objectives, is made up of member company representatives.

An example of one of these member company representatives is William E. Murphy, Executive Vice President at Mueller Co. A Charter Member, Mueller Co. has belonged to GAMA since 1935.



Mr. Murphy has served GAMA in several capacities since 1965. He was Director-at-Large for the Board of Directors and has served on various committees.

Currently, Mr. Murphy is a member of the Marketing Council which is sponsoring the Gas Appliance Information Program. Mr. Murphy says, of this program, "We have given the gas industry a promotional program that is effective and aggressive at a very critical time in their history."

"During recent years, artificial price controls at the well head kept gas energy so low priced at the consumer level that it induced all kinds of wasteful uses. Use of gas to produce electricity and in such uses as patio and yard lights, artificial fireplace logs and the like, plus just general wastefulness because of low cost are responsible for the problem. We are now in a period where this is being corrected."

"Very soon we may find that the scare type coverage of the 'gas shortage' in all the media has led the new, potential natural gas consumer to shift to other less efficient and more costly energy sources for necessary uses such as home heating, clothes drying, water heating and cooking."

"At the same time, the 30 or so percent that was going for gas being burned under boilers for the purpose of generat-

ing electricity, over heating homes and water and unnecessary uses is no longer being 'wasted.' We will then find ourselves in a period of surplus — more gas available than the annual demand."

"The problem is not so much one of supply. Our concern is that of convincing the public that more efficient use of what we have will enhance the supply," Mr. Murphy emphasizes.

"So the industry must go back to marketing their product by selling the advantages of gas. The industry is going to need the support of the state utility commissions to bring electricity and gas consumption back into proper balance. The GAMA program is designed to help achieve this correction."

Our best salesman shows up in your mail once a month.

A high utility bill is one of your best reasons to check out today's new, energy-efficient gas appliances. They use up to 50% less gas than the ones offered just five years ago, saving you money... and precious energy. Gas has always been the most efficient energy for the big household jobs of home heating, cooking, heating water and drying clothes. And, with utility bills going higher, gas and new gas appliances are a better choice today than ever before.



Does the cost of staying warm give you chills?

A new, energy-efficient gas heating system can heat the same amount of space as older systems with up to 20% less gas... enough, in fact, to take care of your total energy needs for cooking and drying clothes. They're quiet, clean, compact, long-lasting and have pilotless ignition.



Only sunshine is more efficient.

Today's new energy-efficient gas dryers can cut your use of gas for drying clothes by 25%. They have pilotless ignition, automatic shut-off when clothes are dry, and multiple temperature settings for all types of fabrics.



The pilot light went out... for good!

Pilotless ignition is just one reason many new gas ranges use up to one-half less gas than older models and cost on average far less to operate. They also feature instant on and off... super fast heat control, multiple temperature settings, ovens that clean themselves and smokeless closed-door broiling.



Why there's really nothing to sing out in the shower. Did you know the average family uses 26,000 gallons of water a year? That's a lot of water... also, a lot of money. You can save both with a new, energy-efficient water heater. Compared to older models, these new water heaters heat the same amount of water with up to a third less gas.

Conserving energy is a national concern... saving money, a personal one. New gas appliances do both, and that's why we say:

Gas Appliances are good for your economy!



Holland-Wallace Company, Ad: GAM-0030B, Better Homes & Gardens, House and Gardens, Family Circle, Good Housekeeping, Better Homes & Gardens (House & Plans), House and Garden (Kitchen & Bath Guide), House and Garden (Building Guide), House and Garden (Plans Guide),



Look to natural gas to do the jobs gas has always done best.

When it comes to the big household jobs of cooking, home heating, drying clothes and heating water, natural gas is the most efficient energy there is. It's pure energy... and used wisely, for human needs in the home, there'll be enough for many decades to come. You can conserve energy

by using gas in the home, and you can save money by using today's new gas appliances. Designed for improved efficiency and economy, new gas ranges, heating systems, clothes dryers and water heaters feature improvements that can mean up to a 50% reduction in fuel consumption and a significant reduction in operating costs. Pilotless ignition. Better

insulation. Improved heat transfer. These and other features add up to big savings in energy and money. If you're considering buying or replacing a major appliance, then look to gas for the jobs gas does best... and has always done best. We invite you to see the new, energy-efficient gas appliances at your dealer today.

New Gas Appliances are good for your economy!



Holland-Wallace Company, Ad: GAM-0030A, Time, Southern Living

Ads like these are a part of GAMA's new marketing program to tell customers that gas burned directly for home heating, water heating, clothes drying and cooking is more efficient and uses less energy than electricity and new gas appliances are 50% more fuel efficient than older models. The aim of the campaign is to convince consumers to retain or purchase gas appliances.

FOR THE EXTRA MARGIN OF CAPABILITY

YOU CAN STOP-OFF 3/4" THRU 30" LINES THE MUELLER® WAY

For many years, Mueller Line Stopping Equipment Methods and Fittings have been available for working on 3/4" thru 12" gas service, distribution and transmission lines.

Now, this field tested and fully proven line of NO-BLO® Equipment has been expanded to handle stop-offs thru 30" diameter.

