ISHE ISSUES

Publication by and for the Healthcare Engineering Industry

2007 NUMBER 2

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ISHE
INDIANA SOCIETY FOR HEALTHCARE ENGINEERING

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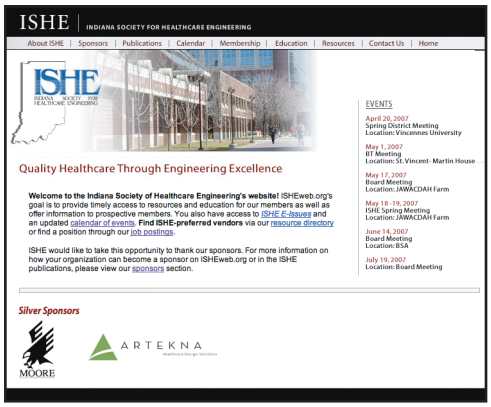

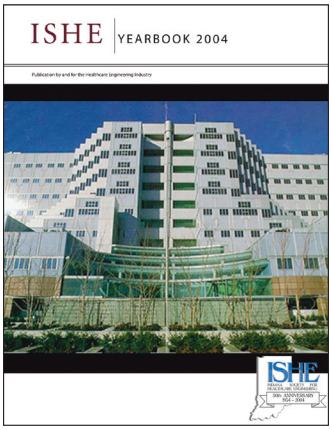

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ISHE ISSUES

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About ISHE ISSUES

ISHE ISSUES is a quarterly publication by and for the Healthcare Engineering Industry.

Our goal is to promote communication between members and to facilitate the exchange of information for the betterment of our Society and of our Members.

ISHEweb.org's goal is to promote communication between members and to facilitate the exchange of information to those interested in becoming a member. You also have access to an electronic copy of ISHE ISSUES, our quarterly newsletter, as well as an updated Calendar of Events. For more information, log on to isheweb.org.

Opinions expressed in articles are those of the authors, not necessarily those of the Advisory Board of membership.

Credo

The members of ISHE continually strive to live up to the motto, "Quality Healthcare Through Engineering Excellence."

That quality and excellence is best achieved in an environment of teamwork and cooperation between the professionals entrusted with attaining the overall goals of healthcare organizations and of the individual institutions that we serve.

That a continuing program of skills enhancement is important, and participation of individuals working together will improve the standards and performance of all in the group.

That the application of advancements in our field, coupled with conscientious attention to the costs of operation is necessary to achieve maximum efficiency in the carrying out of our duties.

That we have responsibility to the public to provide safe and dependable institutions dedicated to the highest ideals of patient care, and to foster this image in community relations.

That the collective interchange of knowledge and experience, couple with the individual integrity of the membership, will make ISHE an effective means of advancing its members in their profession.

Mission Statement

The mission of the Indiana Society for Healthcare Engineering is to promote the professional role of the healthcare engineering professional and advance the development of health care engineering through effective communication, educational opportunities and establishment of professional standards.

ISHE 2007 Calendar

November 8-9, 2007	**Indiana Convention Center** Location: Indiana Convention Center
December 6, 2007	**Board Meeting** Location: BSA (Christmas Dinner - Board Members)

New Resource Center Design

will combine hands-on simulation with classroom environment; serves as new "gateway"

Clarian Health and the Indiana University schools of medicine and nursing are helping enhance patient safety, quality of care and clinical outcomes with IU/Fairbanks Hall — The Clarian Education and Resource Center, which is scheduled to open in summer 2008. The 182,000-square-foot, six-story facility will be located in the heart of Indianapolis' vibrant life sciences quadrant on the east side of the city's Central Canal. BSA LifeStructures is performing architectural and engineering services, Maregatti Interiors is the interior design firm and Lauth Property Group is the general contractor for the building.

Construction is in progress on the center, which will include a 30,000-square-foot, high-fidelity simulation center jointly operated by Clarian Health and Indiana University. Other educational space and offices also will be housed in the center. The total cost of the project is about $52 million.

"This pioneering project will be one of the largest facilities of its kind in the country and creates a shared simulation environment between the medical school, the school of nursing and the hospital," said Todd Buerger, BSA LifeStructures' lead architect on the project. "Our design response for the building considers its combination of a world-class medical training facility with its location in a premier business corridor of the city. It fits into the region's life science initiative, as well as the buildings around it. The facility responds to the architectural elements prevalent along Indianapolis' downtown canal."

It is expected that thousands of students and professionals will be trained annually at the center.

A skills learning area and simulation areas including an operating room, emergency room, patient care room, obstetrical rooms, intensive care unit rooms and debriefing rooms, and other classrooms will be included in the center to provide real-time virtual training for clinicians.

Credit: Eric Schleef Illustration, provided by BSA LifeStructures

While faculty, students and visitors to the new facility will be aware they're in an innovative medical environment, planned artwork, video displays and walls displaying information and notable Clarian Health milestones will reinforce the purpose of the facility, Buerger said.

In many ways, the facility also will serve as a gateway to the downtown medical complex comprised of the university and hospitals. Buerger said the modern, comfortable design and unique building geometry affording views of Indianapolis' downtown skyline are intended to make the facility a useful recruiting tool for both Clarian Health and the schools.

From the Central Canal location, employees will have easy access to the People Mover, Clarian Health's elevated transportation system, which provides efficient access to the hospitals and the Indiana University School of Medicine.

BSA LifeStructures is a national leader in designing healthcare, higher education, research and technology facilities. For more information visit online at www.bsalifestructures.com.

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Q1 2005

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Using Bio Fuels: It's not easy, but it is possible

As engineers and those who are responsible for the efficient operation of big buildings, we have all been confronted with the question: "Why don't you just use current fuel technology to heat/cool/operate your building?" Sometimes the question centers on solar energy. Wind is also thought to be a possibility. Others want to encourage the use of wood or corn in supplying heat. Sunshine is not always abundant and wind is intermittent at best. Based on where we live and our natural environment, a fuel that is grown seems to have the most potential.

In and around the great state of Indiana, we can regularly see huge fields with burgeoning crops of all types. Each spring the farmers plant, and each fall there comes a harvest. Nature always renews itself; sometimes with a little help from man. So why can't we figure out how to get fuel to heat and energize our buildings from a source that is renewable, sustainable, and as an added bonus, supports our local economic activities? Undoubtedly, the first fuels that man utilized for heating were bio mass. If the caveman could manage it, surely, we should be able to figure it out in the 21st century. We regularly perform high tech magic in all sorts of ways. It sounds easy enough and it has to be better than burning fossil fuels, right?

There are a lot of thoughts, opinions, dialogue, and information out there regarding bio fuels and their application. Some is factually accurate, and some is not. Inaccurate information leads to biased opinions. Biased opinions lead to bad decisions. Bad decisions lead to bad experiences. Bad experiences lead to assignment of blame and culpability. Blaming leads to further misunderstanding and often a poor evaluation of where the project went bad. Good ideas that are misapplied tend to make us believe that the idea was bad, when in fact the application of the idea was misguided. Before we begin discussion of what will work, let's take a look at some of the myths regarding bio fuels. For the most part, our discussion will center on the use of bio fuels in boilers for the production of steam.

Myth number 1: Renewable resources (bio mass) are currently a viable alternative to fossil fuels. Depending on your definition of "viable" this statement may or may not be true. We have all felt the pinch of rising gasoline prices at the pump and increasing natural gas prices to heat our buildings. As we feel these pressures, better alternatives are sought. Some are low risk and are pursued on a fairly low-key, informal level. Other more aggressive measures require more planning and expertise. The use of bio fuels is one of the measures that will require a great deal of work.

The widespread commercial use of bio fuels is in its infancy in the United States. Part of the reason for this is the ease of use of natural gas. The natural gas utilities and equipment manufacturers have spent a lot of time and money to accomplish that. It is easy, and up until recently, relatively inexpensive, to design, install, and operate a system fired on natural gas. However, natural gas prices have continued to rise and there is pain associated with this. Applying bio fuels to our buildings is not as easy as using natural gas, so there is a different kind of pain. We are moved to action when the pain of paying the high price for natural gas is greater than the pain associated with investigating and applying bio fuels.

As this point is reached and the investigation into the application of bio fuel begins, we will see that there are a number of issues to understand and obstacles to overcome such as:

- Transportation
- Fuel handling
- Fuel procurement
- Getting the required quantities at the right time
- Fuel quality

- On site storage (short and long term)
- Off site storage (short and long term)
- New equipment (cost and space)
- Modifications to existing equipment
- Maintenance & repair issues
- Waste disposal
- EPA issues
- Corporate mandates to become more "green"
- Impact on current utility rates
- Tax credits or other benefits
- Impact on operations

To make matters worse, few people or companies truly understand these issues, but represent themselves as experts.

