PUBLISHED BY APPA

FACILITIES manager

JAN/FEB 2008

Facilities Manager TRANSFORMED

We are pleased to debut the new look of *Facilities Manager.* This reflects the progressive direction of APPA and the character of our members. Inside you will find the same quality information—all in an updated format. **Enjoy the transformation!**

INSIDE

The Lab of the FUTURE

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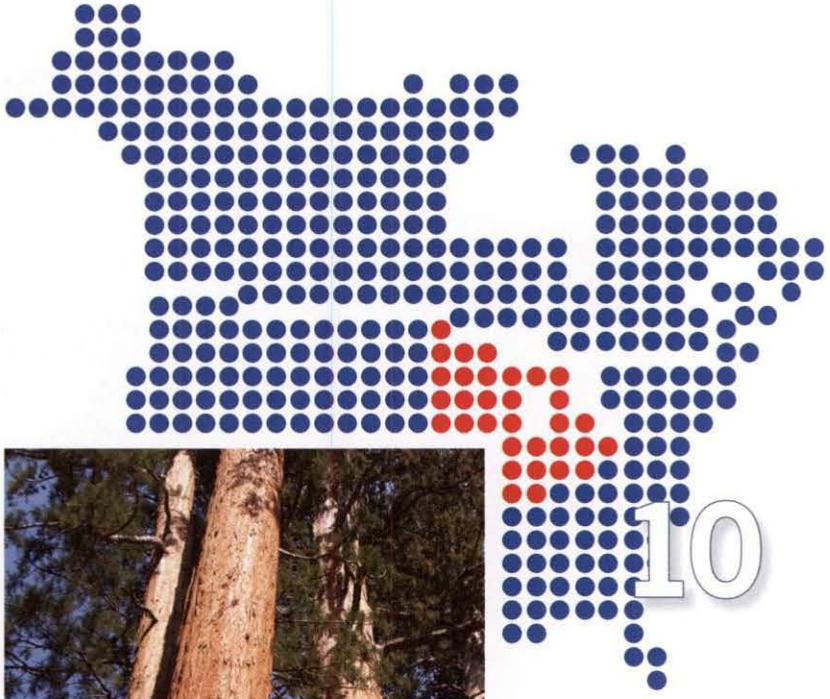
features

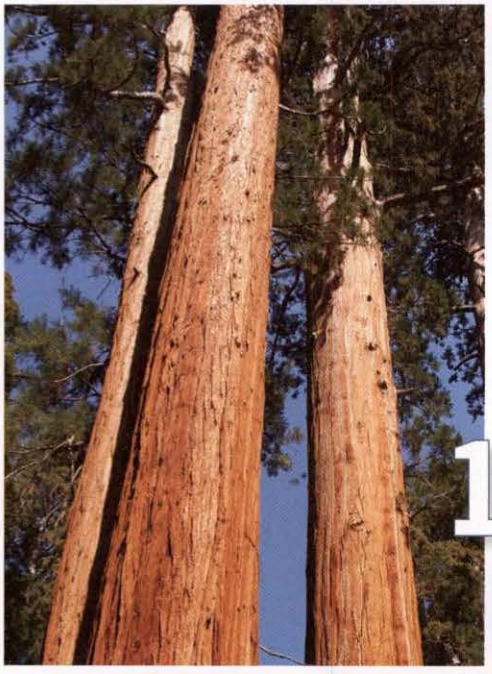
JANUARY/FEBRUARY 2008
Volume 24 • Number 1

The Lab of the FUTURE

columns

JANUARY/FEBRUARY 2008
Volume 24 • Number 1





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Transformation is all around as we begin the new year. APPA continues to embrace the change spurred by our extensive branding initiative and the resulting targeted mission to elevate facilities professionals into influential leaders in education. That is what APPA is about, and that is our focus as we move forward.

In addition to a new logo and a completely redesigned and enhanced website, APPA introduces another manifestation of our brand identity with a redesign of the cover and layout of *Facilities Manager* magazine. You'll see a newly designed banner on the cover, depicting the cleaner lines and forward motion that reflect APPA's fresh approach to all the products, services, and programs offered to our members and others in the educational facilities profession. You'll see a more readable typeface throughout the magazine—designed with more color, brighter graphics, and cleaner layout.

Many thanks to the Information and Research Committee, the APPA staff (particularly Kisha DeSandies, managing editor, and Jill Amstutz, director of communications and marketing), our printer Corporate Press, and our new design partners at touch three (including Les McCarty and Wendy Rogers) for all of their input, suggestions, and assistance to make this happen.

Facilities Manager will continue to bring you the substantive content that you have come to expect since its inception in 1985. We have a dynamic editorial calendar in place for 2008, beginning with this issue on The Lab of the Future. Many thanks to Tim Haley, Bob Bush, Lora Boehlke, and Lee Burch of Jacobs Carter Burgess for putting into words the work they had developed as a special section of the APPA 2007 Hall of Resources in Baltimore last July.

Other themes planned for future issues of the magazine include Sustainability and Environmental Stewardship (March/April), Custodial, Grounds, and Trades (May/June), The Rise to Greatness (July/August tie-in with the APPA 2008 conference), APPA Award Winners and New President Profile (September/October), and Campus Safety and Security (November/December). We'll continue to improve the content of the magazine by asking you, the members and readers, for your opinions and needs in a readership survey scheduled to be conducted in the March-April timeframe.

Another project undergoing major transformation this year is APPA's annual Facilities Performance Indicators (FPI) Report. In December we concluded the data collection portion for fiscal year 2006-07, and our programmers and analysts are preparing the final report and new dashboard indicators for publication in late February. You'll see more automated features, streamlined dashboards, and a focus on the balanced scorecard and "executive tier" survey results.

Thanks to all the 200+ institutions that completed the FPI Survey this year, including all 16 of the University of North Carolina system schools, the many Canadian institutions, and most of the campuses in the California State University system. We look forward to even greater participation by more systems and cohort groups when the next FPI Survey opens in August 2008.

Coming in March/April

- Preview of upcoming APPA sustainability anthology: *The Green Campus – Meeting the Challenge of Environmental Sustainability*
- Features exploring sustainability & environmental stewardship
- Preview of APPA 2008: The Rise to Greatness
- 2008 Readership Survey

FACILITIES manager

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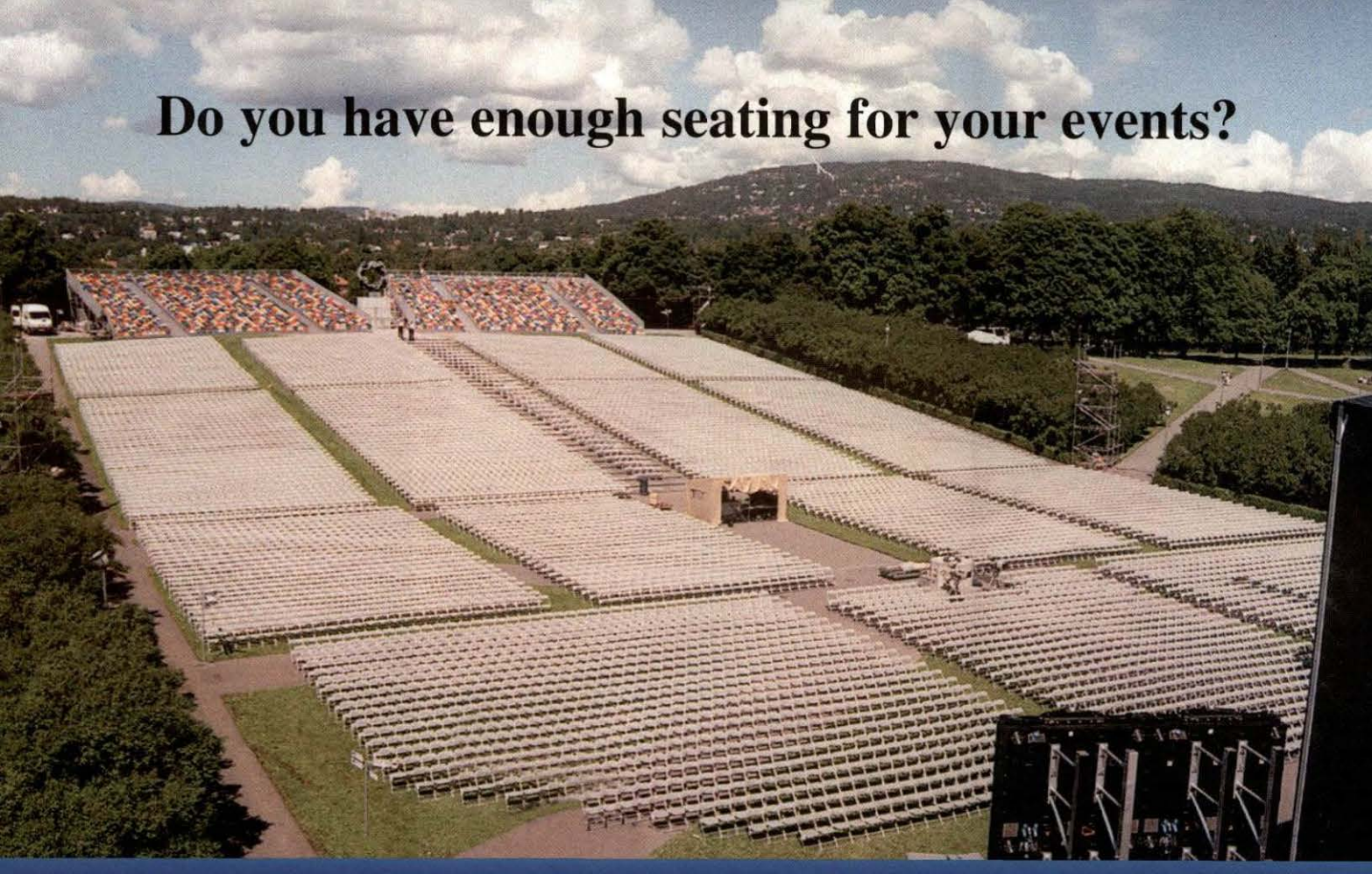
About APPA

APPA promotes leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and elevate the value and recognition of facilities in education. APPA provides members the opportunity to explore trends, issues, and best practices in educational facilities through research, publications, professional development, and credentialing. Formerly the Association of Physical Plant Administrators, APPA is the association of choice for 5,200 educational facilities professionals at more than 1,500 learning institutions throughout the United States, Canada, and abroad. For more information, visit us at *www.appa.org*.

Do you have enough seating for your events?



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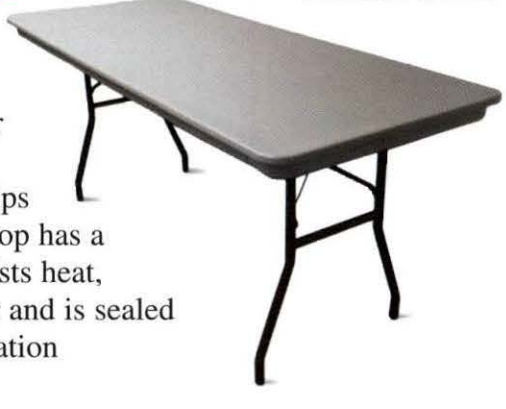

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facilities digest

By Kisha D. DeSandies

APPA's Inaugural EFP Credential Recipients

APPA congratulates the individuals who passed the first Educational Facilities Professional (EFP) exam in September 2007 and received the EFP credential, designating them as a professional proficient in the primary areas of educational facilities management. The credential is earned through a comprehensive examination testing knowledge in four core areas key to the profession: general administration; operations and maintenance; energy and utilities; and planning, design, and construction.

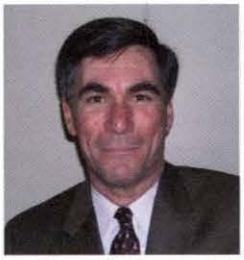
Those receiving the EFP designation are:

- Leon Bivens, University of Maryland/ Eastern Shore
- Don Blackston, Spelman College/ Clement & Wynn, LLC
- Thomas Blume, University of Portland
- Allen Boyette, North Carolina State University
- David Crane, University of Minnesota/ Twin Cities
- Richard Gentry, Texas A&M International University
- Harley Grimes, Middle Tennessee State University
- David Hatch, North Carolina State University
- Martin Hughes, Richard Stockton College of New Jersey
- Jeff McConnell, Middle Tennessee State University
- Raymond Popp, Principia Corporation
- Thomas Shewan, Florida State University
- Jeremy Todd, University of Minnesota/ Twin Cities
- Roger Wakeman, Phillips Exeter Academy
- Eugene Wojtynek, Pine Crest Preparatory School

In April, you too can take your career to the next level by earning Educational Facilities Professional (EFP) credential. The EFP is a way to validate the unique knowledge and competence required of an accomplished professional in the educational facilities field. The next EFP preparatory class will be April 18 in Scottsdale, Arizona, and exams will be given April 18 or 19. For eligibility requirements and to apply for the preparatory course or exam, visit *www.certification.appa.org*.

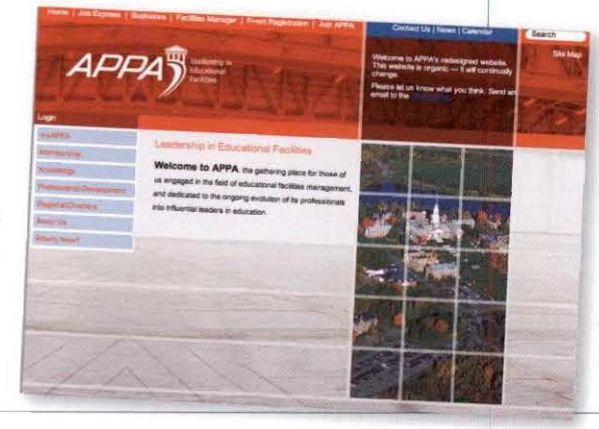
AVP Hired at APPA Headquarters

APPA recently hired John F. Bernhards as its new associate vice president and deputy executive officer. Bernhards, who began in late January, provides management oversight for APPA programs and administrative support, and assists Executive Vice President Lander Medlin in general association management. Previously, Bernhards was the vice president for marketing and public relations at the Alliance for Telecommunications Industry Solutions in Washington, D.C. He will use his extensive association management experience to assist in operational execution and the implementation of our strategic initiatives across various program areas. Bernhards holds a bachelor's of science degree in journalism from the University of Maryland, College Park.



Have You Visited the APPA Website Lately?

Our address hasn't changed but the APPA website's look, feel, and navigation structure have been transformed. The website's new look and enhanced functionality give users the ability to efficiently access and personalize information for their specific needs. So visit us online at *www.appa.org*, take a look around, buy a book, or register for a course, and send your feedback to *webmaster@appa.org*.



New Membership Year Approaches

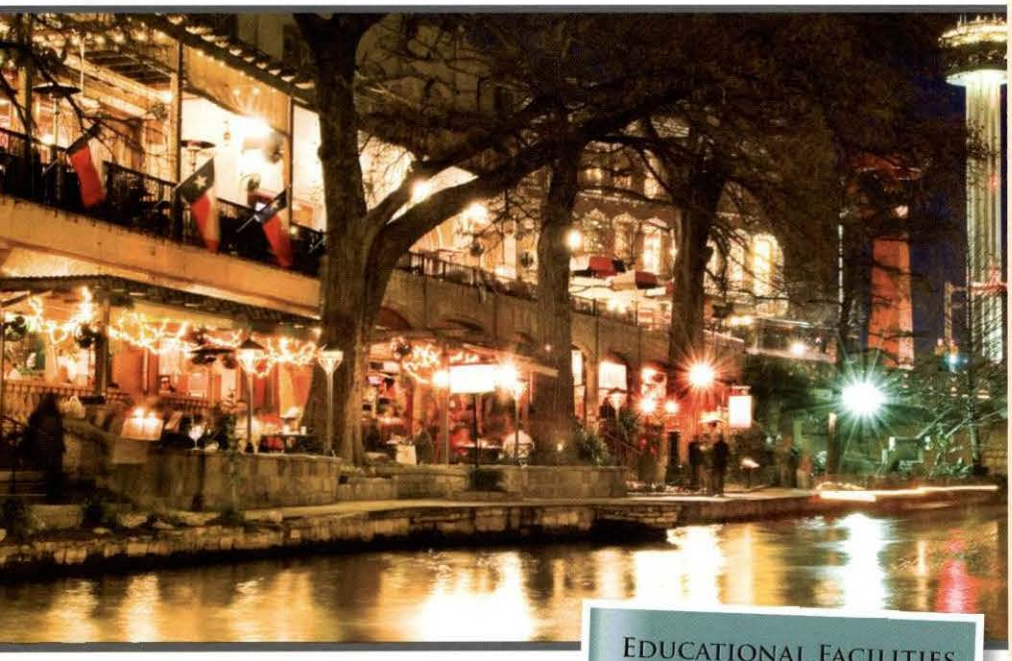
The 2008-09 APPA membership year begins April 1, 2008 and runs through March 31, 2009. The first membership dues notices will be mailed in February. Prompt payment is greatly appreciated and spares APPA the expense of sending multiple invoices. Your regional membership dues are also included on this invoice, so prompt payment helps your region as well. Contact Director of Membership & Outreach Tom Base at *tom@appa.org* for questions regarding APPA membership.

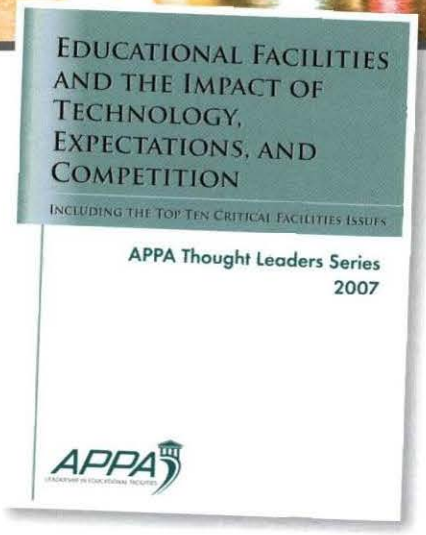
Rise to Greatness in Educational Facilities

Only the astute educational facilities professionals who are at our annual conference in San Antonio will be able to say, "Remember the great APPA 2008 conference?" Register today at *www.appa.org/training/appa2008* to be one of those who seek to build their careers, transform their institutions, and elevate the value and recognition of educational facilities. APPA 2008: The Rise to Greatness, July 9-11 in San Antonio, Texas is designed to make sense of the seemingly conflicting demands on the educational facilities field and help you learn how to:

- Meet the demands of an increasingly competitive environment.
- Assess your organization's financial performance.
- Ensure the effectiveness of the facilities department's primary processes.
- Prepare your employees to embrace future challenges.
- Meet and exceed your customers' needs.
- Achieve the benefits of developing a high performance organization.

APPA 2008 is open to anyone with an interest in public and private educational facilities, including: vice presidents, business officers, and directors of educational institutions and directors of museums, government/public buildings, and facilities suppliers to educational institutions.





Second Thought Leaders Report Released

APPA recently published the second report in our Thought Leaders Series—*Educational Facilities and the Impact of Technology, Expectations, and Competition*. In April 2007, representatives from student affairs, academic affairs, and administration joined facilities leaders at the second Thought Leaders Symposium to consider three major challenges confronting higher education as a whole: evolving technology, changing stakeholder expectations, and the impact of competition on both those drivers of change. Download the 2007 Thought Leaders report at *www.appa.org* or order a printed copy at no charge by calling 703-684-1446.

EVENTS

APPA EVENTS – 2008

March 3-4 CAPPA Technology Conference *San Antonio, TX.* Donna Grebe, dgrebe@maryville.edu.

March 19-21 2008 4th Annual FLAPPA Conference: Taking the "LEED" on Being "Green" *University of North Florida, Jacksonville, FL.* http://www.flappa.org.