With this expanded equipment capability, your Mueller

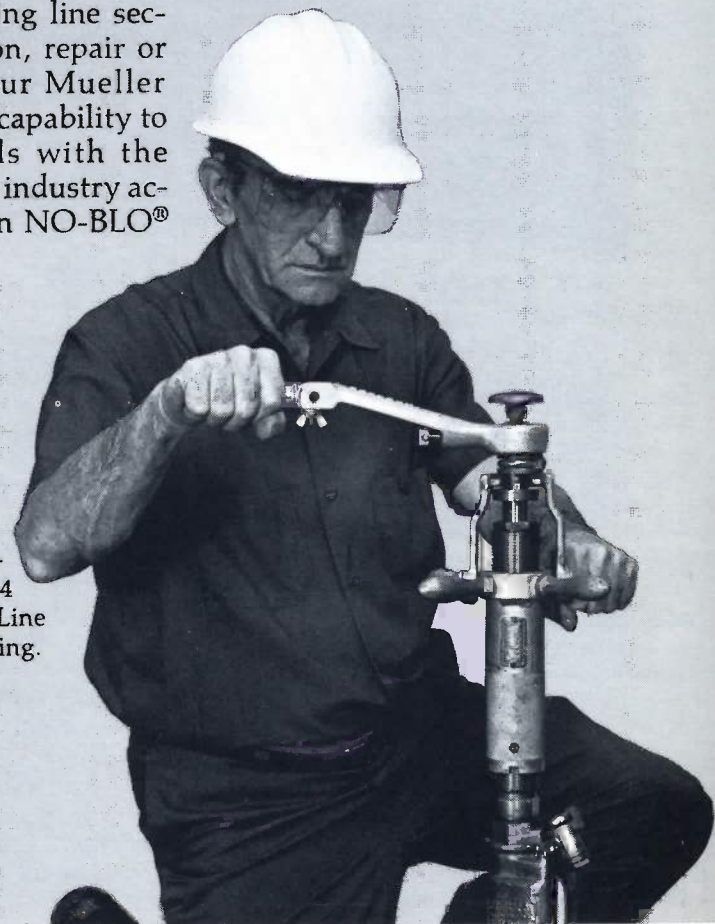
Man represents a single source of knowledge, equipment and experience.

Whether you're connecting new services, stopping-off old ones, extending mains, tying in loops or isolating line sections for relocation, repair or replacement, your Mueller Man has the total capability to serve your needs with the complete range of industry accepted and proven NO-BLO®

Methods and Equipment.

He can show you how to work safely on lines under pressure without interruption of service or hazardous blowing of gas. Ask him. Or write direct.

Stopping-off a 3/4" service line using the hand-operated Mueller E-4 Drilling Machine and Line Stopper Fitting.





To stop off lines up thru 30", large Shell Cutters such as this (shown with pilot drill) are used with the Mueller CH-24 Drilling Machine.

MUELLER® CO. / **DECATUR, ILL. 62525**



Factories at Decatur, Ill., Chattanooga, Tenn., Albertville, Ala.
MUELLER LIMITED, Sarnia, Ont., St. Jerome, Que. Canada

serving the water and gas industries since 1857

Challenges face gas industry as U.S. follows litre down road to metrication

Have you any idea how much effort will be required for Mueller Co. to make the "soft" conversion to the metric system? It would take 600 men working one year, 60 men working 10 years, or one man working 600 years just to convert all of the engineering drawings and records to metric specifications.

With 600 man-years required to make the "soft" conversion, it is mind-boggling to think of the additional time and money needed to make a "hard" conversion. (Soft conversion means simply changing the printed dimensions of a product to read metrically. Hard conversion involves actually changing the size of the product.) Mueller's problem with metric conversion will seem light compared to those facing the gas industry. So warned Carl E. Floren, corporate technical director for Mueller Co. This warning came in a speech he presented at the Pacific Coast Gas Association Distribution Conference in Portland, Oregon earlier this year. Here are some of his ideas.

Metric system — future effect on manufacturer and utility

If you are like me, you have been thinking, "What now?" We have a Metric Transition Act. It is voluntary. It has no timetable. But it does put the will of Congress and the President on the side of eventual change. In our reading we can see this changeover already taking place.

Europe and the rest of the world have been converting to the metric system for generations. At this time almost every country is on the metric system or converting. Yet, conversion is not complete, nor is every country using the same metric standards.

The International Standards Organization (ISO) is writing International Standards. ISO standards are not complete, nor do they have universal agreement, so that different metric standards also exist. At this time we have three metric standards to contend with. The various parts which make up ISO are one. ANSI has another, and the IFI interim proposal is the third.

On inspection, we see that other countries have changed their piping standards in one of two ways — "hard" conversion or "soft" conversion. Soft conversion leaves an item the same size and merely converts its dimensions from

English units to metric units. Thus a 1-inch shaft becomes a 25.4 millimeter shaft. No other change is made. Hard conversion would not only change the inches to millimeters but the module would change as well. Thus a hard conversion 1-inch shaft converts to 25 millimeters. The difference (.4 millimeters) is about the thickness of a dime — just enough in many instances to prevent interchangeability.

The reason for hard conversion is that modules are used for uniform increments of size increase. Supposedly for economic reasons the whole world will be better off when we are all using the same module.

Great Britain chooses "hard" route

Great Britain with its long history of the inch or Imperial System usage started the switch to metrics in 1968. The British have chosen a hard way to go. Situated as close to the continent as they are, it was rather obvious that they would become a partner in the Common Market. Therefore hard conversion was almost a necessity. As a member of the Common Market, they would be following Common Market standards. The CEN standards almost always were ISO metric standards.

The experience of the British Gas Corporation as they changed some of their piping standards was discussed last spring at the AGA Distribution Conference.