Under our current circumstances in Indiana, the use of bio fuel is viable only in certain cases and implementation is never easy. If however, a few things fall into place or if certain influences are present, it is possible. Does the facility have access to large quantities of free or reduced cost bio mass? Are there internal objectives to be "Green"? (For the purpose of this discussion, "Green building" is a process to create buildings and supporting infrastructure that minimize the use of resources, reduce harmful effects on the environment, and create healthier environments for people.) Will the publicity help public perception? Some benefits are tangible and easily measured while others are much less quantifiable. If everything is considered, "critical mass" may be reached and your project becomes viable.

Myth number 2: Natural fuels do not create emissions problems. All of the things that grow around us are composed of many different compounds. Obviously, a large portion of their make-up is carbon, hydrogen, oxygen and their associated molecules. These things seem harmless enough but consider what we can make from these basic building blocks. If you only contemplate the simplest carbon and oxygen molecules, we have carbon monoxide (CO) and carbon dioxide (CO2). Right out of the gate, we have a poison and a substance that has been identified as by the Environmental Protection Agency (EPA) as a greenhouse gas. This does not even begin to address nitrogen oxides (NOx). NOx has been identified as one of the components of acid rain, or acid deposition, and other environmental problems such as smog. The air all around us, which is used for combustion in fired equipment, is approximately 78% nitrogen (N2). Any combustion will produce something that will affect our environment. It is just a matter as to what degree.

Myth number 3: Equipment designed for and currently fired on natural gas can be converted to a bio fuel. Field fuel conversions are often impossible and always very expensive. Consider that a flame from a natural gas burner is injected into the appliance and the products of combustion go up the stack. We're done. The flame is directed and its shape controlled by the burner design. In the case of a fire tube boiler, the flame is projected into the main boiler tube (Morrison tube) and is long and slender. Due to the velocities created by the burner inducer motor, the flame travels horizontally. Water tube boilers have a much more diffused flame pattern, which is shorter, but still horizontal. In both instances however, the fuel is easily and completely suspended in and mixed with the air. All of the surfaces surrounding the flame are intended to absorb the heat and transfer it to the water.

If solid fuel is to be burned, we have to first get it into the boiler. Natural gas burners do not handle solids, so they probably come out. Now we have some sort of hole in the side of the boiler. Throwing solids into the hole and setting them on fire does not seem feasible, therefore some sort of solid fuel handling equipment must be installed. For anyone who has seen the inside of a boiler, this is a difficult task. Even if the handling equipment could be applied, it would cover some of the heat transfer surface, thus decreasing the boiler capacity and efficiency. If we get the fuel to burn in the boiler, ash is created from burning the solid. When natural gas was burned, all of the products of combustion went out the stack. There are no systems in place to remove the ash. This is another problem and another requirement.

A device which is external to the boiler may be installed to address some of the specific problems listed above. The fuel is first introduced into this device, combustion occurs, ash removed, and products of combustion are passed through the existing equipment. If some or all or the combustion occurs in a place other that that intended by the original designers, something is lost. In the case of a boiler, we lose the heat which would have been transferred by radiation from the flame to the water or steam. Capacity is diminished. Efficiency is sacrificed. This option does not even consider the required space for an aftermarket apparatus installation. Few boiler rooms have this kind of "extra" space.

Myth number 4: Bio fuels are as easy to get, handle, and utilize as natural gas. This not so much a "myth" as something people just don't think about. Natural gas has gotten to be pretty simple to use. A pipe is connected, an account set-up with the local utility, and equipment installed. Bio fuels are different. We do not currently have a bio mass production system that is as user friendly. Storage and delivery are rarely considered. In larger, metropolitan facilities, the space for storage is simply not there and bringing in the requisite number of big trucks makes the project even more of a challenge.

Before we can transport the material it obviously has to exist. Where does the bio fuel come from? Do we dedicate land and other resources to growing it? After it exists, it has to be hauled and delivered. Consider the following example and associated quantities.

Bio Fuel Volume & Acreage Example

Heat Content of Bio Mass	15 MM Btu / Ton
	(Nominal, accepted heat content)
Nominal Boiler Size	10 MM Btu/Hour Input (Typical "summer", hospital boiler)
Tons of Consumption Per Hour	2/3 tons / hour (Calculated)
Tons of Consumption Per Day	16 tons / day (Calculated)
Tons Hauled per Semi Truck Load	22 tons / truck (Nominal capacity)
Semi Truck Loads per Business Day (M-F)	Slightly Greater Than 1 truck / day (Calculated requirement)
Operational Hours Per Year	8,000 Hours / Year (Assumed annual run time accounting for down time)
Tons of Consumption Per Year	5,333 tons / year
Approximate Agricultural Production	2.3 Tons / Acre (Conservative estimate for sorghum)
Required Acreage	2,319 Acres (Calculated)

Just to produce and supply fuel to operate a relatively small summer boiler, we have taken up over two thousand acres of farmland and put another truck on the road. On site handling and storage has not even been addressed. Remember too, this boiler would not even begin to heat a small hospital. Imagine an undertaking it would be to get enough fuel for that.

Now that we have pointed out the obstacles, let's look at some of the real possibilities and opportunities for the application of bio fuels. As a starting point, we can all agree that there are a large number of functional installations with operating boilers. These buildings and equipment have certain qualities and characteristics. The buildings have space, floors, walls, roofs, surrounding areas, access, and other attributes. The equipment has been purchased, has some value, and has some useful life left. If possible it would be great if we could use some of this equipment and not place too many demands on the rest of our building & grounds. Up to this point however, we have been looking at the process from the standpoint of burning the fuel directly in, or near, the boiler. Another alternative exists however. That alternative is a process known as gasification.

Gasification has been around for centuries. Early in the 1900's coal was gasified. The resulting product was distributed to homes and known as "city gas". Natural gas was then discovered and became commercially available at better prices, so gasification effectively went away. Gasification of bio fuels is currently used in many less advanced countries because natural gas is not readily available. Now, the entire cycle may be coming full circle in the United States, and the gasification of bio fuels is an attractive alternative. Even gasification of coal is making a comeback. Indiana Governor Mitch Daniels recently announced there are plans to build a $1.5 billion coal gasification plant that would be the first in the country to make pipeline quality natural gas from eastern coal.

Gasification involves the carbon / steam shift. A completely new and separate piece of equipment is installed to accomplish this and can be put anywhere. Under certain temperatures and pressures the atoms that make up the molecules of bio mass break apart and then reform into different molecules. Some of these new compounds are gaseous in nature and are extremely flammable. While other compounds are created which are not gaseous or flammable, our focus will be on the gases. Depending on the reaction, a gas which is a close to natural gas is formed. This bio gas can generally be utilized in most existing, commercially available, natural gas fired equipment. An existing boiler can almost always be fired on this substance. It can be used exclusively or in a blended state (biogas + natural gas). Now we might be on to something! If we can produce a gas which can be transported in existing gas piping, burned in existing equipment without ash production, and comes from a bio mass, could this be a possibility? I would suggest that it is a strong possibility and even a legitimate alternative.

The gasification process also has other advantages. By controlling the chemical reactions which occur, we can take what we want to send to the boiler, and leave the rest behind. What we may

want to leave behind are the pollutants and other materials that cannot be burned and vented without consequences. Now that we have dispelled some of the myths and began down the road of a possible, viable alternative, let's look at how it could work.

Fact number 1: A properly sized bio mass system is critical. Consistent run time is key. The steady consumption of fuel throughout the year is required in order to realize the payback. For example, if someone purchased a reasonably priced, fuel-efficient automobile for the purposes of saving money on fuel, and only spent $10.00 per week on gasoline in the first place, the savings are negligible. The equipment is not used enough and the savings are negligible because the original fuel expense is negligible. Equipment required for gasification is expensive. The initial cost is predominantly determined by the required, full-load capacity. Operating the machine at less than its full potential does not take advantage of the system and therefore does not take advantage of the potential savings. Fuel cost savings are based savings per volume and the volume used. If the volume used is not maximized, the savings will be not sufficient to justify the project.

Intermittent gas usage requires starting, stopping, and modulating the production of bio gas, which adds to complexity and cost. Gasification requires higher temperatures and pressures. In order to bring the reaction up to full capacity, a large mass of steel and bio mass has to be brought up to a suitable temperature. To stop, or slow the reaction, cooling must occur. From the standpoint of the gasifier, as well as most large equipment, it is better to run at a constant rate.

The consistent consumption of bio mass is advantageous from a delivery and storage standpoint. In a perfect world, the biomass supply would instantaneously match demand. However, traditional bio mass production tells us that the fuel is planted in the spring, grown during the summer, harvested in the fall, and stored in mass until needed throughout the remainder year. Bio fuel production would be better suited for our needs if it were in the form of a waste stream from bio mass processing activities or other stream which may have a steady, and consumption matching, rate of creation.

