

- ◆ **Hospital of the Future**
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

HCI Visits the Hospital of the Present

The bus—loaded with EPRI Healthcare Initiative members—sped through the vast south Texas scrubland towards what used to be referred to as the Hospital of the Future. Its destination was the six-month old Mercy Health Center in Laredo, the second-fastest growing city in the United States. Mercy hosted the February HCI conference on February 23.

After participants arrived, Ed Woodruff, Vice-President of Support Services for Mercy Health Center, explained how the hospital was designed with a focus on the patients and their families. He stated that “We are no longer the ‘hospital of the future’ but are now the ‘hospital of the present.’”

Mercy Health Center presented HCI a rare and exciting opportunity to view first-hand a customer-focused hospital. Members and their guests first took an overview tour of the entire hospital that highlighted the pneumatic transport system, laundry and trash handling systems, the emergency room, the NICU and maternity floors, the HVAC systems, and the emergency generators.



**Mercy Health Center has been called
The Hospital of the Future**

A publication of the EPRI Healthcare Initiative

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Continue

- ◆ **Hospital of the Future**
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

After a tasty and healthy lunch HCI took an in-depth tour of seven state-of-the-art technology installations:

- ◆ Ozone Laundry
- ◆ Ozone Cooling Towers
- ◆ Torbed® Medical Waste Treatment
- ◆ Robotic Pharmacy
- ◆ A la Cart™ Food Service
- ◆ Energy Wall
- ◆ UV Germicidal Irradiation

It was also a chance to view the results of cooperation between a hospital, EPRI HCI, vendors, and utility members—Central and Southwest Services (CSW) and its subsidiary Central Power and Light (CP&L). The utility members and EPRI were instrumental in bringing the new technologies of ozone laundry, ozone cooling towers, and UV germicidal irradiation to the hospital.



Using ozonated water in place of chemicals results in cleaner and softer laundry

Ozone Laundry

By washing sheets, towels, scrubs, and other hospital linens in ozonated water, Mercy Hospital has reduced the amount of chemicals and water it uses. It also saves energy because the wash process uses a lower water temperature than traditional methods. RGF Environmental Systems Inc., who installed the system, explained each component of the system to conference participants.

“We are no longer the ‘hospital of the future’ but are now the ‘hospital of the present.’”

***Ed Woodruff
Mercy Health Center***



- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Ozone Cooling Towers

The hot Texas sun means air-conditioning works hard. To keep its cooling towers free from scale, to improve energy efficiency, and to reduce the amount of water and chemicals used, Mercy Health Center decided to install an ozonator system. Marley Cooling Tower, the vendor for the system, brought a demonstration trailer and used red food coloring to graphically show HCI members how ozone destroys organic material and keeps the cooling tower water clean.

Torbed[®] Medical Waste Treatment

Properly disposing of red bag medical waste is a costly issue for all hospitals. Mercy Health Center selected a system that receives medical waste from a wheeled container, shreds the medical waste, disinfects it using the Torbed[®] high-velocity heated air reactor, and discharges it directly into a compactor/dumpster for land fill disposal as unregulated waste. The vendor, KC MediWaste, was on hand to explain how the Torbed[®] uses a very hot high-velocity centrifugal airflow to disinfect the shredded red bag waste. They also pointed out the various system components.



Using the Torbed[®] Medical Waste Treatment system reduces red bag waste to unregulated waste that is safe to landfill



A demonstration trailer provided by Marley Cooling dramatically showed how ozone attacks organic material

- ◆ **Hospital of the Future**
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Robotic Pharmacy

Mercy Health Center installed a robotic medication distribution system that automates the storage, dispensing, returning, and restocking of bar coded patient medications. The top 100 medications used within the hospital are automatically dispensed and restocked using a robot powered by compressed air. Accuracy is 100% and pharmacists are freed for pharmaceutical care initiatives. McKesson Health Systems Group demonstrated their Robot-Rx™ system to the HCI members and answered questions.



