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It's the Effort that Counts

Wayne L. Daniel

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This paper outlines the approach taken by a graphic arts company to continue operating within the confines of its non-interruptible General Service Rate for natural gas and simultaneously expand its production volume.

1972, Josten's American Yearbook Company of Topeka, Kansas, operating on a non-interruptible natural gas rate with Cities Service Gas Company, was fast approaching their maximum usage rate of 3,000,000 cubic feet per month.

An announcement in March, 1972, by Cities Service Gas Company denying requests for new or increased gas supply for large industrial or commercial users as permitted under its tariff on file with the F.P.C. prompted the Topeka Plant to chart a new course in natural gas consumption.

I would like to tell you something about our organization, Josten's American Yearbook Company. This background information will give you an opportunity to relate your company's size, product, people, and structure to ours. We are located in Topeka, Kansas, and are a major publisher of yearbooks for schools and Armed Service Groups. The Topeka Plant is one of four yearbook plants in a division of Josten's, Inc. Josten's, as a corporation, has some 20 plant-sites in the United States. Our plant is 206,000 square feet, flat steel deck roof with fiberglass insulation, sidewalls are steel with fiberglass insulation between skins. Our business is seasonal, employing 1,100 employees during February, March, and April, dropping off to 400 by early fall. The plant was built in 1968-1969 and at the time of its opening went on a natural gas supply under a General Service Rate non-interruptible of up to 3,000,000 cubic feet per month.

A few years ago, 1973 to be exact, many of us faced a problem, "Was there going to be sufficient natural gas with which to operate?"

For us it initiated a concentrated awareness of our natural gas usage. It also prompted us to make some immediate decisions, about how we would control that usage, which we did.

I wish I could say it was because we decided to pioneer a new course, but the course we took came because of an announcement made by Cities Service Gas Company on March 7, 1972, denying requests for new or increased gas supply for large industrial or commercial consummers as permitted under its tariff on file with the F.P.C.

These restrictions effected large consummers of 3,000,000 cubic feet or more of natural gas in a single month.

The restrictions that were imposed were necessary due to an increasing demand of gas, coupled with an inadequacy of additional gas supply committed to interstate markets.

With this problem facing us, we proceeded to develop some alternative solutions:

1. One being installation of a full or partial standby propane system for peak load usage.
2. Converting certain process units to other energy sources.
3. Developing a comprehensive conservation program.

Approximately 20% of the BTU's consumed are in our manufacturing process and 80% for heating and humidity control.

I might note that all our gas supplied equipment reaches maximum utilization during the winter months, which includes building heat, humidification, and production equipment.

We immediately investigated a standby system, and after extensive study decided to shelve a standby propane system due to cost and go with a conservation program and conversion of certain process equipment to other energy sources as a cushion.

In 1974, our first year of gas conservation, we experimented a great deal. We weren't sure what type of problems would be created by drastic cutbacks in consumption, so we played a conservative game of conservation.

1. Thermostats were set at 72 degrees.
2. Rooftop units were never shut off, but the dampers were closed fully at the end of the final shift.
3. Multi-zone units were set for night control.
4. All major exhaust fans were shut off at the end of the final shifts.
5. Converted one of our silk screen dryers to operate off of electricity and gas. This unit is switched to electricity during peak months of gas usage.
6. Doors and hatches were weatherstripped to reduce heat leakage.
7. Daily monitoring and usage was tabulated.

We had a net gas reduction of 18% in annual consumption the first year of our program. Our production was down 1.5% from 1973. There were 5,001 degree heating days. Our highest consumption month was in December at 2,383,000 cubic feet. We were experiencing some success with our program.

The second year 1975, striving for results was tougher so we again continued to experiment further with just how far we could go in turning down the heat or off.

1. Thermostats were set at 70 degrees.
2. All heating units were shut down at the end of the second shift and on weekends. They were shut off manually by designated employees only, and back on by designated employees between 5:30 and 6:00 a.m. for a shift start of 7:00 a.m.
3. In addition to main exhaust fans, all exhausts were shut off at the end of the second shift and weekends, restrooms included.
4. We spend more time communicating with our employees of the necessity to conserve (for example, dock doors were closed when not in use, all hatches closed, etc.). In addition, we communicated to them the need for certain temperature levels in the plant so they did not adopt the attitude we were just penny pinching.