Fact number 2: Fuel flexibility will lower operations cost in the long term. First, let's be very clear about one aspect of this undertaking. The EPA will not allow the random use of any and all materials for fuel in large quantities, without their approval. At least some work will have to be done in order to substitute or add something into the mixture of fuels. That having been said, EPA permitting is possible and should be considered in the evaluation, implementation, and operation of a project.

Once the EPA requirements are satisfied, we are free to choose from multiple sources of bio mass and even other renewable resources. Pricing volatility and availability are the overriding factors for having the alternate sources(s). Depending upon your position in the distribution chain, corn has doubled in price over the past year or so. The purchase of futures may or may not be possible for a particular commodity and will not likely be available for a position longer than three years. Without a back-up position to purchase fuel at a lower price, the operational savings may not be available. There are many classifications of sources of bio fuels.

Refuse Derived Fuel (RDF) – This class of fuel is typically the lowest quality & cost. Consistency is non-existent. It is essentially trash and can be practically anything that is thrown away.

Renewable Refuse Derived Fuel (RRDF) – A slightly higher quality fuel than the RDF listed above. This material is, for the most part, is an undesirable byproduct of other bio mass processing. Examples may include various dusts, stalks, hulls, peels, clippings, chips, and many others yet to be identified, tested, classed and rated.

Pure Renewable Energy (PRE) – This material is typically an engineered fuel for the express purpose for use as fuel. High quality, high cost, and/or low emissions are all qualities which are associated with this class.

Cost and quality vary greatly, even within a given class. Cost per ton is not as important as cost per BTU. It can be stated with a high degree of economic certainty that the large-scale use of bio fuels of any description will impact pricing and availability. A site with access to an existing bio mass stream is ideal. Flexibility in fuel utilization in order to be able to capitalize on the yet unknown sources is vital.

Fact number 3: Government is taking a proactive role in the arena of bio & renewable fuels. On August 2nd, 2007, the United States House of Representatives passed the Agriculture, Rural Development, Food and Drug Administration Appropriations Bill, (HR 3161).

On August 4th, the House passed HR 3221, the New Direction for Energy Independence, National Security, and Consumer Protection Act. Currently under consideration is the Renewable Energy and Energy Conservation Tax Act of 2007 (HR 2776). This bill will be voted upon separately and eventually combined with the larger package. The list goes on and on. If you haven't at least reviewed this legislation, I would encourage you to do so. All of them are packed full of language regarding bio fuels, tax credits, renewable fuel sources, farmers, and other items which pertain specifically to the topic at hand. Political beliefs aside, the reality of our world is that we have to deal with the ever changing landscape; no matter where the changes come from. Our opportunity lies in understanding and working as effectively as possible within our current set of circumstances.

Fact number 4: Public utilities can positively impact the economics. Reduced rates, rebates, and other incentives might be available from your utility. No one's crystal ball is 100% accurate and no one knows how this is going to evolve. Utilities are no different. Their programs are evolving based on available information, regulatory constraints, new legislation, and their individual business objectives & directives. Many are willing to get creative to avoid the cost of current and future demands placed on their organization. Depending upon your relationship with your utility representative, they can be a tremendous asset in the successful implementation of a system of this nature.

Fact number 5: We must understand and apply the science behind BTU content, yield, quality and emissions. Simply stated, this is very complex. If one thing gets better, another gets worse. Gasification has a huge degree of flexibility. With flexibility however, come tough decisions. First, look at what is meant by "yield" and a little about its impact on other factors.

Yield is the amount of chemical potential energy contained within the bio gas, which is produced, divided by the total amount of the heat contained within the original bio mass stock. The first gas that is formed is usually a good quality, relatively high BTU content (about 600 BTU per cubic foot as opposed to natural gas which is about 1,000 BTU per cubic foot). This first gas is typically low in pollutants and easily harvested from the bio mass. Operating the gasification process on this level produces a yield of about 75%. What about the other 25% of the energy? Can we just leave it behind? After all, isn't maximizing energy efficiency is the name of the game? The answer to this question lies in the material that is left behind.

The elements that are first gasified are generally carbon, hydrogen, oxygen and the associated molecules that can be made from these atoms. The material that is left behind in the 25% penalty has good qualities and bad qualities. The desirable quality is the potential heat content that can be gasified and burned to realize that potential. The undesirable quality is that the remaining residue contains high levels of substances that are considered to be part of the nine criteria pollutants designated by the EPA. If we gasify and burn, they become part of the products of combustion and are headed for the surrounding environment. The EPA then enters the picture with a critical eye, and we have to get it permitted. Worse, we potentially have to clean it to acceptable levels and then get it permitted. This is where the tough part comes in. What is the optimum yield?

If materials that are considered to be pollutants by the EPA are processed through, extensive clean-up is required on "the back end" with scrubbers or SCR equipment; the initial, capital cost can be a knock out blow to a project's economic viability. If we leave behind 25% of the potential energy, the operational savings may evaporate because we take an immediate, fuel cost penalty. As a general rule, I would suggest that it is better to sacrifice the energy and keep the bad stuff contained in mercaptan. Mercaptans are substances found in crude petroleum. Methyl mercaptan is produced as a decay product of animal and plant matter. Part of the appeal of bio fuels is that they ostensibly produce fewer pollution issues. Depending on several factors, this may or may not be true. It is absolutely true however that if the pollutants are not burned in a boiler, they do not have the potential to enter the atmosphere. Clean-up on the back end (the stack), and associated equipment, is irrelevant. Ask yourself this question: Would you rather try to handle pollutants that are "pre-contained" in a small vessel or have to capture the same pollutants (which are a very minute amount of total volume) from a high temperature, high velocity, and high volumetric flow stream?

Fact number 6: Fuel transportation is a huge cost factor. The same thing that is making bio fuel more attractive (higher fossil fuel costs) is also impacting the transportation industry. The intent here is not to point out the fact that rising fossil fuel prices have impacted most areas of

business. It is important to note however that there are nearly always some, substantial costs associated with the procurement of bio mass. Production of the fuel on an as needed basis, on site, is ideal. Having someone pay you to remove their bio waste is better still.

Fact number 7: Gasification provides more flexibility and ease of introduction into most facilities. If bio fuel is burned in a traditional bio mass boiler, you get steam; only steam. Steam is good. Steam from bio fuel is even better. With gasification however, the opportunities are exponentially increased. With certain qualifiers, bio gas can be used in conjunction with or even in lieu of natural gas. (Some equipment modifications may be required and EPA permitting is required.) The gas can be introduced into and transported through existing gas piping. Now, our bio fuel is used to offset the total gas usage and can be used to fire multiple pieces of equipment. Consider the following trends.

In newer construction, central power plants may or may not be part of the strategy. Many times, smaller de-centralized equipment is preferred. Applying traditional bio mass fired equipment in this instance is very difficult, if not impossible. Retrofitting multiple pieces of apparatus to burn the fuel, then installing individual systems to bring in the solid fuel & to take out the ash are only a couple of the factors that make this nearly impossible. Bio mass gasification on the other hand can readily be accomplished outside the building and the new gas introduced in controlled quantities into the existing natural gas distribution system. Now the use of bio mass is not tied to a specific need for steam, or heat, from a particular piece of dedicated equipment. Additionally, a central power plant designed to operate from two gas sources will have the built-in advantage of redundancy. In the case where large bio fuel silos are present, this fuel storage can be an emergency backup to a natural gas interruption. Natural gas is a back-up to the bio-fuel.

Generation of electricity is also possible with gasification and this fact creates an entirely new set of opportunities. There are several manufacturers of relatively simple electrical generators which are powered by piston driven, reciprocating engines. Bio mass based, on-site generation of electricity opens an entirely new set of possibilities. As an added bonus, the exhaust from this equipment is on the order of 1,200° Fahrenheit. A waste heat recover boiler would fit very nicely in this application.

If electricity generation is not a requirement or desire, could our newly generated bio fuel be used in an absorption chiller for summer time cooling? Would your electric utility be willing to participate in a peak shaving system? Just a thought…..

The importance of back-up or redundancy cannot be overstated in certain types of facilities. As engineers and building operators, we all like to have redundancy. In hospitals, it is not an option. The back-up for bio gas is a well known commodity. As we stated earlier, it is your existing natural gas supply. Remember, we are introducing the bio gas into the natural gas piping. For now, bio gas is only a probably only a portion of the total fuel supply. Natural gas is still connected and used for significant portions of the demand. If our supply of bio gas is interrupted for any reason, the natural gas supply simply picks up the load until the bio service can be restored. Is redundancy important in your facility?

Fact number 8: Understand and apply the science behind life cycle costing of this kind of endeavor. A detailed life cycle cost analysis is an obviously an absolute must in any project of this type. It is an enlightening and potentially surprising exercise. In an upcoming issue, we will present and discuss scenarios with a wide variety of objectives and given sets of conditions. Stay tuned!