April 18 EFP Prep Course *Scottsdale, AZ.*

April 18 or 19 EFP Exam *Scottsdale, AZ.*

April 19-23 Leadership Academy *Scottsdale, AZ.*

April 19-23 Supervisor's Toolkit *Scottsdale, AZ.*

May 25-28 GAPPA Annual Meeting *Jekyll Island, GA.* www.gappa@org.

July 9-11 APPA 2008: The Rise to Greatness *San Antonio, TX.*

July 7-11 Supervisor's Toolkit *San Antonio, TX.*

July 12 EFP Prep Course *San Antonio, TX.*

July 12 or 13 EFP Exam *San Antonio, TX.*

OTHER EVENTS – 2008

March 2-4 Stitching the Campus Quilt: SCUP's 2008 Mid-Atlantic Regional Conference *Pittsburgh, PA.* www.scup.org/regions/ma.

March 31-April 2 3rd Smart & Sustainable Campus Conference *College Park, MD.* www.nacubo.org.

April 7-8 LEAN Management Models for Facilities Management and Capital Projects Conference *San Diego, CA.* www.tradelineinc.com/lean2008.

April 21-22 The 2008 International Conference on Biocontainment Facilities *Washington, DC.* www.tradelineinc.com/bio2008.

May 7-9 COAA Spring Owners Leadership Conference *St. Louis, MO.* www.coaa.org.

June 1-3 Provision of Cleaning & Grounds Services at Post Secondary Institutions *Alberta, Canada.* www.uofaweb.ualberta.ca/facilities.

June 17-19 Elevator U 2008 Conference *Arizona State University, Tempe, AZ.* http://www.elevatoru.org.

July 12-15 NACUBO Annual Meeting *Chicago, IL.* www.nacubo.org.

July 19–23 SCUP's Annual International Conference and Idea Marketplace *Montréal, QC.* http://www.scup.org/annualconf/43/index.html.

For more information or to submit your organization's event, visit *www.appa.org/applications/calendar/events.cfm.*

facilities digest

Walter Wade Remembered as a Dedicated APPA Leader

1978-79 APPA president Walter W. Wade, 88, Monticello, Indiana died December 20, 2007. A pioneer in progressive facilities management for colleges and universities, Wade spent 35 years building a firm foundation with uninterrupted construction and campus development at Purdue University, ultimately serving as the school's first vice president for physical facilities.

Under Wade's leadership, Purdue earned national recognition for its orderly, rational approach to plant management. He also developed a widely copied facilities inspection program and was instrumental in the development of a model to determine the approximate levels of funding necessary to maintain the facilities of all state universities. These accomplishments earned him an APPA Meritorious Service Award in 1968. Wade retired from Purdue in 1981.

Surviving are two sons, David J. Wade of Lafayette, Indiana, and William D. Wade of Monticello, Indiana. In memory of Walter W. Wade, memorial contributions may be made to Indiana School for the Blind and Visually Impaired, 7725 N. College Ave., Indianapolis, IN 46240.

APPA Award Nominations Accepted Year-Round

Did you miss the January 30 deadline for the 2008 awards? Don't fret—nominations are now being accepted year-round for APPA's institutional and individual awards:

- Award for Excellence
- Effective and Innovative Practices Award
- APPA Fellow
- Meritorious Service Award
- Pacesetter Award

Awards submitted after January 30, 2008, will be considered for the 2009 cycle. For more information or to submit an award, visit *www.appa.org/recognition*.

Biz Partner Rep Appointed to Board

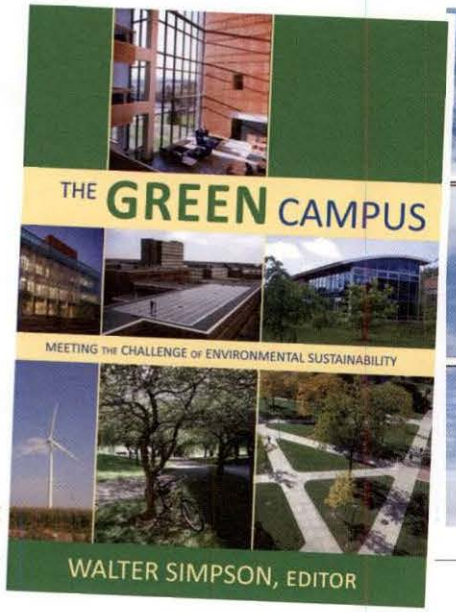
Dan Whitezell, vice president of marketing and sales for Spirotherm, Inc., was recently appointed as a Business Partner At-Large Member to the APPA Board of Directors. This role gives Business Partner members a voice at the APPA Board table and recognizes the significant contributions they make to APPA.

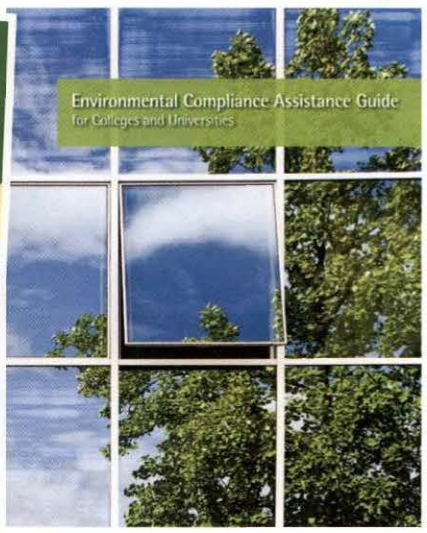
Coming This Spring – New APPA Publications

Sustainability and environmental standards have been hot topics for educational campuses and facilities around the world. APPA is publishing two comprehensive resources covering the latest trends, issues, and solutions on these topics.

***The Green Campus* – Meeting the Challenge of Environmental Sustainability:** This anthology of articles from *Facilities Manager* explores the meaning of genuine environmental sustainability—in global and local terms—while profiling many excellent campus environmental programs. It also includes new essays from top campus environmental leaders and advocates addressing many opportunities for campus greening.

***Environmental Compliance Assistance Guide (2nd ed.)*:** This update is a comprehensive guide to assist facilities and campus safety professionals in meeting current environmental regulatory requirements. The guide provides elements of an effective program for environmental management and compliance, a regulatory and campus programs matrix, and legislative/regulatory program summaries.





Special Member Discounts on Buildings, Frugalisms Books

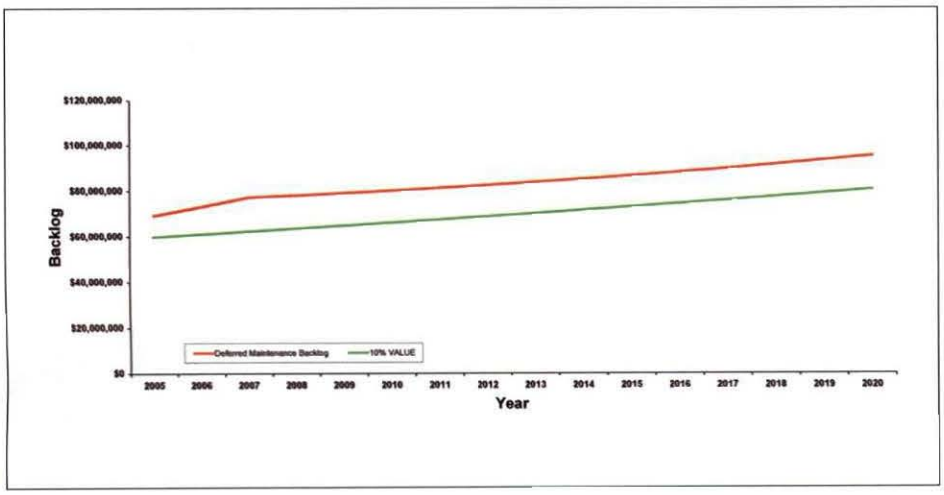
For a limited time, APPA members can purchase *Buildings...The Gifts that Keep on Taking*, for $50. That's 30 percent off the initial price. This must-have tool provides institutions with a framework for integrated decision making in the long-term management and maintenance of a facility built with donated money. APPA members can also buy President, Alan Bigger's book, *Frugalisms: Creative Ideas on Leadership in Facilities and Housekeeping Operations*, for $45. Published by the International Executive Housekeepers Association (IEHA), this book is an anthology of Bigger's Frugal Housekeeping columns in IEHA's magazine, *Executive Housekeeping Today*. This is a great resource for tips on floor care, staffing, budgeting, and customer service. You can purchase these books at *www.appa.org/bookstore*. Special discount ends March 31.

Register for April Educational Programs

APPA is offering the Leadership Academy and Supervisor's Toolkit April 19-23 in Scottsdale, Arizona. The Leadership Academy is designed in four tracks, each emphasizing a different perspective and type of leadership skill on an individual, interpersonal, managerial and organization level. The Supervisor's Toolkit is an open-ended and pragmatic approach to help supervisors realize their personal and professional growth. Go to *www.appa.org/training* for more information and to register for these programs.

Correction

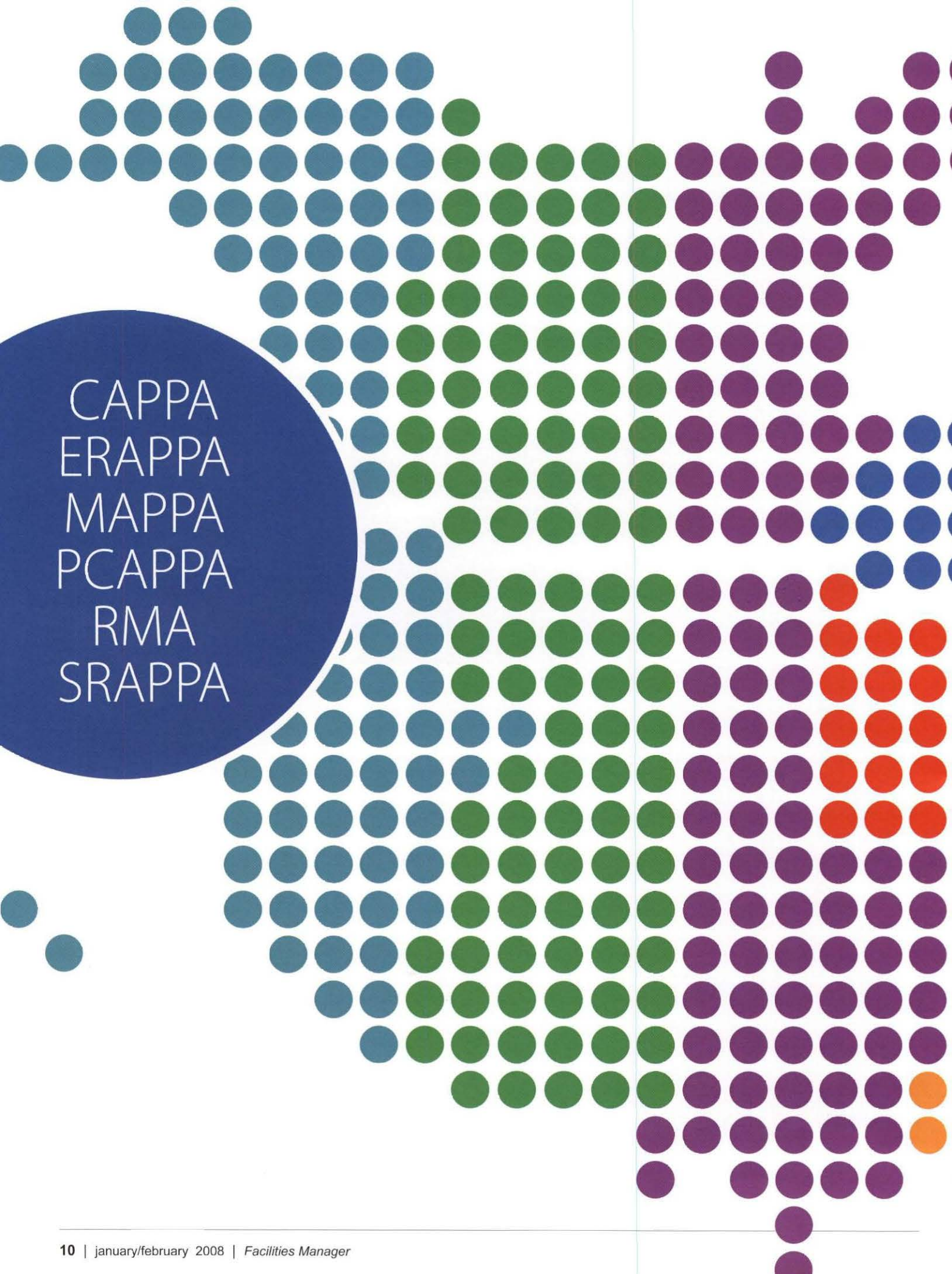
In the November/December 2007 issue on page 21, Decision Chart 2 was incorrect. See the correct chart below. The author's e-mail address was also incorrect. It is *Richard.L.McDermott@uth.tmc.edu*. We apologize for the errors. E-mail the author for a copy of the spreadsheet and chart Wizard.



APPA's 7 KEY STRATEGIES

to promote leadership and growth in educational facilities management.

1. Develop and execute a "brand" initiative.
2. Develop and implement an enhanced website to become the "go to" resource for facilities questions.
3. Expand research to build credibility and visibility by senior institutional officers.
4. Engage in symbiotic and collaborative partnerships.
5. Engage young facilities professionals.
6. Provide targeted cutting-edge educational programs.
7. Establish credible and valued credentialing programs for individuals and institutions.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2007 REGIONAL REPORTS

If you missed your regional conference last fall, this annual report will update you on what happened at the 2007 regional meetings.

APPA's six regions serve member institutions across the United States and Canada. They function independently from international APPA and offer their own educational programs, annual meetings, publications, and other benefits. Each region also maintains its own set of officers, committees, and activities.

Participating in regions and state and local chapters is a great way to become active with APPA. Many APPA board and committee members began their service at a regional meeting.

REGIONAL REPORTS

Central Region

Vickie Younger
CAPPA Newsletter Editor

Three hundred eighty members, business partners, guests, and other friends gathered October 20-24, 2007 in Fayetteville, Arkansas, for the 2007 CAPPA Annual Educational Symposium and Business Exposition. This outstanding meeting was hosted by Mike and Terry Johnson and the University of Arkansas staff.

Pre-conference activities began on Thursday with 32 participants in the APPA Supervisor's Toolkit, followed by the executive board meeting on Friday. Committees gathered early Saturday morning for a group breakfast and then broke out into individual sessions.

The Fayetteville team knows how to have a good time and showed us the area's hot spots through a variety of optional activities. Seventy-six golfers played the Stonebridge Meadows Golf Club on Sunday while others enjoyed the scenery on an Arkansas-Missouri Railroad Tour (robbed by masked horsemen) and took a Backyard Billionaires tour. A first-timers reception welcomed 95 attendees, which was followed by a welcome BBQ and the opening of the exhibition hall. Sunday night football and the Bead Queens wrapped up the evening.

Monday and Tuesday were filled with high-quality educational opportunities including four tracks: (1) Leadership, Management, and Workforce Development; (2) Sustainability—Today's Investment for Tomorrow's Future; (3) Stewardship—Life Cycle Perspectives; and (4) Innovation and Change. The conference ran very well—excellent speakers and terrific coordination by the "home team."

Individual CAPPA membership is currently at 634 and institutional membership numbers 164, with recruitment efforts continuing. Technology 2008 is being planned.

There will be many pre-conference offerings to include: grounds, custodial and maintenance rodeos; safety programs; and project management. Several programs were tested in 2007 and were very well received. Information services has continued enhancements to the website and considerably improved the Easy Post system for handling meetings and registration.

Elections were held during the business meeting, and the new CAPPA board includes:

- **Mike Johnson,** president
- **J.B. Messer,** First vice president
- **Larry Zitzow,** Second vice president
- **Ted Weidner,** Third vice president
- **Sue-Anna Miller,** Treasurer
- **Art Sykes,** Secretary
- **Darrel Meyer,** APPA senior regional representative
- **David Millay,** APPA junior regional representative
- **Pat Apel,** Education chair
- **Randy Culver,** Membership chair
- **Vickie Younger,** Newsletter editor
- **Terry Major,** Information services
- **John Greene,** Immediate past president

A special banquet honored graduates of the Supervisor's Toolkit; Larry Zitzow received the Newsletter award; Miles Abernathy, Neal Swarnes, and Julio Cisneros were given certificates of Meritorious Service; John Brake was given the President's Award; and Joe Phillips was honored with the Distinguished Member Award. We are so proud of the accomplishments of our members. It has been a very good year.

2008 Regional Conference
CAPPA
OCTOBER 11-15, 2008
Oklahoma City, OK
www.cappa.org
The Central Region consists of Arkansas, Kansas, Manitoba, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Texas

Eastern Region

Dan Gearan
ERAPPA VP of Technology & Communications

Ottawa was the backdrop for the 2007 ERAPPA annual meeting September 30 - October 3. The conference theme Capital Ideas for Sustainable Resource Management emphasized the need for all of us to become better stewards of our global environment. The Keynote speaker was Dr. David Suzuki—an award-winning scientist, environmentalist, and one of Canada's most recognizable and beloved public figures. The experience was one that made a lasting impression on all who attended.

The conference was hosted by the Ontario Universities and Ontario Colleges

Keynote speaker Dr. David Suzuki addresses ERAPPA members at their Capital Ideas for Sustainable Resource Management conference.

under the leadership of Mario Bouchard and Darryl Boyce. The host committee provided a stimulating education program and fantastic entertainment that took advantage of the sights in Ottawa. The conference finished with a wonderful awards banquet that was held in the Grand Hall of the Canadian Museum of Civilization. Outgoing President Glenn Smith thanked a multitude of people for the successes of the past year. It was an impressive venue and a tremendous culmination of the week's events.

"Ottawa was a tremendous host for the conference," said Smith. "It is clear that our commitment to the education program was, and continues to be, first rate. We received a tremendous amount of positive feedback and look forward to carrying that momentum to Baltimore next fall."

There were four new board members elected at the meeting:

- **Keith Woodward (Quinnipiac University)**, president-elect
- **Dan Gearan (Saint Joseph's College of Maine)**, VP of technology and communication
- **Terry Pellerin (Worcester Polytechnic Institute)**, VP of chapter affairs
- **Lou Dursi (Princeton University)**, treasurer (second term)

In addition to recognition of ERAPPA scholarship recipients and APPA award recipients, Don Briselden, Ron Dupuis, and Earl Smith were awarded Emeritus status. Several bylaw changes and updates were passed at the meeting, which included a new Board position for our organization, Vice President of Annual Meetings. This position will work with host committees for our annual meetings to help coordinate and assist in planning the meetings. Anne Babcock (Carleton University) was appointed as the interim Vice President of Annual Meetings until the first election for this position which will be conducted in Baltimore next year.

New ERAPPA President Willy Suter (American University) looks forward to continuing to promote ERAPPA as the source for education and professional collaboration.

"I think ERAPPA has benefited from solid leadership over the years and a solid foundation for what we do has been established, Suter said. "My goal is to help ERAPPA members become part of the solution to the primary issue of our times."

2008 Regional Conference
ERAPPA
SEPTEMBER 28-OCTOBER 1, 2008
Baltimore, MD
www.erappa.org
The Eastern Region consists of Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Brunswick, New Hampshire, New Jersey, New York, Newfoundland, Nova Scotia, Ontario, Pennsylvania, Prince Edward Island, Quebec, Rhode Island, Vermont

Midwest Region

Ernie McVay
MAPPA Newsletter Editor

The salmon were making their autumn run up the Grand River as MAPPA gathered on its banks for the 2007 educational conference October 6-10 in Grand Rapids Michigan. A quartet of hosts—Ferris State University, Grand Valley State University, North Central Michigan College, and Western Michigan University—welcomed more than 500 attendees to this joint meeting of the region (MAPPA) and state organization (Michigan APPA, MiAPPA) in Grand Rapids.