The Robot-Rx™ system accurately fills prescriptions at a fraction of the cost of humans

A la Cart™ for Food Service

People often complain about hospital food but Mercy Health Center decided to do something about it. They selected the A la Cart™ meal rethermalization system to take food from the hospital kitchen to the patient's unit. The A la Cart™ cart is designed to be docked to the A la Cart™ controller chiller in the patient's unit. When docked to the controller chiller, the cart becomes a refrigerator, with cold air circulating through the cart to keep all foods cold. Then, approximately 38 minutes prior to serving, conduction heating elements inside the cart heat the hot food while the cold food on the same tray stays cold. When the food is served to the patients, lettuce is crisp and the aroma from the hot foods helps entice the patient to eat.

Mercy Health Center's food service manager explains the A la Cart™ and demonstrates its features



◆ **Hospital of the Future**

- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Energy Wall

The hospital kitchen was designed to provide outlets to the large electric food-preparation equipment along both sides of one wall. Circuit breakers are centralized in one panel on the end of the wall. Should a problem develop, they can be easily accessed and reset. The hospital chef showed the participants the Energy Wall and how it works.

UV Germicidal Irradiation

Hospital workers and others who deal frequently with people who may be infected with tuberculosis or other infectious diseases are at risk for acquiring those diseases. In order to reduce the rate of infection, Mercy Health Center selected air purification systems fitted with ultra-violet lights that destroy infectious airborne organisms and improve indoor air quality. They installed the purification systems in areas of likely high exposure such as the emergency room intake and waiting areas. The vendor, UV Technologies, was present to discuss their product.

To reduce the risk of hospital staff acquiring an infectious disease, Mercy Health Center installed UV lights in key areas



Food-preparation equipment drawing large loads is located along the Energy Wall for easy access in case of tripped circuit breakers



- ◆ **Hospital of the Future**
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Back to San Antonio

At the conclusion of the tour and with up-close and personal inspections of seven electrotechnologies, HCI members boarded the bus to return to San Antonio. But not before a quick stop for refreshments. The tour of the Hospital of the Present proved to be a rewarding educational experience.

A list of Web sites for vendors profiled in this article can be found in the new feature, Internet Resources

*Photos for HCI Visits the Hospital of the Present
Courtesy of ProWrite Inc.*



- ◆ Hospital of the Future
- ◆ **Manager's Column**
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Premier Issue of *Power Prescription™* for Healthcare Unveiled

As you can see, we have made some exciting major changes to Power Prescription™ for Healthcare.

The Power Prescription for Healthcare newsletter is now going to be distributed only electronically. This poses a variety of opportunities. As you may know the original intent of Power Prescription for Healthcare newsletter was as a marketing tool to be used by our members with their customers. In making this newsletter entirely electronic, it now has the ability to be posted directly to existing web sites. Whether it is posted to our members' sites or posted to interested associations such as the American Society of Hospital Engineers, the ability to effectively distribute Power Prescription for Healthcare newsletter as a marketing tool has increased dramatically.

In taking full advantage of our new all-electronic newsletter, we completely revamped the format so it is easier to view on screen. We also added some new features such as

- ◆ **Internet Resources:** We have added links to other Internet sites that have an impact on our members and their customers' industries.
- ◆ **Feedback:** This feature permits healthcare customers and members to discuss pressing issues and permits us at EPRI HCI the opportunity to act accordingly.
- ◆ **Q & A:** This question and answer feature enables customers to gain direct access to energy and healthcare experts to address their energy questions.

Power Prescription™ *for Healthcare*

EPRI

April 2000

- ◆ Hospital of the Future
- ◆ **Manager's Column**
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Information is the driving force of business today. We trust that the changes make this newsletter an even more effective way of distributing the valuable information we have at EPRI HCI and sends a message to the appropriate people of the role that energy providers can play in assisting the healthcare industry.

We hope that you will find this new format for Power Prescription for Healthcare a good tool for your marketing purposes. Please review each of the features and provide us with your feedback.



Joel Bauch
EPRI, Manager Healthcare



Continue

- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ **Power Quality**
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Power Quality Influences Medical Equipment

For healthcare facilities, the performance of equipment is critical to delivering a high standard of care. Modern medical equipment is composed of electronic devices—microprocessors, sensors, integrated circuits, wireless technology—materials that are sensitive to certain electrical and electromagnetic disturbances.