Five controlling factors were set out as they commenced the change: Existing suppliers of Imperial System components were given long lead times in which to change over.

Orders between all the parts of the country were coordinated so that existing suppliers would be assured of continued sales during the change over.

Levels of Imperial inventories were closely monitored to assure that they were sufficient and yet not to the point of surplus and obsolescence.

Even so, lead times extended to the point that 18 months supply was necessary for some items.

Training sessions to familiarize their workers in metrics had to be scheduled. And any new supplier, wanting to do business, could only do so with products to metric specifications.

The greatest problem reported was that of ensuring a long term supply of "change" or transition fittings to convert Imperial System piping to the metric system piping.

Yet, we have been told by our licensee in Great Britain that this is a time fraught with troubles. They were and are producing fittings to ISO metric standards, to DIN metric standards, to some particular country's standards that they happened to do business with, and finally to the old Imperial Standards.

The Gas Board's job was complicated by the fact they were also converting cast iron pipe from gray iron to ductile iron during the Imperial to metric conversion.

Starting in 1970, they began to phase out Imperial sized gray iron pipe. In three years it was no longer being used. At the same time they began to use metric sized ductile iron pipe. By April of 1972 they began to phase out use of Imperial sized ductile iron pipe. In one year it was no longer being used. In a three year period they had switched from gray iron to ductile iron and Imperial sizing to metric sizing.

Great Britain's plan was in marked contrast to that of Canada. As you probably know, Canada is opting for soft conversion.

Future of gas industry

What does all this mean to us who are concerned with piping gas? It means that we need to keep up our careful planning. Our industry has to decide on hard conversion or soft.

I know that my company does not plan to lead you into either choice. We do plan to stay in business, we want to keep serving you. This means that we will have to offer the products you desire.

For some years now we have produced our shop drawings with dual dimensions. Even so, it has been estimated that it will take 600 man-years to convert our engineering drawings and records to metrics. And this is just a soft conversion. A hard conversion would mean tooling changes as well. We have not attempted to estimate time or the cost outlay for tools and equipment.

Hard vs. soft — critical factors

While all countries may have adopted the S.I. metric system, they have not all adopted the ISO standards. The

politics of ISO are such and national self-interest is still so high that unanimous agreement in the near future seems unlikely.

I am not just crying "wolf" here. There is a basic difference in quality levels and technical capability between much of the U.S. industry and its counterpart overseas. Mueller Co.'s analysis would indicate that this is particularly true in the gas products supply industry.

Many of the products which we bring over for test and analysis simply do not measure up to what you are used to buying. The danger in this would be that we would open our market to foreign products that do not measure up to our level of technology. This would mean that a choice of hard conversion would be a step backward in safety and quality for many of the items you are now using.

Also, costs of hard conversion for the producer will increase product costs which must be passed on to the consumer — or some manufacturers will have to drop out of business.

Due to the size of the distribution system already in place and still in use, two sets of equipment will be required — English and metric. Service trucks will have to be jointly stocked for English and metric products and equipment or separate trucks will have to be set up. And mistakes will be made in mixing the components of each system. These will add cost.

Training will be a cost. You will not only have to teach an employee to think in meters and pascals, but it will have to be instinctive with him so that safety levels will be maintained.

The gas industry uses a lot of specials. A choice of hard conversion will have to consider these "specials." In a sense, you have already paid your dues to get tooling for their production. If you decide to keep them in inch modules, there is no big problem—just drawing changes and allied cost.

But change the "specials" in a hard conversion and the problem of new dues will come up. Someone will have to pay

for that tooling. A pattern and a set of plastic core boxes can cost Mueller Co. \$2,500 to \$3,500. This is more cost that has to be passed on to the ultimate consumer — that is you and me.

Gas industry is vulnerable

I believe that our gas industry is particularly vulnerable to a hard conversion. Our products are so long lived. Many items installed last year will be around for the Tricentennial. A choice for hard conversion will mean that the transition items, the dual equipment, the double stocks will be with us for a hundred years or more.

Most of the points I've made argue for soft conversion. I leave it up to you to decide if your cost of hard conversion is worth improving the large international corporations' position in world trade.

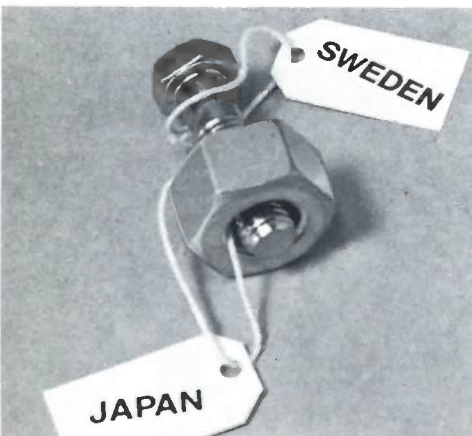
If you do have opinions, make them known to your standards writing people. These are the ones who will make our decisions for us.



"It would take one man working 600 years just to convert all of Mueller's engineering drawings and records to metric specifications."



"Meter vs. Metre?"



"... a bolt from Sweden might not fit a tapped hole from Japan ..."

State of the U.S. gas industry

Last winter's frigid temperatures plus gas curtailments left 1.2 million workers without jobs.

Industrial gas sales decline due to conservation warnings and curtailments.

Folly of federal gas regulation curtails pipeline deliveries for past 5 years.