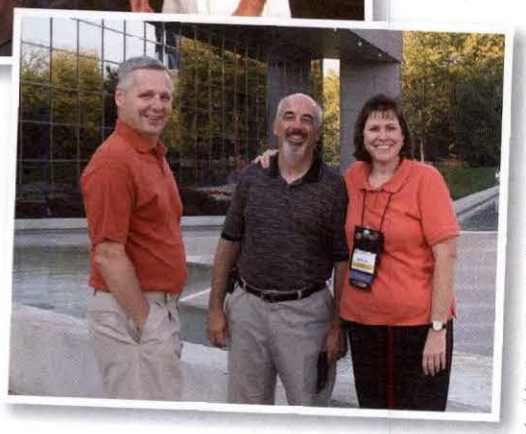
A golf outing to the Egypt Valley Country Club—a PGA senior course—was on the agenda Sunday morning for 80 early arriving attendees. That evening the conference kicked off with a welcome reception at the Gerald R. Ford Presidential Museum. Surrounded by exhibits and artifacts from the life of the late President, the museum was an inspiring venue for beginning the "Networking on the Grand."

Monday morning began with breakfast, followed by the Keynote Speaker: Mary Jane Pories. An alumna of the comedy troupe Second City, Pories is an award-wining actor/improviser and writer who

REGIONAL REPORTS

founded Fish-ladder Inc. She uses improvisation to improve teambuilding, communication and creativity, and she emphasized the application of these tools for use in our workplace:

1. Focus
2. Yes (say yes and build on it)
3. Be in the moment



Above: Terry Burke, MAPPA Education Committee, converses with colleagues as they showcase MAPPA resources. **Right:** President-Elect Martha May, Purdue University, attends the opening MAPPA reception at the Ford Museum.

The educational sessions began after the keynote, which also happened to include Tim Thimmesch, a co-host from Grand Valley State University. Monday sessions included:

- **Your Consultant Works for You** by Craig Scully (Design Collaborative)
- **The Latest Trends with LEED** by Jim Nicolow (Lord, Aeck & Sargent)
- **Cool Trends on Campus** by John Andrepont (The Cool Solutions Company)
- **Access Management/Security Info Exchange** by Joseph White (A-1 Corporate Hardware)
- **Seven Habits of a Highly Effective Maintenance & Operations Director and the Seven Deadly Signs** by Herb Crawford (SchoolDude);

The exhibit hall was filled with more than 100 booths and filled with exhibits from our valued business partners. The afternoon wrapped-up with the always-popular Large/Small School Discussion Sessions with topics that ranged from bio-fuels to sustainability to waterless urinals to the University President's Climate Letter. Kris Ackerbauer from the University of Wisconsin—Madison facilitated the Large School Discussion and Ralph Zia from Northeastern Illinois University facilitated the Small School Discussion.

Tuesday morning began with the annual business meetings being conducted for both MAPPA and MiAPPA. Following the breakfast and business meetings, educational sessions continued with various Conflict Management sessions. During Tuesday's lunch, our co-hosts were recognized for the outstanding conference they coordinated. The MAPPA Officer Election was also held with John Ott (Ohio State University—OARDC) being unanimously supported for President-Elect and Ralph Zia (Northeastern Illinois University) being unanimously selected as Secretary.

Educational sessions continued Tuesday afternoon and the end of the session day concluded with participants having to make the tough choice of which of three terrific tours to take. The first was a tour of LEED sites within Grand Rapids. Another choice was a tour of the Grand Valley State University's Pew Campus. The final choice was a trip to the Steelcase University Learning Center's Classroom of the Future. Regardless of which tour was taken, participants were rewarded with an enriching experience.

The MAPPA 2007 Educational Conference ended with dinner at the world-renowned VanAndel Museum on the banks of the Grand River. Following a wonderful dinner, Fred Plant of Valparaiso University passed the presidential gavel to Martha May from Purdue University. Martha looks forward to the challenges the upcoming year brings and took the opportunity to express her sincere thanks to her colleagues who have entrusted her with this leadership opportunity. The following MAPPA Officers for 2007-2008 were installed:

- **Martha May (Purdue University)**, president
- **John Ott (The Ohio State University OARDC)**, president-elect
- **Brandon Baswell (Michigan State University)**, treasurer
- **Ralph Zia (Northeastern Illinois University)**, secretary
- **Greg Fichter from (Indiana University)**, senior representative
- **Jerry Carlson of (Butler University)**, junior representative

2008 Regional Conference

MAPPA

October 5-8, 2008

Madison, WI

www.m-appa.org

The Midwest Region consists of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, Wisconsin

Pacific Coast Region

Mark Hunter
PCAPPA Newsletter Editor

The joint annual PCAPPA & RMA conference October 10-13 in Albuquerque, New Mexico was a successful conference was had by all. Strong educational sessions formed the heart of three very full days; book-ended by first class golfing, a truly unique banquet, and surrounded by the incredible spectacle of a balloon fiesta.

If there was one message that rang out loud and clear in all of the educational sessions, it was sustainability. Eleven of 21 educational sessions and one of two keynotes focused on the many aspects of this broad topic. Throw in another three energy related presentations, and nearly 67 percent of the educational opportunities spoke to the important responsibilities of facility professionals in facing these serious challenges to our world today. What made the sessions so valuable was the positive thread that ran through many of the presentations, represented most clearly by the title of one session; "It's Easy Being Green." Still, education facilities professionals are nothing if not realists. Salas O'Brian Engineering presented the gory details of one LEED project that went drastically wrong (not one of theirs!). A wise man once said that we learn more from our failures than our successes…this conference let us learn from both.

Another area of significant focus at the conference was the largest resource managed by every facilities professional; our people. Keynote speaker Cecy Kuruvilla of Sodexho primed the group by describing the company's diversity and inclusion journey. She opened Sodexho's playbook and shared key staff development strategies, highlighting their approach to the new generational challenges affecting business and higher education. The following sessions covered challenges in recruitment and retention, and building a new facilities organizational culture.

Leadership in educational facilities cannot be distilled into two topics, and there were plenty of additional sessions to demonstrate the breadth of knowledge necessary in our endeavors. Topics ranged from Doug Christensen introducing Life Cycle Management of the Facility portfolio, to Jeri King's work on reimbursement rates. One goal of the combined PCAPPA/RMA conference was sharing experiences from our two regions. The many and diverse sessions achieved this goal admirably by mixing presenters from across the western states and Canada.

PCAPPA attendees enjoy the International Balloon Fiesta.

The business meeting began with a welcome by President "Buzz" Nelson. PCAPPA officers each then briefly took the stage and provided a status update. Members heard that the treasury is sound, the scholarship program is successful and available, membership is growing, and that next year our host is Robyn Pierce of Portland State.

Those individuals who have contributed outstanding service to PCAPPA were honored at the meeting, as well. This year the gentlemen so honored were Towny Angel and Dan Johnson. Towny received the warm thanks from PCAPPA for his six continual years of service to the PCAPPA Board. Dan received the Meritorious Service award for many years of dedicated efforts on both the PCAPPA board and the APPA board.

Finally, APPA's international board was ably represented by President Alan Bigger. President Bigger congratulated PCAPPA on its many successes both at the conference and in its wider support of facilities managers. He also took the opportunity to share the results of APPA's new branding endeavor.

The unique structure of this joint conference provided new opportunities for our business partners and new opportunities for our membership to meet vendors from the Rocky Mountain region. The conference facility layout wove the partner booths throughout the hotel, creating great ability for informal discussions and lots of face time. The closing meeting between business partner representatives and conference management staff was a very positive affair, with much praise for the style and amount of interaction possible.

2008 Regional Conference
PCAPPA
October 5-7, 2008 (tentatively)
Portland, OR
www.pcappa.org

The Pacific Coast Region consists of Alaska, American Samao, British Columbia, California, Guam, Hawaii, Idaho, Nevada, Oregon, Washington, Yukon Territory

Rocky Mountain Region

Mary Vosevich
RMA President

New Mexico was the host site for the joint RMA-PCAPPA annual meeting October 10-13 in Albuquerque. What a treat it was for RMA to host this year's conference with our colleagues to the west. It was quite an event as over five hundred attendees, including 60-plus business partners, came together to share knowledge and expertise.

We were honored to have APPA President, Alan Bigger, Immediate Past President, Christopher Ahoy, and Executive Vice President Lander Medlin in attendance. We were also fortunate to hold the meeting while the International Balloon Fiesta was taking place in Albuquerque. And, as is typical for any APPA affiliated event, we were all up at the crack of dawn the first day to play golf or go to the balloon fiesta.

Our conference theme—Sustaining a Balanced Mission—was very timely, as we are all challenged with operating our respective facilities in a more efficient manner. For many, sustainability means energy conservation. But it is important to note that it truly transcends all operations. Sustainability is about good human resources, good business practices, good customer relations, being accountable, and in short, doing the right thing. If we look around our organizations, there are opportunities galore to function in a more sustainable manner. To that end, I think our speakers and topics were right on point. The challenge now is to use the information that was presented and share it with our colleagues throughout our region.

We were honored to have Cecy Kuruvilla and Edward Mazria as our keynote speakers. Ms. Kuruvilla, Sodexho's Higher-Education Market Senior Director of Diversity, discussed this international mega-firm's "diversity journey." Most of us learned that we were traditionalists-in-boomer-clothing, exhibiting some Gen X and Y behaviors.

Ed Mazria, Principal of Mazria and Associates Architectural Consultants, delivered a presentation on Global Warming. Ed drew great applause for his riveting, non-political assessment. Few APPA audiences have been so deeply moved by a scientific and sociological review of the sustainability challenge we are facing.

The educational sessions that followed the keynote addresses were equally provocative and informative. We rallied PCAPPA's and RMA's most dynamic thought-leaders and innovators to deliver cutting edge presentations. Delegates had access to a balance of presentations from nationally recognized authorities on physical plant staff development, resource management, and sustainability. Most popular were sessions on early campus successes in advancing sustainability programs, new approaches to strategic asset management, and case studies that linked academic success to facility condition. Congratulations to those who designed an education program that successfully competed with the "Land of Enchantment's" many attractions and distractions.

RMA mingled at the Welcome Reception with the background sounds of a Mariachi band.

Boredom was not an option at this year's conference. In addition to outstanding educational sessions, our opening social and closing banquet dinner at the Hotel Albuquerque located in historic Old Town, along with our New Mexican fiesta-themed dinner at the beautiful Sandia Resort and Casino, a variety of special events and activities were offered. Delegates were treated to excursions to the 2007 International Balloon Fiesta which included the dawn patrol and special shapes rodeo, the Glowdeo and fireworks show, and the always exciting Saturday morning mass ascension of over 700 hot air balloons. New Mexico's incredible fall weather provided for a great day of golf for those playing in our conference golf tournament which was held at UNM's nationally recognized Championship Golf Course.

For those wishing to experience our southwestern culture, a day trip to Santa Fe or shopping in Old Town Albuquerque was just the ticket. In addition, conference attendees could choose an afternoon of New Mexico wine tasting at the beautiful

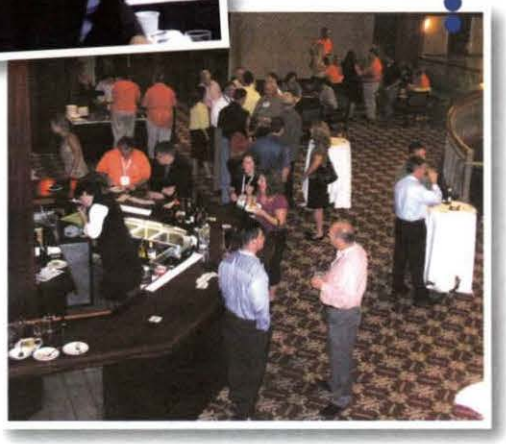
2008 Regional Conference
RMA
September 28-October 1, 2008
Park City, UT
www.rmappa.org

The Rocky Mountain Region consists of Alberta, Arizona, Colorado, Montana, New Mexico, Saskatchewan, Utah, Wyoming

Casa Rodeña Winery, take on an adventurous day trip to the Albuquerque Biological Park and Rio Grande Zoo, or spend the afternoon touring the University of New Mexico Campus, renowned for its pueblostyle architecture and high desert campus arboretum. In keeping with our New Mexico heritage, conference entertainment provided by Mariachi Nuevo Sonido, UNM's Alma Flamenca, and The New Mexican Marimba Band was enjoyed by all.

Southeastern Region

Kate Van Sant
SRAPPA Vice President for Communications



Above: Deborah Love, Vice President for Institutional Equity at Tulane University, and Sylvester Johnson, also of Tulane and Vice President at-Large of SRAPPA. **Right:** The members reconnected during the opening SRAPPA reception at the host hotel.

The 56th Annual SRAPPA Conference—*Win, Place or* Show—was hosted by Northern Kentucky University, October 6-9 in Covington, Kentucky. The Riverfront Marriott was the official Conference hotel, a beautiful facility connected to the Northern Kentucky Convention Center offering ideal convenience for attendees, presenters, and exhibitors.

The festivities began on Saturday with the obligatory golf tournament, and the first official social event was an evening reception featuring shrimp cocktail, burgoo, pecan pie, and generous helpings of many other delicacies, held next to the lobby gazebo of the Marriott.

The traditional SRAPPA diversity reception and women in facilities session were combined for a very successful presentation and workshop given by Deborah Love, Vice President for Institutional Equity at Tulane University. Many interesting educational sessions were offered, including several on sustainability and one on pandemic planning for higher education institutions.

Spouse tours included an up-close-and-personal look at a brewery and a historical tour of Cincinnati. One of the highlights of the Conference was a trip to Keeneland Racetrack, where we ate lunch in the exclusive top floor of the club house and had a chance to bet on the horses. One of our members won $400, but he paid me not to divulge his name.

SRAPPA officers selected for 2007-2008:

- **Glenn Reynolds**, President
- **Larry Blake**, President-elect
- **John Malmrose**, First vice president
- **Dan Young**, Second vice president
- **Jeff Turner**, VP for long-range planning
- **Kate Van Sant**, VP for communications;
- **Sylvester Johnson**, VP-at-large
- **Curtis Reynolds**, Secretary/treasurer
- **Ron Brooks**, APPA representative-elect
- **Marion Bracy**, Junior APPA representative
- **Joe Fisher**, Senior APPA representative

Tuesday's reception was held at the Newport Aquarium, followed by banquet and address from the president of Northern Kentucky University. Attendees had an opportunity to explore the Aquarium, including the chance to pet a shark. Your intrepid conference reporter dripped seawater all over the bus back to the hotel but enjoyed herself thoroughly.

President Brooks gave the President's Award to Northern Kentucky University and congratulated Larry Blake's staff on an excellent conference, resulting in a standing ovation. The SRAPPA Service Award was presented to Bob McMains of Emory University, and Appreciation Awards went to David Gray and Brenda Dressler of Middle Tennessee State University.

The grand prize was an Alaskan cruise for two, won by Alyson Goff, Program Manager for Finance and Facilities for the South Carolina Commission on Higher Education.

Next year's Conference will be held at the Medical University of South Carolina in Charleston, and in 2009 SRAPPA will meet at Embry-Riddle Aeronautical University in Daytona Beach, Florida.

2008 Regional Conference
SRAPPA
October 25-28, 2008
Charleston, SC
www.srappa.org

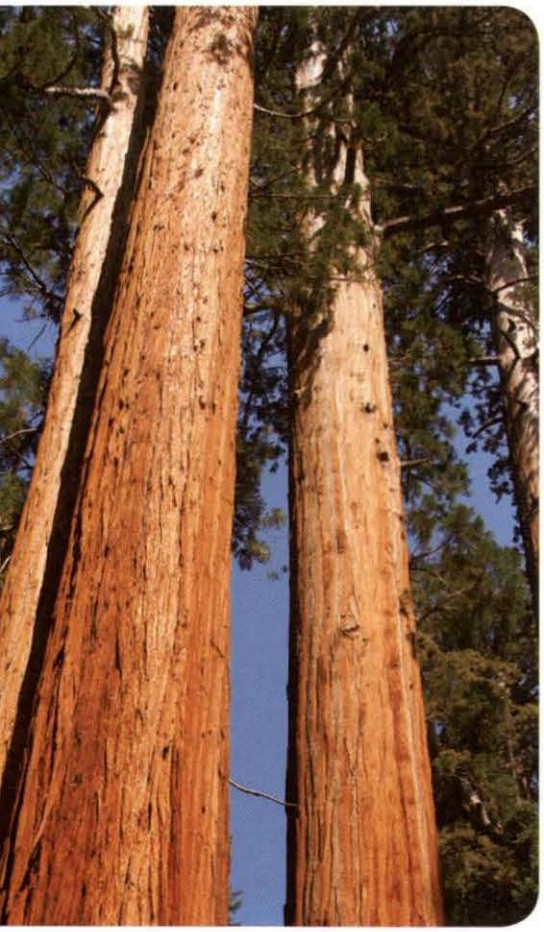
The Southeastern Region consists: Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Virginia, West Virginia, Virgin Islands

Lessons Learned from the Giant Sequoia Trees

By E. Lander Medlin

The largest living thing on earth is the Sequoia tree. There are a number of things about life, longevity, and the strength of community we can learn from these magnificent creations.

As APPA continues to build on our multifaceted community, we are learning that we must synergize our efforts in promoting leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and evaluate the value and recognition of facilities in education. With nearly a century under our belt, the APPA community can look to the Sequoia trees for the secrets to thriving amidst seasons of environmental, industrial, and social change.



From a seed the size of a piece of oatmeal and growing only six inches to one foot per year, Sequoia trees can extend to well over 300 feet tall across their lengthy lifetimes; some Sequoias are as old as the pyramids. Where does this sustained growth and longevity come from? There are a number of contributing factors.

First and foremost is the nature of the Sequoias' root system. Although each individual tree's roots are shallow, extending only two to three feet deep, they are spread out and entangled with one another giving each tree the collective strength of the entire community of trees. This provides them unmatched strength, with a synergistic effect that is evident in their incredible longevity. Only three Sequoia trees have fallen in the last 100 years, and those few had somehow spawned outside the cluster of the community

In addition, the whole unit of trees grows straight and stands tall, contributing to the integrity of purpose and strength in and for the community.

Amazingly, Sequoias not only survive but actually thrive in the midst of a fire. Indeed, their fire-resistant bark is two feet thick and needs the fire to reduce the thickness for better growth. Further, the fire's heat releases minerals in the soil for nourishment, thins out other competition, and releases its seeds for more Sequoias to grow.

The bark's chemical makeup is also resistant to pests that would otherwise harm and/or deter its steady growth. These trees grow slowly, steadily, and diligently over time, undeterred by the external crises of fire and wind which so frequently undermine the longevity of other trees—how instructive for each of us and our own professional community. So I ask:

- Where does your strength come from?
- What actions are you taking to ensure sustained growth?
- Are you focused on just surviving amidst this firestorm of change, or are you thriving?
- How do you achieve deliberate focus on that which is most important?
- How do you create or stimulate that sense of urgency so necessary to achieve organizational excellence?
- Who can see your leadership?
- Who is benefiting from your leadership?

The life and qualities of the Sequoia trees offer these and many more questions for you to ponder during the new year as you consider your organization's professional growth and development, as well as your own.

Consider the great fire of 1918, when Thomas Edison's laboratory building burned. The battery technology he was working on caught fire, with the raging blaze engulfing much of the building before the fire could be arrested. Edison walked with his son the next day amidst the charred embers and reportedly exclaimed, "Don't worry son; there is great value in disaster! All our mistakes are burned up. We can start anew!" With this attitude his focus was not on just surviving the fire but on thriving from that fire. And, indeed he did. Three weeks later Edison invented the phonograph. He said the fire cleared away all the other distractions so he could focus on this important project. Sometimes it takes a crisis to clear away everything superfluous so we can focus on what is

most important. In our organizations, one of the great challenges is creating or stimulating that sense of urgency for ourselves and our organization to achieve the same focusing effect. And, from time to time, we should consider whether our focus should be on what we should "start" doing rather than our tendency to focus on what we should "stop" doing.