During this year, we found that approximately 30 feet in from most of the outside walls we were maintaining 55 degree temperatures on Monday morning even over a normal weekend shutdown. This same year we experienced a 23% reduction in consumption over 1973, with a monthly consumption high of 2,692,000 cubic feet in February. Production was up 16.8% and total number of heating degree days were 5,199.

In 1976, in addition to items we had done in prior winters, we started the following:

1. Each fall we called in experts in their field for adjusting and calebrating heating, ventilating, and air conditioning equipment to set thermostats, pneumatic controls, dampers and proper burner combustion on our boilers.
2. We lowered the operating pressure of our boiler from 13 lbs. to 10 lbs. We have experienced no problems operating at this lower pressure level.

Gas reduction was 28.0% with 2,110,000 cubic feet occuring in December. Production was 18.6% above the base year, with 5,361 degree heating days.

Then in 1977, the crunch! Prior to those critical months we had already decided to:

1. Set thermostats at 68 degrees where operating conditions permit. I might point out that no one is authorized to change that setting, except the Plant Engineer or the Maintenance Foreman.
2. Timers were installed on all heating units programmed for start and stop times.
3. Further evaluations proved, that in areas of high people concentration and lighting, we could shut off the heating units at the end of the first shift and it would maintain our approximate established temperature level for the duration of the second shift.
4. Dock doors were purchased and installed that provided higher efficiency in sealing air leaks.
5. Installed insulation along the interior of some walls.

1977 was a good year, production was up 29.5% from the base year. In addition, we experienced minimal weekend work due to a production control solution which directly helped in gas conservation. Even with a bitterly cold winter, our gas consumption was only 13,434,000 cubic feet, down 40.0% from 1973. Our peak consumption month was January using 1,991,000 cubic feet. The year contained 4,965 degree heating days.

One very important fact I would like to point out at this time is that during the critical months of usage regardless of where that might begain, November, December, or January, we monitor daily and watch very close the daily consumption and if we start using in excess of 100,000 cubic feet per day, we immediately initiate certain actions to start reduction of that consumption by shutting off heat for periods of time in non-key areas (for example the warehouse area is on of the first to go). We not only take daily readings of gas consumption in the peak months, but we do it year-round for historical purposes also.

Production! How does our reduction in gas usage correlate with our production schedules? Well, I am pleased to note in yearbook volume of pages our production has increased 29.5% over the past five year span and in our Cover Plant section, where the silk screen dryers are used, we have had an approximate 32.0% growth over the same period of years.

One other point worth mentioning is that since 1973, there has been a real concerted effort to reduce Saturday and Sunday production schedules and yet meet our quotas. That effort has paid off! During this interim period we have reduced weekend work approximately 75.0% during peak heating months.

What has it cost us to achieve these results?

1. To date we have had one large expenditure of funds, converting one silk screen dryer to electrical/gas usage for approximately $7,000, the payback on this was 2½ years.
2. Employee Satisfaction
   You can please some of the people some of the time, but not all of the people all of the time, so there are complaints of temperature variations to handle from time to time.

In summary primary reasons for our reduction in natural gas usage were:

1. Communication between management and employees informing them of our program and why it is needed. Especially it was important during the winter of 1977 when we had to shut off units during critical periods. We were able to keep working though!
2. A well trained maintenance crew in heating and air conditioning equipment.
3. Recognizing the benefits to be gained by calling in outside experts to make adjustments and calebrations to equipment.
4. The most significant impact of our overall program was finding out we can shut off our building heating units for one or two shifts or a weekend without an overall significant heat loss in cold weather!

We don't do this without monitoring our temperature conditions. An employee is assigned responsibility to observe temperature levels and if it drops below our predetermined minimums, we do turn on heat to return or hold at an acceptable level.