These and other concerns of the national gas industry were discussed by Mr. G. J. Tankersley, President of the Consolidated Natural Gas Company of Pittsburgh, Pennsylvania. He presented his findings and ideas in a

speech, "State of the United States Gas Industry", to the International Gas Union Council Meeting in October, 1977 in Arlington, Virginia. The following is a condensation of his talk.

At this time the United States depends on imported oil for almost half of all the oil it uses. This is one of our basic national concerns. Because of the serious effects these imports have on our economy, the subject of developing our domestic fuel resources has become one of great importance to our citizens, our industry and our government.

Here is how our gas industry now stands.

The advent of new pipeline technology permitted development of a million-mile transmission and distribution system. This enabled gas to become this nation's sixth largest industry as measured by capital investment.

We have more than 137,000 producing gas wells and proved reserves of 216 trillion cubic feet, the equivalent of more than 6 trillion cubic meters. More than 9,000 new producing wells, completed last year, represent the greatest number in any one year in the history of the industry. We have 386 underground storage reservoirs . . . most of them, depleted gas fields.

In 1976, consumers in the United States used 74.2 quadrillion British Thermal Units of energy. Of this total, gas supplied 27.3 percent, domestic oil also supplied 27.3 percent. Coal supplied 18.5 percent; uranium, 2.8 percent; hydro, 4.1 percent; and imported oil, 20 percent.

U.S. consumer energy consumption in 1976 (74.2 quadrillion BTU's)	
gas	27%
domestic oil	27%
coal	19%
uranium	3%
hydro	4%
imported oil	20%

Marketed production of gas in 1976 totaled 20 trillion cubic feet, equivalent to 566.3 billion cubic meters. This was 40 percent of the world's total gas production. Though gas production has declined here in this decade, indications show that, with increasing prices, the trend is leveling.

Of our 20-trillion-cubic-feet-gas sales in 1976, about 26 percent went to the residential market, about 12 percent went to the commercial market — for example, schools, hospitals, bakeries, laundries, apartment houses. Some 44 percent went to the industrial market — for example, factories which manufacture steel, glass, chemicals and the like.

Gas sales in 1976	
residential market	26%
commercial market (schools, hospitals, apartment houses, laundries, etc . . .)	12%
industrial market	44%
electricity generation	15%
other	3%

Last year we served more than 41 million residential accounts, and these customers used more than 5 trillion cubic feet, equivalent to 142 billion cubic meters, for heating, water heating, cooking and clothes drying.

Gas serves more than 3 million commercial customers who used 2.5 trillion cubic feet last year. This is equivalent to 71 billion cubic meters. More than 50 percent of all the energy used in the residential and commercial markets is supplied by gas.

Our 100,000 industrial customers used 8.8 trillion cubic feet or 249 billion cubic meters. Almost 41 percent of all the

energy used by factories is supplied by gas.

About 15 percent of our gas sales were used for electric generation.

Industrial sales have declined in the past few years because of conservation efforts, curtailments of supply and because of a decline in economic activity. Use of gas for electric generation is declining, and over the course of the next ten years, gas will be practically eliminated as a fuel for generating electricity.

Government regulation problems

Present turmoil within the gas industry and question over future national energy development originated in 1954 from an important ruling of the United States Supreme Court. The "Phillips Decision," narrowly voted by the Court, imposed federal price controls on sales of gas at the wellhead if they were made across state lines from producing states to other areas of consumption.

The Court ruling spawned our government's policy of price controls, maintaining artificially low prices at the wellhead during the past 23 years. This federal policy has distorted the supply-demand equation as exploration for new supplies was discouraged by the low price to the producer and as demand was stimulated because of unnaturally low prices for the user.

That was enough of a problem, but, in addition, as a result of the regulation of interstate prices, a second market structure developed involving gas produced and consumed within state boundaries — the so-called intrastate market.

This second intrastate market has not been subject to federal price controls. Gas has been freely bought and sold at free market prices. As you might expect, this state system has had higher prices, but abundant gas supplies were available to those willing to pay.

Finally, the folly of federal regulation came to a head. Supply shortages resulted in curtailment of deliveries by the pipeline suppliers for the past five

or six years. These curtailments coupled with the severe cold weather last winter resulted in the reports of our problem which many of you read about.

Winter damages, too.

The United States experienced an unprecedented, record-breaking cold winter like none in our previous history of 200 years. The frigid conditions put great demands upon all fuel supplies: oil, coal, but especially natural gas, which dominated the headlines. Delivery systems are not built to handle such peak conditions.

During one period — from January 17 through February 8 — my company and many others were forced to impose *force majeure* curtailments. This means that industrial customers were ordered to use just enough gas to keep their plants and equipment from being damaged. In addition, commercial and residential customers were urged to take extensive measures to save gas.

The abnormally frigid temperatures caused no end of problems. Rivers froze and ice blocked intakes of cooling systems at power-generating plants. Barge loads of oil and liquified petroleum gas for utilities and industrial plants were delayed or stopped by ice. Coal could not move on frozen rivers and railroad carloads froze in 60-ton blocks. The cold combined with our industrial gas curtailments, caused job stoppages which put 1.2 million workers out of action the first week of February.

Our new President's first order of business was to convene a White House meeting of gas industry executives and federal policymakers so that emergency rules could be formed to permit moving gas from warmer West Coast states to the frozen East.

Permission to circumvent that unworkable dual market structure also came in the form of emergency authorization to purchase available supplies at a higher intrastate free-market prices.

Jack Tankersley, a past chairman of the American Gas Association, which bestowed upon him its Distinguished Service Award in 1972, has been appointed as America's representative to the International Gas Union and serves as chairman of its Committee on Production of Synthetic Gases.