Frankly, this is all so difficult to do alone. However, you can draw upon the great strength found in the community of educational facilities professionals in APPA's membership. Ultimately, it is about the relationships we have built over time and the network we have created as a result that will expand our knowledge, sustain our growth, and stimulate new perspectives.

Like the oatmeal-sized seed of the Sequoia, big things come in small packages. Such is the case when considering APPA's array of programs, products, and services. Taken individually, education from our extensive number of educational programs (like the SFO Summit, Annual Conference, Certification, Institutes, Academy, and Toolkit); knowledge from *Facilities Manager* magazine, books, and the website; and industry standards derived from our staffing guidelines, key facilities performance indicators, and evaluation criteria could seemingly be considered little things.

Nonetheless, each represents small seedlings that sprout in support of your individual professional development. However, systematically combined, they help build a solid foundation, like the intertwined root system of the Sequoia, enhancing each facilities professional's career growth and upward mobility and helping each facilities organization achieve unparalleled excellence and reach greater heights.

And, much like the community of the giant Sequoia, you too can give back to the profession and demonstrate your leadership by contributing to this enormous root system through your active engagement and participation in APPA. Your contributions (such as serving on a committee, running for an elected office, writing an article, or being part of an organizational evaluation team) will add immense value to this professional network, thereby strengthening the profession itself and the synergy we provide throughout the educational community.

Choose now to make APPA the association of choice for educational facilities professionals.

Ultimately, we all gain immeasurably from and build upon the collective knowledge and expertise of others to improve ourselves, our organizations, and our profession.

Lander Medlin is APPA's executive vice president. E-mail her at *lander@appa.org*.

Glidepath to Compliance:

Managing the Regulatory Risk/Return Trajectory in Educational Facility Enterprises

By Michael A. Anthony, P.E. and Richard Aaron, Esq.

Author's Note: *This article provides general information only and does not constitute legal advice for any particular situation.*

Perplexed by the proliferation of codes and standards with slow gains in funding to meet their objectives? Higher education and other enterprises in highly regulated sectors face a common problem in figuring out how to capture, assess, and calibrate risk in code and standards compliance.

Complicating typical out-of-step conditions among standards that update every 3-5 years is the federal-state-local alignment that enforces them. The federal government gives states the power to make decisions about matters not specifically assigned to the federal government. But in some states, municipalities have authority only when it is granted to them by the state. The determination of who has authority in which circumstance is not enshrined in a single state policy; rather, it is delegated by individual laws passed by the state legislature that assign authority to various entities in particular situations. The state legislature creates local municipalities and decides what powers they should have. State agencies typically try to comply with local ordinances—even when not required to—unless they have a compelling reason not to do so.

Even when an organization is able to proactively catch a regulatory issue, it must document for authorities having jurisdiction that it was successfully remediated and then show there is an ongoing process in place to mitigate risk for the future. The financial and health care sectors, driven by Sarbanes-Oxley and the Joint Commission (JCAHO), are tooled up for regulatory compliance and robust enforcement.

> ARGUABLY, WE ARE NOT FAR FROM A CONTINUAL STATE OF NON-CONFORMITY BECAUSE, TO PARAPHRASE BROOKS BAKER, FORMER APPA PRESIDENT, "BUILDINGS SOMETIMES FALL OUT OF COMPLIANCE EVEN BEFORE THEY ARE FINISHED BEING BUILT."

SECURE LINKAGE WITH LIKE-MINDED ORGANIZATIONS

APPA's mastery of the code and standard universe might be more fully realized with accreditation as a Standards Developing Organization (SDO) through American National Standards Institute (ANSI). Just as our facility-related documents refer to "other applicable standards," those other standards could reference one of our own. Much of what is needed to establish consensus for best practices is already in place. What effect might an ANSI/APPA standard have?

- The International Building Code would reference an ANSI/APPA standard on the special considerations in educational facilities which are commonly built, in stages, in wide time intervals, with mixed occupancy classes.
- Chapter 28 of NFPA 101 (The Life Safety Code) would reference an ANSI/APPA standard on dormitories and permit industry-specific exceptions that distinguish student housing from commercial- class apartments and hotels.
- The National Electric Safety Code (ANSI/IEEE C.2) would reference the unique "system with a system" conditions of campus power distribution networks that operate in a manner similar to cooperative and investorowned utilities. To the extent there is a reasonable degree of uniformity, the newly developing utility best practices intended to promote safety, adequate service, and reliability would be considered as an analog for generally accepted operating guides and practices.
- Legislation pending in the U.S. House and Senate in the Campus Fire Safety Right-to-Know Act of 2007 (S.354 and HR.592) will require an annual report to the Secretary of Education and to all users of campus facilities. Campus fire safety information could be made uniform across our sector if we have a hand in setting the standard for counting, analyzing and presenting it.
- Re-shuffling of the training and "qualified person" definitions that appear in labor and trade association guidelines.

There are many other examples. It may not be possible, nor even desirable, to relax a local jurisdiction's adoption of other international standards. Many colleges and universities operate as "campus states" anyway with their own authority- having jurisdiction. It does not mean that everyone in our sector has to do things the same way, either. The conditions of maintenance and supervision for educational facilities in Florida can be, and probably should be, different from facilities in British Columbia.

It still needs to be determined if we need one document or several guidelines/standards (a discipline design guideline, an O&M standard, etc.). It would be important not to exaggerate the difference between "educational facility practice" from "commercial practice." That might weaken the case for ANSI-accreditation. Still, such a standard, or groups of standards, could integrate the common elements of compliance tasks across our sector and among our consultants. The extent to which ANSI-accreditation benefits the goals of regulatory authorities will be mirrored in bottom-line benefits for our sector.

THE GLIDEPATH

A prospective ANSI/APPA standard would have to help us reckon with a problem that dominates all of our budgets: maintaining non-conforming facilities. Arguably, we are not far from a continual state of non-conformity because, to paraphrase Brooks Baker, former APPA president, "Buildings sometimes fall out of compliance even before they are finished being built." Code updates, occupancy changes, and the sheer complexity of new building systems make the argument an urgent reality.

Thus, non-conformity may be close to being the rule—rather than the exception—in many colleges and universities in the United States. To deploy capital to limit risk, facilities professionals must travel along a glidepath, or a trajectory with a narrow tolerance. Too much repair and alteration will trigger a complete code upgrade; too little maintenance will result in denial of occupancy or loss of business continuity. There is risk on both sides of the mandate.

Even when conditions in a facility are grandfathered, risk does not disappear. Duty-of-care issues remain; retroactivity clauses in various codes and standards come into play. Take, for example, language that comes from the State of Michigan Bureau of Construction Codes:

Existing installations.
Existing electrical installations that do not comply with the provisions of the code shall be permitted to be continued in use unless the authority having jurisdiction determines that the lack of conformity with the code presents an imminent danger to occupants. Where changes are required for correction of hazards, a reasonable amount of time shall be given for compliance, depending on the degree of hazard.

This language is identical to Section 80.9(B) of the Administration and Enforcement Annex G of the 2008 NEC which many—but not all—jurisdictions adopt as enforceable. Design, even budgeting, decisions are made with highly personal views of the word "reasonable." Imagine a facility manager having to decide between:

1. funding an effort to meet the "flash hazard" requirement that appears in NFPA 70E – Standard for Electrical Safety in the Workplace by marking incident energy numbers on equipment that may not need to be worked on energized by one electrician because the PPE requirement is aggressively enforced by OSHA; or,
2. funding alterations to a dormitory with a capacity of 500 students that does not meet current seismic zone requirements.

How can we make this decision a little less like a day at the track? An engineer's solution might be, "give me funding to solve 5 percent of the problem and then in 20 years, we'll have it finished." This kind of percentage compliance speed resembles some local government requirements that a certain percentage (often 5 percent) of new multifamily housing meet more rigorous ADA physical accessibility requirements than

required under the Fair Housing Act. How would you limit litigation risk in the intervening time?

Mitigating or limiting risk involves two steps: identifying the risk and developing a measure or strategy to address the foreseeable consequences. Strategies include shifting the risk to another party (e.g., insurance or warnings), taking measures to avoid the risk (e.g., adopting new practices to eliminate), reducing the risk consequences (e.g., adopting protective safety measures or emergency responses) and accepting some of the consequences of the risk. Each strategy should be gauged by a reasonableness test which considers the facts and circumstances.

Stated another way, is there a duty of care to address a foreseeable risk of harm? A duty of care can be seen as a legal obligation requiring adherence to a standard of care to avoid foreseeable harm. While the obligation can arise from government laws and regulations, the obligation can also be a simple test of reasonableness— whether or how a reasonable man, under the circumstances, would act. If so, does compliance with codes or standards establish a reasonable response to the risk?

In some cases, the answer is yes. In other cases, the standards are only one measure of reasonable conduct. Codes and standards do, and should, allow for waivers and exceptions, and frequently are prospective, thereby "grandfathering" existing conditions because codes and standards alone do not take into account the specific facts and circumstances including the costs of complying. The risk of litigation, like acts of God, unfortunately cannot be avoided. The next best step to avoidance can be taking a reasonable response to a foreseeable risk and acting accordingly. Compliance with uniform codes and standards provide one strategy but not a safe harbor.

Perhaps the determination of conformity, and effective advocacy for damages, is more of an art than a science.

For additional context on this subject, go to the archives section at *www.appa.org/facilitiesmanager* to read Quality Measurement in a Facilities Management Environment (*Facilities Manager* May/June 2004) by Richard Robben, director of plant operations at the University of Michigan–Ann Arbor.

Michael A. Anthony is senior electrical engineer at the University of Michigan and APPA's representative on the National Electric Code. E-mail him at *maanthon@bf.umich.edu*. Richard Aaron is a partner at Honigman, Miller, LLP and specializes in business and energy matters. E-mail him at *raaron@honigman.com*. This is his first article for *Facilities Manager*.

BUILDINGS...*The Gifts that Keep on Taking*

A Framework for Integrated Decision Making

RODNEY ROSE
with David A. Cain, Ph.D., James J. Dempsey, P.E., and Rich Schneider

THE HIGHLY ANTICIPATED *Buildings...The Gifts That Keep on Taking* is now on sale. Primary author Rodney Rose presents the oft-neglected considerations for the hidden costs and long-term management and maintenance of a facility built with donated money. *Buildings...* is a timely, must-have tool for all educational facilities managers and other top university administrators.

Buildings... highlights detailed findings of a four-year project sponsored by APPA's Center for Facilities Research (CFaR) on best practices for facilities planning and management. Primary author Rod Rose identifies:

- Seven key facilities issues
- Strategic questions to consider
- Asset investment perspectives

This essential resource will equip facilities administrators with a framework for evaluating facilities investment alternatives to support their institution's mission and help achieve long-term goals.

"We love to receive donations for building or renovating appealing campus facilities, but we struggle down the road because we don't realize the long-term impact of the gift. With more intricate facilities demands, higher costs, and stricter standards, facilities managers and key administrators need a concrete framework to help us be good stewards of our facilities."

—Brooks H. Baker, III, Associate VP for Facilities, University of Alabama-Birmingham, former APPA President

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NON-MEMBER PRICE: $95.00
ISBN: 1-890956-38-4

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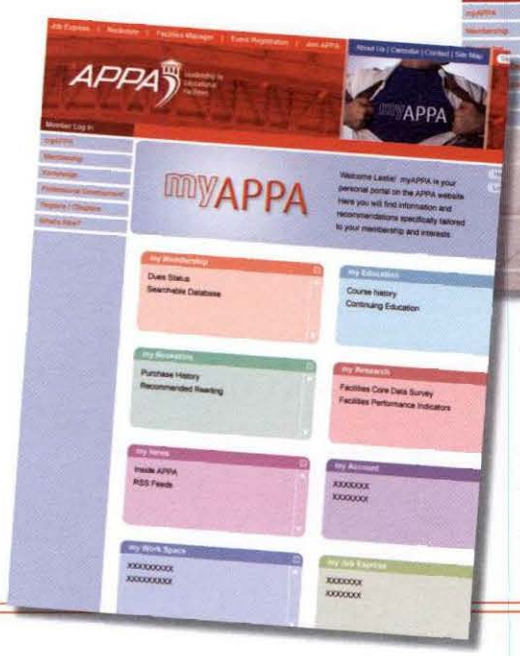
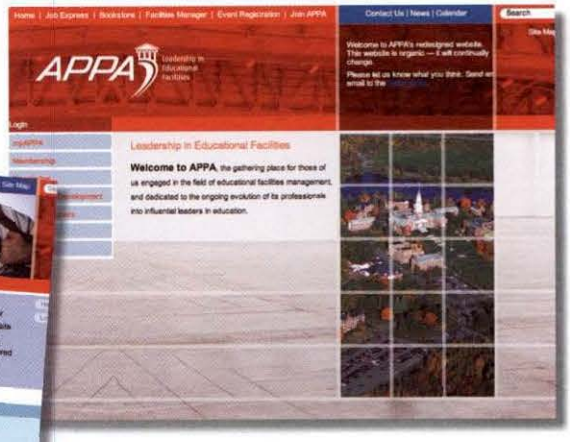
Extreme Website Makeover

By Norm Young and Leslie Young





If you go to www.appa.org, you will see a complete website overhaul. After a great deal of membership demands, the deed is done. APPA staff, Information and Research Committee members, and consultants spent six months evaluating needs, building the framework, and implementing a robust tool for our members to use as the premier resource for enhancing, maintaining, and protecting the quality of their educational facilities, as well as promoting leadership in the profession.

This accomplishment also supports Strategy #2 of APPA's 7 Key Strategies: to "develop and implement an enhanced website to become the 'go to' resource for facilities questions." Now, members and other users can easily navigate and access desired information on our website—all within a distinct look and feel that incorporates APPA's new brand identity and aligns with the mission, vision, and values of our association. This is a big moment for APPA.

Features of the New Face of APPA

Ease of Navigation: We have arranged the website so that the content is more intuitively-oriented. There is now a direct link to region/chapters on the homepage to emphasize this symbiotic and collaborative relationship, as these organizations are the grassroots of APPA.

Enhanced Search Engine: The new search engine is located in the top right corner of each page on the site. This gives users the ability to locate desired data and information based on content areas, topics or programs, and returns more results than ever before.

Introducing myAPPA: myAPPA is your personal portal for viewing your history and activity with APPA, including lists of professional development courses you have taken; registration for events and/or educational programs; the ability to change your personal information; access to and tracking of your participation in the annual Facilities Performance Indicators Survey; access to APPA's online Bookstore including the tracking of your publications history, and much more.

Primary Representatives will also be able to renew their membership and pay their dues through myAPPA. (The target launch date for applying and paying for new APPA memberships will be fall 2008.)

Bookstore Redesign: Stock your shelves with APPA's books by visiting the newly designed online APPA Bookstore. Enhanced features of the new bookstore include:

- A shopping cart that allows you to save your items so that you may view and change upon your next log in.
- Easy-to-use search function by author, title, and topic.
- Ability to check the status of your order.
- Ability to track your shipment.

Message Board: This online networking feature allows you to stay connected through various forums, created based on discussion topics. There will be member- only and general public areas for messaging and information sharing. In these areas, you can chat, post messages, or send an e-mail to a colleague.

Contribute Software: APPA staff use this comprehensive content management software to make changes on individual program webpages themselves. This removes a layer from the updating process and ensures current and relevant information is quickly disseminated to members.

SO WHAT'S IN A WEBSITE ANYWAY?

There are a number of comprehensive and user-friendly features implemented on the new site. These features and enhancements will help you as members build credibility, stay informed, and stay connected.

The website is the virtual front door for all organizations. APPA.org creates an impression to visitors just as we do when we welcome people into our own homes. As guests arrive at our door, they get an immediate sense of APPA, what we do, and what we have to offer. It is critical for us to project an interesting, dynamic, and professional first impression. We want to clearly state our identity on our homepage

through words and images which engage young and seasoned professionals alike.

Of course, first impressions only go so far. There must be substance and relevance backing up those impressions. The ability to provide useful information on a variety of topics with intuitive navigation and continual updates builds credibility and enhances the importance of APPA as a "go to" resource for facilities professionals.

WHAT'S MY MEMBER BENEFIT?

There are many tangible benefits for us as members. The new site is generally more accessible and easier to use. The homepage is much cleaner and more dynamic, providing a quick view of the latest news and events. The navigation is intuitive, and most information can be accessed with only a few clicks. The enhanced search engine is a substantial improvement from previous versions and allows for instant access to virtually any information on the APPA website. Another substantial improvement is a new content management system which enables APPA staff from various departments to update sections of the website as needed. This software will greatly enhance the ability of staff to keep the site current without relying on technical support.

All of these features will result in a direct benefit to APPA members, as more timely and detailed information and resources will be at our fingertips.

POSITIONING FOR A BRIGHT FUTURE

Creating the new APPA website is just the beginning of the transformation. The subtext of Strategy #2 notes:

"As the world shifts technology from information to communication, it will be critical for APPA to compete with other providers by improving the content and delivery of its website."

Now that we have this exciting tool, we must continue to focus on vision and transformation in the evolution of APPA's site. Thus, the Information and Research Committee has established a standing website subcommittee to work with APPA staff to ensure the site remains comprehensive, collaborative, and credible. A website is a living thing, so as APPA grows, the content will expand and change to adapt to member needs well into the future.

Visit your new APPA home and let us know what you think at *webmaster@appa.org*.

Norm Young is the executive director of facilities at the University of Hartford in Connecticut and a member of APPA's Information and Research Committee. E-mail him at *young@hartford.edu*. Leslie Young is APPA's web and database systems manager. E-mail her at leslie@appa.org. This is their first article for *Facilities Manager*.

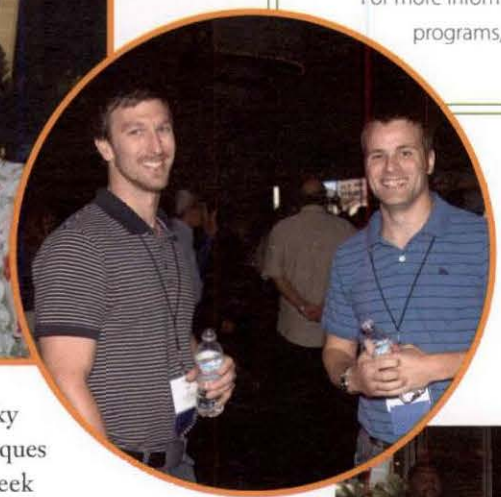
Educational WRAP-UP

APPA INSTITUTE & TOOLKIT WRAP-UP

Phoenix, AZ – September 2007

APPA's ended its 2007 education program year strong with offerings of the popular programs, the Institute for Facilities Management and the Supervisor's Toolkit, September 9-13 in Phoenix, Arizona.

Special thanks to the deans: Mary Vosevich, Jay Klingel, Cheryl Gomez, and Don Guckert, who continually provide a broad range of topical material for the educational facilities professional. Students had the opportunity to interact with experts who shared their knowledge and specific experiences.



The Supervisor's Toolkit trainers—Nancy Yeroshefsky and Michelle Estep-Frederick—taught the latest techniques to frontline supervisors. This group spent an intense week learning how to be effective supervisors and hone their skills.

There were 51 Institute graduates and more than 400 individuals who completed various core areas of the Institute program. APPA looks forward to promoting leadership for more educational facilities professionals in 2008.

2008 APPA Programs

April 19-23
Scottsdale, AZ
Leadership Academy,
Supervisor's Toolkit

July 7-11
San Antonio, TX
Supervisor's Toolkit

September 7-11
Austin, TX
Institute for Facilities Management,
Supervisor's Toolkit

For more information on APPA's educational programs, visit www.appa.org/education.

