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The often substantial costs of a plant's operation tend to be overlooked in the company budget, but a facility audit can help identify and contain them.

Are You're Facilities Fit?

By Jennifer LeClaire

IS YOUR PLANT as efficient as it could be? Is it compliant with health, safety, and environmental regulations? Do you face a significant maintenance problem? Is your processing equipment working under ideal conditions? In other words: Is your facility in tip-top shape?

A facility audit is the only way to thoroughly assess the condition of a manufacturing or industrial plant. But today's facility audits go beyond basic physical condition and functional performance. While these things are critical to efficient operation, forward-thinking facility executives are looking at new strategies that leverage technology and design principles to decrease waste, increase productivity, and eliminate crippling downtime.

Finding the Starting Point

The condition of a facility is impacted by factors such as age, use, application, and environment. Some form of facility audit should be conducted on a daily basis, experts say, and comprehensive yearly audits should focus on the usual suspects, including mechanical, electrical, plumbing, and architectural factors, elevators, structural components, energy use, fire, lights, safety, etc.

"One of the first things facility executives need to do is perform a building assessment. Where are you in the building's life?" asks Ray Stribling, director of Op2 services for Aircond, a commercial and industrial heating, ventilating, and air-conditioning (HVAC) service company in Smyrna, Ga. "You have to know what type of shape your building is in, regardless of how old it is. You need to have a starting point."

Energy use is a good starting point because the opportunity for cost savings is significant. Lighting tops the list of the potential savings and HVAC systems run a close second, says Gene Meyer, Energy Extension Services mechanical engineer for Kansas State University. New lighting technology, called T-8, uses only about half the energy of older systems, says Meyer, and high-tech HVAC systems can save 30 to 40 percent on energy costs. The ROI on lighting and HVAC upgrades ranges from one to five years, depending on the system's level of use.

"Utility companies have conservation programs that help pay for some of the high-efficiency upgrades," says Rich Girolami, director of consulting services at PSEG Energy Technologies, a New Jersey-based integrated– energy-services provider. "They will contribute toward the new lighting system or the new air conditioning system if it's high efficiency. Don't just call your electrician to make these changes. Call a qualified energy-services company who will be aware of what the utility rebate programs and latest technologies might be."

Revealing Hidden Costs

Even as media attention focuses on a chaotic energy market and a slowing economy, experts say many CFOs fail to grasp just how much impact sanitation, utilities, maintenance, and operation (SUMO) services have on a facility's profit margin.

While spending on SUMO services comes with a "just pay the bill" attitude, it represents substantial costs. Case in point: For every $1 billion in revenues, Fortune 1000 companies consume on average between $18 million and $30 million annually in the SUMO category, according to data from Cadence Network, a Cincinnati-based company specializing in Internet-enabled facility-expense management. Leveraging Internet technology in an audit can help executives see the overall picture and assess opportunities for cost savings in SUMO services.

"Volatile energy costs and fragmented facility expenses translate into higher expenses and lower profitability for businesses, which result in increased prices," says Tony Collins, vice president of marketing and strategy for Cadence. "Failing to manage the use of facilities' resources is costing both businesses and consumers. What we have found is that the vast majority of businesses are unknowingly ignoring these costs because they are often hidden, and, when looked at individually, appear small."

Collins cautions against this type of thinking. When SUMO costs are viewed together, he says, they can make up almost 24 percent of the indirect costs of most facilities. Often, the indirect spend areas like energy, water, and telecommunications remain hidden in filing cabinets or internal databases — preventing managers from seeing a consolidated view of their SUMO expenses.

"From an executive-management perspective, laying off workers or cutting production can seem like a quick fix to trim expenses, but progressive companies are finding that better management of these costs can make a real difference," Collins says. "These costs can be controlled when managed properly. With the right tools and technology, a company can dramatically improve processes and significantly reduce indirect costs to make a big impact on their bottom line."

Regulatory Compliance

In addition to leveraging Internet technology to identify cost savings, savvy facility executives understand the value of software that can identify wasteful and negligent practices. Stribling says facility-management software is paramount to a healthy plant.

"Facility-management software can track everything in the building from membrane roofs to the subpumps in the basement," says Stribling. "It helps the customers spend their dollars better instead of just continuing to repair equipment that has a history of neglect and/or trouble." And then there are critical regulatory-

compliance issues. “Big Brother is no longer watching over your shoulder,” Stribling says. “Big Brother is now in the office with you. And Big Brother carries a big stick.”

If there is a problem, he says, the first thing the auditors are going to examine is your record keeping. How do you know the filters have been changed? How do you know the drains have been swabbed? How do you know the proper treatment has been put in those drains? Today, the best way to keep abreast of these concerns is with a computer program. This responsibility, experts say, should be appointed to a facility manager.