G. J. Tankersley,
President
Consolidated
Natural Gas
Company

Voluntarily, our gas companies provided magnificent cooperation with each other, arranging contracts by telephone, with paperwork to follow months later. Both government and gas men seemed to learn that overly rigid rules, only bothersome in normal circumstances, must be swept aside in difficult times so that operations could continue.

Our gas industry demonstrated that it can operate well without having mandatory government allocation of gas forced upon transmission and distribution companies. We also know that we have a workable national gas pipeline network as a result of the experience of the trying winter past.

Fortunately, gas supply conditions are beginning to improve. For many reasons, most of our customers are practicing conservation very cooperatively. Much gas is being saved and being made available for sales to new customers. In the case of my own company, residential and commercial customers are saving between 14 and 15 percent of the gas we would normally have expected them to use.

In addition, gas supply projects which many gas companies started in the early 1970's are beginning to come on line. Imported LNG, synthetic gas from hydrocarbons, and accelerated conventional exploration and development — partly as a result of some recent federal government price relief — all are acting together to improve the short-term supply outlook.

For the longer term, the outlook is not nearly as dim as some government experts would have the public believe. Our geologists estimate that we have at least 35 and possibly as much as 60 years of supply from conventional sources of gas. These estimates rise steeply when you add the gas from supplemental and non-conventional sources.

Solutions

The gas industry in the United States has been most active since the supply shortage became evident in seeking solutions to the problem. The gas industry is deeply involved in promoting the wise use of energy. Our efforts in the past decade have developed an energy analysis program for building construction and design. We have been active in every facet of energy conservation.

Conservation, however, deals only with the demand side of the equation. In the struggle to form a national energy policy in this decade, the gas industry has continuously urged attention to supply measures to stimulate production from conventional and supplemental sources. How quickly these resources become available to consumers will depend on the policy evolved.

Our industry has been urging expanded conventional production by immediate removal of federal wellhead price controls and the increased leasing of public lands for exploration, especially those offshore on the outer continental shelf.

We are also urging accelerated development of supplemental supplies and sharply increased gas-related research.

We are encouraged that the President made a decision on the routing of new resources from Alaska. We are urging rapid endorsement by the Congress to bring proved reserves of 32 trillion cubic feet of Alaskan gas to market as soon as possible.

We have been urging the Federal Government to ease restrictions on the use of petroleum feedstocks needed to manufacture synthetic natural gas.

We are pleased that increased imports of liquified natural gas are possible as the removal of volume limits on importations were lifted.

We are petitioning the federal government to stimulate creation of coal gasification industry by providing loan guarantees for commercial demonstration of first generation synthetic fuel technology.

Future expectations

Many aspects of the Carter Energy Act are still unresolved. The Congress is divided as to the provisions of the Act. The House of Representatives has passed a bill which adopted most of the points that the President proposed.

The Senate, however, has opposed most provisions of the President's bill. An anti-deregulation filibuster by a few senators trying to keep federal price regulation finally drew to an unsuccessful end. And the Senate narrowly passed a favorable deregulation amendment.

Now we face the prospect of a difficult House-Senate Conference committee meeting to settle the wide differences between the two bills. Our satisfaction with the positive action of the Senate is tempered somewhat by the possibility of a veto by the President if a bill favorable to our point of view emerges from the conference.

I personally feel that, even if the industry fails this time to get the result we hope for, ultimately we will win. Gas is too important in this country's energy equation not to be recognized as such and its production encouraged.

Eventually, rational people will reason together to form guidelines permitting more of our citizens to share in the use of what President Carter himself has described as our nation's premium fuel.

Synthetic Natural Gas (SNG) — One alternative to gas shortage.

By the year 2000, the United States will be using more than twice as much energy per year as it does now, according to government forecasters. The energy-minded are asking what will happen when needs have doubled but supplies have not. Alternative energy sources will provide the answer.

Northern Illinois Gas Company (NI-Gas) a leader in developing alternative energy sources, has been exploring Synthetic Natural Gas (SNG) — a supplemental form of natural gas. SNG is produced from liquid hydrocarbons, mainly naphtha and other natural gas liquids.

Northern Illinois Gas, serving an area covering 17,000 square miles, is one of the nation's larger gas distribution companies. Its SNG plant is the first of its kind in Illinois.

Storage of gas, a related energy problem, is also being alleviated by an underground storage system. NI-Gas uses this system to store natural gas as well as the SNG.

How SNG is produced.

The 129-acre site located near Morris, Illinois, was designed to produce 55 billion cubic feet of gas per year. Enough to supply 300,000 residential space heating customers annually.

The structure contains 50 miles of pipe, 55 miles of conduit, more than 10,000 valves (they use Mueller products) and 99 reactors. Over two million gallons of liquid hydrocarbons are processed daily to produce 10% of NI-Gas' yearly gas sales.

The process used in this plant to produce SNG is the Catalytic Rich Gas (CRG)-process. It has been used successfully for a number of years by the British Gas Corporation.

There are three basic steps: purification, gasification and preparation for distribution. During purification liquid hydrocarbon is heated and hydrogen is added. This removes the sulfur and chlorides.

Gasification occurs in the reactor vessels when the purified hydrocarbon is combined with a catalyst and steam. This step rearranges the carbon and hydrogen atoms.

The rearrangement of carbon and hydrogen atoms form two gases — methane and carbon dioxide. This is important because natural gas is composed mostly of methane. So, SNG needs to be high in methane content to be interchangeable with natural gas.