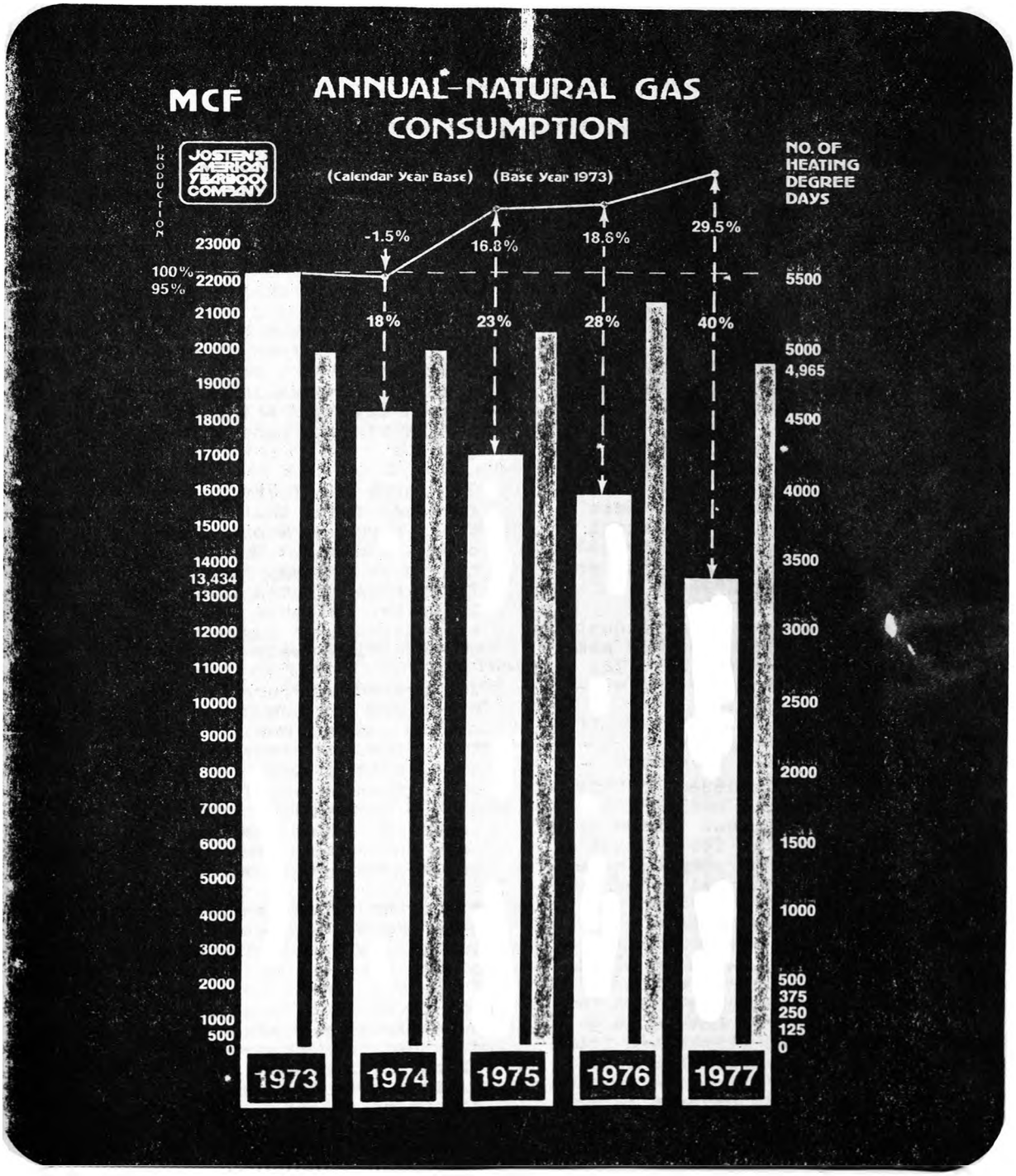
IT'S THE EFFORT THAT COUNTS!

See illustration at end of article.

Mr. Wayne L. Daniel is Production Manager at Josten's American Yearbook Company in Topeka, Kansas. Mr. Daniel has been with Josten's since August, 1975. In his present position he has responsibility for all phases of production. Prior to his current position, he was Manager of Industrial and Facility Engineering.

Prior to joining Josten's American Yearbook Company, Mr. Daniel was with AMAX, Inc. serving in various engineering and production management positions.

He holds a B.S. Degree from Southwest Missouri State University. He is a member of A.I.I.E.


MCF
ANNUAL-NATURAL GAS CONSUMPTION
JOSTEN'S AMERICAN YEARBOOK COMPANY
REDUCTION
(Calendar Year Base)
(Base Year 1973)
NO. OF HEATING DEGREE DAYS
-1.5%
16.8%
18.6%
29.5%
100%
95%
18%
23%
28%
40%
23000
22000
21000
20000
19000
18000
17000
16000
15000
14000
13,434
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
500
0
5500
5000
4,965
4500
4000
3500
3000
2500
2000
1500
1000
500
375
250
125
0
1973
1974
1975
1976
1977