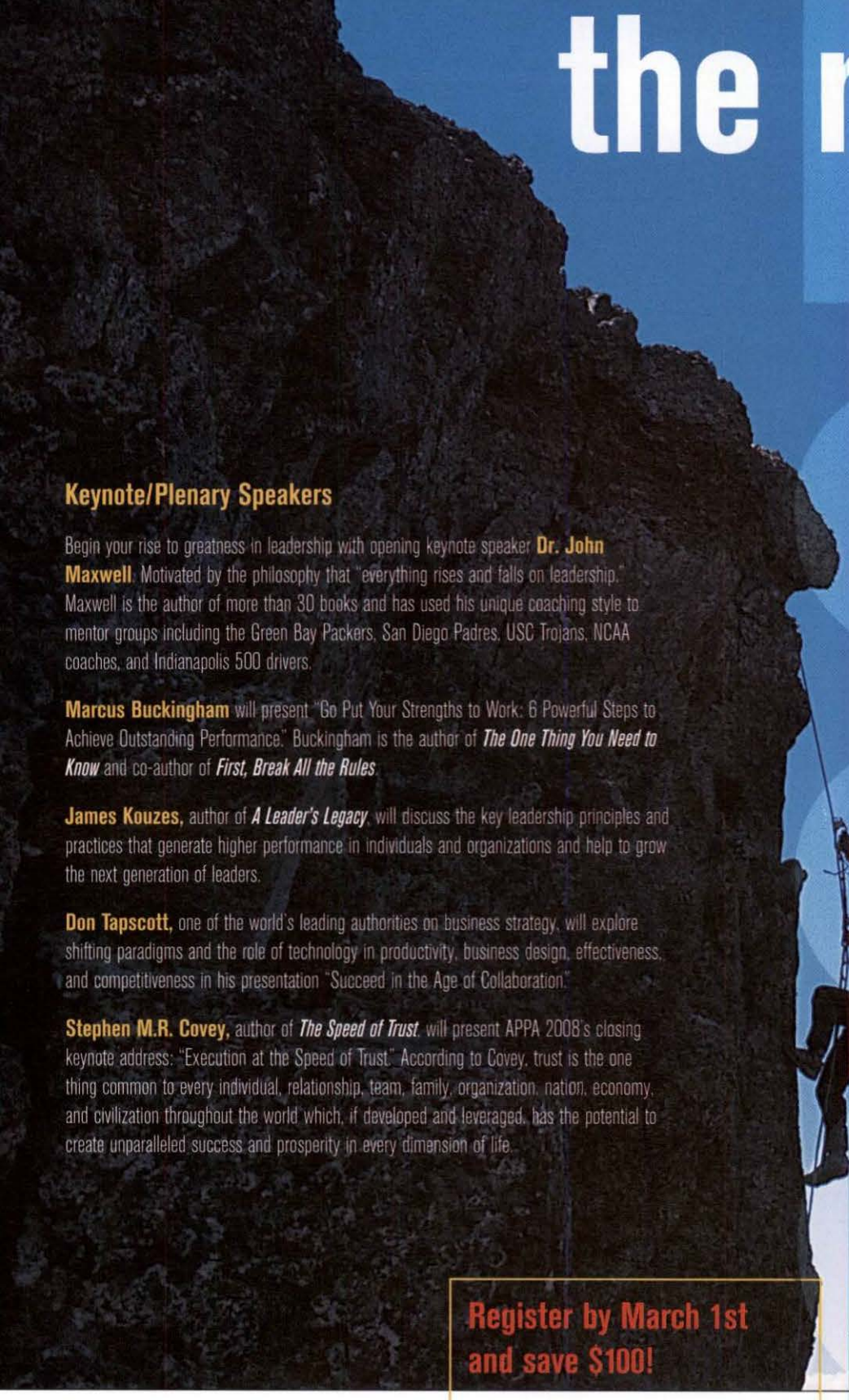
September 2007 Toolkit Participants

Randall Arnold, Principia College
Melba Bick, Principia College
Joseph Borden, University of North Carolina/ Greensboro
Nik Butera, Babson College
Richard Carruth, Linfield College
Ken Collins, San Diego State University
Mark Cusack, Montana State University
Donald Day, Brigham Young University/Idaho
Teretha Day, UCLA
Marion Dietze, Fanshawe College of Applied A & T
Tiger Funk, Southern Utah University
Carlton Ho, University of Hawaii
Gary Hodge, Western Washington University
Scott Holmes, Dartmouth College
William Jones, University of California/Los Angeles
Martin Klein, University of Alaska/Fairbanks
David Laliberte, University of Colorado/Boulder
Otis McCray, University of North Carolina/Greensboro
Kevin Miller, Vassar College
Robert Miller, University of Alaska/Fairbanks
Jose Molina, UCLA Facilities Management
Edward Morasch, St. Mary's College of Maryland
Stephen Morrow, Western Washington University
Allen Nelson, Western Washington University
Dennis Nieves, Vassar College
Ruben Oliver, Langston University
Jagaite Packard, University of California/Los Angeles
Steve Pflipsen, University of Colorado/Boulder
Mark Rhodes, Principia College
Ralph Savage, Southern Utah University
Jason Schlosser, University of Colorado/Boulder
Terry Sullivan, Babson College
Robert Thebodo, Dartmouth College
Gary Vargas, Santa Clara University
Glenn Wallace, Trinity Western University
Willie Wright, Saint Louis Community College

September 2007 Institute Graduates

Darrell Agopsowicz, University of Regina
Sam S. Arlia, Case Western Reserve University
Gary Atkins, Cornell University
Walter Banziger, Montana State University
David Barkenhagen, University of North Texas
Eugene Bellomy, University of Victoria
Greg Benton, University of North Carolina/ Greensboro
Richard Berwanger, University of Central Florida
Don Blackston, Spelman College/Clement & Wynn
Kelly Bledsoe, Wesleyan College
Thomas H. Blume, University of Portland
Paul H. Bringhurst, Brigham Young University
Allen Boyette, North Carolina State University
William Bryant, Cornell University
Scott Byars, California State University/Northridge
Laura E. Coar, Rollins College
Pierre deGagne, University of Ottawa
Carol P. Dietz, Case Western Reserve University
Allison Dixon, Rutgers University
Michael Duncan, Aiken Technical College
Sandra S. Ellis, Texas Tech University
Ben Elisondo, California State University/Northridge
Stephen H. Fore, Virginia Commonwealth University
German Gonzalez, California State University/ Northridge
Christina M. Goodermote, University of Rochester
Robyn Green, University of Texas/Austin
Christopher J. Gunther, University of Maryland/ Baltimore County
David Hatch, North Carolina State University
Ad Van Hess, Drexel University
Julie Im, Middle Tennessee State University
Chaudry Jameel, University of Montana
Mike W. Jordan, Texas Tech University
Tom Kane, Bentley College
Margaret S. Kelland, Virginia Commonwealth University
Paula S. King, Drexel University
Shawn A. Albaugh Kleppe, University of Iowa
Romeo Lopez, Babson College
Diane Martinez, San Mateo County Community College District
Joseph C. Martinez, The College of William and Mary
John Marujo, Wentworth Institute of Technology
Gwen E. McCay, Indiana University
Todd T. McComb, California State University/ Sacramento
Victor Menedez, University of Colorado/Boulder
Delma Munoz, San Fransico State University
Mary Pardo, Texas State University/San Marcos
Vita P. Paschal, Campbell University
Alfred J. Robles, University of Arizona
Sherry J. Ruesch, Dixe State College of Utah
Hal Shelton, University of North Carolina/ Greensboro
John Shenette, Bentley College
Robert A. Simmons, University of Missouri-Kansas City
Brad Songhurst, Yakima County
Tom Sullivan, University of Michigan/Ann Arbor
James Sutton, California State University/ Northridge
Jeremy Todd, University of Minnesota/Twin Cities
Mark A. Townsend, Purdue University
Christopher L. Vetick, Catholic University of America
C.J. Wiles, University of Texas/Austin

the rise to



Keynote/Plenary Speakers

Begin your rise to greatness in leadership with opening keynote speaker **Dr. John Maxwell**. Motivated by the philosophy that "everything rises and falls on leadership," Maxwell is the author of more than 30 books and has used his unique coaching style to mentor groups including the Green Bay Packers, San Diego Padres, USC Trojans, NCAA coaches, and Indianapolis 500 drivers.

Marcus Buckingham will present "Go Put Your Strengths to Work: 6 Powerful Steps to Achieve Outstanding Performance." Buckingham is the author of ***The One Thing You Need to Know*** and co-author of ***First, Break All the Rules***.

James Kouzes, author of ***A Leader's Legacy***, will discuss the key leadership principles and practices that generate higher performance in individuals and organizations and help to grow the next generation of leaders.

Don Tapscott, one of the world's leading authorities on business strategy, will explore shifting paradigms and the role of technology in productivity, business design, effectiveness, and competitiveness in his presentation "Succeed in the Age of Collaboration."

Stephen M.R. Covey, author of ***The Speed of Trust***, will present APPA 2008's closing keynote address: "Execution at the Speed of Trust." According to Covey, trust is the one thing common to every individual, relationship, team, family, organization, nation, economy, and civilization throughout the world which, if developed and leveraged, has the potential to create unparalleled success and prosperity in every dimension of life.

Register by March 1st and save $100!

For more information and to register visit:
www.appa.org/training/appa2008

Download a copy of the preliminary program at:
www.appa.org/training/appa2008/program.cfm

Hotel

Marriott Rivercenter Hotel
101 Bowie Street
San Antonio, Texas 78205
210-223-1000

Conference Room Rate: $168 per night + 16.75% tax (Single/Double Occupancy)

Please call the hotel directly to reserve your room(s). Remember to advise your reservation agent that you are attending APPA 2008 to obtain the group rate.

LEADERSHIP IN EDUCATIONAL FACILITIES

GREATNESS

APPA 2008 is designed by facilities professionals for facilities professionals. The program will focus on three perspectives:

Leadership & Collaboration

Explore the desire and necessity to build strong leadership, and experience the benefits of collaborative interaction.

Sessions include:

Go Put Your Strengths to Work: 6 Powerful Steps to Achieve Outstanding Performance
- Speaker: Marcus Buckingham

Total Cost of Ownership – Cradle to Grave
- Moderator: Terry Ruprecht

Balancing & Articulating Expectations – Improving Communication
- Moderator: Chris Ahoy

Planning & Management of the Facilities Portfolio
- Moderator: Jack Hug

Confronting Future Challenges
- Moderator: Jack Colby

What a Leader Needs to Know
- Speaker: Kevin O'Connor

Building a Team
- Speaker: Daniel Grissom

Intuitive Leadership
- Speaker: Dr. Judith Orloff

Vital Friends: The Folks You Can't Live Without
- Speaker: Teri Bump

Solution Revolution & Technology

Learn to embrace changes in technology, understand the impact new developments have on educational environments, and hear about student needs and expectations for technology at learning institutions.

Sessions include:

Succeed in the Age of Collaboration
- Speaker: Don Tapscott

Intelligent Buildings
- Moderator: Paul Ehrlich

Student Demographics and Expectations
- Moderator: Diana Oblinger

Pirate's Dilemma
- Speaker: Matt Mason

Virtual Handshake
- Speaker: Scott Allen

Technology Project Delivery
- Speaker: Tim Cape

Opportunities & Strategies: IT and a LEED Case Study
- Speaker: Scott Walker

CFaR Student Research Project
- BYU Students

Connection & Communication

Understand expectations, bridge gaps in communication, and learn about the future of interaction.

Sessions include:

The Leader's Legacy
- Speaker: James Kouzes

Price of Paralysis
- Moderator: Steve Thweatt

Improving Communication & Articulating Expectations
- Moderator: Andy Brantley

Leadership Is Everyone's Responsibility
- Moderator: Boone Hellman

Coming Revolution and Personal Broadband
- Moderator: Scott Slater

Dealing with the Media
- Speaker: Betty Alexander

Motivation Keeps a Team
- Speaker: Kevin O'Connor

STEP UP! Best Practices for Successful Teams
- Speaker: Daniel Grissom

Email Productivity
- Speaker: Marsha Egan

The Geek Gap
- Speakers: Bill Pfleging and Minda Zetlin

Conflict Management: Change Agents - Successful Resolutions
- Speaker: Gwen McCay

Presentation Skills
- Speaker: Todd Dunn

Customer Service
- Speaker: Matt Adams

Spouse/Guest Program

(subject to change and additional charges)

La Villita–a unique arts and crafts community with shops, working artists, and restaurants.

Mission San Antonio de Valero (The Alamo) –established in 1718 as the city's first mission, contains relics and mementos from the Republic of Texas and offers narration on the fall of the Alamo.

Missions and Margaritas–sights of the Mission Trail followed by lunch with margaritas and a cooking demonstration.

Missions of San Antonio–for history lovers wanting to go back to the mission period to explore the sites from the time of the Spanish drive to save souls and expand their world dominance in south Texas.

This is San Antonio–includes a trip down the San Antonio River on a guided barge; a visit to Hemis Fair Park; a driving tour through many of the city's historic and arts districts; a stop at the Alamo and the historic and haunted Menger Hotel.

APPA 2008 Hall of Resources & Sponsorships

The Hall of Resources provides business partners the opportunity to connect with key decision-makers from institutions around the world. Interested in participating as an exhibitor at APPA 2008? Visit us at www.appa.org/training/appa2008/exhibitors.cfm to download your application for space today. For assistance with booth reservations, please contact Maxine Mauldin, exhibits coordinator, at ***mmauldin@appa.org***.

Sponsorships of APPA 2008 meals, sessions, and special events are also available. Please contact Suzanne Healy, director of educational programming at ***suzanne@appa.org*** for sponsorship opportunities.

Ray and Maria Stata Center at MIT

the LAB of the FUTURE:

Building Facilities that Attract Premier Faculty and Students

By Tim R. Haley

Does the physical environment improve an institution's recruitment efforts? More specifically, could a facility such as a laboratory of the future attract the best and the brightest students and faculty? This issue has been the subject of at least two studies—first, "How Do Students Choose a College?" in 1986 by the Carnegie Foundation for the Advancement of Teaching and more recently in 2006, "The Impact of Facilities on the Recruitment and Retention of Students" by David Cain, Ph.D., and Gary Reynolds, P.E., for APPA's Center for Facilities Research (CFaR).

Both studies reveal significant implications on the importance facilities have in attracting top students to our educational institutions. The CFaR report included responses from over 16,000 students, from 46 institutions, across the United States and Canada. Forty-five percent of the respondents reported a grade point within the 3.5 to 4.0 range. Various questions on the decision process were directed to the relative importance of the physical environment of an institution. At the top of the "essential" or "most important" characteristics list are academic-oriented facilities, with the top of the list being "facilities for their major." Although the study does state that "there is not a correlation of grade point with the satisfaction of campus facilities," it does clearly report that facilities do have an impact on the choice of an institution.

STUDENT RECREATION AREAS, PHYSICAL EDUCATION FACILITIES, SOCIAL AREAS, AND MOST IMPORTANTLY, STUDENT HOUSING, ARE TYPICALLY EMPHASIZED IN UNDERGRADUATE RECRUITING PAMPHLETS AND CATALOGS.

In looking at all of the university and college recruitment data that is available on the Internet, or that a prospective family receives in the mail, it seems that undergraduate student recruitment is primarily focused on favorable student life, extracurricular activities, overall rankings of the institution in the national polls, and maybe the attractiveness of the grounds, or at least the ability to circulate on campus without getting lost the first couple of years. Student recreation areas, physical education facilities, social areas, and most importantly, student housing, are typically emphasized in undergraduate recruiting pamphlets and catalogs. Most information seems to focus on all but the academic facilities, especially for the first-year or transfer student.

However, graduate student recruitment seems to focus on the program, including the "facility," the program's qualifications/ rank, and the backgrounds of faculty. If the graduate student is in the sciences, engineering, or a related field, having the "lab of the future" would definitely be an attraction and perhaps a strong recruitment amenity. However, most importantly, the graduate student is looking for a strong institutional reputation, and faculty members that have noteworthy credentials. Attracting the best and the brightest faculty may be strengthened by the level of investment and commitment the institution makes to its research and teaching laboratories.

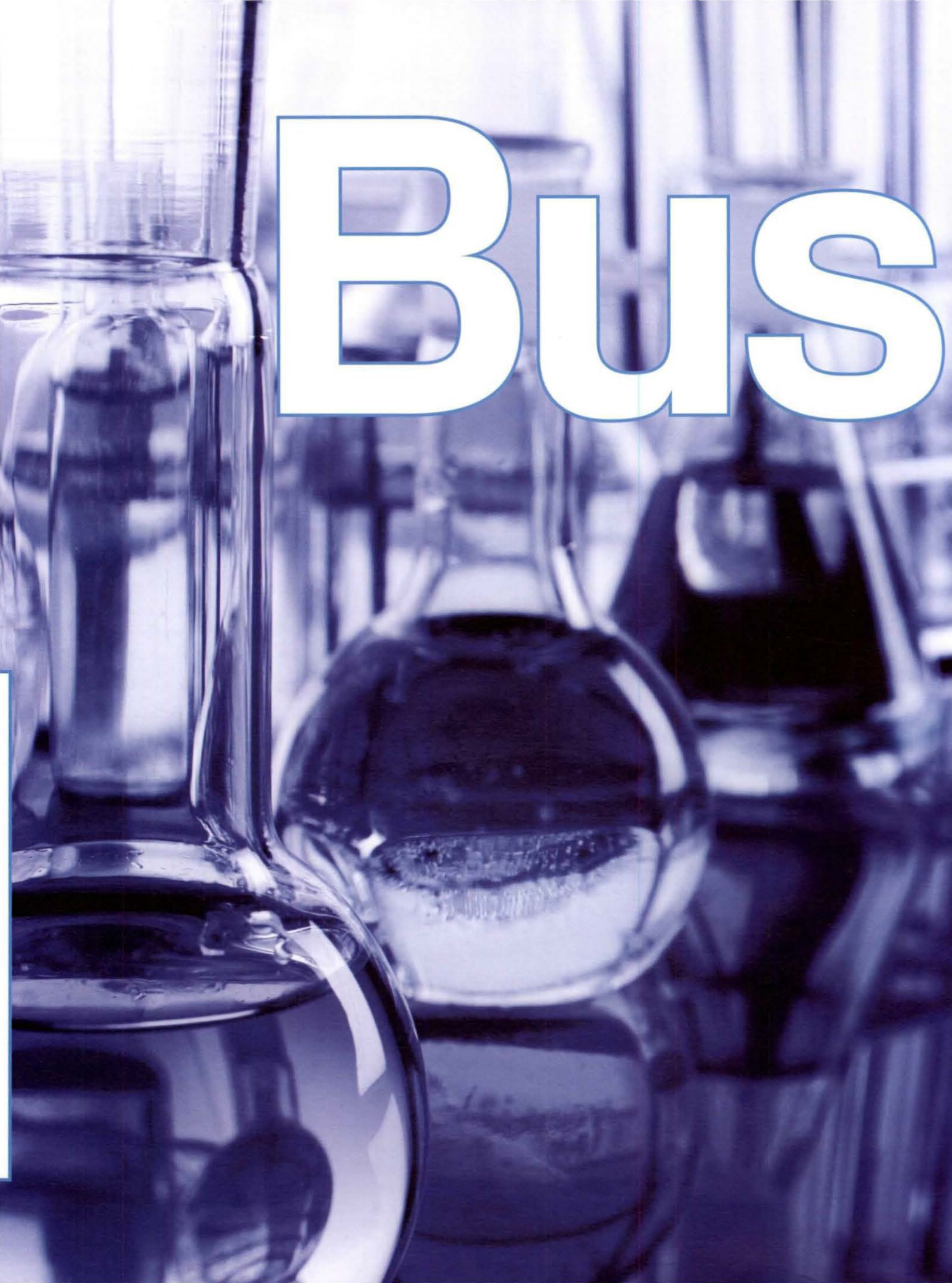
Marget Sughrue Carlson, Ph.D., an alumnus of the University of Minnesota, wrote in November 2006, "What would cause a prominent stem cell researcher with a world-class reputation and an office view of the Golden Gate Bridge to move from the University of California, San Francisco to the University of Minnesota?" Two reasons: "First, the University of Minnesota had established the world's first Stem Cell Institute," and second, UM had developed, "first-class research space in the new McGuire Translational Research Facility." As Dr. Carlson further states, "It takes state-of-the-art laboratories to attract top-ranked scientists." The University of Minnesota has made a commitment to advance their positioning in science and technology and stated this in their *Strategic Positioning Report of September 2007*.

