January/February 2006
VOLUME 22
NUMBER 1

Facilities Manager

The official publication of APPA: The Association of Higher Education Facilities Officers

A FUTURIST LOOKS AT
Trends in Higher Education

ALSO IN THIS ISSUE:

Capital Budgeting Practices | After-Action Reviews | Programmable Logic Controllers

Nonprofit Org.
U.S. Postage
PAID
Permit No.653
Alexandria, VA

Run your facility and housing maintenance department efficiently and effectively with a CMMS that fits your every need.

Benefits

- *Rapid Implementation*
- *Improve Staff Productivity*
- *Lower IT Support*
- *Effective Asset Management*
- *Reduce Total Cost of Ownership*
- *Capture Vandalism Cost*

Functionality

- *Work Order & PM Management*
- *Computer Aided Facilities Management*
- *Key Performance Indicators*
- *Handheld Paperless Solutions (Pocket PC)*
- *Room Inspection Module*
- *Plus Much More...*

Whether you use one of TMA's desktop solutions, TMA eXpress, TMA WorkGroup, TMA Enterprise, or the most powerful web-based system available for facilities — WebTMA, you are assured that you're on the leading edge of facility maintenance and asset management.

TMA is the solution for you...
TMA offers both Desktop & Web-based Maintenance Management Software Systems

TMASYSTEMS

800.862.1130 (Toll Free) 918.858.6600 (Main) www.tmasystems.com

The *Power* to Manage. The *Power* to Succeed.

Facilities Manager
The official publication of APPA: The Association of Higher Education Facilities Officers

Volume 22 Number 1 January/February 2006

THIS ISSUE'S TOPIC:

A Future View

Facilities Manager
The official publication of APPA: The Association of Higher Education Facilities Officers

Volume 22 Number 1 January/February 2006

Columns

Facilities Manager

PRESIDENT: Jack K. Colby, North Carolina State University
EXECUTIVE VICE PRESIDENT: E. Lander Medlin, Alexandria, Virginia

EDITOR: Steve Glazner
ASSISTANT EDITOR: Julie Ecker
SUBSCRIPTIONS: Cotrenia Aytch
CREATIVE DIRECTION: Creative Media Group
PRINTING: Corporate Press, Inc.
EDITORIAL OFFICE: 703-684-1446 ext. 236
FAX: 703-549-2772
E-MAIL: steve@appa.org
julie@appa.org
cotrenia@appa.org
WEB: www.appa.org
ADVERTISING:
Gerry Van Treeck
Achieve Communications
3221 Prestwick Lane
Northbrook, Illinois 60062
Phone: 847-562-8633
Fax: 847-562-8634
E-mail: gvtgvt@earthlink.net

Facilities Manager (ISSN 0882-7249) is published six times a year (January, March, May, July, September, and November). Editorial contributions are welcome and should be sent to the address below.

Of APPA's annual membership dues, $53 pays for the subscription to ***Facilities Manager***. Additional annual subscriptions cost $66 for APPA members, $120 for non-members. For information on rates and deadlines for display advertising, telephone 847-562-8633 or 703-684-1446 ext. 237.

POSTMASTER: Send address changes to *Facilities Manager*, 1643 Prince Street, Alexandria, VA 22314-2818.

Published by APPA:
The Association of Higher Education Facilities Officers
1643 Prince Street
Alexandria, VA 22314-2818

Global Partner in Learning

From the Editor

by Steve Glazner

Every new year brings thoughts of the future. We wonder what will happen in our personal and professional lives. We make resolutions to improve ourselves. We hope to make better decisions for ourselves and for those to whom we're accountable, but we can only do so based upon the information we possess or our perceptions and interpretations of where things are headed.

Now and then it is helpful to hear the prognostications of individuals who spend their time looking at where we are and suggesting where we might be in the future, both near and far. APPA had the pleasure of hosting one such futurist at our 2005 educational conference in Orlando, Florida last August.

David Pearce Snyder, contributing editor of *The Futurist*, first presented a history of the higher education enterprise, which he then used as context for discussing the technologies and processes that are affecting the learning environment and making an impact on our students, faculty, and staffs. We are pleased to share a lengthy excerpt in this issue of Snyder's keynote address to APPA.

You'll also find in this issue an update of Derrick Manns and Stephen Katsinas' research on capital budgeting practices as they relate to deferred maintenance at public institutions in the United States. Beginning with Manns' doctoral dissertation in 1999, his occasional updates on funding for capital renewal and deferred maintenance at our college and university campuses has been increasingly valuable.

We're delighted to hear from Roger Rowe again through his article on after-action reviews. Roger spent most of his campus career at Miami University in Ohio, and we thought we had lost him to retirement a few years ago. However, he now works at the University of West Florida and graciously shared another article with us on another of the useful processes he and his staff instituted while at Miami, helping to make it one of the more innovative campuses around within facilities management.

Finally, Linda Hafar and Daniel Leon share an exciting look at the successes they've had when implementing programmable logic controllers at California State University, Sacramento. They have made great strides in improving efficiency as well as effectiveness in their facilities operation.

Facilities Core Data Survey

Deadline Extended to February 10 for Facilities Core Data Survey!

The survey closes soon, so complete your survey at www.appa.org/research/fcds.cfm.

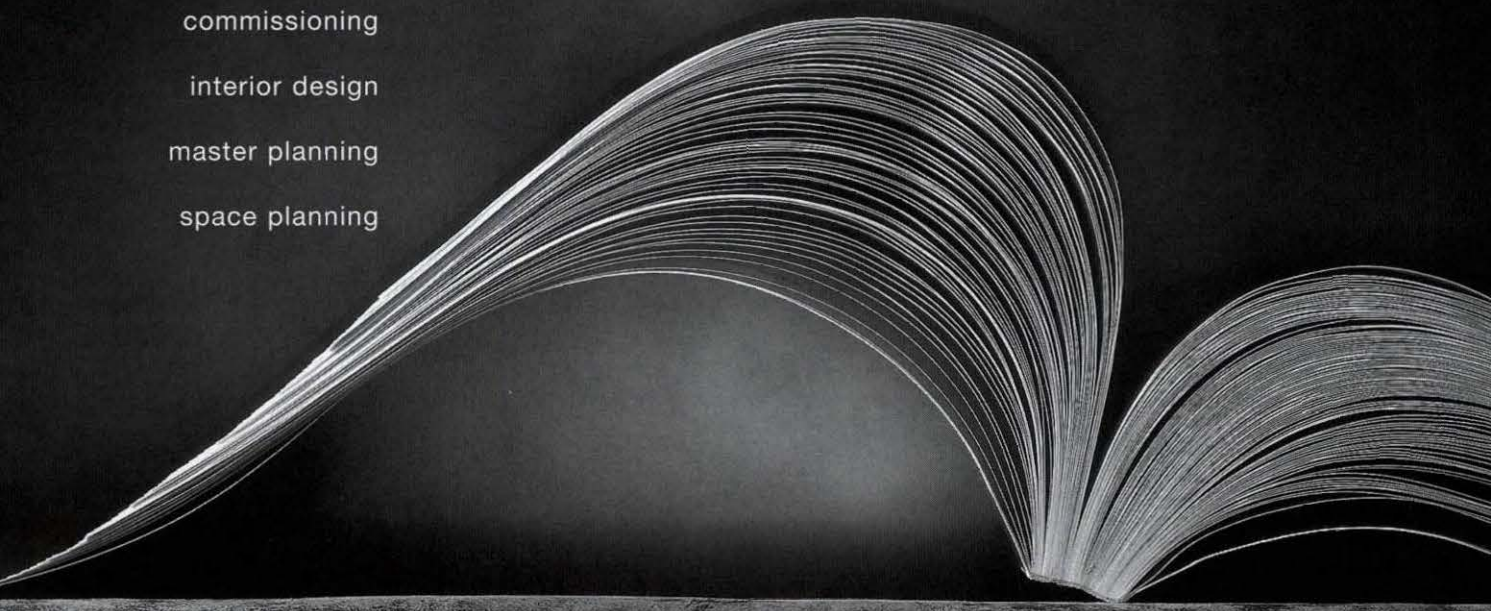
* * *

Awards Applications Close February 15!