Bio fuels will play some role in our energy future. Economics, sustainability, the environment, better control of our own destiny as well as other factors, all dictate that. It is our opportunity as engineers and scientists to use them to our maximum benefit. These benefits will only be realized by applying facts, not believing myths.

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U.S. Department of Energy Confirms Breakthrough Performance of LED Downlight

Lighting Comparison (photos have not been altered):
Left: 108 total watts, LLF LED Module
Right: 595 total watts, Incandescent

It was announced on September 11, 2007, that the LR6 module from LED Lighting Fixtures, Inc. (LLF) won Grand Prize for the 2007 Lighting for Tomorrow solid state lighting (SSL) competition. The contest is organized by the American Lighting Association, the U.S. Department of Energy (represented by Pacific Northwest National Laboratory) and the Consortium of Energy Efficiency.

Forty-five fixtures were evaluated by a panel of experts on the basis of energy efficiency, overall lighting quality, aesthetic appearance and innovation. LLF's LR6 product was judged to be the best. All finalists in the competition were tested by independent labs under the direction of the U.S. Department of Energy. LLF's six-inch downlight delivered 600 lumens of light operating at 11 watts, with a color rendering index (CRI) measured at 95.

Dr. Steve DenBaars, Professor of Materials and Co-Director of the Solid State Lighting & Energy Center at University of California-Santa Barbara and a judge in the 2007 Lighting for Tomorrow competition said, "This competition places a high priority on energy efficiency, but not at the expense of fixture appearance or lighting quality. We were very impressed with the LR6 product as it offers the highest efficacy for any downlight product on the market and has the appearance of incandescent lamps typically used in residential downlights while using less than one-fifth the power consumption. This product platform has the potential to save US consumers billions of dollars in energy costs."

LLF LR6 Module Benefits:

- Available in warm (2700K) and neutral (3500K) colors
- 12 watts per fixture, 650 lumens
- 50,000 hour lamp life (approx. 20 years for residential use)
- Contains NO mercury
- 92+ CRI
- Designed for new construction or retrofitting existing applications
- Fits into many new and existing 6" housings, including IC rated housings
- Dimming capabilities to 25-30% of full

Until now there has not been a suitable product to replace the typical incandescent. LLF has entered the market with the first and only LED downlight that offers light visibly indistinguishable from that of an incandescent and has hit the ground running. LLF has a mission statement that says it all: Accelerate the adoption and evolution of LEDs into high volume general lighting applications so that consumers can realize lower energy and maintenance costs.

C.M. Buck & Associates is honored to be the Indiana representative for LLF product. You can read more about LLF and see products, accessories, spec sheets, application photos and more at their website (www.llfinc.com). Please call C.M. Buck (or e-mail sales@cmbuck.com) for further information or for a product demonstration.

IHHA President's Letter

New President Seeks to Align Mission With Patients

"It's time to draw a bright line connecting patients and hospitals," said Douglas J. Leonard, IHHA president. "I'd like to see patients become a fundamental part of this association's mission," he said.

Leonard, who became IHHA president/CEO June 1, says he believes that when employees are empowered to focus on patient care, employee satisfaction and patient satisfaction improve.

"Everyone wins when you focus on the patient. Once you adopt that mindset, everything else falls in line," he said.

Leonard and other IHHA board members will meet in late June to address the association's leadership transition and its future. The group will review the results of the most recent member survey and discuss how IHHA can best serve its members.

"IHHA is a high-performing organization," said Leonard. "It's a great place to start. We have challenges ahead, but I see them more as opportunities." Leonard said that patient safety is one area of opportunity.

"IHHA has an opportunity to play a major role in setting the safety agenda," he said. "Certainly, the association can facilitate standardization within the industry. Standardized root-cause analysis is just one example."

Leonard said workforce is another challenge, and he'll work with members to identify what roles the association can play. "Obviously, reimbursement is a big challenge," said Leonard. "While we can't pretend that reimbursement issues are going to be solved in the short term, IHHA can continue to help its members secure the resources to fulfill their missions."

Leonard most recently served as chief executive officer of Columbus Regional Hospital. During his tenure, the hospital achieved a 98 percentile adoption of national quality practices endorsed by the Hospital Quality Alliance. It was the first hospital in the state to be designated as a Magnet Hospital for Nursing Excellence by the American Nurses Association and has been named by the Indiana Chamber of Commerce as one of the "Best Places to Work in Indiana."

"It's a personally rewarding time for me. I feel good about what we accomplished in Columbus. It's a good way to part," he said.

On joining IHHA as its chief executive, Leonard said that he admires the culture that Ken Stella created and the way that he advanced IHHA traditions through the years.

"The culture he created resonates with my style," said Leonard. "I'm looking forward to working with the IHHA staff and the membership. In a way, it feels like I'm leaving one family for another."

Keeping It Cool – Healthy, In Standards, and Efficient

As this past summer heat put heating, ventilation and air conditioning (HVAC) systems to the test, healthcare facility managers worked to maintain comfortable and healthy Indoor Air Quality (IAQ) while controlling energy costs and lowering health-related risks. Now is the time to start thinking about next summer while you have time to prepare.

Maintaining the IAQ of a healthcare building is particularly vital to ensuring hospital outcomes, including patient health and staff productivity – and is particularly important in areas sensitive to infection control, such as intensive care units, surgical suites, protective environments, and laboratories.

Hot and humid summer weather can increase the challenge for facility managers to maintain a healthy and efficient facility environment. There are also special considerations to take during periods of construction and renovation, which often take place during the summer months.

Begin with the standards

Assuring IAQ and comfort begins with conforming to industry standards for the design, construction and maintenance of HVAC systems in the healthcare industry. Set by ASHRAE, the American Institute of Architects (AIA), the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and the U.S. Centers for Disease Control and Prevention (CDC), they include:

- Effective air distribution, including requirements for total ventilation and air flow
- Room and building envelope pressure relationships
- Parameters for temperature and humidity design
- Filtration practices
- Strategies for the selection of air handling systems, distribution systems and associated controls
- Operation and maintenance procedures for HVAC systems

Humidity control is often particularly challenging to maintain during summer. While IAQ requires bringing large quantities of outdoor air into a facility, avoiding microbial growth and occupant discomfort requires that moisture in that air is first removed before it's introduced into the building. To enable tighter temperature control and lower humidity set points, incorporate desiccant dehumidification technology. Desiccants are substances specially designed to attract water vapor from the air.

Desiccant dehumidification is a single unit solution for controlling humidity, temperature and ventilation. These controls help to control infection and maintain the integrity of the buidling structure by reducing the potential for condensation on walls and ceilings.

Strict pressure control is also important to the mitigation of airborne contaminants. Operating rooms and protective environment rooms must be kept at positive pressure relative to other areas to diminish movement of infectious contaminants, while airborne infection isolation rooms must be kept at negative pressure to limit movement of infectious agents from the patient to other areas of the building. Proper HVAC system design and maintenance ensures the right pressure levels.

Summertime maintenance

Getting cooling systems into shape during the winter enables upgrades, retrofits and repairs to be in place and tested by the time the cooling season kicks in. A preventive maintenance program then optimizes HVAC system performance and building systems lifecycle during the summer. Some specific maintenance tasks to stay on top of include:

- Checking filters regularly and following proper procedures when it is necessary to shut down fans to avoid allowing spores to enter the ventilation systems. The performance of ventilation systems changes over time. It is important to avoid reverse of airflow direction between zones, which could result in contamination.
- Maintaining moisture control systems and keeping humidification and dehumidification systems clean and dry. Bacteria mold, and viruses can breed in stagnant water that accumulates in ducts, humidifiers and drain pans of the ventilation system, or on the moisture that collects on ceiling tiles, carpeting, or insulation.
- Keeping utility bills under control with proper preventive maintance of building comfort systems – a large consumer of energy. Utility companies report that hospitals use an average of 27.5 kilowatt-hours of electricity and 110 cubic feet of natural gas per square foot annually.

Reducing Infection Risks

Experts estimate that it's possible to prevent a third of nosocomial infections and 90 percent of the deaths they cause. Since, up to one-third of nosocomial infections are airborne.

Diminishing infection risk requires careful control of air flow and circulation, ventilation, humidity and pressure, and summertime construction and renovation projects can stir up additional challenges. When walls and ceilings are broken, mold spores and pathogens can be released into the air.

At project start, conduct an Infection Control Risk Assessment (ICRA) to maintain the integrity of the healing environment. ICRAs are required by the AIA's "Guidelines for Design and Construction of Hospital and Health Care Facilities," JCAHO's "Environment of Care Standard 8.30," and the CDC's "Guidelines for Environmental Infection Control in Health-Care Facilities."