Early in 2001, a special committee of researchers at Purdue University distributed a survey to the faculty at its West Lafayette campus. The survey covered a range of topics, one being the recruitment and retention of faculty members. The survey included a few questions on the reason why faculty initially chose Purdue. The following four factors surfaced from the survey:

1. Prestige of the unit, school, or university (88% agreed that this was a positive influence)
2. University benefits (81%)
3. Balance between teaching and research responsibilities (78%)
4. Access to research facilities (72%)

Although facilities ended up as number four on the list of those choosing Purdue, a significant percentage of the respondents included it. In 2005, Purdue University built the impressive Birck Nanotechnology Center and currently have a new Structured Biology Center on the drawing board. The physical environment of a university or college campus has an effect on the recruitment of both the best and the brightest students and faculty members. Although there is no conclusive evidence at this time indicating that a specific space, such as a "lab of the future," could attract the best and the brightest, all indicators point in that direction.

Tim Haley is the senior project manager for education project development for Jacobs Carter Burgess, Seattle, WA. E-mail him at *tim.haley@c-b.com*. This is his first article for *Facilities Manager*.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THE LIMITS OF SCIENCE LABORATORY ECONOMICS

BY ROBERT C. BUSH

When you entered your first science lab in high school, it was probably not that much different than the lab where your parents had their first taste of "real" science. "Hands-on" was the rule, and experimentation was encouraged in a 30' x 40' room where theory and practice collided to inspire.

For the most part, these were just wet and dry labs. The wet labs were equipped with Bunsen burners, test tubes, and the all-important fume hood. The dry labs had models, weights, rock samples, and various devices that measured in basic dimensions. Both labs had a handful of Zeiss light microscopes tucked away in cases and minimal storage closets for samples and reagents. These lab resources haven't changed much (with a few exceptions) primarily because of the cost to upgrade laboratories.

REALITIES OF LABORATORY ECONOMICS

On the college level, however, labs are very different. Increased workforce specialization demands comparable specializations in college education. The proliferation of labs includes geology labs, materials labs, hydrodynamics labs, fluid mechanics labs, general chemistry labs, organic chemistry labs, inorganic chemistry labs, microbiology labs, meteorology labs, aerospace labs, and astrophysics labs.

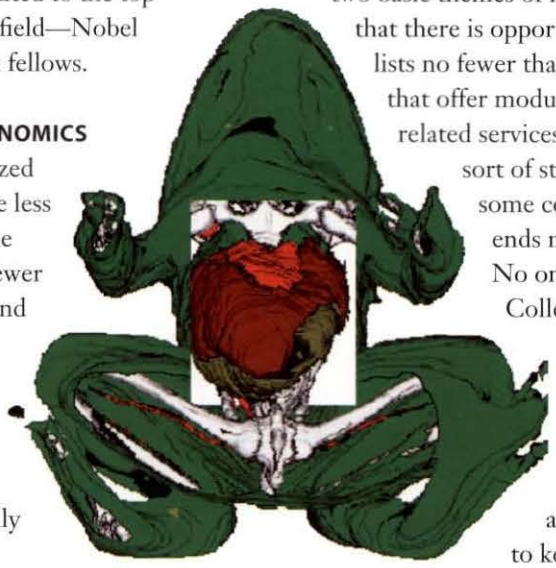
Labs at the college level are still dominated by teaching and learning for 20 to 30 students at a time. Colleges are challenged to keep up with the times, however. Older lab spaces simply cannot be converted to updated, specialized labs mostly because of the physical limitations of the lab room and/or building. Replacement facilities are often the answer, but developing comprehensive funding for these is a huge challenge. Increasingly, replacement science buildings are found at the top of the list for state support or bond funding, where education leaders and policymakers jockey for position among their peers.

Each university research laboratory is unique to its own discipline and set up to conduct research in a paradigm unique to a particular professor. Daily access to a typical university research lab may be limited to a major professor and a post-doctoral student or two who guide experimental design and oversee operation of the lab. A few graduate students and a handful of higher level undergrads are fortunate enough to have a role in the hands-on research that goes on in these labs. By this juncture, these students are a committed core of future scientists. I was lucky enough to be a part of the tribe in a visual psychophysics lab, where complex optical instrumentation combined with behavioral apparatus (such as the ubiquitous "tmaze"), a microscopy and tissue station, a surgical suite, and a PDP-8 minicomputer with several workstations to control instrumentation and crunch numbers existed.

It is not uncommon for a large state or well-funded private university to have scores of such expensive labs that a scant few students and professors use for intensive research efforts. Professors even compete intensively for a wide variety of contracts and grants to support their favorite lines of inquiry, pay for the use of space, and upgrade or buy new equipment. The university administrators must figure out how to convert these many disparate sources of income into justification for suitable facilities to house the most up-to-date labs expected by top researchers. Avenues such as "lease-lease back" design and construction are increasingly popular as means of focusing the many sources of funding.

At the very pinnacle are the U.S. national labs, such as the Argonne National Laboratory, National High Magnetic Field Laboratory, Fermi National Accelerator Laboratory, or the Lawrence Livermore National Laboratory. The extraordinary expense of setting up and operating these labs means that they are each unique, non-replicative, and exclusive. Consequently, these labs are constructed and run as national strategic resources, often by a consortium of universities with line-item support of the Department of Energy or another federal agency. Even though billions of public dollars are spent annually to maintain and operate these labs, practical access is limited to the top tier of accredited researchers in a given field—Nobel laureates, their peers, and their research fellows.

Colleges are challenged to keep up with the times, however. Older lab spaces simply cannot be converted to updated, specialized labs mostly because of the physical limitations of the lab room and/or building.



OVERCOMING THE LIMITS OF LAB ECONOMICS

Trends are evident; the more specialized the lab, the more expensive it is, and the less accessible it becomes. Or conversely, the more accessible a lab needs to be, the fewer resources can be dedicated per capita, and the less specialized it becomes. From a numerical standpoint, "real" science is in many respects out of reach of the majority of science students. Thus the fundamental question is: "How can real scientific experience be economically offered to today's proto-scientists?"

One approach to answering this question comes from the *virtual lab*. It has been nearly two decades since the first virtual alternatives were offered to students who had ethical or moral dilemmas about "pithing" and dissecting a frog in first-year biology. Over a decade has passed since the first viable "Virtual Frog Dissection Kit" was offered free of charge by authors at the Lawrence Berkeley National Laboratory. While there is tremendous merit to increasingly realistic virtual laboratory "gaming," the virtual world will only take an experimenter so far, since consequences are controlled and limited by programs that do not allow the student to experience real lessons learned.

Another alternative gaining traction is *laboratory modularization*. This solution works best on the "left side" of the laboratory economics dynamic, where higher numbers of students still means overall higher aggregate costs of labs but lower per capita costs. Funding for science facilities at this level is often an artifact of the FTE approach (full-time equivalency students)—where the formulae for distribution of limited construction, maintenance, and operation dollars are based on the number of students served. At this level, working from two basic themes of laboratory— wet and dry labs—means that there is opportunity for modularity. Thomas Register lists no fewer than 300 companies in North America that offer modular laboratory components, units, or related services. There is clearly a trend toward this sort of standardization, as school districts and some community colleges struggle to make ends meet on limited taxpayer allowances. No one is exempt from economic realities. Colleges nationwide still struggle to find the right balance of cost and capabilities to create compelling environments for students to gain a flavor of differentiated disciplines. Universities compete intensively for government and private grants that will allow them to keep up with the pace of change for high-end equipment and laboratory resources demanded in state-of-the-art research labs. By definition, there are a limited number of institutions that have the political and financial muscle to become national and international centers of excellence, where highly specialized labs are second to none. This all means that a Darwinian bottleneck applies, and there are no easy solutions.

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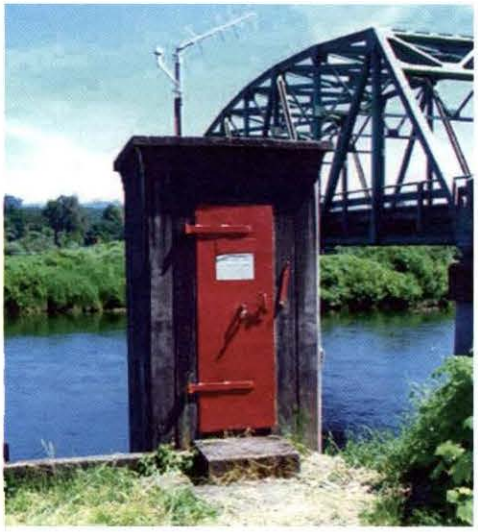
DAWNING AGE OF THE ILAB

From the perspective of expectations, lawmakers and taxpayers are increasingly impatient to significantly expand the opportunities and benefits of specialized labs for students and researchers—naturally, without a parallel, prohibitive increase in expenditure. A solution to this daunting equation may be found in the conjunction of trends in *telemetry*, *computing* and the *Internet*, *and robotics*—the iLab—a hybrid environment that promises to allow users from anywhere on the planet, or in space for that matter, to access, control, manipulate, and analyze results of scientific experiments that are physically removed from their location.

Telemetry: Just a hundred years ago, many large areas of the United States were still prone to annual flooding. As it is today, prediction was an essential tool to prepare for the worst case. For starters, a pole in the stream was adequate to measure both height and rate of flow. The limited predictability offered by this method was not enough, however, and the USGS began locating measurement and reporting sites further upstream to extend their predictive horizon. Time and staffing required to collect, communicate, and manage data from reporting stations represented a challenge that was overcome after World War II, when the addition of simple radio telemetry "patched" onto local instrumentation allowed remote data collection. Today, there are millions of independent monitoring stations that, without human intervention, send a continuous stream of real-time data to databases that are in turn accessed by computer programs designed to detect anomalies and generate warnings with adequate warning horizons.

Computing and the Internet: When computing first showed up on

college and university campuses in the late 1960s and early 1970s, it was in the form of mainframe machines—heavy iron. Access to computers was limited to high-end users during these early years. Processing was done in heel-to-toe batches, and most involved running manually encoded data (remember the ubiquitous punch-card stacks?) that would be fed in through an ungainly reader, and then processed by simple programs that were written in assembly language and stored on a tape. The work of writing and "tweaking" programs was done on a workstation hard-wired to the mainframe. Graduate students and some higher level undergrads lined up at specified times to collect their printouts. If there was even a small glitch—like a hanging chad or one line of imperfect code—that would mean starting over by manually checking code and data sets, and waiting once again in queue for your print job.



The USGS began locating telemetry sites like these upstream to improve their forecasting of flooding in select areas.

With more demand for university computing resources, data also began to be encoded and stored on large portable discs or tapes. Corrections or changes to data became invisible to the naked eye. Noisy punch-card readers disappeared. Next, parts of programs and in some cases complete programs, began to be shared and were even made available in electronic "libraries." This began to create a level of demand that could not be met with the limited number of hard-wired workstations coupled to any one mainframe computer. Similarly, inefficiencies in heel-to-toe batch processing began to be recognized, since there would be inherent peaks and valleys in processor usage, while each new program was loaded and each data set read in.

It began to dawn on owners of these expensive resources that processor time was the most precious commodity in the equation. Economics are never very far away. Colleges and universities found that additional "dumb terminals" could be added to the computers, allowing the user to initiate programs, call data sets, and watch the results, but programs still had to be written and edited from a workstation hooked directly into the computer. Professors (being professors) found a way to get terminals to work from their offices or labs.

Understanding that there would be little long-term tolerance for dumb terminals, IBM and other mainframe manufacturers begin putting "memory" and a bit of processing power into remote terminals, making them smart. Coupled with the technology that was maturing around the field of telemetry, it was not long before workstations were untethered from their mainframe hosts altogether.

The last piece of the computing/Internet equation was the move from batch processing to timesharing on processors. Instead of heel-to-toe processing of single batches, much shorter segments of code from a variety of programs could be run in priority order, resulting in much more efficient use of processor time. With this breakthrough, college and university computing centers found that they were flooded with requests for "processor cycles" by researchers from all parts of the globe. The bigger and faster the computing resource, the greater the demand.

While the major national labs had been in the game during the earliest, most expensive era of computing, they found themselves becoming centers of attention for another reason altogether. The formidable combined computing resources of the national labs, linked in these new ways, created a new national strategic resource. This first showed up on the horizon as ARPANET and its defense corollary DARPANET, and then ultimately the public Internet.

The conjunction of unmet demand for access to advanced labs, telemetry, robotics, and the Internet lead us to a vision of the future where laboratories become shared resources—much like the expensive mainframes of old.

Robotics: Isaac Asimov's dream of humanoid robots with positronic brains was a far cry from reality when he started writing his famous "I Robot" series in the 1950s. By today's standards, crude actuators and joints have been a part of the manufacturing landscape for some time. Sure, these have removed much of the risk of defects from production, assembly, and processing lines, but are no replacement for their biological analogues—that being us "carbon units." We humans have key attributes that enable us to function smoothly in the controlled settings of scientific laboratories: fine motor manipulation, tactile sensitivity, and visual guidance of our work.

These areas have received the most attention from researchers in robotics. Advanced robots can now recognize objects by shape and mass, extend arms and articulate joints for microscopic positioning, and use tactile sensitivity to pick up and move objects without crushing or dropping them. The fly in this ointment is the brain. There is still a lot to be done to gain facile, adaptive control of these robotic capabilities. Even the most sophisticated programs designed to enable autonomous operation of advanced robots are far down the food chain from the amazing, adaptive human mind.

An interesting adaptation to advanced robotic capabilities, though, is the human-robot interface. Think of the Mars Rover as a highly sophisticated robot, with some limited decision-making capability "on board." When the Rover met unknown conditions, however, it had to wait for hours while its human operators back in Pasadena, aided by telemetry, figured out what its next move should be and sent a program through the great void, telling it what to do. Closer to home, Space Shuttle astronauts routinely work on the International Space Station—an orbiting lab—moving a robotic boom "arm" by a remote manipulator that translates the human arm movement of the astronaut operator into the galactic proportions of the boom.

Back on earth, robotic technologies have advanced to the degree that most fine surgery is performed by highly skilled surgeons observing their work on a screen that shows a microscopic view of the subject area, and using super-fine instruments controlled by actuators that "step down" the skilled, yet gross movements of the surgeon's hands. More recent is the ability to perform surgery via the Internet. Now being demonstrated, this technology allows a specialty surgeon in Denmark to operate on a patient in Greenland using the same visual field and instrumentation used by surgeons in the same room as the patient—enabled by telemetry and robotics. Economics are the drivers of this equation. It's less

expensive to train a couple of specialists and equip operating theatres with telemetry, the Internet, and robotics than it is to populate the world with specialists.

OPENING GAME—THE ILAB IS ALIVE!

The conjunction of unmet demand for access to advanced labs, telemetry, robotics, and the Internet lead us to a vision of the future where laboratories become shared resources—much like the expensive mainframes of old. A proliferation of "observation stations" are already here. When Dr. Robert Ballard explored the depths of the ocean looking for the remains of the Titanic, he took 5th to 12th graders all over the world with him, live, via the Internet. While scientific workstations are now a ubiquitous part of the landscape, they are still largely doing the same thing they were doing over three decades ago—crunching data. For the most part, workstations that control instrumentation are still found in close proximity to the actual experiments. Add robotics to this equation and this will change, as is transpiring in the medical field.

Famous for its related Artificial Intelligence Labs, the Massachusetts Institute of Technology iCampus Project, with the support of Microsoft, has come a long way in the development of models and resources for prototypical iLabs. In their own words, "iLabs is dedicated to the proposition that online laboratories— real laboratories accessed through the Internet—can enrich science and engineering education by greatly expanding the range of experiments that students are exposed to in the course of their education. Unlike conventional laboratories, iLabs can be shared across a university or across the world. The iLabs vision is to share expensive equipment and educational materials associated with lab experiments as broadly as possible within higher education and beyond. iLab teams have created remote laboratories at MIT in microelectronics, chemical engineering, polymer crystallization, structural engineering, and signal processing as case studies for understanding the complex requirements of operating remote lab experiments and scaling their use to large groups of students at MIT and around the world." (*http://icampus.mit.edu/ilabs/*)

Move over *virtual* and *modular* labs—*iLabs* are coming through.

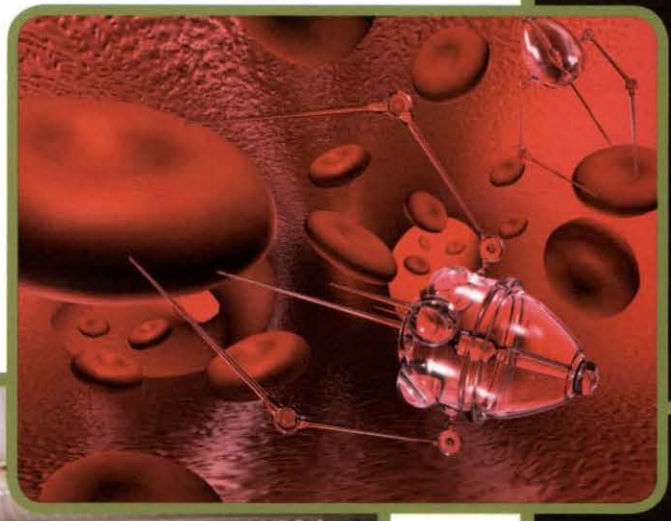
Bob Bush is a trained psychobiologist and a senior program manager for building programs with Jacobs Carter Burgess, Seattle, WA. E-mail him at *bob.bush@c-b.com*. This is his first article for *Facilities Manager*.

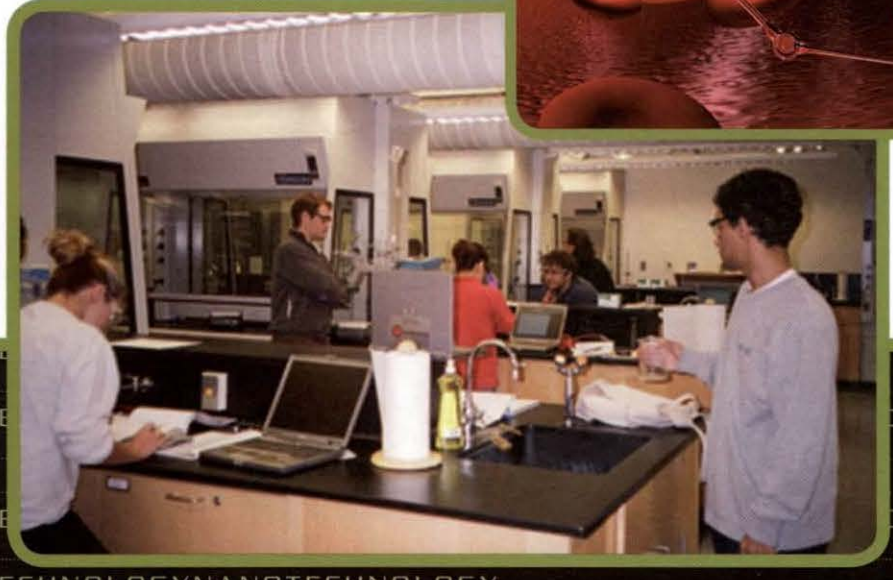
Focusing on the Invisible

by Tim R. Haley

You can't see it, but soon it will be everywhere. The size of one nano is a billionth of a meter. Nanotechnology is the science of building microscopic devices at the molecular and subatomic levels. These invisible tools are destined to be used in a vast number of industries and fields of engineering and science.