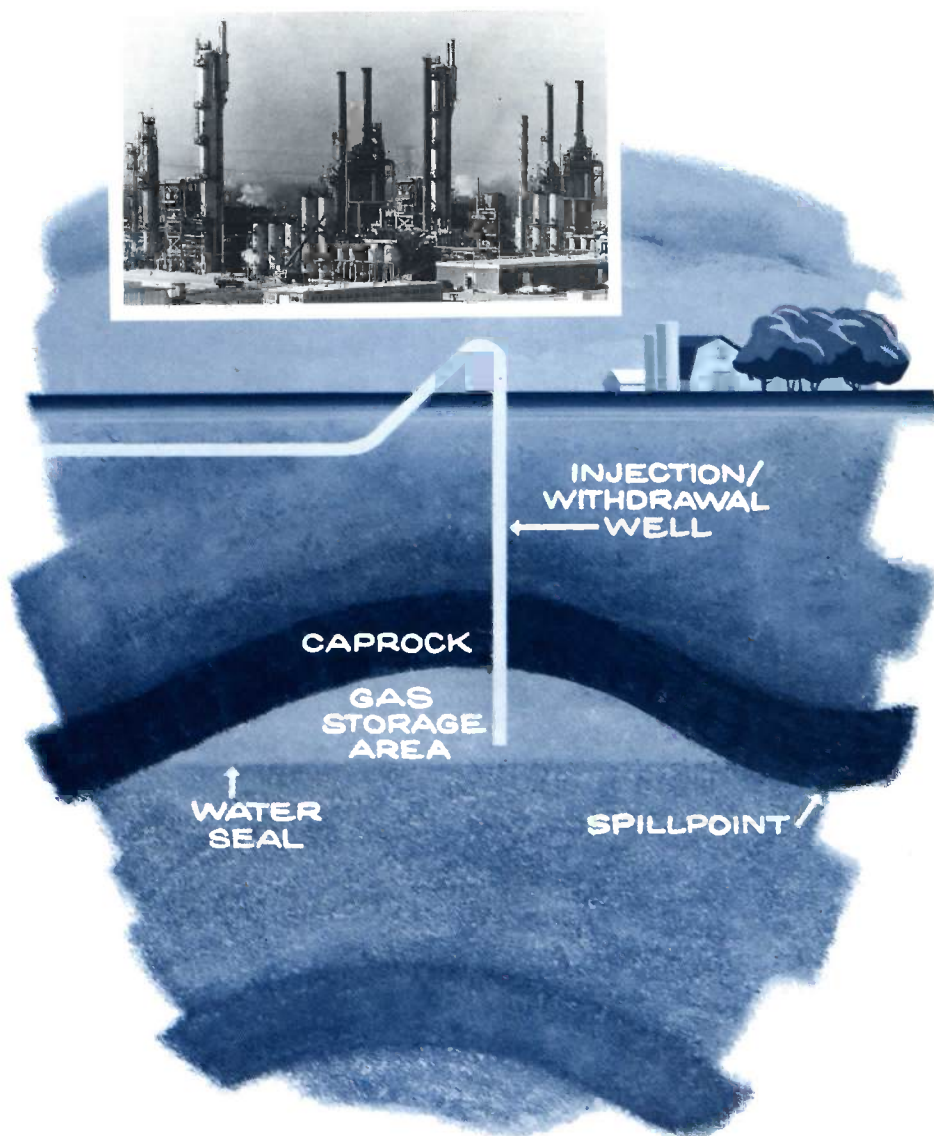
Through careful monitoring of all aspects of the complex SNG process, a high quality, environmentally safe product is produced. The SNG processing plant meets or exceeds all government air, water and noise pollution standards.

After all of this processing, the SNG is ready for customer distribution or underground storage.

According to NI-Gas, their SNG facility is helping alleviate the present natural gas shortage. They are now servicing about 300,000 customers or 10% of their yearly gas sales.

Building up adequate supplies of natural gas and the supplemental natural gas is another problem being solved at NI-Gas. Its solution is underground storage. NI-Gas has one of the largest underground storage systems in the world.

Upper left corner: NI-Gas' SNG facility
Drawing: Cross-section of underground storage field



What is underground storage?

Pipelines deliver volumes of natural gas to NI-Gas in winter and summer months. NI-Gas produces volumes of SNG. Being able to use vast reservoirs beneath the earth's surface helps build up a supply of natural gas and SNG to ensure that gas will be on hand when it is needed the most — in winter for heating and summer for cooling.

The gas is stored in natural underground reservoirs. These storage "fields" lie 800 to 4,000 feet below the earth's surface. Gas is injected into water-bearing layers of sandstone that are completely covered by dense domes of caprock. These domes can vary from 40 to 300 feet in height.

There are three geological essentials to have successful underground storage. As shown in the pictured cross-section, they are an aquifer (a natural reservoir containing water), the caprock and the dome formation.

How are storage fields developed?

Trained specialists use known geological characteristics of the prospective area to map out potential storage fields. They obtain permission to perform tests to see if the potential storage fields possess the three necessary geological characteristics (aquifer, caprock, dome). They must also determine the quality, shape and size of the field.

The specialists obtain this information by drilling shallow wells in the area. If these tests are positive, deeper drilling begins. Using the same type of equipment used to drill oil wells, researchers drill 8 to 10 of these deep wells. Special bits cut and bring up samples of the sandstone and its caprock. These samples are tested by geologists.