ICRAs advise personnel involved in the construction process to consider precautions for infection control and risk management planning. They also identify infection control issues that may affect air quality during renovation or construction. When implementing an ICRA:

- Identify high risk patient groups
- Analyze and identify areas where airborne-infection control is necessary
- Determine standards and parameters for the number of air changes per hour, filtration and pressurization
- Maintain accurate, up-to-date records on maintenance response, quality management and risk management

Upon the completion of an ICRA, implement best practices to reduce risk, including dust and moisture control practices, pressurization strategies, and the construction of temporary barriers between construction areas and occupied space.

Despite the hazy, hot and humid challenges of summer, with proper planning, healthcare facility owners and operators can maintain healthy, high performing, energy efficient buildings throughout the season by taking proactive steps to ensure proper control of air flow and circulation, ventilation, humidity and pressure.

For more information, contact Mark Sundstrom, Sales Engineer at TRANE in Indianapolis by phone: 317-255-8777 or email: mesundstrom@trane.com.

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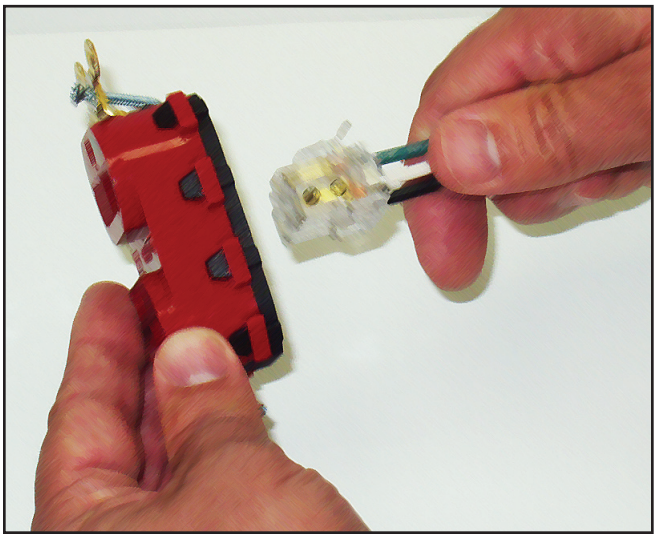
Play It Safe Electrical Solutions

By John Gunderson Crescent Electric Supply Company

crescent electric supply company

Over the years when it comes to electrical work in health care facilities there has been a steady improvement in electrical equipment but very few breakthrough products.

For example, electricians use Hospital Grade "Green Dot" switches, receptacles and devices in all healthcare environments, but the wiring and installation of these products has stayed relatively unchanged for 50 years.



Obviously, healthcare facilities need maximum dependability. You can't afford to be without a circuit - or even a receptacle - for long. Hospital Grade "Green Dot" devices deliver maximum dependability but when they need to be replaced, they require an electrician to turn off the circuit to the device, pull it out, remove the wires, and rewire it again. This process is time consuming and requires an experienced electrical professional to perform.

However, recently all of the major wiring device manufacturers have come out with a breakthrough receptacle solution.

These receptacles have factory-installed leads that make for faster installation than traditional external clamps - without sacrificing performance and reliability. The pre-stripped leads eliminate the need to make pigtails.

When it is installation time, just snap the terminal or plug into the back of the receptacle, screw down the mounting screws, and add a wallplate to complete trim-out, often in less than a minute. It is terminated with exactly the same reliable consistency every time, yet you get the quick device change-out you need for patient and staff safety.

These new plug-in hospital grade receptacles make change-outs easy, and qualifiy as a breakthrough in electrical and patient safety.

Developing an Inspection Program

There are no easy solutions to the high costs of maintenance. The amount of time and effort required to select predictive methods that will provide the most cost-effective means to evaluate the operating condition of critical plant systems; establish a program plan; create a viable database; and establish a baseline value is substantial. The actual time and manpower required will vary depending on plant size and the complexity of process systems. For a small company, the time required to develop a viable program will be about three manmonths. For large, integrated process plants, this initial effort may be as much as 15 manyears. Are the benefits worth this level of effort? In almost every instance, the answer is an absolute yes.

Here are 10 steps that can help you implement a successful total plant predictive maintenance program:

1. Determine existing maintenance costs

The most difficult step in the initial justification of a predictive maintenance program is the determination of actual maintenance costs. Most plants do not track all controllable costs that are directly driven by the maintenance operation. In most cases, the cost-accounting function limits cost tracking to actual labor and material used to maintain plant equipment. They do not include the impact of maintenance on availability, production capacity, operating costs, product quality and the myriad of other factors that limit plant effectiveness.

In addition to maintenance labor and material costs, your evaluation should include all maintenance-related costs associated with delays, reduced capacity operation, overtime premiums, and product quality. Safety and environmental compliance should be included in your evaluation.

In some cases, your accounting department can help develop a close approximation of the true costs of maintenance. Explain the reason for your request and let them help quantify the historical plant costs.

The cost history developed at this time is extremely important. Initially it will be used to develop a cost-benefit analysis and justification for your predictive maintenance program. Later, this data set will become the baseline for quantifying the actual benefits derived from the program. Plants should not shortcut this part of the program implementation. Accuracy and completeness of this data set is critical to the long-term success of your program. The majority of programs that failed in the first two years following implementation can be directly attributed to the lack of quantified results.

2. Select predictive systems and vendors

Another major contributor to program mortality is the selection of either the wrong predictive technologies or a vendor who cannot provide long-term program support. Extreme care must be used during this selection process.

A total plant predictive maintenance program must use a combination of monitoring and diagnostic techniques to achieve maximum benefits. None of the individual technologies, such as thermal imaging and vibration, provide all of capabilities that are required to evaluate critical plant process and systems. What combination of technologies is best for your plant?

Unfortunately, there is no easy answer to this question. The predictive requirements of each plant are different. As a minimum, your program should include (1) key operations processes analysis, (2) thermal imaging, (3) process parameters, and (4) visual inspection. Lubricating oil and wear particle analysis (tribology) should be used only where the added information derived will justify the costs.

Care should be exercised when selecting predictive systems and vendors. As a minimum, the following should be considered when selecting predictive maintenance systems:

a. Adequacy to your specific needs

None of the predictive maintenance systems are perfect. Each has its unique strengths and weaknesses. For example, many of the vibration monitoring systems cannot handle machine speeds below 600 RPM or lack the ability to use a variety of transducers. Either or both of these limitations will reduce the benefits that can be derived from your program. Define the specific requirement for your systems and make sure that the selected systems will fulfill all requirements.

b. Stability of system and vendor

Predictive maintenance programs are intended to be life of plant, continuous improvement programs. Therefore, it is essential that the systems you select for your plant will remain viable for an extended time period. Competition within

the predictive maintenance arena is fierce and many of the early players have gone out of business, merged with other companies or constantly change their system structure. All of these factors will affect the long-term status of your program. Your evaluation should include:

- Financial strength of the vendor;
- History of product development;
- Technical support and
- Existing client base.

3. Training requirements and support

Most predictive maintenance vendors will offer some level of training. However, most of these training programs are directed toward the use of a specific system, i.e. software and instrumentation, rather than comprehensive use of the technology. As a reference, I have used all of the predictive maintenance technologies for more than 30 years and still learn something new every day. There are a number of vendors that offer technical training that can support your predictive maintenance program. However, you should carefully evaluate the merit of their courses before electing to use them as training support. In general, independent training companies, with no association with equipment manufacturers, can provide high quality training with an unbiased approach.

4. Get management support

Lack of a total commitment from plant or corporate management to provide the resources required to implement and maintain a program is the single largest reason for failure of predictive maintenance programs. There are a number of reasons for lack of long-term commitment. However, in most cases, it stems from the lack of planning and justification in the pre-program effort. Management must know the true cost and potential benefits of the program before it begins. After implementation, they must be continually informed of the progress and actual benefits that the program provides. Therefore, it is imperative that a viable means of quantifying the actual results of the program be developed and the ongoing status of the program communicated to all key management staff.

Management support should include implementation of a formal maintenance planning function, a viable information management program and craftsman skill training in order to gain maximum benefits from predictive maintenance. The predictive program will provide the trigger for maintenance activities, but without proper planning and repair skills, full benefits cannot be obtained. The information management program has two functions: (1) maintain equipment histories and (2) track program benefits.

5. Develop a program plan

A definite program plan that includes all activities required by a total plant predictive maintenance program must be developed before implementing your program. The program plan should include:

- Specific scope of program;
- Goals and objectives; and
- Methods that will be used to implement, maintain and evaluate the program.

The plan should also include specific return-on-investment (ROI) milestones that can be used to measure the success of the program.

6. Dedicated personnel

A key part of a successful program is a full-time, dedicated staff. The program cannot be implemented or maintained with part-time personnel. Regardless of the predictive maintenance techniques used for the program, regular, periodic monitoring of critical plant parameters is an absolute necessity. Most programs implemented with part-time staff have failed because activities required to maintain the program have been delayed or ignored because of other pressing demands on staff time.