In the medical field, nanotechnology will be used to help with diagnosing and treating diseases. For instance, tiny gold-coated "nanoshells" could act like smart bombs, zeroing in on a tumor, entering cancer cells, and lying in wait until an infrared beam or radio wave signals the particles to release an intense, deadly dose of heat energy that destroys the cancer cells.





DOES THE DESIGN AND DEVELOPMENT OF AN EDUCATIONAL LABORATORY REALLY CHANGE WHEN THE FOCUS OF THE TEACHING IS INVISIBLE—THE NANO WORLD?

THE NSABP PATHOLOGY LABORATORY PHOTO IS COURTESY OF THE NSABP FOUNDATION, INC.

This is all well beyond my understanding, given the biology laboratory of my youth, where I used mice, worms, toads, and other unsuspecting creatures to learn the structure of a living organism. The overlying question is how do we teach this new technology, and where? Will we use the same educational laboratory facility that has existed for years at every school, college, or university?

Does the design and development of an educational laboratory really change when the focus of the teaching is invisible—the nano world? Even the word nanotechnology is as radical as one can believe, and to imagine a structure that facilitates the teaching of such science generates thoughts of a fundamentally different nature when it comes to design.

However, today the dominion of educational laboratory design is being explored and changed, not only to facilitate the extreme of the nano world, but to increase flexibility for collaborative initiatives of the "real world" and crossdisciplinary engagements, all driven by the new technologies.

In the article, "Trends in Lab Designs" published in *Whole Building Design Guide*, the authors stated, "Science functions best when it is supported by architecture that facilitates both structured and informal interaction, flexible use of space, and sharing of resources" (Watch & Tolat, 2007). They further noted that, "modern science is an intensely social activity. The most productive and successful scientists are intimately familiar with both the substance and style of each other's work. They display an astonishing capacity to adopt new research approaches and tools as quickly as they become available. Thus, science functions best when it is supported by architecture that facilitates both structured and informal interaction, flexible use of space, and sharing of resources."

A collaborative laboratory, according to the article, requires:

- Creating flexible engineering systems and casework that encourage research teams to alter their spaces to meet their needs
- Designing offices and write-up areas as places where people can work in teams
- Creating "research centers" that are team-based
- Creating all the space necessary for research team members to operate properly in proximity to one another
- Minimizing or eliminating spaces that are identified with a particular department
- Establishing clearly defined circulation patterns
- Providing interior glazing to allow people to see one another.

Are collaborative, interactive, and multidisciplinary spaces and buildings the only changes necessary to facilitate the teaching of new technologies? If this is the case, perhaps the renovation of all current laboratories requires essentially gutting what we have and creating a large shell that can be used to place movable fixtures, served overhead by utilities that are on large grids allowing for maximum flexibility, and not enclosing the space or creating any subspace.

However, it is not that simple. The invisible nano requires sophisticated viewing equipment, environmentally dustfree, vibration resistant, RF (Radio Frequency), and EMI (Electromagnetic Interference) controlled to degrees unheard of only a decade ago. An open, interactive space may be an area for discussion and interdisciplinary partnerships, but the actual nano laboratory is a tightly controlled space. Today's trend is new space, as opposed to renovating space. High-bay laboratories– with flexible and movable fixtures–are a must, such as in the Molecular Science and Engineering Building at Georgia Tech. Designed by CUH2A, it is a multi-disciplined building offering a variety of spaces including nanobiotech and nanochemistry.

Another example can be found at the University of Arizona, where the Meinel Optical Sciences Research Lab is a physical sciences facility designed by Architects Richärd+ Bauer. It contains 47,000 square feet, including a multitude of labs allowing research in total darkness or at extremely low levels of light. In every lab, overhead flex grids with connections for power, data, and lasers bring the necessary energy and technology to the microscopy systems. The building contains Class 10,000 clean-rooms with a small amount of Class 100 space, absolutely necessary for today's nanotechnology.

There are great examples of laboratories specifically built for nanotechnology, such as the National Standards and Technology Laboratory, designed by HDR Architects. This facility is specifically designed to:

"... spy an individual molecule in a throng of millions, to seize it, and to manipulate it...To arrange atoms into an ordered nanotechnology landscape of precisely spaced steps and terraces ... To determine the size of an electrical current by tabulating, one by one, the number of electrons flowing by...To gauge distances in increments tinier than the radius of an atom... To measure the strength of a chemical bond between an antibody and a virus particle."

The facility was completed in 2004 and, at the time, had few equals among the top research facilities. Is the nanotechnology laboratory the "lab of the future" or is it merely a "now thing?" There are other new discoveries that are currently developing; how will they affect our institutional facility design? Will the "lab-on-a-chip" or MEMS—the integration of biochemical analysis with microelectromechanical systems—change current design parameters? Or will the needs for robotics and automation in the laboratory change the need for more energy, more space, and different space? And what if virtualreality laboratories at several institutions, such as the University of New York, UCLA, the University of Connecticut, or the Swiss Federal Institute of Technology, were to be merged with the current state-of-the-art nanotechnology, and we were able to teach using less space with fewer restrictions on air quality and the cleanliness of the space?

The website for the Building Science Laboratory at the University of California, Berkeley (*http://arch.ced.berkeley.edu/resources/bldgsci/bsl/bsl.html*) states, "The quality of our built environment depends on the ability of designers to judge, in advance, how their designs will perform when constructed. For individual designers, this judgment comes from training and experience, but the knowledge underlying their judgment often originates from research."

The nano may be invisible, but the impact of this new technology and its future subdivisions are currently stimulating the design of the laboratory of the future.

Tim Haley is senior project manager for education project development for Jacobs Carter Burgess, Seattle, WA. E-mail him at *tim.haley@c-b.com*.

The U.S. Department of Homeland Security (DHS) is working to enhance the security of facilities storing chemicals that could either be stolen or used by terrorists to inflict mass casualties and destroy critical assets. DHS has identified security issues at these facilities, including the potential for chemical release; theft or diversion; and sabotage or contamination.

REDUCING THE RISK OF DANGEROUS CHEMICALS GETTING INTO THE WRONG HANDS

By Nancy Mathews

Under the Department of Homeland Security Appropriations Act of 2007, DHS has the authority and funding to regulate security at facilities storing chemicals considered to be high-risk (P. L. 109-295, Section 550). The Department of Homeland Security Chemical Facility Anti-Terrorism Standards (CFATS) Final Rule (6 CFR Part 27) was published in the *Federal Register* April 9, 2007. This Rule uses 19 Risk-Based Performance Standards (RBPS) designed to improve the security of facilities storing chemicals.

DHS expects most submissions to come from chemical manufacturing, storage and distribution facilities, petroleum refineries, and liquefied natural gas storage (peak shaving) facilities. These facilities can store one or more of the "chemicals of interest" at the threshold quantity identified in Appendix A of the Rule. Depending on the types and quantities of chemicals stored at research and laboratory facilities, universities and colleges may be responsible for responding to these new standards.

FAST-PACED COMPLIANCE SCHEDULE TO COMPLETE TOP SCREEN

On November 20, 2007, Appendix A: Chemicals of Interest (COI) was published in the *Federal Register*, identifying the specific chemicals and storage thresholds for these chemicals. The addition of Appendix A to the Rule triggered a fast-paced compliance schedule.

The initiating event is fairly straightforward. If a facility stores any of the chemicals listed in Appendix A at the storage thresholds given, the facility will have 60 days to register each facility and complete the on-line Chemical Survey Assessment Tool (CSAT), or Top Screen. Top Screen asks for detailed information on the quantity, storage method, and location of any COI that exceeds the given threshold. Universities and colleges may request a 60-day extension with no further explanation.

The process of matching a facility's inventory to the COI seems simple, but it ignores the challenges seen by organizations that aren't traditionally classified as large chemical handlers, such as universities, colleges, hospitals, and other medical research facilities. Due to the nature of the operations and funding of these institutions, chemical purchasing is often conducted by researchers, rather than through a central office. Thus, these institutions don't always know which chemicals they have on property.

WHO IS RESPONSIBLE FOR COMPLIANCE ACTIVITIES?

The Department of Homeland Security's Chemical Security Task Force is reaching out to the top 50 large chemical handlers to assist them in complying with CFATS. But DHS originally estimated 40,000 facilities will need to submit a Top Screen and approximately 6,000 of those will be classified as high-risk.

Another concern is that many facilities that should comply with CFATS may not even know that the rule exists. Thanks to professional organizations focusing on environmental health and safety (EHS) and large chemical handling companies, word is gradually reaching the intended targets. And, while security is the primary driver of the rule, EHS professionals seem to be tasked with leading compliance activities.

Whether compliance is assigned to EHS, security, emergency services, or facility operations, the ultimate responsibility lies with a designated officer at the institution, who must signoff on the CSAT/Top Screen submission, verifying its content. For colleges and universities, this may be the president, provost, dean, or another senior official.

GETTING INFO TO COMPLETE THE TOP SCREEN—THE BASICS

DHS has assigned chemicals to a category (or in some cases multiple categories) of security vulnerability, based on their potential use: Release, Theft, and/or Sabotage. While cumbersome to review in concert with Appendix A COI, these categories are important to identify because of their associated security vulnerabilities.

When determining if you have a COI at the threshold identified in Appendix A , remember that the calculation is cumulative, so if a chemical has a 500 lb. threshold and you have three buildings storing 200 lbs. each, the aggregate total is 600 lbs., and must be reported. Also, if the identified chemical makes up over 1 percent of the constituents of a mixture, you must include the sum total in your analysis.

Colleges and universities are exempt from including chemicals used in laboratories which fall under the category of Release; however some of those are also categorized as Theft or Sabotage chemicals, in which case they must be reported. Information about the Rule relevant to colleges and universities is available on the Campus Safety, Health and Environmental Management Association (CSHEMA) website at www.cshema. org. CSHEMA and the National Association of College and University Business Officers (NACUBO) have been closely following the rule and have posted guidance on everything from how to request a 60-day extension, to a list of the most common chemicals found on campuses on the CSHEMA site.

Respondents need to gather not only the types and quantities of chemicals, but also the types of storage containers used. Can one person pick the container up and carry it away? Is it in a tank on wheels that could be hitched to a vehicle? Is it in a permanent storage tank that could be sabotaged, used to ignite an explosion, or tampered with for deliberate release? Also, DHS needs not only the street address, but the GPS coordinates for each identified chemical. In addition, DHS's analysis of your Top Screen submission, and subsequent classification under CFATS as either a high-risk/regulated facility or a low-risk/not-regulated facility, includes an examination of the surrounding community and neighboring businesses.

IDENTIFYING SECURITY VULNERABILITY AND PLANNING FOR SITE SECURITY

Once a facility submits its Top Screen, DHS will analyze the results and determine whether or not the facility will be categorized as high-risk. Each facility will be electronically notified of the results, and facilities deemed high-risk will be assigned a Tier (1 to 4, with 1 being the highest risk). The owner/operator of facilities deemed high-risk will be provided with a list identifying which of the 19 Risk-Based Performance Standards (RBPS) they will need to address in a Security Vulnerability Assessment (SVA) of their site, due 90 days after notification. a look at the 19 risk-based PerFormance standards (rbPs) When DHS categorizes a facility as high-risk, they use the following 19 RBPS to communicate measures required to secure chemicals. It is up to the facility to interpret these and determine the best methods for implementation of and response to the identified RBPS:

1. Restrict Area Perimeter
2. Secure Site Assets
3. Screen and Control Access
4. Deter, Detect, Delay
5. Shipping, Receipt and Storage
6. Theft and Diversions
7. Sabotage
8. Cyber
9. Response
10. Monitoring
11. Training
12. Personnel Surety
13. Elevated Threats
14. Specific Threats
15. Reporting Significant Security Incidents
16. Incidents and Suspicious Activities
17. Officials and Organization
18. Records
19. Any RBPS specified by DHS

While requirements will vary at each specific site, it is likely that training and records will be on most lists.

SITE SECURITY PLANS (SSP)

The final step for each facility will be to design and implement a Site Security Plan (SSP), closing any security gaps identified in the SVA and taking into consideration the applicable RBPS. All facilities with multiple buildings, including colleges and universities, are given flexibility to define their boundaries as either the entire property or the individual building where the COI is stored.

The Rule expects facilities to develop a layered approach to security measures, with a written plan which describes each component and how it—in combination with other security measures—will address the identified RBPS. The owner/

THE RULE EXPECTS FACILITIES TO DEVELOP A LAYERED APPROACH TO SECURITY MEASURES, WITH A WRITTEN PLAN WHICH DESCRIBES EACH COMPONENT AND HOW IT–IN COMBINATION WITH OTHER SECURITY MEASURES–WILL ADDRESS THE IDENTIFIED RBPS.

operator of the facility will also be required to maintain and update the SSP on a regular basis. Facilities covered by the Rule have flexibility in determining the methods they will use to meet the requirements. DHS will assess the adequacy of those security measures by reviewing the written SSP and conducting site visits.

PROTECTING CHEMICAL-TERRORISM VULNERABILITY INFORMATION (CVI)

Of course, businesses and institutions are concerned with keeping detailed chemical inventories and security vulnerability data private. Many states have "Right to Know" or "Sunshine" laws which require a facility to disclose to the public which chemicals are on site. Emergency response plans shared with local law enforcement and fire departments may also be available as public documents.

This Rule treats all such information, once submitted to DHS through the Top Screen, as Chemical-Terrorism Vulnerability Information (CVI). This information remains secure under the CVI designation, and is not subject to any "Right to Know" laws. In fact, DHS takes protecting CVI so seriously that anyone with access to the CVI must complete CVI training to ensure they understand the responsibility to protect what they know.

While there are significant penalties for non-compliance (up to $25,000/day), the intent of this regulation is to improve chemical security, not collect fines. DHS is doing its best to assist institutions with the CFATS process. Their website (www.dhs.gov/chemicalsecurity) includes many useful tools, such as a PDF file of the Top Screen questions and a Top Screen users manual, dozens of FAQ's, CVI training, and contact information for the CSAT help desk. Institutions need to begin this process now in order to address the important issues of creating a database of current chemicals, identifying funding for security improvements, and maintaining confidentiality while developing site security plans in coordination with local public agencies.

Nancy Mathews is a certified emergency manager and serves as senior disaster response manager for Haley & Aldrich, Inc., Manchester, NH. E-mail her at *nmathews@haleyaldrich.com*. This is her first article for *Facilities Manager*.

Coming Soon

Environmental Compliance Assistance Guide for Colleges and Universities, second edition

Published by APPA and CSHEMA. Available at www.appa.org/bookstore

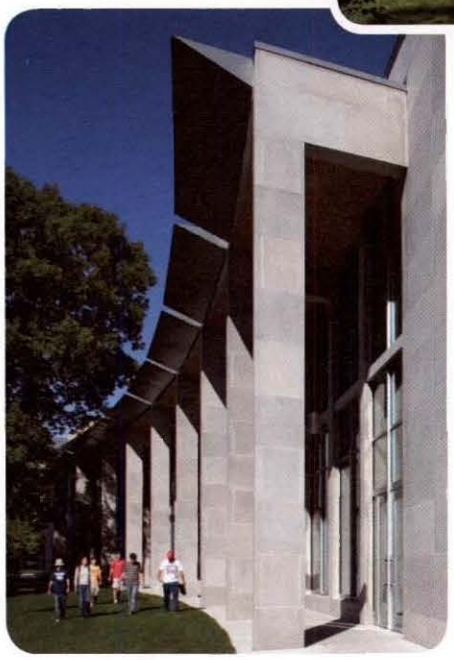
Pay Now or Pay Forever: The Design of Control System Software

By Greg Cmar, Bill Gnerre, and Kevin Fuller

The Gerdin Business Building features wireless access and high-tech laboratories so Iowa State's business students and faculty can replicate real-world situations.

PAY FOREVER

The vast majority of buildings, new or old, simply do not operate well. The construction industry works on a "get in, get out, get paid" approach to delivering buildings. The HVAC and other building systems may work well enough for acceptance and occupancy, but typically don't work well from the viewpoint of the operations and maintenance staff that has to live with the building for the next couple of decades. This "pay forever" approach dominates our industry today, even when buildings are formally commissioned (or retro-commissioned). The reason for it all starts with the control system's design.



GOOD INTENT, BAD DESIGN

The building highlighted is the Gerdin Business Building at Iowa State University, an 113,000 square-foot building constructed in 2003. Its HVAC systems include three air handlers and 218 VAV boxes with reheat-some of which are fan-poweredplus fan coil units, exhaust fans, pumps, etc.

Upon a thorough analysis of the building operations, the analysts identified a few dozen issues. The individual problems found weren't the most interesting part. What was interesting were the "bigger picture" issues and identifying the root cause of each problem. We're not talking about the root mechanical or control issues, but back to where the process went astray.

Through discussions with the facilities staff, and while reviewing the original design documents (and changes), the team was able to trace the building problems back to the original source.

The operations staff is often blamed for "screwing up the building." However, this analysis showed that over 80 percent of the issues identified existed the day the school took occupancy of the building—traced to design intent or controls programming implementation errors and omissions.

SOFTWARE ≠ HARDWARE

Let's refine what part of the design had issues. The mechanical design was fine. The breakdown was in the sequence of operations—a.k.a. the software layer of the control system. More specifically, most issues were at the integration level of the controls programs.

The current controllers available from vendors are highly advanced and capable of sophisticated control strategies. However, the software tools to program them make it difficult (sometimes virtually impossible) to achieve what the hardware is capable of doing. Design engineers' understanding of control systems, especially DDC systems, is often lacking. Add to that a copy/paste approach to deliverables, and you have a recipe for a sequence of operations that is littered with vagueness and incomplete instructions.

NO HABLE INTEGRATION

Let's look at an example. Figure A shows the air handling system attempting to perform a warm-up command. There is one room operating below the warm-up command setpoint, which triggers the control. What we see is that the supply air temperature rises and most of the rooms follow suit. However, the remainder of the rooms don't need warm-up at all, and many get too warm, getting well above 80°F.

Why did this happen? The VAV boxes remained in cooling mode while the warm-up command took place. They were trying to cool with hot air—opening their dampers further as the room got hotter. Where did this process go wrong? While the AHU sequence defined the warm-up cycle, there were no instructions for VAV operations during warm-up; no one considered the integration between the two.

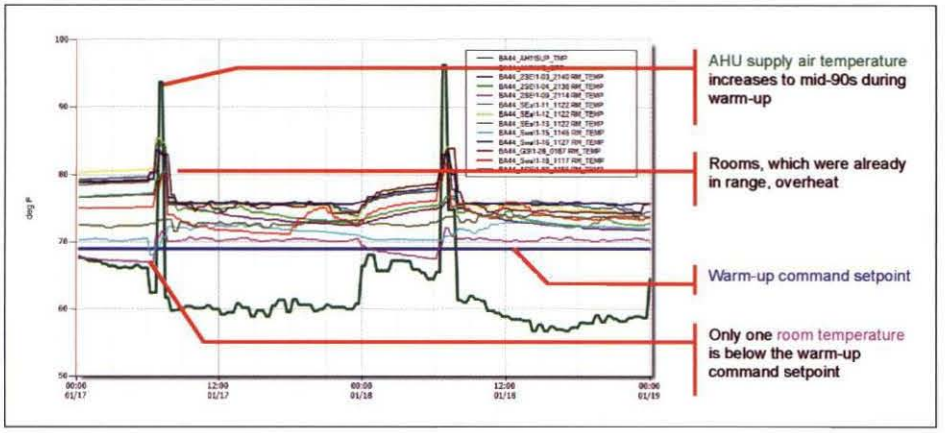


Figure A: Warm-up control gone wrong.

Therefore, the Gerdin building wound up with a warm-up command that worked exactly as specified…and entirely wrong. (OK, not entirely wrong, mostly that pesky detail of the VAV boxes needing to know about the warm-up cycle.) Iowa State was enrolled in the "pay forever" plan, experiencing daily energy waste during heating season by providing a lot of unnecessary heat and then needing to immediately correct that mistake with cooling. They also paid through hot and cold calls.

