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FOR ALABAMA INDUSTRY

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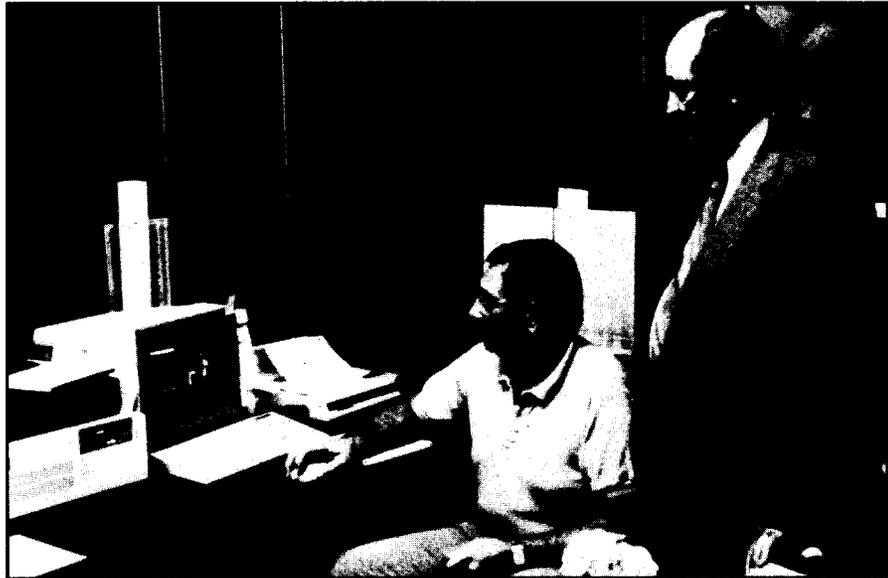
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## Energy Management Pays Dividends in Jefferson County

Bill Oden, Division Superintendent for Jefferson County Schools, has proven that energy management can pay big dividends. Since 1981, he has helped the school system save over \$1,460,000. Last year alone they saved almost \$266,000. His tools have been a centralized energy management control system (EMCS) computer and some common-sense management philosophies. More recently, he has used new lighting technology to reduce energy costs further. Matching grants from ADECA's Institutional Conservation Program (ICP) have made the economic benefits even more attractive.

The EMCS now controls 42 of their 62 schools. A central operator makes any schedule changes or temperature adjustments needed. Computers at each school site do the job of controlling major equipment according to schedules downloaded from the central computer. They also call the central computer if an alarm condition occurs.

One key to success of the system, Bill says, was selecting an experienced heating and cooling technician to operate the central computer. Jerry Heis uses his mechanical background to diagnose and prevent service problems from computer-provided information. Besides utility bill savings, the maintenance department has saved thousands of dollars on transportation



*Bill Oden (right) and Jerry Heis make control changes using EMCS.*

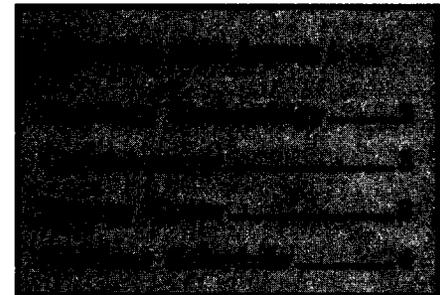
and labor costs. Technicians do not have to drive to the site to diagnose many problems. Lower run-times have extended HVAC equipment life. A principal makes operating schedule changes by telephone or written request. They cannot make changes by overriding mechanical room controls. While many principals were skeptical at first, they are now pleased with the system.

Besides basic schedule control, the EMCS allows Bill to use a "free-cooling" strategy. The computer turns ventilation systems on during the night to circulate cool night air through the building. This removes stored heat in the building. This strategy reduces the following

day's air-conditioning energy and electric demand charges during building cool-down.

To continue the trend of energy cost reduction, Bill has recently started installing reflector devices in fluorescent light fixtures. So far, five buildings have the devices, pro-

*(Continued on page 2)*



## Lighting Technology Offers Energy Savings

Lighting can consume as much as 50 percent or more of the energy budget in most commercial buildings. While lighting efficiency has improved in recent years, the Department of Energy estimates users can save 50 percent of current lighting energy by using available technology.

There are three fundamental ways to reduce lighting energy. First, operating hours can be reduced. Second, lighting load (requirements) can be reduced. Third, lighting efficiency can be improved. We will address each category with examples of current technology.