7. Establish accountability

The predictive maintenance team must understand the reason for implementing the program and be accountable for its success or failure. Staff commitment is an absolute requirement for a successful program. Without this total commitment, the program will probably fail. Division or area managers must also accept responsibility for program success. In most plants, these managers control the resources, both financial and personnel, within their departments. Without their full support and commitment to the program, little can be accomplished.

8. Develop a viable database

The actual benefits derived from a program will depend on the accuracy and completeness of the database developed for the program. All predictive maintenance technologies depend on a clear, detailed definition of the critical equipment that is included in the program.

Database development requires a tremendous effort in both manpower and time. A typical microprocessor-based predictive maintenance program may require as much as 10 man-years to develop in a large, integrated process plant. Even small plants must invest an average of 1 to 3 man-years in this startup effort. However, the time is well spent. The initial investment will greatly reduce the manpower and time required to maintain your program and will greatly improve the benefits derived from the program.

Many program failures result from shortcutting the database development step. In part, this is driven by the absence of accurate machine data and by the restrictions of many predictive maintenance systems. To achieve maximum benefits from your program, invest the time and manpower required to establish a complete database.

9. Maintain the program

Do not quit after the implementation phase is complete. Many programs fail because the plant staff did not follow through after the development stage. Follow the program plan. Meet each of the schedules and milestones developed in the program plan. Constantly evaluate the program's progress and correct any errors or problems that may exist. A successful predictive maintenance program must be dynamic. Follow through.

10. Communicate

Communication is absolutely necessary for long-term success. All successful programs have a well-defined communications plan that includes transmittal of corrective actions identified by the program; feedback from manufacturing; and a regular program status report that is circulated throughout the plant and corporate management team.

Program justification is a never-ending process. Management and other plant team members must be continually informed of the program's status and the benefits derived from it. Failure to communicate will severely reduce the potential for a successful program.

The Payoff

Although the effort required to implement and to maintain a total plant predictive maintenance program is great, so are the benefits that can be derived. Properly implemented and maintained, predictive maintenance, as part of a total plant performance management program, can reduce the negative impact of maintenance on availability, product quality and operating profit.

Predictive maintenance can transform the maintenance operation from an expensive support function to a full member of the profit generating team in your plant. Do not expect an easy quick fix. Like all things of value, a certain amount of effort is required to gain positive results. If you follow these steps, you can establish a total plant predictive maintenance program that will provide maximum benefits for your plant.

Hope is Growing and Going Green Across the Country

The American Cancer Society will broaden the "home away from home" it provides for cancer patients and their caregivers with the opening of seven new Hope Lodges and the expansion of four current facilities by December 2008. At that time, nearly 850 rooms will be available nationwide to provide guests with a warm, friendly environment that spares them the cost of lodging while facing the financial burden of cancer treatment.

Among the new facilities is the Grand Rapids Hope Lodge which has two important "firsts" to its name: It is the first Hope Lodge in Michigan, and it is the first Hope Lodge in the Midwest to meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards.

The Grand Rapids Hope Lodge is located in downtown Grand Rapids near public transport to minimize the impact of transportation on the environment. Guest rooms boast large windows that allow extensive natural light, and the entire building possesses an energy-efficient lighting control system. The facility also uses 28 percent less water than conventional

buildings and features construction materials and interior finishes with a high recycled content.

"We are constantly striving to provide a healthy, healing environment for cancer patients during treatment," said Cindy Paquin, program manager of survivorship initiatives for the American Cancer Society, Great Lakes Division. "If we can accomplish this while having a positive effect on our environment through construction of energy-efficient, water-conserving and easily maintained buildings, then we're doing our job even better."

The Grand Rapids Hope Lodge has received the Silver level of LEED certification. The AstraZeneca Hope Lodge in Boston is targeting a Gold rating. The New England facility's design already features more than 40 percent water efficiency and exceeding performance in use of daylight and natural views to save on artificial lighting. The new Manhattan Hope Lodge and the Hope Lodge expansion in Burlington, Vt. will also meet LEED certification standards.

For more information about the American Cancer Society's Hope Lodges, call 1.800.ACS.2345 or visit www.cancer.org.

ACS Hope Lodge by the Numbers

2007	
# of Hope Lodges currently open	22
# of rooms as of January 2007	500
# of Hope Lodges under construction as of July 07	9
# of Hope Lodges opening in remainder of 2007 (Grand Rapids, Manhattan, Twin Cities, Seattle HLC)	4
# of Hope Lodge expansions opening in 2007 (Burlington)	1
# of new rooms adding in 2007	206
Total # of Hope Lodge rooms by December 2007	706
% of Growth in 2007	**41%**
2008	
# of new Hope Lodges to open in 2008 (Boston, Philadelphia, Iowa City	3
# of Hope Lodge expansions to open in 2008 (San Juan, Atlanta, Charleston)	3
# of new rooms adding in 2008	143
Total # of rooms 2008	849
% of Growth in 2008	**20%**

Interested in Becoming a Member?

Please contact Steve Thurston with any questions you have about ISHE Membership. ISHE also has a website where you can find up to date information about our events throughout the year.

Phone: 317-908-8222 | Email: sthurston@indy.rr.com | Website: www.isheweb.org

Do Your Circuits Call You When They Open? Now They Can...

A Revolutionary Wireless Circuit Monitoring System That Immediately Notifies You When Critical Circuits Open

Reduce Downtime

The cost of unscheduled downtime is a continuing problem in many industries. Downtime costs can range from $300,000 to millions of dollars per site per hour.

The Cooper InVision™ Downtime Reduction System helps eliminate waste in your maintenance program to dramatically increase productivity by actively monitoring your critical circuits.

Safe

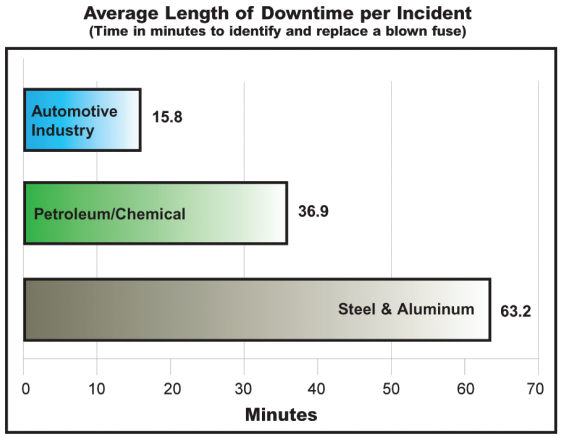
- World class encryption protocol
- Automatic security updates
- Finger-safe hardware
- Control and access to your data

Simple

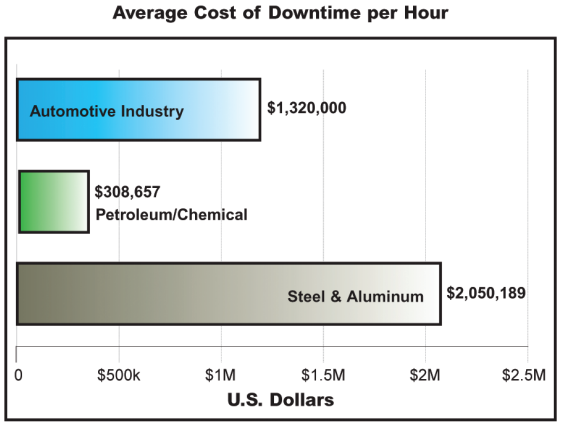
- Retrofittable on existing equipment in seconds
- Access from anywhere, anytime
- No software to configure, support or upgrade

Reliable

- 99.999% reliability
- Field tested in extreme harsh environments
- UL Listed
- Monitor thousands of circuits per network
- Built-in escalation features
- Self healing network



Source: AMG, 2006



Sources: AMG, Advanced Technology Services, Inc., Meta Group, 2006

Can You Afford to Wait?