While the fix to this warm-up command example is straightforward, it represents a systemic problem. The software layer of control systems, particularly the integration logic, is lacking. It's not just this building, or this school. Every building (even those recently commissioned) our analysts have reviewed has significant operational problems caused by poor integration control programming.

PAY NOW

Curing the "pay forever" situation is a difficult issue. It's not as simple as, "take two ASHRAE standards and call me in the morning." The path to fixing the building was to fix the software, and the prerequisite to fixing the software was to create a software specification.

RECOGNIZE THE ISSUE

Software commissioning is not something the industry is automatically qualified to do. Engineers and commissioning professionals commission the hardware and construction aspects of a building. But software engineering is a separate discipline.

AN OPERATIONAL DESIGN (SOFTWARE) SPECIFICATION

Returning to our case study, Iowa State opted to reprogram the control system based on a well-engineered, detailed, and well documented operational design.

"Design is not just what it looks like and feels like. Design is how it works."

—Steve Jobs (co-founder of Apple, Inc.)

Now, Steve Jobs may know nothing about HVAC systems, but he knows a lot about design and a lot about software, and what we're talking about is a software design problem. The new specification needed to deliver a fresh approach to communicating the building's operations, as well as ensure predictability and consistency of the resulting implementation. The design intent is to enable Iowa State to achieve three simple goals:

- Meet comfort and IAQ requirements in every individual occupied space,
- Do so at the minimum possible operating cost, and
- "We don't want to have to dink with the system."

The team creating the new specification included professionals from engineering, software, and communications disciplines. Sure, there are points lists and sequences of operations (with extensive detail), but the new specification also tackled topics

never included in standard specs, such as a description of the operational philosophy; how the university defines and measures comfort and IAQ; and an extensive set of acceptance criteria.

ANATOMY OF AN OPERATIONAL SPECIFICATION

Again, the key word here is *operational*. With the exception of adding some sensors, there were no hardware or configuration changes in the physical system. However, the new specification represented a complete redefinition of the control system software.

Existing control specifications tend to be written by engineers, for engineers. The new specification informed design engineers, controls engineers, building automation system vendors, mechanical contractors, field mechanics, and other suppliers/contractors of the university's requirements for operations and performance. The following highlights some of the main sections:

Philosophy: This section provides an overview of how the control system must function in language that both engineers and non-engineers can easily understand. It describes the approach to each aspect of control system operations, but not the detailed sequence of operations.

Comfort/IAQ: Comfort expectations are virtually absent from most specifications, aside from setpoint specifications or trite statements such as, "the system shall provide a comfortable work/learning environment." The new specification defines comfort and indoor air quality requirements based on the ASHRAE 55-2004 and 62.1-2004 standards. Design intent is not accepted as a proxy for anything—the university measures and verifies conformance, and therefore the method of measurement is detailed as well.

Points: The specification defines a series of naming standards designed to provide users with an understandable, maintainable system. It then defines which points are mapped to the control system user interface, which are trended, and which are collected into an external historical database as a record for the building owner.

Control Strategies: This is the meat of the specification with the most important aspect being to make the result predictable. The software specification must provide sufficient detail to remove the inconsistency and unpredictability from the result. The design engineer, controls contractor, or the design's commissioning agent must properly define the integration software.

Acceptance: Finally, there are acceptance criteria. The specification defines acceptance criteria at three levels: comfort, component operations, and integration operations. Comfort checks validate that each individual room in the building meets thermal comfort and ventilation requirements. Component operations checks each piece of equipment to assure it is running properly; and the integration-level tests show that the entire system works as it should.

Operations Manual: Despite only accounting for 17 percent of the issues found, operational errors do cause building performance to degrade over time. Why? Operators are rarely trained on how the system works. They know how equipment works, but they do not often have the background to realize the systemic effects of some of their actions.

SUCCESSFUL APPROACH

Problems in modern buildings nearly always trace back to inadequate control systems programming, typically the result of inadequate software design. Software is as important a component of building controls as hardware, and requires its own specification. The software specification goes well beyond the standard sequence of operations provided as part of system designs today. This approach is required to make DDC systems finally deliver on their potential, and make well-performing buildings as commonplace as they should be.

We are pleased to report that after following this new specification and fixing only sequences (not hardware), Gerdin's energy consumption has dropped (confirmed via the utility bill) by 15 percent when measured directly, and 18 percent when normalized for weather.

RESOURCE

Interval Data Systems, Inc. *Pay Now or Pay Forever, Commissioning the Design of Control System Software.* National Conference on Building Commissioning. May 2007.

Greg Cmar is cofounder and CTO of Interval Data Systems, Inc. in Watertown, MA. E-mail him at *gcmar@intdatsys.com*. Bill Gnerre is cofounder and CEO of Interval Data Systems, Inc. E-mail him at *bgnerre@intdatsys.com*. Kevin Fuller is executive vice president and general manager of utility billing at Interval Data Systems. E-mail him at *kfuller@intdatsys.com*. This is their first article for *Facilities Manager*.

Leadership in Educational Facilities Administration

Achieve Greatness in Educational Facilities Management

Christopher K. Ahoy

2006-07 APPA President Christopher Ahoy shares the wisdom he has gained while leading Iowa State University Facilities Planning and Management Department on a 12-year journey to becoming a world-class organization. This is a key resource for fellow facilities managers who are eager to lead their own organizations on the path to greatness.

Leadership in Educational Facilities Administration examines leadership styles, types of people in an organization, and the importance of mission and vision statements. Woven throughout the book is a detailed account of Ahoy's use of the latest in performance improvement methodologies—including Baldrige and Six Sigma—to streamline operations and satisfy customers.

"Managing campus facilities is like managing a small municipality. To effectively manage an entire campus' physical assets, administrators need to connect the goals of their facilities with the complex mission of the institution. Chris' book will provide the tools to transform your institution into a world-class organization."

—E. Lander Medlin, Executive VP, APPA

Leadership in Educational Facilities Administration will bolster your leadership skills and transform the way you approach educational facilities management. Author Chris Ahoy offers solutions to the biggest challenges facing the facilities management field to help you:

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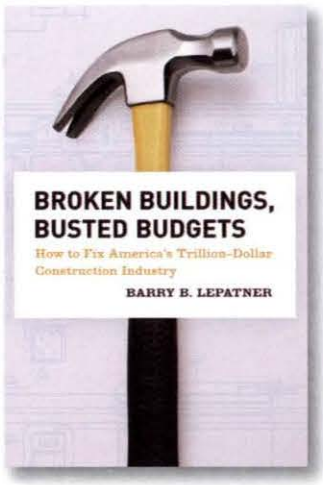
APPA
LEADERSHIP IN EDUCATIONAL FACILITIES

Book Review Editor: Theodore J. Weidner, Ph.D., P.E., AIA

This issue addresses three important elements of APPA's Body of Knowledge (BOK)—design, construction, and leadership. Start the new year off right and consider these books.

BROKEN BUILDINGS, BUSTED BUDGETS: HOW TO FIX AMERICA'S TRILLION-DOLLAR CONSTRUCTION INDUSTRY

by Barry B. LePatner, University of Chicago Press, Chicago, 2007, 185 pages, hardcover, $25.
Reviewed by Ted Weidner



The APPA Body of Knowledge includes a great deal of information about the design and construction of facilities, which is an important element in a facility officer's job. It is also a costly and risky area for colleges and universities, as Barry LePatner points out in *Broken Buildings, Busted Budgets*.

I first learned about *Broken Buildings* from a colleague who sent me an op-ed piece LePatner wrote in the *Boston Globe*. I thought the op-ed piece was slanted, so I decided to buy the book and attempt to debunk the author. As I read *Broken Buildings* I came to agree with the author's opinion about problems in the design and construction industry and some of his suggestions for improvement.

So here's a facility officer's perspective—throughout *Broken Buildings*, LePatner presents examples of what he considers successful and unsuccessful construction projects. The Big Dig—Boston's effort to bury the elevated I-93 highway that cut through downtown Boston—features prominently as an example of a construction project gone bad. After living in Massachusetts for five years and working in the public arena with the complex public construction requirements the Commonwealth demands, I can understand how the Big Dig was also referred to as the Big Pig (over budget by a factor of five or more). The 1970s' attempts to rein-in the old-boy, mysterious, and corruptible Massachusetts construction environment by legislating how construction is supposed to be done just increased the networks, mystery, and opportunities for corruption. In my opinion, the laws don't work; LePatner provides examples of how they don't work and suggests a different approach.

On the positive side, he cites the massive residential development of Levittown, the post-war, Long Island community meant to provide affordable home ownership to thousands of returning GIs and their families. Levittown was a construction success, producing a large number of limited designs in assembly-line fashion. What Henry Ford did to automobile and then aircraft production, Arthur Levitt and his sons did to housing after the war. "You can have any color as long as it's black" was Ford's way to keep production of the Model-T economical. In the Levitts' case, home owners could choose from minor variations in the finished product but otherwise, each house in town was the same as everyone else's. Architects don't like the initial concept but do like how individual homeowners have changed their houses over time. Obviously, the homeowners didn't like the uniformity and made changes to personalize their homes to their liking.

LePatner points out that the design and construction industry is full of small, mom-and-pop operations that come and go and often have little construction or business know-how. These companies may not be the well-capitalized firms that are covered by typical contract requirements for performance and payment bonds, but as suppliers of key components they may have a costly, adverse effect on the project anyway.

LePatner advocates several changes in the construction industry.

- Vertically integrate construction; create a corporation that fabricates its own parts, windows, doors, shingles, woodwork, brick, etc., and eliminate the need for multiple conflicting technical specifications and multiple intermediaries who take a percentage along the way. While the Levitts did this in Levittown, it doesn't appear likely in our highly decentralized and regulated environment. Recently, vertically integrated industries have been moving toward increased subcontracting and use of multiple suppliers; this too is possible, but there are other technical demands, which reduce the likelihood.
- Create large companies serving large regions (or the entire country) so economic variations can be ameliorated. LePatner recognizes the difficulty of this with many conflicting codes and regional construction techniques. The capital requirements alone would require enormous investment and resources.
- Increase use of the design-build delivery method, where designers and contractors work together and provide a fixed price for the project upfront. This approach carries its own risks for the owner who must have a significant in-house staff time focused on careful planning and budgeting to maximize value. There are APPA members who use this delivery method for all building types: dormitories, classrooms, and research facilities.
- Increase the detail provided by architects and engineers. The AIA appears resistant to increased detail (and responsibility by

the A/E team) as evidenced by recent changes to their standard documents. (I hope to get a review of those documents in a future column.)

- Improve the transfer of information between the A/E team and contractors to eliminate confusion, errors, delays, and additional costs. There's promise here with the development of BIM (building information modeling) and the use of the Internet to correspond with all parties.
- Develop the skills and expertise, or buy them independently, to keep the contractor from winning the scheduling and change order game. This is a key action an owner can take to prevent the contractor from using his knowledge to get more money.

One of LePatner's best recommendations is to designate an on-site representative for each project. This is consistent with the practice at many campuses. The education and experience of these institutional representatives is important. APPA members can leverage their knowledge and expertise to address this and other recommendations.

The author makes a convincing argument using examples of problems within the construction industry to make his points. While several of his recommendations are consistent with APPA's BOK, the book provides good documentation for anyone on campus who may doubt the costs of managing a construction project. It's one more opportunity to use outside expertise to make your case for increased in-house attention to design and construction details.

THE SOURCE OF LEADERSHIP: EIGHT DRIVERS OF THE HIGH-IMPACT LEADER

by David M. Traversi, New Harbinger Publications, Inc., 2007, 208 pages, hardcover, $24.95.

Reviewed by Suzanne Drew

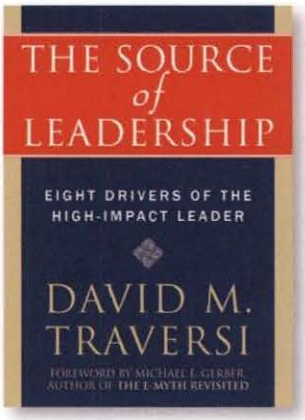
There seems to be a consensus across management publications regarding the character traits of effective leaders: credibility and curiosity; positivity and resiliency; courage and forward thinking; and focus and integrity. Unfortunately, while these descriptors are often documented, there are far fewer resources to help people acquire or develop the traits described. How does an adult truly become more curious, positive, courageous, or people-oriented than they naturally are?

In *The Source of Leadership*, author David Traversi describes choices anyone can make to help them expand their capacity for these behavioral traits. These drivers—as he calls them—include:

- Living in the present
- Being open to others and new ideas without judgment or defensiveness
- Having clarity and alignment across your thoughts, actions, and behaviors

- Acting with intention and positivity
- Taking personal responsibility for things you want to influence
- Knowing when to use and trust your intuition
- Looking for connections others may not yet see
- Communicating with honesty and empathy

Traversi also provides a variety of tips, techniques, and exercises to help put these choices into daily action. While some of the proposed techniques may lean a bit toward the new-age, including meditation and positive visualization, many are simple, practical, and easily applied.



The author suggests the most fundamental choice is the decision to live in the present. By choosing to not allow thoughts about the past or future to color or distract from the moment—or at least choosing to be aware of how they are impacting your perception of it—you can pay better attention to the people, opportunities, threats and the interrelationship of things before you. The purpose of the past, he says, is to remind us of happiness and good things and to help us learn so that we can make better decisions for the future. To replay the past for any other reason is usually neither productive nor enjoyable.

Similarly, the purpose of thinking about the future is to figure out a way to make tomorrow even better than today. A sample of his advice: when you can, plan; when you cannot, pray and then redirect your focus onto something that you can control or influence.

There are a number of management books, which give advice on how to structure an organization or what to say to influence others. Traversi, who describes leadership as the ability to transform one's personal energies into extraordinary interpersonal results, takes a more elemental approach and focuses instead on how to manage your own thoughts and energies. By making conscious decisions about how we think and act, we affect how we are perceived and followed. All in all, it is an interesting choice.

Ted Weidner is assistant vice chancellor of facilities management & planning at the University of Nebraska-Lincoln and president of Facility Asset Consulting. E-mail him at *tweidner2@unlnotes.unl.edu*. Suzanne Drew is the director of staff development and management at the University of Nebraska-Lincoln. E-mail her at *sdrew@unlnotes.unl.edu*.

FlowCon International recently introduced the FlowCon adjustable flow controller that is pressure-independent and can be applied wherever flow control is important. While it is controlling flow, the device is also equalizing the differential pressure to smooth out the operation of the system and ensure a consistent level of comfort for building occupants. This pressure equalization also reduces strain on the control valves, pumping mechanisms and comfort-creation equipment. Importantly, energy consumption is reduced because the system is dynamically balanced automatically. This all-in-one device can be adapted to piping packages and hose kits and is available with a variety of electronic actuators and outfitted with a manual close-off valve. GPMs are adjustable either externally or by using an optional internal adjustment cartridge. *www.flowcon.com*

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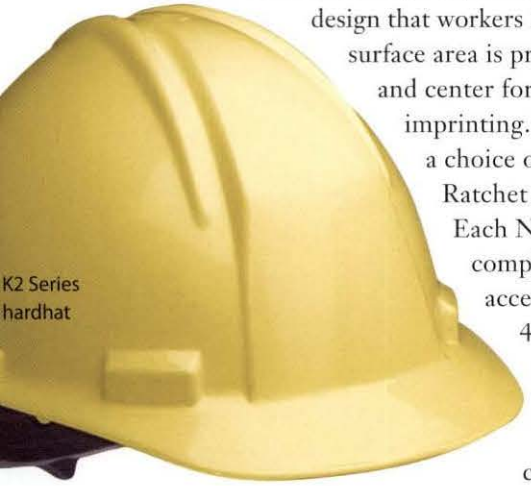
K2 Series hardhat

Quick Crete Products introduces the Halo smokeless ash receptacle. The Halo provides a truly smoke-free environment at the entrances to buildings, athletic stadiums, stores, eating establishments, and other outdoor areas where smoking is prohibited or discouraged. In addition to completely eliminating smoke, the Halo receptacle keeps the eyesore of used tobacco products out of public sight, making for a cleaner and more attractive environment. The Halo's covered design also keeps out rain, snow, and other elements, making it practical for use in every state. Tobacco-related litter is a major problem on many campuses, and research shows that if ash receptacles are provided, most smokers will use them. *www.haloqc.com*


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Valspar Flooring

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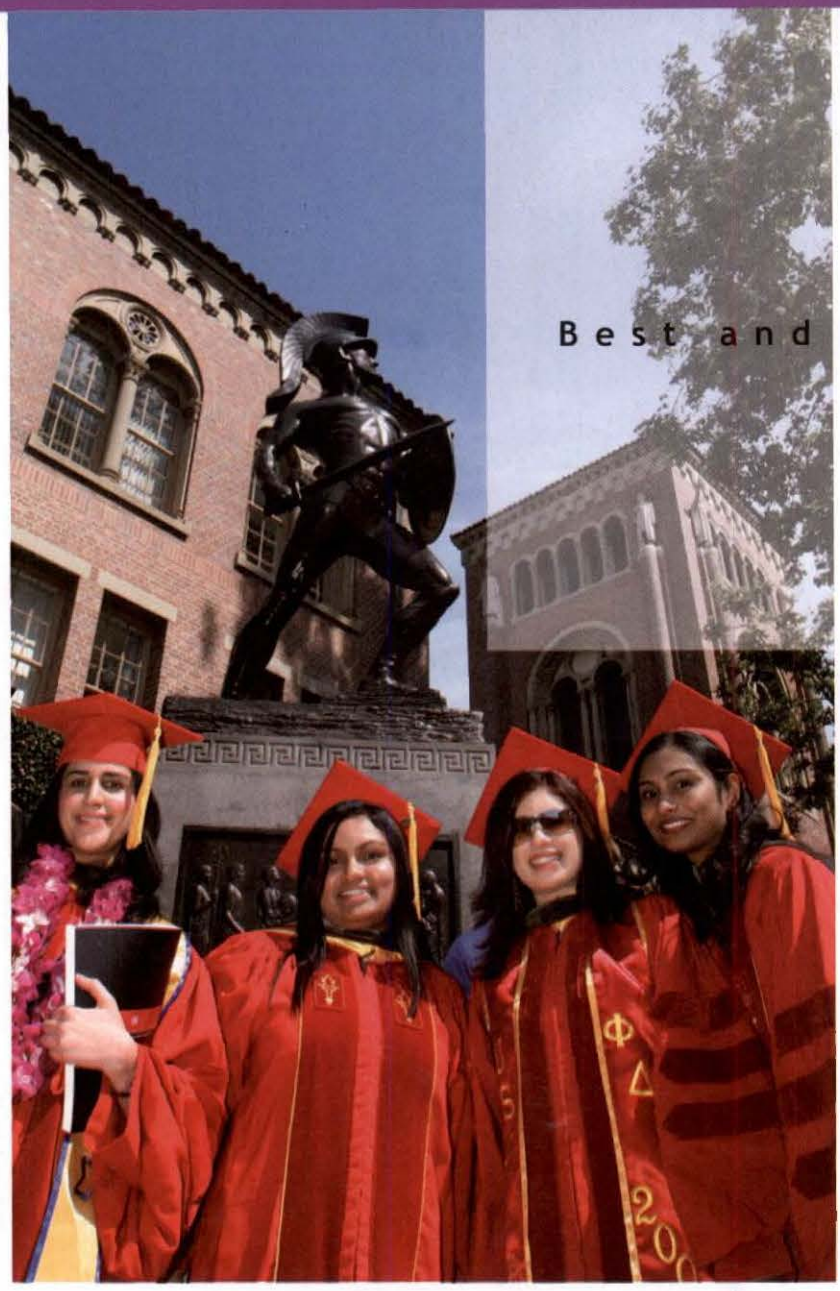

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