All applications and nominations for APPA's individual and institutional awards closes at midnight Greenwich Mean Time (7:00 p.m. Eastern), on February 15, 2006. To apply for an award, please visit www.appa.org/recognition. Good luck!

smart solutions for commissioning

architecture/engineering
acilities condition inspections
facilities management
fire and life safety systems
central power plants
energy management systems
utility master planning
commissioning
interior design
master planning
space planning



For more than 65 years, Carter & Burgess has provided intelligent solutions to challenges in planning, engineering and construction management. Let us provide the answers to your educational facility needs.

800.580.6278

www.c-b.com

for more information contact:
Scott Clark - energy/utilities
Eric Dillinger - asset management
Randy Edwards - campus design
George Bourassa - commissioning

Carter::Burgess

by Julie Ecker

Business Partner Recognized

APPA Strategic Business Partner member Sebesta Blomberg & Associates, a consulting engineering firm, was recently recognized as a silver level sustaining firm of the Minnesota Society of Professional Engineers (MSPE), the only engineering society that serves as an advocate and resource for licensed Professional Engineers (PEs) across all disciplines in Minnesota. Sustaining firms help support MSPE's programs and activities that benefit the entire engineering community. Sebesta Blomberg is one of 27 engineering companies participating in MSPE's sustaining firm program for 2005-2006. "Our sustaining firms make some of our goals easier to reach through their financial and volunteer support," said Mary Detloff, MSPE executive director. "Without sustaining firms, it is very possible that some of our outreach programs would need to be scaled back or even eliminated."

EPA Finalizes OSWI Rules

On November 30, 2005, the U.S. Environmental Protection Agency (EPA) finalized rules to reduce emissions of air pollutants from other solid waste incineration (OSWI) units. The final OSWI rules regulate two classes of incinerators: 1) institutional wastes incineration units and 2) very small municipal waste combustion units. The final rule is available at www.epa.gov/ttn/oarpg/t3pfpr.html.

Asbestos Claims Due March 15

Colleges and universities have until March 15, 2006 to recoup some of the costs incurred for removing asbestos-containing materials from campus facilities. More than $50 million in settlement funds are available from the class action suit *Central Wesleyan v. W.R. Grace, et. al.*, filed 18 years ago. Official notices have been mailed to all institutions. The American Council on Education and the National Association of College and University Business Officers helped to organize and support the institutions involved in the suit. Except for those institutions that opted out of the class action in 1996, colleges and universities that can document expenses for the removal or abatement of friable asbestos-containing materials from campus facilities may file claims.

While there is no limit to how long ago abatement expenses were incurred, claims will only be accepted for work that is completed before the March 15 deadline. No claims for future expenses will be allowed. Preferred documentation includes an asbestos survey, laboratory reports verifying asbestos content, abatement contractors' bills with evidence of payment, canceled checks, and receipts. Claims will be paid after all claims have been reviewed and processed. The dollar amount of all accepted claims will be totaled and divided by the total funds available to determine each institution's pro rata share of the settlement. Claim forms and more information about the process and requirements are available on a website set up by the class counsel at www.collegeclaims.com. For more background on the case and a list of institutions that opted out, see www.nacubo.org/asbestos.

Campus of the Future

Campus of the Future: A Meeting of the Minds is a first-of-its-kind joint conference of three leading associations that serve higher education: APPA, NACUBO, and SCUP. This collaboration will result in enhanced educational and networking opportunities for everyone involved.

The conference, taking place July 8-11, 2006 in Honolulu, Hawai'i, will provide an opportunity to explore a vision of the trends, challenges, and advancements anticipated for the Campus of the Future; enable access to high-quality, joint educational programming that will address the top

Continued on page 8

THE CAMPUS OF THE FUTURE

A MEETING OF THE MINDS

Honolulu, Hawaii · July 9-11, 2006

Carpets clean, dry, and ready for use in less than 30 minutes

More than clean, it's ReadySpace®.

Carpets cleaned with ReadySpace technology are dry and ready for foot traffic in less than 30 minutes. By minimizing dry time, **ReadySpace empowers you to:**

Reopen rooms and carpeted areas sooner

Improve carpet appearance in high traffic areas with regular cleanings

Minimize disruption in locations with extended hours

Free crews from the constraints of night and weekend cleaning

Seeing Is Believing.

For a demonstration or additional information, call 800.553.8033.

READY SPACE™

More than clean, it's ReadySpace.™

Continued from page 6

issues to higher education; provide an opportunity for cross-collaborative campus teams to attend one conference that meets all their needs; offer a single educational event for individuals who wear many hats on the job; and enhance opportunities to build synergy across the higher education community.

Campus of the Future will also feature two outstanding plenary speakers, Tom Friedman, Pulitzer Prize-winning columnist and best-selling author of *The World is Flat*, and Tim Sanders, former Chief Solutions Officer at Yahoo! and an irrepressible advocate for good value in the business world. Friedman will share his insights on the impact of globalization on higher education. Sanders will offer his perspective on how higher education creates today and tomorrow's civic society.

Registration is now open! Visit www.campusofthefuture.org for more information and to register for this important event!

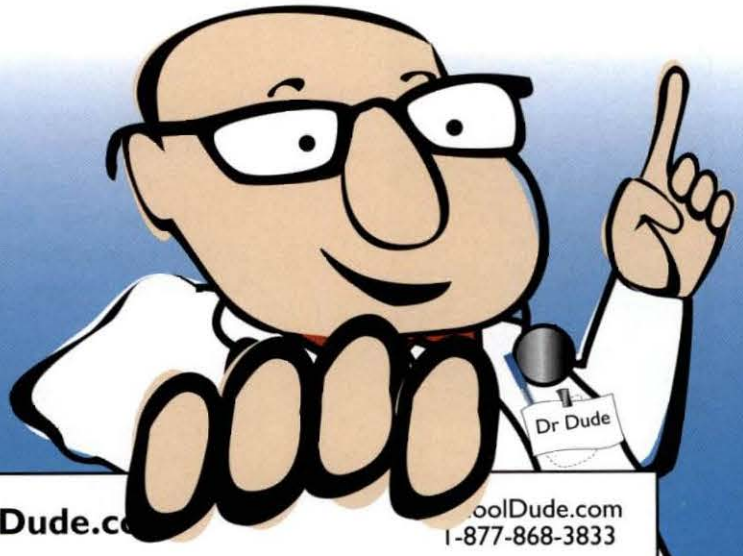
Johnson Controls Awards FSU with Upgrades

In October 2005, Johnson Controls, Inc. presented Florida State University (FSU) an award for the university's efforts to make energy-smart upgrades since 1996. The award ceremony included presenting the university's president and facility staff with a symbolic $2.5 million check representing the excess energy savings achieved by Johnson Controls and the university on the FSU campus. An $8 million contract FSU signed with Johnson Controls in 1996 involved major building improvements and other conservation measures on campus. These projects were funded through energy and operational savings that the projects created. The measures were projected to yield $8.5 million in savings over 10 years, but after less than eight years the original project is $2.5 million ahead of savings guarantees. The excess savings means the university has $2.5 million in additional funds for other purposes, over and above the savings guaranteed by the contract.