### Reduce Operating Hours

Reducing operating hours to correspond with actual occupancy can be very profitable. In theory, the least expensive method is employee education. Products such as occupancy sensors, either infrared or ultrasonic, cost money but are consistent and reliable. Switch replacements and wall- or ceiling-mounted sensors are available. These can pay for themselves in two years or less.

Lighting energy management control systems can be programmed to control major lighting loads from

a central computer. Timer controls can control individual loads without the capability for central programming. Twist timers can replace switches in rooms occupied for short durations. Light level sensors reduce operating hours by turning lights off when natural daylight provides a preset footcandle level.

### Reduce Lighting Load

You can reduce lighting loads (requirements) if you find existing light levels exceed Illuminating Engineering Society (IES) standards for the function of the space. Meters costing less than \$100 can provide the necessary measurement. You may be using an area for a different purpose than originally intended or the original contractor may have oversized the lighting system. While recommended light levels should be maintained for optimum safety and productivity, excess light usually is not profitable.

Task lighting may be used to reduce total lighting loads. General light levels may be reduced by dimming or using current limiting devices. Small work areas can use task lights to provide sufficient illumination for the specific task.

### Improve Lighting Efficiency

To improve lighting efficiency requires that more useable light be produced for a given amount of electricity. Incandescent lights may be replaced with fluorescent lights. Mercury vapor lights may be replaced with metal halide or high pressure sodium. Most conventional lighting now has some, if not several, higher efficiency replacement options. Higher lamp costs are displaced by reduced energy costs and less frequent replacement.

Reflector devices for fluorescent fixtures may improve efficiency. Typically, a contractor will remove two lamps and one ballast while installing a parabolic reflector in a standard four lamp fixture. In an IdEA\$ test of a typical office, a 50% reduction in wattage caused only a 15% reduction in light level.

The maintenance department can improve lighting efficiency by regularly cleaning light fixtures and diffusers. Dirt buildup significantly reduces the transmission of light. Group relamping at 80 percent of rated lamp life can maintain light levels while reducing labor costs for bulb replacement. ■

### Energy Management (Continued from Page 1)

jected to pay for themselves in less than three years.

Bill makes several suggestions for those looking at energy-saving projects. "Show them where you can make money. Dollars and cents are the bottom line. Do not sacrifice student (occupant) comfort in the name of energy savings. Hire top quality maintenance personnel. The person you can hire for minimum wage just does not have the necessary experience and training to operate the system."

Starting with two buildings nine years ago, Bill has made consistent progress toward energy cost reduction in Jefferson County Schools. As he says, "you have to crawl before you can walk. The cat didn't eat the whole grindstone in one sitting." Today there is a grinning cat and a little grindstone in Jefferson County. ■

### Recycled Paper Saves Energy and Reduces Waste

This newsletter is printed on 100% recycled "Minimum Impact Paper" (also known as Recycle 100). During recycling, the waste paper is not de-inked or bleached so the dyes and inks are included in the paper product. As a result, the process uses less water, fewer chemicals and produces only 10% of the normal solid waste. Recycling paper saves energy and reduces solid waste.

IdEA\$ is proud to "practice what it preaches" whenever possible. As we found, however, finding suppliers who sell recycled paper at a reasonable price is just as hard as finding some energy-saving products at the local supply house. Call us when you have problems locating vendors and we will help you find what you need at a competitive price.

Commentary

T. Kenneth Spain

## Environmental Issues May Force Us to Conserve

It's beginning to look like an oil shortage may not be the cause of our next energy crisis. It may be caused by an abundance - an abundance of environmental pollutants.

Energy-related environmental problems will lead to the ultimate conservation motivation - higher energy prices. Department of Energy statistics show that energy prices are a major reason for conservation activity. It seems that most of us need some budget pressure before we trim the fat.

Scientists blame Chlorofluorocarbons (CFC's), common in refrigerants, for contributing to ozone layer damage. New legislation designed to restrict or eliminate

CFC's is forcing development of new refrigerants. Refrigerant prices have doubled due to new taxes on R-11, R-12 and R-502. Equipment operating efficiency may decrease with substitute refrigerants. The net result will be increased operating costs for air-conditioning and refrigeration equipment.