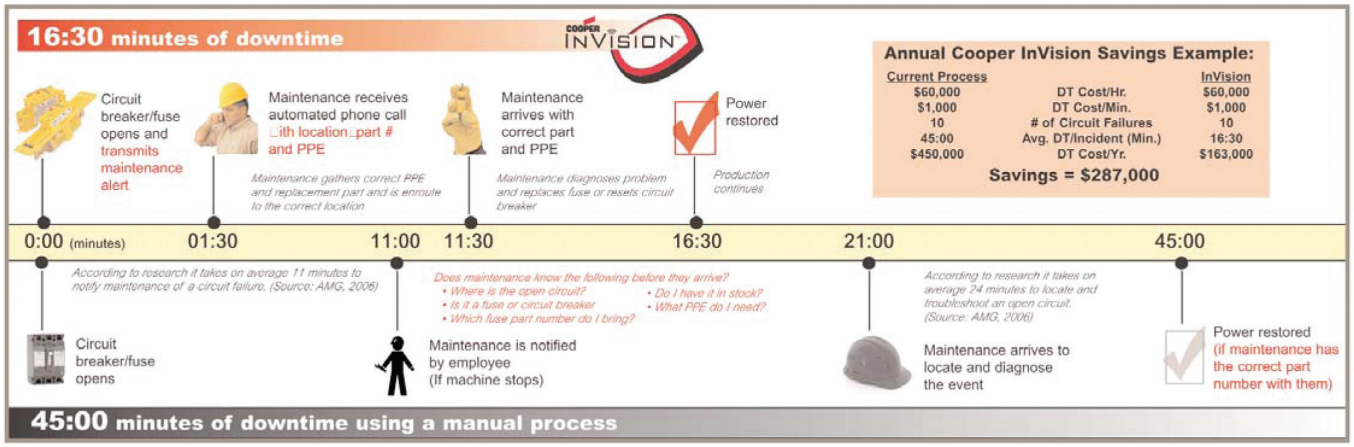
- Reduce downtime and increase the productivity & profitability of your facility.
- Retrofits on existing equipment.
- Trending reports and analysis to identify critical issues.
- Optimize your maintenance & engineering resources.
- Reliable wireless mesh technology.
- Secure data control & access from anywhere.

The Cooper InVisionTM Downtime Reduction System can reduce your downtime, save you money and improve electrical safety.

To learn more, consult a Cooper Bussmann representative by phone at 866-436-7870 or by e-mail at invisionsales@cooperbussmann.com.

COOPER Bussmann

How the Cooper InVision™ System Saves You Time & Money



The Safe Approach to Reducing Downtime.

Protects your employees, equipment and bottom line.

The new Cooper InVision™ Downtime Reduction System increases the electrical safety and efficiency of your maintenance personnel. This wireless, circuit monitoring–and easy to retrofit–System immediately notifies the properly trained personnel of an overcurrent event identifying the exact location of the open circuit, the correct replacement part to bring, and the appropriate personal protective equipment (PPE) for the specific hazard level. The System utilizes finger-safe components to maximize safe working conditions.

The Cooper InVision™ System is recognized by the International Brotherhood of Electrical Workers (IBEW) as critical to improving electrical safety and productivity.

For a **90-day trial** contact us today at 866-436-7870 or invisionsales@cooperindustries.com.

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Midwest Healthcare Engineering
Conference & Trade Show

November 7 – 9, 2007
Indiana Convention Center
Indianapolis, Indiana

There is no better way to combine your knowledge with industry leaders from across the Midwest.

You won't want to miss the 2007 Midwest Healthcare Engineering Conference if you aspire to:

- strengthen and transform your career;
- shape your future;
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- discover innovative ideas and gain practical information.

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- Choose from 24 educational sessions to match your information and learning needs, and provide you with solutions to your every day challenges.
- Gain knowledge and motivation through powerful general session speakers as they explain the latest industry updates and advances that you need to succeed and solutions to issues you face daily.
- Grow your professional network at events such as the luncheon and reception.
- Discover and evaluate the latest products and services offered by more than 80 exhibitors.

Opportunity to Renew Your Healthcare Construction Certificate!

The American Society for Healthcare Engineering (ASHE) of the American Hospital Association (AHA) has approved the Midwest Healthcare Engineering Conference & Trade Show for Continuing Education Units (CEU) toward the renewal of your Healthcare Construction Certificate (HCC).

Attendance at this Conference demonstrates the interest and commitment to keep up with the latest codes and standards affecting the industry and your profession.

Healthcare Construction Certificates are valid for two years from the issue date. If you have participated in the Healthcare Construction Certificate program and would like to use contact hours gained from attending this conference to renew, simply complete the renewal application, which can be found at www.ashe.org. Be sure to attach your Certificate of Attendance from attending the Midwest Healthcare Engineering Conference & Tradeshow along with the renewal fee. If you have any questions, please visit us at www.ashe.org or contact us at 312.422.3800.

Continuing Education Units (CEU)

Midwest Engineering Conference has been approved for CEU's by the American Society for Healthcare Engineering of the American Hospital Association. Fifteen (15) contact hours or 1.5 CEUs will be awarded for your participation at the Midwest Healthcare Engineering Conference. To qualify for this award, you will need to attend all three days of the conference.

Educational Sessions

Wednesday, November 7
9:15 a.m. – 10:15 a.m.

Prescriptive Design: RX for Healthy Buildings
Robert Schilling, Jr, *AIA, Senior Principal, Director of Healthcare, Champlin/Haupt Architects*

Ideal Planning Process: Reality After Construction
Mary Ann Derr, *Healthcare Director, Messer Construction*

10:30 a.m. – 11:30 a.m.

Tenant Metering to Recover Utility Costs
Kevin Cunic, *Regional Metering Specialist, Square D Company*

Safely and Legally Remediate Small Areas of Mold Yourself
David Meier, *President, Meier Environmental Services*

12:45 p.m. – 1:45 p.m.

Healthcare HVAC, IAQ and UVC Source Control
Robert Scheir, *President, Steril-Aire*

LEED, Green, Sustainability: Effects on Central Plant Construction
James Edward, *Associate, KJWW Engineering Consultants*

2:00 p.m. – 3:00 p.m.

Steam Heat Transfer Principles and Calculations
Walt Deeton, *President , MaxiTherm*

Best Accounting Practices for Project Management
Chris Mayfield, *Manager Construction & A/E Team, Somerset CPA's, P.C.*

3:15 p.m. – 4:15 p.m.

Planning for Power Failures
David Stymiest, *Senior Consultant, Smith Seckman Reid, Inc*

Emerging Surgical Trends: Impact of Effective Equipment Planning on OR Design
Sudhakar Nagavalli, *GM of Medical Equip Planning Svcs, KJWW Engineering Consultants*

4:30 p.m. - 5:30 p.m.

Changes to the 2007 Edition NFPA72, National Fire Alarm Code and NFPA 13, Automatic Sprinkler Systems
Frank Van Overmeiren,
President, FP&C Consultants Inc

Planning the Master Plan
Phil Cartwright, *AIA, ACHA, LEED AP, Senior Healthcare Planner, BSA LifeStructures*

Thursday, November 8
8:00 a.m. – 9:00 a.m.

The Value of a Post Occupancy Project Evaluation
Clay Seckman, *Executive VP, Smith Seckman Reid, Inc*

Healthcare Facilities and their Contribution to the Bottom Line
Laura Rygielski, *Director of Healthcare, Trane Co.*

9:15 a.m. – 10:15 a.m.

Building Maintenance Programs for Fire and Life Safety Features
Frank Van Overmeiren, *President, FP&C Consultants Inc*

The Future of Hospital Design: Using Joint Venture Physician Ownership to Stabilize Your Marketplace and Advance Healthcare Delivery
David Redemske, *Senior Designer, HDR Architecture*

10:30 a.m. – 11:30 a.m.

Integration of Communications and Technology Systems in the Planning, Design, and Constructions of Healthcare Facilities
Scott Johnson, *Vice President , Smith Seckman Reid Inc*

20 Tips on How to Prepare Your SOC
Beth Alexander, *Senior Consultant, FP&C Consultants, Inc*

2:45 p.m. – 3:45 a.m.

Environmental Infection Control – It's Not Just a Construction Issue
Tim Adams, *Director, Society for Healthcare Engineering*

2:45 p.m. – 3:45 a.m.

Innovated Facility Designs Pertaining to Maintenance and Operations
Robert A. Boellner, *Principal, BSA LifeStructures*

4:00 p.m. – 5:00 p.m.

2007 Environment of Care Survey Focus
Dean Samet, *Regulatory Compliance Services, Smith Seckman Reid, Inc*

Indoor Air Quality in Healthcare Environments
Brian Kuhn, *CIH, Micro Air, Inc.*

Friday, November 9
9:15 a.m. – 10:15 a.m.

Healthcare Facility Risk Assessment and Mitigation
Carl Schultz, *Engineering Project Manager, URS Corporation*

Proper Waste Segregation & Pharmaceutical Waste Requirements
Lisa Hardesty, *President/CEO, Healthcare Support Services*

General Sessions

The Least We Can Do!
Ralph Hood, *President & CEO, Ralph Hood, Inc*

Lucas Oil Stadium – New Home of the Indianapolis Colts
John Wilczynski & Tim Moore, *Principals, Moore Engineers*

Ok, What Do I Do Now? Challenges Of Building In Today's Healthcare Environment
Clay Seckman, *PE, Executive Vice President, Smith Seckman Reid, Inc*

Thursday, November 8

Trade Show and Luncheon
Plan to spend time with exhibitors and enjoy lunch on November 8.

www.midwest-healthcare-engineering.org
317-713-1551

Indiana Society for Healthcare Engineering

What is ISHE?

The Indiana Society for Healthcare Engineering is a resource for hospitals and suppliers. We formed in order to develop solutions to common problems. We have been recognized as a Gold Chapter by the American Society of Healthcare Engineering (ASHE) for the past six years.