FSU has recently signed an extension of this original facility upgrade and energy savings contract with Johnson Controls. The extended phase of the contract includes new technology lighting retrofits, water and sewer retrofits, steam retrofits, computerized energy management, an energy awareness program and chilled water system retrofits.

SchoolDude is just what the doctor ordered for your educational operations headaches!

Our integrated suite of web-native solutions can take the pain out of managing your facility, technology and business operations processes.



SchoolDude.c oolDude.com
1-877-868-3833

For: All College and University Operations Professionals

℞

- **MaintenanceDirect** – work order management system
- **PMDirect** – preventive maintenance scheduling system
- **PlanningDirect** – capital planning and budgeting system
- **UtilityDirect** – utility tracking and analysis system
- **InventoryDirect** – inventory tracking and management system
- **ITDirect** – technology help desk management system
- **FSDirect** – facility usage scheduling system
- **TripDirect** – trip planning and management system
- **CommunityDirect** – peer networking for educational professionals

Get a FREE sample of SchoolDude's operations management solutions in our online seminars!

www.schooldude.com/seminars

℞ **SchoolDude.com**

Side effects of using SchoolDude's operations management technology were generally mild but may include:

- **Extreme Euphoria**
- **Tension Relief**
- **General Peace of Mind**
- **Reduced Irritation**
- **Swelling of Pride**
- **Looking Good!**

"I have been very impressed with the [SchoolDude] system. There is more accountability and better communication for the requesters and the technicians. It's very cost effective and user-friendly. Implementation was very smooth. If there are questions, SchoolDude is quick to respond. The experience tracking data will be very helpful in evaluating labor, materials, building performance and budget forecasting."

James Fredricks - College of St. Benedict, MN

Online tools for managing colleges and universites.™

SchoolDude's web-native technology is clinically proven to provide the following benefits:

- **Simplicity -** easy to implement and utilize
- **Productivity -** generate productivity gains of 15% or more
- **Efficiency -** save time and money by streamlining workflow
- **Affordability -** for small and large colleges and universities

SCHOOL DUDE .com®

Save money. Manage operations. Look good.

Visit on the web: www.schooldude.com Call now: 1-877-868-DUDE E-mail now: salesrequest@schooldude.com

Eastern Region

Keith Woodward
ERAPPA Vice President of Technology & Communications

ERAPPA had a productive and successful 2005 under the leadership of President Ron Dupuis. The board structure, which was implemented in 2004, is working as its creators had expected.

"I think it's a credit to the people who comprise the ERAPPA membership," said Dupuis. "We are fortunate to have a structure that allows volunteers to step up and participate in a growing organization. That said, we shouldn't rest on yesterday's success. Working for a thriving ERAPPA future is in everyone's best interest."

That success carried over to the 55th Annual Meeting in Atlantic City, New Jersey. The event, which had a host committee of 28 people, was led by Kevin Herron and Danny Fuchs as co-chairs.

"What a great experience hosting the annual meeting was," said Dan Fuchs (Middlesex County College). "It's funny, because after two years of planning the event, it is over in about five days. I know I speak for Kevin when I say we had a fantastic group of volunteers and our business partners played a key role in our success. I'm very proud to be associated with ERAPPA."

Kevin Herron and Dan Fuchs received Certificates of Merit for their leadership as co-chairs of the Host Committee for the 55th Annual Meeting in Atlantic City.

At the end of the conference, everyone relaxed and had a good time, including Randel Edwards, APPA director of member services and ERAPPA liaison.

Part of the annual meeting consisted of the installation of new officers. Those officers took office on the Tuesday night of the installation. They are President and Junior APPA representative Leon MacLellan (St. Francis Xavier University), President-Elect Glenn Smith (Bryn Mawr College), Past President Ron Dupuis (Wilfrid Laurier University), Vice President of Education Willy Suter (American University), Vice President of Chapter Affairs Fred Long (LaSalle University), Vice President of Membership Sarah High (American University), Vice President of Technology Keith Woodward (Quinnipiac University), Secretary Jim Barbush (Pennsylvania State System of Higher Education), and Treasurer Lou Dursi (Princeton University).

For only the 4th time in ERAPPA's proud history, the Norman H. Bedell Award for Distinguished Service was presented. The award memorializes the contributions by recognizing another member who has served with distinction and exemplifies the leadership qualities of the late Norman H, Bedell. Presented by former ERAPPA and APPA President Phil Cox (Cornell University), Joe Rubertone (Quinnipiac University) was recognized with a standing ovation. Rubertone truly represents the spirit of ERAPPA. He has attended the last 25 consecutive ERAPPA Annual Meetings, and 27 of the last 28. He routinely gives his time to mentor and guide others from all levels of the association in a quiet and unassuming way.

ERAPPA President Ron Dupuis presents Anita Bailey (Philips Exeter Academy) with a Certificate of Merit for her contributions from ERAPPA to the APPA education committee.

Willy Suter (American University) and the Education Committee announced that Carol Doscher will be the ERAPPA circuit speaker for 2006. The education opportunities at Annual Meeting City, under the committee of Carol Trexler (Rutgers University), and Patty Smith (Princeton University) Don Durst (Middlesex County

The shores of the Atlantic Coast played host to the 2005 ERAPPA Annual Meeting in New Jersey.

College), Rick Frazier (New Jersey City University), and Amy Baker (Spiezle Group), were top notch and extremely inspiring and timely.

The scholarship committee approved five scholarships for 2006, and the recipients are Gene Berrio, SNEAPPA; Michelle Frederick, DVAPPA; Leo Deon, NNEC ERAPPA; Claudia Runciman, OAPPA; and Connie Simmons, NNEC ERAPPA.

The website (www.erappa.org) continues to draw members for the latest information on what's happening. Mystic, Connecticut is the host site for the 56th annual meeting October 15-18th. The Mystic Marriott is the host hotel and host committee chair Terry Pellerin (Worcester Polytechnic Institute) encourages all attending to make their reservations early as space is limited. Check the website for complete details.

Planning for a successful 2006 is underway under the leadership of Leon MacLellan who outlined the operating plan at the annual meeting.