Pumping water into the reservoir is the final test. If no changes are detected in water pressure it means that the reservoir is sealed and will not allow the gas to escape.

After receiving appropriate governmental permission, workers install a pipeline to carry gas to the reservoir. Compressors are built to bring the gas to a pressure high enough to force it into the storage field. This pressure is also used to retrieve gas from storage for distribution to customers when needed.

Information for this article was provided by the Northern Illinois Gas Company (NI-Gas).

(Editor's note: The ability to meet challenges and customers' needs, as shown by NI-Gas, is commendable and representative of the natural gas industry.)

MEXICO BECOMING MAJOR OIL POWER

With discoveries of new oil deposits, Mexico may become a major oil exporter within three to five years, according to the United States-Mexico Chamber of Commerce.

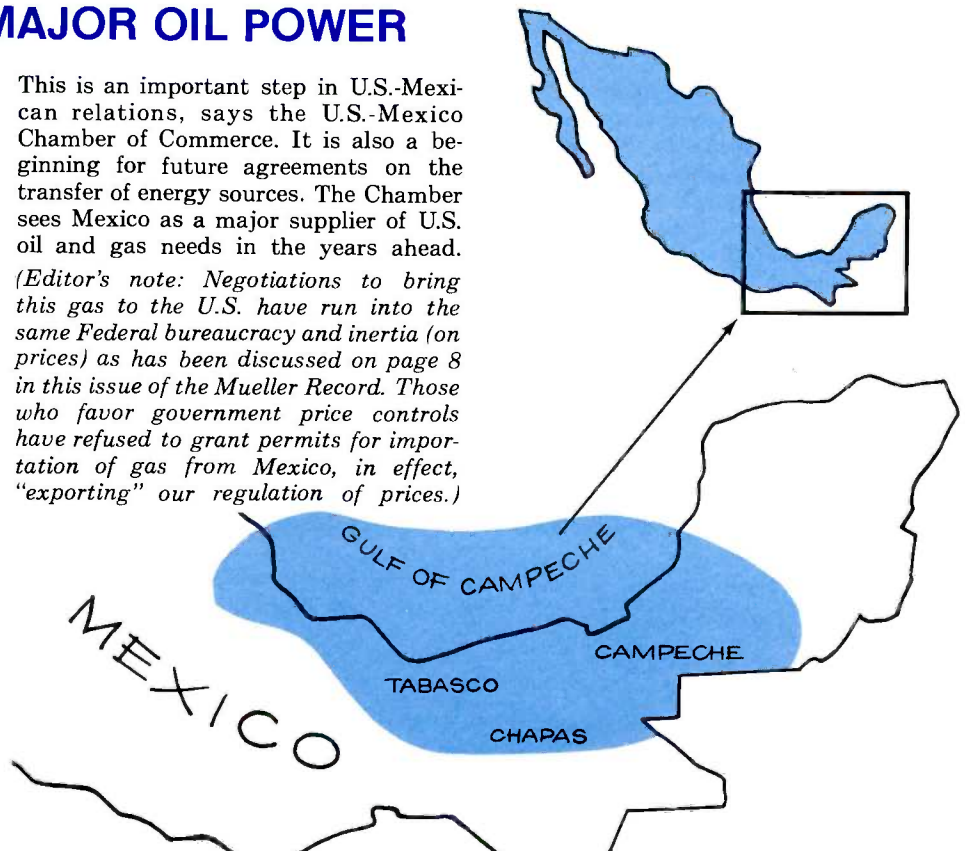
Finds in Tabasco, Chiapas, and the Gulf of Campeche promise to yield enormous quantities of oil and natural gas. The Gulf of Campeche find alone may surpass Alaska's Prudhoe Bay discovery.

An important advantage the Mexican oilfields have over those in Alaska is location. They can be easily connected to existing U.S. pipelines. This will help hold down costs. The gas and oil will travel shorter distances and no environmental problems are anticipated. Further, completion time for the Mexican sources to go into production is estimated at between 12 and 24 months . . . less than half the optimistic five years projected from start to deliveries of gas and oil from the Alaska discovery.

A consortium agreement has already been worked out between the Mexican Government and six major U.S. gas producers to divert Mexican gas to U.S. pipelines.

This is an important step in U.S.-Mexican relations, says the U.S.-Mexico Chamber of Commerce. It is also a beginning for future agreements on the transfer of energy sources. The Chamber sees Mexico as a major supplier of U.S. oil and gas needs in the years ahead.

(Editor's note: Negotiations to bring this gas to the U.S. have run into the same Federal bureaucracy and inertia (on prices) as has been discussed on page 8 in this issue of the Mueller Record. Those who favor government price controls have refused to grant permits for importation of gas from Mexico, in effect, "exporting" our regulation of prices.)



MUELLER NEWS

A REVIEW OF 1977



Helmut Biller

Helmut Biller was employed by Mueller Co. as a sales representative in our International Division. He started with Mueller December 10 and on completion of a training program will assume the position as Regional Director, Mid-East. Helmut was educated at the University of Munich in Germany and has been a permanent resident of the U.S. since 1968. Prior to joining Mueller Co. he was employed as a Branch Sales Manager with Scriptomatic. Earlier he was General Manager for an international subsidiary of Modern Fibers, Inc., and earlier was V.P., International, Chadbourn, Inc. In these positions he has traveled extensively in overseas markets developing agents, representatives, and relationships with users. After receiving training in Mueller Product lines, Helmut will spend a large part of his time overseas. Helmut is married and has a daughter. The Biller's permanent residence will be in Decatur.