Causes

Electrical disturbances result from voltage variations, harmonic distortion, improper wiring or grounding, power interruptions, or voltage transients from other pieces of equipment. These disturbances are commonly referred to as power quality issues. Power quality is the concept of powering and grounding sensitive electronic equipment in a way that is best suited to the operation of that equipment. A high level of power quality equates to a low level of electrical disturbances.

Electromagnetic disturbances may be conducted through wires or radiated through the air. Electromagnetic compatibility is the ability of electronic equipment to function satisfactorily in its electromagnetic environment without electromagnetic interference from other equipment within its environment or from the electric system itself. A high level of electromagnetic compatibility is associated with a low level of electromagnetic interference.



- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ **Power Quality**
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Effects

The impact of power quality and electromagnetic compatibility cannot be understated. Electrical and electromagnetic disturbances can cause intermittent equipment malfunction resulting in:

- ◆ Repeated diagnostic tests
- ◆ Misdiagnoses
- ◆ Wasted resources, supplies, and staffing
- ◆ Increased equipment service calls and repairs
- ◆ Delays in providing care
- ◆ Extended patient time and discomfort, resulting in a disgruntled customer
- ◆ Frustration of medical staff
- ◆ Events that compromise patient safety
- ◆ Increased legal costs

Given the serious effects of electrical and electromagnetic disturbances, healthcare facilities can develop programs to effectively manage power quality and electromagnetic compatibility issues. Hospitals can proactively identify potential problems before new equipment is purchased, installed, or relocated. If problems are suspected, hospitals can utilize diagnostic tests to identify the problem and initiate a solution. Electric power providers that are EPRI members can be a strong resource in helping to diagnose and solve power quality problems.



- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ **Power Quality**
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

In Your Facility

Are there power quality or electromagnetic compatibility problems in your facility? Look for the following warning signs:

- ◆ Equipment that often resets for no apparent reason
- ◆ Distortion of displayed medical information
- ◆ Equipment that malfunctions after a thunderstorm
- ◆ Frequent memory losses in equipment that requires the equipment to be reprogrammed
- ◆ Incorrect diagnostic results
- ◆ Equipment that experiences malfunctions in one area, but not when it is moved to a different area
- ◆ Frequent failures or errors that cannot be reproduced
- ◆ Equipment that undergoes frequent repairs to the electronic components or to the power supply

Solutions to problems are often simple and inexpensive. The addition of filters, surge suppressers, shields, power conditioners, isolation transformers, or line voltage regulators can solve electrical and electromagnetic disturbances cost-effectively.

For more information on power quality, electromagnetic compatibility, or diagnostic services, contact EPRI HCI at 800-424-3774.



- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ Power Quality
- ◆ **Photocatalytic Cleaning**
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Photocatalytic Air Cleaning Eliminates Pollutants

Healthcare facilities may want to consider employing an air cleaning system that removes and destroys contaminants rather than just transferring them to an air filter or venting them to the outside. Photocatalysis is an Advanced Oxidation Technology (AOT) that eliminates pollutants such as *Mycobacterium tuberculosis*, viruses, allergens, and odors from the air by converting them into harmless products.

Photocatalytic technology uses ultraviolet light to react with a catalyst such as titanium dioxide (TiO_2) to produce the reactive hydroxyl radical (OH^*). The radical then oxidizes volatile organic compounds (VOCs) and other pollutants into carbon dioxide and water. TiO_2 is a low cost material, and since it acts as a catalyst, it is not consumed during the process.

The benefits of this new technology are numerous and include:

- ◆ Low maintenance – Photocatalysis eliminates the need to change air filters each month.
- ◆ Environmentally-friendly – Photocatalysis does not generate waste pollutants during the air cleaning process.
- ◆ Speed – Photocatalysis is one million to one billion times faster than conventional air cleaning methods.
- ◆ Cost savings – Photocatalytic air purification can reduce HVAC costs 20% by decreasing the number of air changes needed in buildings.

For more information on photocatalytic technology, see EPRI report TR-111898 or contact EPRI HCI at 800-424-3774. For more information on companies supplying photocatalytic air cleaners, see the Internet Resource section of this newsletter.



Stand Alone Unit
Courtesy of Universal Air Technology



HVAC Duct Unit
Courtesy of Universal Air Technology



- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ **Q & A**
- ◆ **New Publications**
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Q & A

This column serves to assist healthcare facilities with their energy issues. If you have a question you would like answered or if you have an alternate response to a previously published Q&A, please send it to Joel Bauch or Kelly Ciprian at kciprian@epri.com.