ISHE's members are those professionals who are interested in personal and professional development, and engage in one or more of the following healthcare team responsibilities:

- Plant Operations
- Safety Management
- Related Hospital Fields
- Plant Engineering
- Clinical Engineering
- Suppliers to Hospitals

ISHE
INDIANA SOCIETY FOR HEALTHCARE ENGINEERING

Benefits you can't find anywhere else.

What are the Benefits of ISHE Membership?

Membership in ISHE gives you a combination of benefits you can't find anywhere else:

Professional Development - ISHE provides educational opportunities geared toward your special needs as a healthcare engineering professional. Planning to enhance your career with CHFM certification? ISHE education is designed with CHFM in mind.

Healthcare Facility Tours - See facilities behind the scenes. Hear the insider stories, tips and challenges that only an ISHE facility tour can offer.

Connection - ISHE membership gives you the opportunity to meet and develop friendships with fellow professionals. These are people who really understand what you do for a living because it is their profession, too.

Networking - The answer to a difficult problem may just be a phone call or conversation away. You'll be surprised at how much easier your job becomes when you have a resource network of the best minds in the industry. Your fellow ISHE members are always at your fingertips with the online and print directories of members and resources.

Industry News and Trends - No one gives you as much local industry news as ISHE. The ISHE quarterly magazine, monthly email newsletter, and web site contain stories and information about Indiana healthcare facilities you can't find anywhere else.

Scholarships - To promote the field of engineering, ISHE offers two $1,000 healthcare engineering scholarships to children of ISHE members every year. Winning one of these scholarships could immediately pay out up to 20 years of ISHE membership!

Advocacy - ISHE makes sure your voice is heard on important issues about codes, standards and other regulations that affect your career and facility. As individuals, are voices are small; but together, we can make a difference.

Recognition - ISHE provides opportunities for professional recognition. Volunteer, serve on the board, or contribute an article on your facility for the magazine or newsletter – these are all great ways to improve your profile in the industry and in your organization.

Who is Eligible for ISHE Membership?

Full Membership to the society is available for those individuals who are active in the field of health care engineering or a related health care field. Healthcare engineering embraces multiple engineering disciplines that include managing, operating and maintaining physical plan facilities, communication and biomedical equipment, and systems in health care facilities. A full membership is available at $50.00 to those who qualify as being directly responsible for a health care facility.

Associate Membership to the society if available for those individuals whose firms provide products or services. This may include manufacturers representatives, vendors, contractors, distributors, registered architects, professional engineers and consultants. An Associate Membership is available at $100.00.

Membership to the society becomes effective upon approval of membership application and receipt of the specified dues by the ISHE Board of Directors.

Join today using the application.

Questions? Contact Stevens & Stevens at 800-685-1248.

ISHE Membership Application

RETURN APPLICATION AND PAYMENT TO:
Indiana Society for Healthcare Engineering
P.O. Box 40727
Indianapolis, IN 46240-0727

I hereby apply for membership in the Indiana Society for Healthcare Engineering.

❒ My $50.00 dues for FULL MEMBERSHIP status are enclosed.
❒ My $100.00 dues for ASSOCIATE MEMBERSHIP status are enclosed.

This is for:
❒ New Membership ❒ Renewal Membership ❒ Replacing a Member

You may apply and pay via credit card online at www.isheweb.org.

Please make checks payable to "Indiana Society for Healthcare Engineering."

NAME: _____

TITLE: _____

ORGANIZATION: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

COUNTY: _____

TELEPHONE: _____

FAX: _____

E-MAIL: _____

SIGNATURE: _____

Requirements for Membership as quoted from bylaw as:

SECTION 1 – FULL MEMBERSHIP

A. Individuals eligible for full membership in the Society shall be those active in the field of hospital or healthcare engineering in the State of Indiana. Candidates for membership must be eligible for personal membership in the American Hospital Association and the Indiana Hospital Association.

B. A member in good standing is one who meets the requirements for eligibility and whose membership has not been terminated as specified in Article III, Section 12. Only active members in good standing may vote, be recognized, or hold office to the Society.

SECTION 2 – ASSOCIATE MEMBERSHIP

A. Associate membership may be granted to individuals not otherwise eligible for full membership, who are actively involved with hospital and healthcare engineering in the State of Indiana. Associate membership shall be granted only to those professionals who will make a significant contribution to the betterment of the Society.

Indiana Society for Healthcare Engineering
P.O. Box 40727
Indianapolis, IN 46240-0727

Get the latest ISHE news and event dates from ISHE *E-Issues* email and the ISHE website, www.isheweb.org.

The ISHE Yearbook is returning!

ISHE
E – ISSUES
E-Newsletter by and for the Healthcare Engineering Industry

Time Change for the Golf Outing

Tee time for the golf outing planned for Thursday, May 13 at Hillcrest Golf Course at Batesville, IN has been changed to **11:30 am** with a foursome teeing off every seven minutes. The cost for golf will be $35 for 18 holes and $15 for a cart. There are some rooms available at the Farm Thursday evening for those who attend the golf outing. Please RSVP to Tim Adams if you are planning to play golf and indicate if you would like to stay at the Farm Thursday evening.

Mark your Calendar for other Upcoming Events

Meeting	Location	Date
Spring Meeting	Hillcrest Jewish Farm Batesville, IN	May 14 – 15, 2004
Northern District Summer Meeting	Ball Memorial Hospital Muncie, IN	August 27, 2004
Southern District Summer Meeting	Ohrech Memorial Hospital Seymour, IN	August 13, 2004
Midwest Healthcare Engineering Conference and Trade Show	Crown Plaza Hotel Indianapolis, IN	November 9 – 11, 2004

EVENTS

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May 14 – 15, 2004

Northern District Summer Meeting
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August 13, 2004

Midwest Healthcare Engineering Conference and Trade Show
Crown Plaza Hotel
Indianapolis, IN
November 9 – 11, 2004

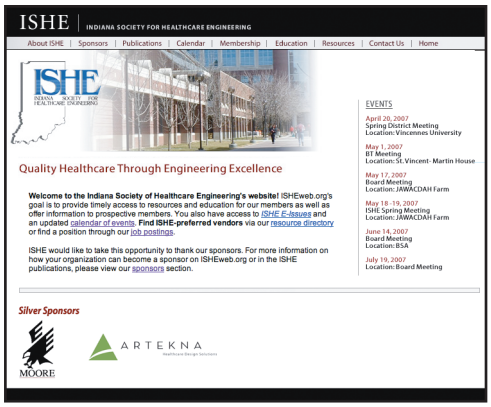
ISHE Board Meeting
Board Meeting (ISHE members)
Date and Location TBA
December 2004

SPONSORS

BREMNER & WILLEY
BSA
RUTLEDGE

ISHE E-Issues is sent to the members and friends of the Indiana Society for Healthcare Engineering. If you would like to update your email address or not receive email communications from ISHE, please send an email to Karen Barry at kbarry@ctmount.org or contact us via postal mail at

Indiana Society for Healthcare Engineering
P. O. Box 40727
Indianapolis, IN 46203-0727



ISHE | INDIANA SOCIETY FOR HEALTHCARE ENGINEERING

About ISHE | Sponsors | Publications | Calendar | Membership | Education | Resources | Contact Us | Home

Quality Healthcare Through Engineering Excellence

Welcome to the Indiana Society of Healthcare Engineering's website! ISHEweb.org's goal is to provide timely access to resources and education for our members as well as offer information to prospective members. You also have access to *ISHE E-Issues* and an updated calendar of events. **Find ISHE-preferred vendors** via our resource directory or find a position through our job postings.

ISHE would like to take this opportunity to thank our sponsors. For more information on how your organization can become a sponsor on ISHEweb.org or in the ISHE publications, please view our sponsors section.

EVENTS

April 20, 2007
Spring District Meeting
Location: Vincennes University

May 1, 2007
BT Meeting
Location: St. Vincent- Martin House

May 17, 2007
Board Meeting
Location: JAWACDAH Farm

May 18 -19, 2007
ISHE Spring Meeting
Location: JAWACDAH Farm

June 14, 2007
Board Meeting
Location: BSA

July 19, 2007
Location: Board Meeting

Silver Sponsors

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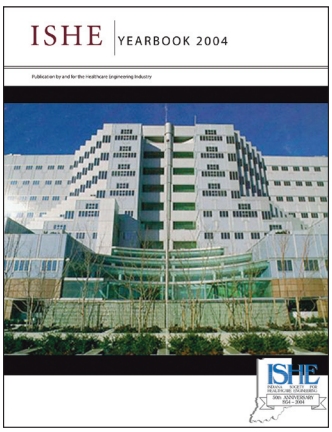
ARTEKNA



ISHE | YEARBOOK 2004

Publication for and for the Healthcare Engineering Industry