"I look forward to continuing the work of the men and women who have come before me to keep ERAPPA moving forward," said MacLellan. "Though the operating plan touches on a lot of different areas, I think it's fair to say that I would like to focus on promoting membership retention, recruitment, and diversity. That combined with developing a new model for our educational programming at annual meetings, and creating an accurate, user-friendly database for accurate membership information are tops on the list of things to work on this year."

* * *

Pacific Coast Region

John Schulze
PCAPPA Newsletter Editor

The University of Puget Sound hosted PCAPPA's 54th Annual Meeting and Educational Conference in Tacoma, Washington on October 1-5, 2005. The conference had 312 total registrants and over 140 first-time attendees. The host committee made every effort to make each attendee feel welcome and to ensure that everyone who came expecting something excellent left realizing their expectations. Exceptional teamwork from the education committee, the speakers, the ever supportive business partners, and the attendees at large made the event a success. Clearly a conference is only as good as those who attend and participate in its program. This was an engaging and encouraging group that exhibited patience and were a pleasure to be around. The kind words directed to the host committee at the conference and the supportive messages received since then have been appreciated and valued.

The conference began with a cruise to Blake Island that included sun, wind, rain, hail, and rainbows, and ended with an awards banquet and installation of new officers four days later. The friendly atmosphere of Tacoma provided many opportunities to reconnect with old friends and network with others for the first time. Great reports about the educational sessions and speakers were received.

With distinctly different styles, messages, and personalities, those who gave our keynote addresses urged us to consider how we think and how we act. The attendees were called upon to consider their roles as, and in the development of, excellent people and to inspire those around them. They were asked to consider how their thinking and planning can impact their institutions and communities from the outside in and from the inside out and to offer compelling visions for the future. The message to see our places, our campuses and facilities, through the eyes of others; to recognize that what we do to make things better ultimately impacts real people with real experiences. We, as facilities professionals were urged to realize that we can and do make a difference and that it is in being

Scholarship check received from San Joaquin Chemical.

excellent of our kind, that we find fulfillment in service.

The leadership of PCAPPA was placed in the capable hands of a new board as APPA President Jack Colby installed APPA Senior Representative Chris Christofferson, APPA Junior Representative Towny Angell, PCAPPA President Scott Burns, PCAPPA President-Elect Buzz Nelson, PCAPPA Vice President for Annual Meeting, Tony Valenzuela, PCAPPA Vice President-Elect for Annual Meeting Mark Hunter, and our committee chairs. The conference attendees then took their future into their own hands by pledging their support to the board and to the committee chairs.

A special thank you goes to San Joaquin Chemical. Their commitment to PCAPPA and our annual conference remains stellar. From having a booth, to sponsoring the banquet, to providing scholarship funds (this year's recipient of the San Joaquin Chemical Scholarship was Robyn Pierce from Portland State University), to their hospitality suite, to

Passing the mantle of leadership and gavel to Scott Burns.

contributing to the Katrina and Rita relief, their support is invaluable for the continued success of our PCAPPA conferences. And finally, they offered a friendly challenge to other business partners to join them in this commitment. Other sponsors this year were Sellen Construction, Spirotherm, Primex Wireless, Architects BCRA, Ameresco, and SRG Partnership.

Johnny Torres—now Emeritus—being honored.

The 2006 conference will be hosted by Tony Valenzuela and his staff from San Jose State University. With all of Silicon Valley and nearby San Francisco to explore, this promises to be a great venue and great conference. Amongst their many accomplishments, San Jose State has partnered with the City of San Jose to build a spectacular new library that is a must see, and their new multi-story student housing building has received wide acclaim. The theme of the conference will be "Learn, Implement, and Evolve."

The conference host, Craig Benjamin, summed up his feelings about the conference when he stated: "May each of us be encouraged to make a difference. As Walt Stasinski said, 'Great Leaders Touch the Heart.' And per the video clip, 'It's So Simple.' Thank you for the opportunity to serve you for this brief period. I look forward to seeing you again."

* * *

Southeastern Region

Kate Van Sant
SRAPPA Vice President for Communications

The 54th Annual SRAPPA Conference, "Takin' Care of Business in Memphis," held at the famous Peabody Hotel in downtown Memphis, was a great success. Early arrivals enjoyed a golf tournament at the Cherokee Valley Golf Club, and the conference kicked off with a Rock 'n' Roll Reception in The Skyway, an elegant nightclub at the top of the Peabody, with Elvis himself in attendance. Other social events included a barbecue picnic at the University of Memphis, followed by a spectacular show of the University of

Sylvester Johnson of Tulane and Marion Bracy of Xavier admire the display of T-shirts donated by SRAPPA institutions. Rather than hold the customary T-shirt exchange, the membership voted unanimously to donate all the shirts to SRAPPA's member schools affected by Hurricane Katrina.

Memphis' most musically talented students. We know we'll be hearing more from them!

Everyone enjoyed the Peabody Duck March, as five of our most pampered feathered friends traveled by elevator from their penthouse home each morning and waddled along the red carpet to the lovely lobby fountain, then returned each evening, accompanied by a rousing John Phillips Sousa tune.

Members were offered complimentary tickets to The Art of the Motorcycle, a once-in-a-lifetime exhibit held in the famous Memphis Pyramid. Over 90 vendors exhibited at the conference; visits to the vendor booths in the exhibit hall were rewarded with bingo chips, and each "bingo!" was good for one entry in the raffle of a brand-new Harley Davidson Sportster motorcycle. Chris Willis of the University of Virginia was the lucky winner.

SRAPPA 2005-2006 Board members elected at the conference. Left to right, David Gray, Sylvester Johnson, Jeff Turner, Marion Bracy, Joe Fisher, Jim Hellums, Glenn Reynolds, Larry Blake, and Kate Van Sant.

Of course the major concern of SRAPPA for the past few months has been the devastation of colleges and universities in our region by Hurricane Katrina. Our new President, Marion Bracy, was on the scene when his institution, Xavier University of New Orleans, was inundated by 12 feet of water; Marion himself rowed a boat loaded with warm food to students stranded in the residence halls. Tulane University, represented at the conference by Sylvester Johnson and Karen Henley, has opened its doors to support Xavier University and Dillard University as they recover. SRAPPA established an e-mail listserv to coordinate the needs of affected institutions with resources offered by our members.

Revisions of the Constitution and By-Laws were approved by the membership at the Business Breakfast, thus culminating over a year of efforts to clarify and update both documents.

Larry Blake, assistant vice president for facilities at Northern Kentucky University, graciously offered to host the 56th SRAPPA Conference in 2007, and was unanimously elected as 2nd Vice President. Other members of the SRAPPA 2005-2006 Board of Directors:

Marion Bracy, President
James E. Hellums, President-Elect
Glenn Reynolds, 1st Vice President
Jeff Turner, Vice President for Long-Range Planning
Kate Van Sant, Vice President for Communications
Sylvester Johnson, Vice President at Large
David Gray, Secretary/Treasurer
Joseph C. Fisher, APPA Representative-Elect
Robert E. McMains, Junior APPA Representative
William M. Elvey, Senior APPA Representative
Steve Glazner, APPA Liaison to SRAPPA

Outgoing President Joe Fisher; Joe Patten and Randy Hudak from West Virginia University; Ed Rice, Immediate Past Present of APPA and his wife Janet enjoy an early evening reception sponsored by Carrier on the rooftop terrace of the Peabody Hotel.