The problem, says John Anderson, senior project manager at Meredith/Boli & Associates, a scientific, environmental-engineering, and regulatory-consultancy firm in Los Angeles, is that facilities often do not have people dedicated to the pursuit of regulatory compliance, and therefore operate in a reactive rather than proactive mode.

“It’s a difficult decision because it’s hard to put tangible, quantifiable benefits on being in compliance and having someone pay particular attention to that,” says Anderson. “If a company is struggling at all financially, one of the first places they look to cut is the people that are responsible for those issues because there is no profit center there. They may not have to pay the price for two or three years, but it will catch up with them sooner or later. Losing your operations for two days will far outweigh any fine.”

Avoiding Downtime

Experts agree: the most costly problem in any facility is downtime. A comprehensive facility audit, then, should examine the functions that affect productivity. Eliminating downtime depends on identifying components — large and small — that impact mission-critical processes, and planning for some level of redundancy to avoid stoppage.

“If a plant loses a pump or chiller, their whole line can shut down,” says Mark Dickson, corporate engineering advisor at Aircond. “We try to identify bottlenecks where a plant can’t afford to have a shutdown and work out a reasonable alternative or backup for that situation.”

Beyond technology, design issues also impact today’s facility audit. There are two aspects to this: facility design and equipment design.

Experts say that design of manufacturing operations is moving away from the traditional batch mentality and toward a lean or cellular strategy that groups equipment by the type of product it makes rather than the type of equipment it is. A comprehensive facility audit should include a look at efficiencies that could be gained from moving processing equipment.

“As more companies go to lean manufacturing, the vast majority are going to find that they have to move equipment to do it effectively,” says Rebecca Morgan, president of Fulcrum ConsultingWorks Inc., a manufacturing and industrial consulting firm in Cleveland. “That can be a major challenge.”

The second aspect of design concentrates on the equipment itself. The design of an HVAC system, for example, has major impacts on productivity and energy savings.

“Every place we’ve been, we’ve found some typically gross energy misuse where people really don’t know how systems are being controlled,” says Dickson. “A lot of times you’ll find simultaneous heating and cooling to obtain a temperature when there’s really no reason to do that. If they have an old air conditioning system we’ll evaluate options for a new system or a completely new type of arrangement so the plant can maintain the environment to optimize their productivity.”

Such was the case with C-MAC Carolina Circuits, which uses proprietary technology to manufacture high-performance medium- and high-density printed circuit boards (PCB) and complex multilayer backplanes for the electronics industry. Carolina Circuits recently augmented its technology to expand manufacturing of large-area backplanes and higher-complexity PCBs. The process uses film negatives to manufacture the circuitry of the many layers of a PCB and is subject to expansion or shrinkage with small variations in the room’s absolute humidity. A facility audit revealed that any deviation in the size of the stacked core panels resulted in wasted product.

The company looked at equipment-design issues in an effort to reduce rejects attributed to environmental concerns. Aircond audited Carolina Circuit’s HVAC systems and discovered that the pneumatic temperature controls serving critical areas did not have the flexibility or repeatability to maintain tight conditions under varying-load situations; something that state-of-the-art digital controls could do. The results paid for the retrofit with a four-year ROI.

“The improved adherence to temperature and humidity tolerances provided by the digital controls resulted in significant and measurable revenue improvement in our four critical areas of production,” says Lee Chaplin, Carolina Circuits’ facility manager. “Integrating the impact that the efficiency improvement of each step has on the entire operation, our core production thru-put has increased by 17.5 percent. Measured another way, our quality-control rejection rate has decreased about 26 percent. This is significant.”

Dickson says the problem at Carolina Circuits’ is not an isolated case. The longer a plant has been in operation, he says, the greater the number of people who have operated it with different controls and strategies. After 15 years without a facility audit, systems often run without rhyme or reason.

Buy-in From Employees

Apart from all the questions a facility audit answers, there is one more that every facility executive should ask: Does the company have buy-in from its employees? Without it, even the best-laid plans can go to waste.

Steve Rowe, an environmental attorney with Preston Gates & Ellis in Seattle, says that one of the best ways to get operations into top shape is to employ a diversity of management tools in order to obtain buy-in from the employees.

For example, while he was the assistant general counsel and manager of environmental affairs for a large cement manufacturer, Rowe made sure that the hourly work force had a say in the decision-making process while still making sure he maintained overall control.

“Recognizing that members of the work force had done their jobs for years and had valuable expertise, I worked to educate them about the short-term goals of the facility,” says Rowe. “For example, we started to track the types of facility breakdowns and the extent of the resulting consequences. This then gave us a roadmap in setting maintenance priorities, and I knew that experienced maintenance staff could better manage tensions regarding addressing breakdown concerns than if someone from upper management tried to impose changes without staff input.”

Getting a plant in tip-top shape means looking at facilities in a new way — through the eyes of technology and design. Opening the door to new tools and techniques for auditing a facility can lead to greater efficiencies, less waste, and higher productivity.