Q: How will the total deregulation of utilities (electric and gas) affect my facility with respect to price and service?

-Jack Boyles, Facilities Manager, University Hospitals East, Columbus, OH

A: This is a question that does not have a simple answer. The deregulation of utilities varies from state to state—it currently exists in some states, it is approved to begin in other states, and some states may not experience it at all.

Where a deregulated environment exists, each state has its own unique regulations for the utility companies. The utilities' rate structures and services are determined by the specific regulations of the state, among many other factors. Therefore, healthcare facilities located in different deregulated states will have different experiences with respect to the price and service they receive.

-Pete Meloro, Economic Development Manager, ConEdison, New York, NY

New Publication – The Use of Robotics in Hospitals

TB-114823

Robots are invading hospitals. But this invasion results in reduced costs, improved accuracy, and a hospital staff freed for other duties. You can find more information on this topic in the new Technical Brief: *The Use of Robotics in Hospitals*. This publication is available at www.epri.com or contact EPRI HCI at 800-424-3774.

Continue

- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ **Internet Resources**
- ◆ Upcoming Meetings
- ◆ Feedback
- ◆ Next Issue

Internet Resources

The following Web sites feature companies discussed in this newsletter and organizations of interest to healthcare facilities. Bookmark or save these sites as "Favorites" for future reference.

A la Cart Inc.	www.alacartinc.com
American Hospital Association	www.aha.org
American Society of Healthcare Engineers (ASHE)	www.ashe.org
American Society of Healthcare Environmental Services (ASHES)	www.ashes.org
American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)	www.ashrae.org
EPRI	www.epri.com
Joint Commission on Accreditation of Healthcare Organizations (JCAHO)	www.jcaho.org
Marley Cooling Tower	www.marleyct.com
Matrix Photocatalytic Inc.	www.nttc.edu/env/site95/emgr/complete/matrixti.html
McKessonHBOC	www.mckhbo.com
RGF Environmental Systems	www.rgf.com
Universal Air Technology	www.universalair.com



- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ **Upcoming Meetings**
- ◆ Feedback
- ◆ Next Issue

Upcoming Meetings

2000 ASHRAE Annual Meeting

June 24-28

Minneapolis Convention Center, Minneapolis MN

Contact: ASHRAE at 800-527-4723

ASHE 37th Annual Conference and Technical Exhibition

July 10-12

Washington State Convention and Trade Center, Seattle WA

Contact: ASHE at 312-422-3800

ASHES Annual Conference and Technical Exhibition 2000

August 5-9

Denver Convention Center, Denver CO

Contact: ASHES at 312-422-3860

EPRI Healthcare Initiative Conference

October 17-19

Ocean Place Resort and Conference Center, Long Branch NJ

Contact: EPRI HCI at 800-424-3774

American Hospital Association

A listing of the various state meetings can be found at:

www.aha.org/calendar.html

Please notify us of any meeting that should be added to this list in upcoming newsletters.

Continue

- ◆ Hospital of the Future
- ◆ Manager's Column
- ◆ Power Quality
- ◆ Photocatalytic Cleaning
- ◆ Q & A
- ◆ New Publications
- ◆ Internet Resources
- ◆ Upcoming Meetings
- ◆ **Feedback**
- ◆ **Next Issue**

Feedback

We welcome your feedback on energy topics that are important to healthcare facilities. Send us an e-mail and share your building performance and power quality experiences. Please direct your e-mail to Joel Bauch or Kelly Ciprian at kciprian@epri.com.

If you need additional information regarding any article, publication, or service in this issue of Power Prescription™ for Healthcare, please contact EPRI HCI at 800-424-3774.

June Power Prescription™ for Healthcare Preview

The method in which healthcare facilities purchase goods and services is based on several factors: total cost, type of item purchased, the facility's organization, and the facility's affiliations. When the service to be purchased is utilities, the presence of a regulated or deregulated marketplace is an additional factor to consider. In the June issue of Power Prescription™ for Healthcare, learn how healthcare facilities are choosing their energy providers in these various markets.