We were honored to be joined by Ed Rice, Immediate Past President of APPA, and APPA Executive Vice President Lander Medlin.

The many educational sessions were well attended, including special forums for New Members, Getting Involved in APPA, Diversity, and Women in Facilities.

Attendees also had the opportunity to enjoy an outing at Grand Casino, and the spouses were treated to a tour of Graceland and a cooking demonstration with lunch at the world-famous Viking appliance company. The conference ended with a reception on the roof of the Peabody, a presentation on next year's conference at Duke University, and a banquet in the Skyway Lounge.

* * *

Midwest Region

Ernie McVay
MAPPA Newsletter Editor

Postcard perfect autumn weather greeted MAPPA when it visited the upper Mississippi River Valley for its 2005 Educational Conference and Annual Meeting. With the colors of the changing leaves and crisp, abundant sunshine, St. Paul was the perfect setting for discovering all that MAPPA has to offer its members. From the golf outing and trip to the Mall of America on Sunday afternoon to the closing banquet, the conference provided educational and networking opportunities for all.

Situated on the bluffs overlooking the mighty Mississippi River, the Radisson Riverfront Hotel proved to be a convenient and scenic location for the conference. The rotating Carousel Restaurant on the 22nd floor provided a bird's eye view of the valley and barge traffic on the river when one wasn't busy with the educational sessions and conference proceedings. Our hosts from the University of Minnesota, the Minnesota State Colleges & Universities, and Sebesta Blomberg provided outstanding hospitality and coordinated an outstanding

Small school experience exchange.

conference loaded with informative topics as well as abundant entertainment. Enjoying this hospitality were 181 participants, 11 spouses and guests, and 55 business partners who had 55 booths set up for exhibits.

Many attendees arrived early so they could enjoy the pre-conference golf outing to the Edinburgh USA course with its "island hole" and triple green. Other early arrivals enjoyed the opportunity to shop at the Mall of America. Later in the afternoon a well attended first timer welcome meeting took place.

The official opening of the conference occurred on Sunday evening with the Business Partner Tradeshow and Welcome Reception. The Oktoberfest themed affair provided attendees the first opportunity to visit with our valued business partners and view their exhibits while enjoying delicious foods ranging from prime rib to brats and kraut.

Since our trip to Minnesota involved a unique situation of having multiple hosts, our hosts from both the Minnesota State Colleges & Universities and the University of Minnesota began Monday morning with a welcome address. They introduced the charity for the conference—the Storm Eye Institute— and we watched a video on the outstanding research and service being performed there. It was noted that our Tuesday morning speaker, Michael Veeck, waived his speaker fee in lieu of a donation to the charity. The Keynote Speaker was Robert Jacobs, the director of global facilities management for 3M. He spoke on the forces of change facing the facilities profession and outlined his path for negotiating these changes: be a knowledge seeker, create positive change, be professional, manage detail, and remember to say, "thank you."

Training session with Terry Burke.

Following the first networking break, the educational sessions began. The concurrent education sessions both Monday and Tuesday were divided into one of three tracks: Human Resources & Staffing, Energy & Environmental, and Service Delivery. The first set of classes were: Interview Techniques by Terry Burke (Ball State University); Environmental Sustainability, Green Buildings, LEED by Bob Cox (Defense Facilities Directorate) and Tia Heneghan (Sebesta Blomberg); and APPA as Your Resource presented by Suzanne Healy of APPA.

St. Paul Skyline

Following the morning's educational sessions, participants had another opportunity to browse the exhibits and booths of our business partners while enjoying lunch. The afternoon was spent in the always-popular experience exchanges. One of the primary benefits of MAPPA is the ability to share experiences and, based on the virtually "standing room only" crowd in both the large school and small school exchanges, there are many problems for which our colleagues may have an answer. Becky Hines (Ohio State University) facilitated the large-school session and Ralph Zia (Northeastern Illinois University) facilitated the small-school exchange.

A final opportunity to visit our business partner exhibits occurred Monday evening during the reception before we headed off to the Minnesota Science Museum for a dinner with spectacular views of the Mississippi River and the historic St. Paul skyline. After dinner, we were free to explore Minnesota's favorite museum.

The annual business meeting was held Tuesday morning. The MAPPA leadership provided updates and information relating to their committees and the minutes and budget were approved. The meeting ended in the election of new officers for the coming year. Fred Plant (Valparaiso University) was voted President-Elect and John Ott (Ohio State OARDC) was re-elected to serve as Secretary.

The Tuesday morning educational sessions began with a presentation by Mike Veeck on his "Fun is Good" program. The son of renowned baseball owner Bill Veeck, Mike believes the best way to go through life is by

Large school experience exchange.

taking one's work seriously, but not one's self. Using his wonderful sense of humor, his presentation was humorous, touching and inspirational. His belief is that "change is going to happen so why not have fun with it?" The morning's educational sessions wrapped up with: Labor Management Tools by Mitchell Franklin (Federal Mediation and Conciliation Service); Sustainable Campus Operation & Stormwater Management by Candice Richards and Erik Larson (both from the University of Minnesota-Duluth); and Beautiful U Day presented by Lori-Anne Williams (University of Minnesota).

Tuesday's lunch allowed MAPPA to recognize and award those who contribute to its success. President-Elect Jerry Carlson (Illinois State University) recognized members of the Educational and Programming Committee and President Becky Hines (Ohio State University) presented awards to our hosts. Jenn Rowe (University of Minnesota) also recognized the tremendous contributions of the Host Committee.

The educational sessions wrapped up Tuesday afternoon with: Supervisor Development Training & the APPA Supervisor's Toolkit presented by Peggy Barylak (Ohio State University); Energy Audit & Energy Conservation by Janet Razbadouski (University of Iowa); Service Level Agreements with Mike Dixon and Becky Hines (both from Ohio State University); Violence in the Workplace by David Johnson (retired from the University of Minnesota); Campus Utilities: A Public/Private Partnership by John Harrod Jr. (University of Wisconsin); and Building Coordinators, Panel Discussion, U of M FUN presented by Rich Robben (University of Michigan).

The 2004 educational conference concluded with the annual MAPPA banquet. Following a wonderful dinner, Jerry Carlson from Illinois State University was passed the presidential gavel from Becky Hines of Ohio State University. Jerry thanked all responsible for his success during his inaugural address. The MAPPA officers for 2005-2006 include: President Jerry Carlson from Illinois State University, President-Elect Fred Plant of Valparaiso University, Secretary John Ott of The Ohio State University OARDC, and Treasurer Martha May from Purdue University. Following the formal segment of the banquet, the evening's entertainment was delightful. The Twin Cities' Comedy-Sportz troupe was hilarious as they "volunteered" members of the MAPPA board to participate in their comedy skits.

Wednesday morning the conference wrapped up with breakfast and self-guided tours and shopping. A special thanks goes to our educational programs and host committees whose hard work resulted in MAPPA discovering the Mississippi.

MAPPA will be "racing to Indy" next year so mark your calendars for October 1- 4, 2006 and plan on being in Indianapolis.