Michael R. Mueller



Joseph R. James

Joseph R. James has been appointed sales representative for Mueller Co. in our Central Sales District. This is due to a realignment of territories for better service to our customers.

A native of Greensboro, North Carolina, Joe attended Appalachian State University in Boone, North Carolina.

During the summer while in college Joe worked for Utility Contractors. After graduating with a Bachelor of Science Degree in Marketing. Joe worked for a leading waterworks distributor in Greensboro. Later transferred to Westerville he served as a sales representative in Central and Southern Ohio until he joined Mueller Co.

Since that time he has completed an intensive sales training program where he has gained a thorough knowledge of products for both the water and gas industries, making him well qualified to serve you.

Joe is married and resides in Delaware, Ohio.



David B. Anderson

David B. Anderson has been appointed sales representative for Mueller Co. in our Midwest Sales District.

A native of Iowa, Dave is a graduate of Southeast Iowa University. Since graduation Dave has been serving as a sales representative for a leading waterworks distributor in Omaha. This experience has given him an excellent background for working with our water customers. Since joining Mueller Co. he has completed an intensive Sales Training Program where he has gained additional knowledge of products for both water and gas industries. This knowledge, in addition to his previous experience, makes him well qualified to serve you.

Dave and his wife make their home in Omaha, Nebraska.

Board Elections

Mr. Michael R. Mueller was elected a member of the Mueller Co. Board of Directors at the annual meeting of the shareholders held in Decatur on May 3. He is a Senior Analyst with Connecticut General Life Insurance Company of Hartford, Connecticut. As a member of the Mueller Co. Board, he is the sixth great-grandson of the founder of the company presently serving in that capacity. He is the son of Mr. and Mrs. Frank H. Mueller of Decatur.

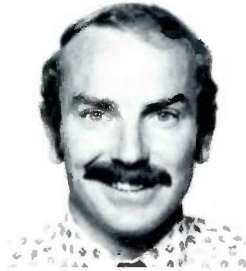
Other members reelected were:

Dudley J. Godfrey, Jr.
Robert V. Krickorian
Adolph Mueller II
Mrs. Bessie I. Mueller
Frank H. Mueller
John S. Mueller
Philip M. Mueller
John A. Schluter
Mrs. Lenore M. Schmick
A. E. Staley III
Harlan A. White



Malvin C. West

M. C. West has been appointed sales representative for Mueller Co. in our Southeast Sales District, succeeding R. C. Sponsler. Born in Missouri, Mal attended school in Decatur and has lived here for the last 23 years. He joined Mueller Co. in 1963 and has worked in our Decatur Plant and Foundry. Before being selected as a Sales Trainee, he was our Assistant Brass Foundry Supervisor. Since he has been a Sales Trainee Mal has completed our thorough sales training program where he gained a detailed knowledge of products for both water and gas industries. This training plus his previous experience makes him exceptionally well qualified to serve you. Mal is married and has two daughters and a son. He and his family make their home in Annapolis, Maryland.



Karl Miersemann

Karl joined Mueller Co. on October 14 as a sales representative in our International Division. A graduate of San Jose University with a BS in Industrial Engineering and a Minor in Business Administration, he worked with Fairchild Semiconductor, Inc. following graduation in January, 1969. In May, 1970, Karl joined FMC Corp. where he worked as an Industrial Engineer, moving into sales as a Sales Service Engineer and then Export Sales and Service Manager, and finally Product Sales Manager, Mobile Equipment in the Airline Equipment Division. He has traveled extensively throughout the world — in Europe, the Mid-East, Africa, Far East, and Latin America. Following training in Mueller Co. product lines, he will spend a large part of his time overseas building contacts, relationships, representation and sales, as the Regional Director of Western Europe and North Africa. Karl is married and has two daughters.



R. Wm. Henderson

Bill Henderson has been appointed sales representative for Mueller Co. in our Southern Sales District.

A native of Maroa, Illinois, Bill joined Mueller Co. in 1965. As part of his work as a Senior Laboratory Technician, Bill has made many field service trips supervising the use of Mueller machines and equipment in "Line Stopping" and "Hot Tapping" jobs in both water and gas installation.

He has recently completed an intensive sales training program covering products for both gas and water systems.

Bill is married and has four children. His headquarters will be in Clinton, Mississippi.



The girl with the million dollar voice

Many who have called the Mueller Co. office in Decatur, Illinois, have been impressed by the voice of telephone operator, Norma Enloe. They say she has the kind of voice any woman would love to have — and any man would love to listen to.

What does such a person with such a voice look like? This is she.

Norma is a native of Decatur. She's an outdoor type who enjoys horseback riding, hiking and water skiing. During her at-home hours, she restores antique furniture. And she's never studied voice!

Norma Enloe, Decatur, Illinois, telephone operator.

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contained perforating tools that also act as shut-off valves... tees and transition fittings with the Mueller Gas-Phase® safety device. Valve tees with combined stem and completion plug. Angle tees, gas main valves, meter valves. Repair clamps as well as service clamps, and more.

The entire line is compatible with Mueller Machines and No-Blo® Methods for fast installation under

pressure without blowing of gas. You can standardize on Mueller service connections—and gain the advantages of single-source ordering convenience and stocking efficiency. You can also draw on the Mueller organization's years of experience for advice. It's all you need—products, methods, and service. Just contact your Mueller Representative or write direct.



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