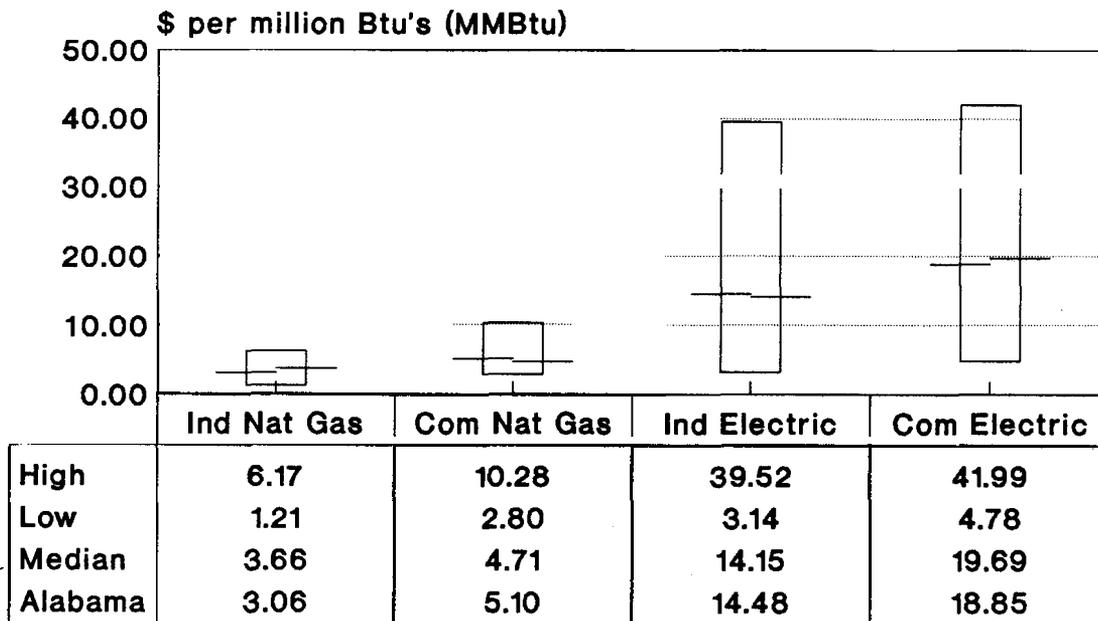
New standards for ventilation for acceptable indoor air quality (IAQ) have resulted from problems with "sick buildings." These buildings are characterized by excessive employee health problems caused by poor IAQ. One cure for many indoor air pollutants, among them radon, is increased ventilation. This effectively dilutes the concentration

of the pollutant to an acceptable level. It also increases energy costs for comfort conditioning as much as 20 percent.

New EPA regulations now require small producers of industrial wastes to treat, transport and dispose of these wastes properly. Treatment and transportation require substantial energy. It seems that most of our environmental issues have a direct impact on energy use and cost.

You may have heard experts suggesting that another energy crisis is coming. They just don't know when it's coming. Perhaps it's already here, we just haven't recognized it yet. ■

## US Commercial & Industrial Energy Prices



High   
  Low   
  Median   
  Alabama

## Energy Bookshelf

Our energy situation has been through many changes in the past ten years. *Managing Energy Resources in Times of Dynamic Change* by William H. Mashburn provides management aids for financially surviving those changes. It provides step-by-step procedures for organizing and carrying out a successful energy management program.

The book deals primarily with the management aspects of energy cost control. It acknowledges the importance of employee involvement in a successful program.

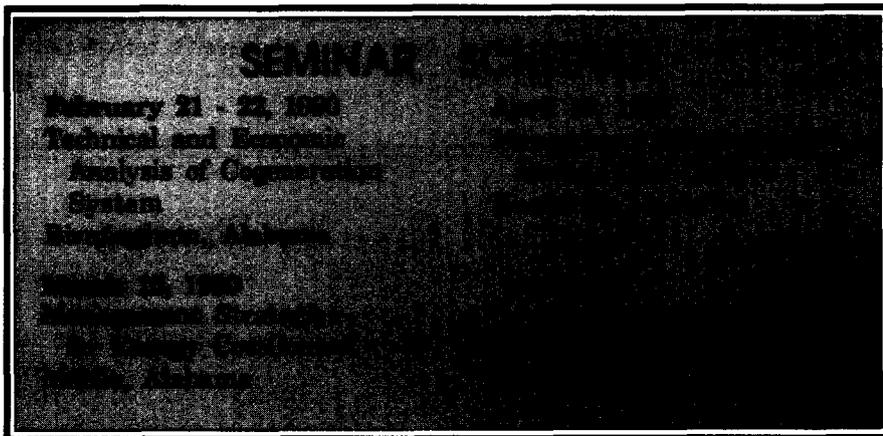
Mashburn bases much of the book on models of real-world success stories.

While management oriented, the book covers necessary technical subjects. The author includes chapters on utility rate structures and economic life cycle cost analysis, for example.

This should be a valuable addition to any manager's library.

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