* * *

Central Region

Vickie Younger
CAPPA Newsletter Editor

Three hundred thirty-six members, business partners, guests, and other friends gathered September 16 - 21, in Little Rock, Arkansas, for the 2005 Annual CAPPA Conference. This exceptional meeting was hosted by Dave Millay and his high performing staff at University of Arkansas–Little Rock.

The conference began on Friday with the executive board meeting and 24 participants in the APPA Supervisor's Toolkit. Committees gathered early Saturday morning for a group breakfast and were addressed by Darrel Meyer and Dave Millay, giving committee members both direction and encouragement for the coming year. We are very fortunate to have such great work coming out of our regional committees.

CAPPA Conference attendees tour Little Rock and the Clinton Library.

The Little Rock folks sure know how to have a good time and showed us many of the highlights of the area by hosting a golf tournament, Little Rock tour, rafting expedition, Clinton library tour, and Sunday night football just in the first day. They brought the pre-conference events to a climax with a great welcoming reception hosted by Custom Energy.

Monday and Tuesday were filled with high-quality educational opportunities including such topics as LEED certification, Recycling Electronic Waste, Mixed Space Use on the University Campus, Green Cleaning Strategies, Zone Cleaning, ADA: Beyond Access Compliance, Utility Billing and Cost Allocation, Low Temp/Low Flow HVAC, and Elevator Maintenance: Making the Low Bid the

UALR staff welcome conference guests.

Right Bid. UALR gave very interesting campus tours after a warm welcome by Chancellor Milazzo. The tours had a unique twist in that you were able to take an actual walking tour or a virtual tour. Others headed to the sports complex with anticipation of exciting things to come. The Razorbacks (the other Arkansas school) played University of Southern California while we were in Arkansas. Overall the weather was perfect, the people were beautiful, and we had a grand time that will be remembered for years to come.

Other information to report includes individual membership at

APPA Supervisor's Toolkit attendees check their communication skills.

645 and institutional membership at 197 with recruitment efforts continuing strongly. Technology 2005 had over 150 in attendance and included the Supervisor's Toolkit for the first time and offered an highly rated custodial program. Scholarship information was put out and a new push for drive-in workshops will begin. Information Services has to be commended for their outstanding efforts for improving the website and ease of registering on line. In the background of the website is an Easy Post function which allows host schools and board members quick reporting of registrants and event numbers. Darrel Meyer passed the gavel to David Millay and wished him much success with the coming year.

Darrel and Jane Meyer enjoy a ride down a lazy river with their guide Jeremy.

During the banquet, Supervisor's Toolkit graduates were recognized; Jane Meyer received the Newsletter award; Scott Turley, Bob Rau, and Kerry Cejka were given Certificates of Meritorious Service; Terry Major, David Gronquist, and Haley Lacy were given President's Awards; and Al Stoverink and Art Sykes were honored with Distinguished Member Awards. We are so proud of the accomplishments of our members. It has been a very good year.

* * *

Rocky Mountain Region

Tommy H. Moss
RMA President

The 53rd RMA Meeting was held September 11-14, 2005 in Vail, Co. with the theme of "Turn a new Leaf". We chose this theme because it's what goes on in the fall in our beautiful mountains. When we arrive at Vail, Co. the aspen leaves were in the process of turning from their rich green color to a vibrant gold color. This color change makes the aspen trees stand out among the greenery and pines in the Mountain countryside. The conference was held at the Vail Marriott, nestled at the base of Vail Ski Mountain.

APPA representatives attending the meeting included APPA Executive Vice President Lander Medlin and APPA President Jack Colby who addressed the attendees at the Tuesday morning breakfast.

The conference started Monday with a Golf tournament at Cotton Ranch Country Club, a Pete Dye course that can be challenging for any golfer. The majority of course is similar to a valley course, but there are three holes located on side of a mountain with a lot of drop off. For those who didn't golf you had the opportunity to go on a jeep tour. Participants rode in an open-air jeep through the White River National Forest around the Camp Hale Area. Camp Hale is the National Historic Site of the 10th

Camp Hale—the National Historic Site of the 10th Mountain Army Division.

Mountain Army Division. While some were relaxing in the mountains, registration was taking place on Sunday and Monday. Monday evening the Business Partners opened exhibits and hosted a reception and social hour.

With the leaves beginning to turn in the Colorado high country and with changes being seen daily in our institutions, this was a very timely theme. The Forum began building on the theme with the keynote address by John Jenson, who spoke of how

The bridge on the Jeep tour.

Keynote speaker John Jenson.

institutions should inspire by coaching and mentoring others in the direction of good. He also discussed how to get members to become stronger and more compelling leaders. During the next two days participants were able to attend educational sessions on many diverse topics. Some of the topics included: How to Get Involved with CFaR, Irrigation Design Considerations for Alternative Water Sources, Developing a Sustainable Building Program Based on the LEED? For Existing Building Rating System, Creative Ways to Accomplish Deferred Maintenance, APPA Supervisor's Toolkit Minimodules, and The Human Connection—Presentation/ Communication Skills Workshop. With a total of 16 individual sessions offered, participants were able to take back to their respective institutions useful and current information.

Tuesday evening social events were based on the Vail area heritage from the Bavarian Alps of Europe. Helmut Fricker played his Zappon and sang songs with his band. Highlight of the evening was Jack Colby playing the fluggel horn for us.

Wednesday evening had light entertainment at the social hour by Sal Mancini before dinner and our awards banquet. At the dinner the new officers were installed by Jack Colby. They are, Dave Brixen, Senior APPA Representative; Mark Shively, Junior Representative; Tommy H. Moss, President; Eakle Barfield, First Vice President; Mary Vosevich; Second Vice President, Kevin Hansen Third Vice President; John Morris, Secretary/Treasurer; Joseph Metzger, Newsletter; George Stumpf, Awards & Recognition Committee Chair; Nancy Hurt, Membership Committee Chair; Lorenzo Cotton, Information & Research Committee Chair; Dave Button, Professional Affairs Committee Chair; and, Polly Pinney, Educational Programs Committee Chair.

Awards were presented to the following. Business Partner, West Inc., Award, Val Peterson Award, Mary Ellen Monroe, University of New Mexico, The Golden Nugget award was started to recognize universities registering the most participants at the conference. The 2005 recipients were Colorado College (enrollment under 5000), University of Colorado Health Sciences Center (5000-10,000), and Salt Lake Community College (over 10,000).

Special thanks go to a committee that put on an excellent program. They are Christine King, J.E. Dunn Construction, Chuck Gumeson, Gordon Gumeson & Associates, Lisa Jelliffe, Slater Paull Architects, Erik van de Boogaard Mesa State College, Rick Tonnessen, Western State, Al Mages, Fort Lewis College, John Morris, University of Colorado, and Colorado State University Representatives Nancy Hurt, Amy Kugelman, Jim White, Gene Stroh, and Steve Hultin. A high five to organizer extraordinary Jackie Lindsay.

The dinner closed with a barbershop quartet, The Kowalski Twins, performing their unique version of songs.

The RMA 2006 Educational Forum will be held October 16-18 in Billings, Montana. See you there!

Helmut Fricker and Jack Colby provide the entertainment for Tuesday evening's social events.

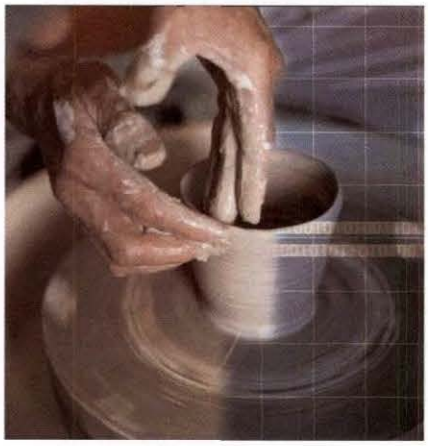
Shaping Ourselves for the Future

by E. Lander Medlin

"Just imagine what it would feel like if your job was being totally reshaped right before your very eyes? Well, it is. That's right! The look and feel of our jobs, our organizations, and our institutions has changed dramatically and is continuing to change right before our very eyes. It's stunning! Therefore, we must reinvent ourselves; we must reinvent our organizations; we must explore new ways of thinking; we must explore new approaches to doing our business; we must be problem-finders and not just problem-solvers. Our roles are shifting and, even more importantly, the education community needs our best efforts.

Like our jobs, the driving forces and competing pressures of today's world are converging to significantly reshape higher education. I have stated several times over the past year that our regents are worried about accountability; our presidents are worried about accessibility; our vice presidents are worried about affordability; and we (educational facilities professionals) are worried about the continued viability of the physical infrastructure. The Association of Governing Boards' public policy paper series corroborated that statement in its recent piece identifying the top ten issues for this academic year:

> "Higher education leaders are focused on the price of tuition, soaring enrollments, and new demands for accountability to the public. . . . What is different now, in addition to the anxieties all of us feel, is a sense among those of us who follow the public-policy debates that higher education appears to be struggling to hold its own ground. . . whether higher education effectively makes its case. . . . It does not feel as though we are making progress. . . (the appropriate response) about how to maintain higher education as a worthwhile public investment. . . (we) will need to articulate the fundamental value of a vibrant and vigorous system of higher education."



It is indeed like Charles Dickens said in the opening of his book, *A Tale of Two Cities,* "It was the best of times and it was the worst of times." For us, it is the best of times given increased, even burgeoning, enrollments and the public's unquestionable recognition of the value of a college degree. However, it is also the worst of times given the unprecedented decline in funding support from the state and federal governments and untenable congressional scrutiny around college costs and business practices. It is sad to think that our public institutions have gone from being state-sponsored to state-assisted to state-located institutions.

Beyond the status of just the education community to that of the global economy, the Business-Higher Education Forum stated:

> "Jobs that were once thought to be untouchable in this country now gravitate overseas, and, as a result, America's technological dominance is being challenged. . . (our) prosperity is tied to the health of the international economy. . . (yet) The age of globalization is producing transnational problems ranging from terrorism to infectious disease to climate change that spill across borders and frustrate the best efforts of governments to control. . . Americans now live in a world in which the American homeland is the planet."

A recent pundit captures the conundrum we face and depicts a worldview that is ever present (much of the disparity and discordance) in the world we live today.

> "We have taller buildings, but shorter tempers; wider freeways, but narrower viewpoints. We have more degrees, but less common sense; more knowledge, but less judgment; more experts, but more problems; more medicine, but less wellness. We've learned how to make a living, but not a life; we've added years to life, not life to years. We've done larger things, but not necessarily better things. We've learned to rush, but not to wait. We plan more, but accomplish less. We have more acquaintances, but fewer friends; more effort but less success. We build more computers to hold more information, to produce more copies than ever, but have less communication. These are the times of more leisure and less fun; more kinds of food, but less

Lander Medlin is APPA's executive vice president. She can be reached at lander@appa.org.

nutrition. It is a time when there is much in the show window, and nothing in the stockroom."

Frankly, the cynicism can be staggering. Unfortunately for many of us, it all seems impossible, even feels impossible, to turn around or to overcome. Yet, we cannot succumb to these thoughts, this attitude or belief that all is lost; that it's just too impossible to change. The unseen forces of our belief system are powerful and can actually shape our thinking and responses to such situations. Will we be a positive force for change?

One clear example of the power of our belief system is that of the 4-minute mile. Up until 1955, no one in the world, including members of the medical community, believed it was humanly possible for a runner to break the 4-minute mile. However, in 1955 Roger Banister did just that, he ran the mile in under four minutes. He did the impossible! In that same year, three more people did the same thing and within two years 17 people had accomplished the same feat. Lance Armstrong is another example, in the bicycle sports community, of someone who did the seemingly impossible.

The unseen forces of our belief system are powerful and can actually shape our thinking and responses to such situations.

All that changed is what they believed was possible. Therefore, you have to think creatively enough, believe passionately enough, and engage actively enough to overcome the forces in your belief system that hold you back. As leaders at our institutions, the same holds true. So what should we believe passionately to aid in our success at work?

- ***Believe passionately in what we do/our jobs***—Consider the priest who stepped onto the construction site of the church building project and approached four workers. He asked each of them to tell him about the work they were doing. The first said, "I am chipping stones"; the second said, "I am building a wall"; the third said, "I am erecting a cathedral"; and the final gentleman said, "I am advancing the kingdom of God on earth." All were engaged in similar work activities on this project; each of them had a different perspective about their jobs, their contribution, their work performance. What is your perspective? Is there fire in your belly or has the pilot light gone out? You can't instill passion in others if it's not in *you* first and foremost. Just think of the awesome responsibility each of you has on your campus. You create that sense of place, that sense of community that enhances learning

both formally and informally. You have a demonstrable impact on the educational process. Frankly, you're changing the world one student lifetime at a time. You're building our children's future.

- ***Believe passionately in your people/your staff***—Your impact on your staff is no different than the impact a teacher has on his or her students. The famous study done by Harvard in 1964 later called the "Pygmalion Principle" identified the impact a group of teachers had on their students' IQ and achievement just by being told that all their students were gifted. Their expectations were high and they taught them as if they were intellectually gifted students. Their expectations were met and in some cases exceeded. The same goes for you and your staff. You can have an unbelievable impact on their performance.
- ***Believe passionately in a brighter future***—We must be incurable optimists. No one wants to follow you into a bleaker future. We must understand and identify the fears we all have about the future and still press on with necessary changes to ensure that brighter future is achieved. However, we have to exude confidence in our ability to lead folks to that brighter future. Lou Holtz, head coach for NCSU, was considered the "turnaround coach." No matter if the team was down two touchdowns and all seemed for naught, he would clap his hands and say, "That's okay—we'll come back!" And he meant every word. Those players believed in him and followed him. Your staff believes in you and they look at you and your face to get clues in how they should respond.
- ***Believe passionately in yourself***—The statistics say that we engage in negative self-talk 75 percent of the time. The mental tapes we play in our heads script our outward behaviors. Earle Knightingale of Knightingale-Conant (the largest producer of audio educational cassette tapes in his time), said that one of the secrets to life's success is, "We are what we think about!" What do you think about day-in and day-out? What are you projecting to your staff? Ultimately, we have a choice in what we believe. Life changes when we choose to believe we can change it!

Your impact on your staff is no different than the impact a teacher has on his or her students.

So how can APPA help you with some of the changes you need to make?

- ***Utilize Available Information and Benchmarks to Your Advantage***—
  - ✔ THINK "Facilities Performance Indicators"—Data and information gathered from the most recent, highly successful facilities core data survey and correlated with SAM, the Strategic Assessment Model. By utilizing this data as a baseline and/or comparing and contrasting the data with other institutions, you can dramatically improve your organization over time.
  - ✔ THINK "CFaR"—APPA's Center for Facilities Research—when it comes to research on our most pressing facilities issues. APPA is in the final stages of completing two research projects that will be important information for you to have.
    - ❖ The first project is called the "Asset Investment Strategy: A Framework for Integrated Facilities Decision Making" and is focused on the development of a comprehensive framework for

understanding the total cost of ownership of our educational facilities and for making strategic, integrated decisions about facilities by senior institutional officers.

- ❖ The second project is called "The Impact of Facilities on Student Recruitment and Retention," which received enormous participation from the spring 2005 survey by collecting over 16,000 student responses across 46 institutions. Although much of the data remains to be analyzed, it is clear that facilities play a key role in the selection process by incoming students.

- ***Train and Develop your Staff—***
  - ✔ THINK "Supervisor's Toolkit" which is APPA's newest educational offering to support the facilities organizations initial, important supervisory training needs. This week-long program is offered at the same time as the Institute for Facilities Management (September and January of each year) or can be delivered to you at your time and place of choice as well. Remember, the only thing worse than losing a long-term employee is to never have trained that employee in the first place.
  - ✔ THINK "Institute" and "Leadership Academy"—both these educational programs offer an enormous training opportunity around the body of knowledge of facilities management and the necessary leadership skills required for growth and development at all levels of the organization. This training is essential if we are to successfully move from being great maintainers of things to becoming great leaders of people.
- ***Develop Yourself—***
  - ✔ THINK 2006 Joint Conference with APPA, NACUBO, and SCUP in Honolulu, Hawai'i next July 8-11 to increase the awareness of the facilities profession with senior institutional officers.

Goethe once said, "Knowing is not enough, we must apply. Willing is not enough, we must do." Therefore, it is more important than ever before that you:

- ***Become Engaged and Involved in your Association***—You will develop your management and leadership skills immeasurably and you will establish a rich network of relationships that will prove invaluable over the life of your career.

Remember, your job isn't about just building buildings. Your job is ultimately about building our children's future by making each student's seemingly impossible dream of a college education a possible reality.

Taking the Bull by the Horns

by Brooks H. Baker III

Some of you may recall that I grew up on a cattle ranch in Alabama and enjoy sharing some of the experiences of my youth and what I learned from them. When I was a teenager, I was out one day repairing fences, a very common chore on a cattle ranch. On this particular cold and windy day, I was repairing a fence that was constructed of hog wire that was four feet tall and barbed wire above the hog wire nailed to railroad cross ties. The fence was constructed in this high-strength manner because it was where we kept our bulls during their "off season." The fence was built very strong so that the bulls could not easily tear it down and get into the herd of cows where they tended to really enjoy the conversation with the females more than with each other (at least that's what my Mom always told me).

This particular fence had suffered from a falling limb which had knocked out quite a few staples. I was bent over, working on the bottom part of the fence, hammering staples into the wooden post, and unfortunately not paying much attention to what was going on around me. As I was in this bent-over position with a hammer in one hand and a staple in the other, I was surprised by a sharp pain in my backside as my feet left the ground and I sailed completely over the fence. As I was lying there on the ground and looking up, I saw two large brown eyes and 2,000 pounds of Black

Angus bull looking down at me with a rather amused look on his face. Fortunately, he was one of our friendly bulls who normally behaved without malice, and I believe his question was "wanna play?"

That memory is brought to mind on many occasions when similar experiences occur regarding codes and standards and the process by which they are established or modified. Many times I have been happily working away here at my job at the university when a notice comes across my desk like the one telling me that now I have to replace all of my hydraulic elevator cylinders with some expensive replacement as a result of a new standard that someone thought was a good idea. I suddenly felt that sharp pain in my backside again as I was looking at the new requirement, which caught me totally by surprise.

Just a couple of months ago, we were informed by our Local Authority Having Jurisdiction (LAHJ) that the wiring for the fire pumps in two research buildings under construction was not in compliance with a requirement of NFPA 70. We questioned this and our design engineers who do work all over the country had never seen the code interpreted in this manner. But when we contacted NFPA (National Fire Protection Agency), the response was that with the wording the way it is, the LAHJ may interpret the code that way. As a result, we had to spend tens of thousands of dollars removing the electrical services in the fire pumps and pulling new service to them. Once again, I felt that sharp pain in my backside as I was looking up into the figurative eyes of that 2,000-pound bull again.

It looks like we are about to be surprised again. New requirements outlined in the proposed 9th Edition of UL864 are apparently moving forward creating "proprietary systems" that will prevent us from being able to utilize devices in fire alarm systems unless they are specifically listed for and by that manufacturer and model of system.

What this means to us as owners is that when we need to go back and add notification appliances or detection devices on a system, we cannot do so unless that particular control panel is listed with that particular device or appliance. If we have a renovation project and the fire alarm system is, let's say, 15 years old, we will experience great difficulty in finding devices or appliances listed for a newly listed fire alarm control panel. The new panel will most likely require us to remove all the notification appliances and four-wire devices, as they will not be "compatible" with the new front end of the system.

The question will no longer be if it meets the criteria required to function from a design standpoint, but will shift to just a question of UL labeling for specific devices. The technical aspects of this are too detailed for a short discussion, but I am told that this requirement may severely limit our opportunity for competitive

Brooks Baker is a Past APPA President and the associate vice president for facilities at the University of Alabama, Birmingham. He can be reached at bbaker@fab.uab.edu.

The bottom line is that we need to be paying attention to what is going on in the confusing world of codes and standards.

bidding; it will surely lock us into one manufacturer for the life of the system, even though what we have installed in the past functions perfectly well and meets all installation codes and standards. Based on these newly proposed requirements, it is our understanding that retrofit projects will become very expensive, maintenance contracts could escalate, replacement parts could become expensive, and for what?

What can you do to stop all of us from feeling that sharp pain in the backside which we periodically get by surprise when something has gone awry in the codes and standards process?

October 2005 was the last meeting of this cycle for the members of the National Fire Alarm Code Technical Committee on Testing and Maintenance of Fire Alarm Systems. Each of the NFPA Codes is on a revision cycle of approximately three years, and the committee with responsibility for oversight of these codes meets two or three times during that three-year period. The committee meets to review changes, additions, or deletions to the code as recommended by the public and to recommend changes that the committee deems appropriate. Hundreds of public proposals may be received and each must be carefully reviewed and addressed by the committee. This process can be rather laborious and at times tedious, but it has a significant opportunity to impact our construction and operating costs.

Being a long-time member of NFPA 72 Testing and Maintenance Committee has provided me many opportunities to tell the owner's side of the story when discussing the pros and cons of implementing new requirements or modifying old requirements of the code. Our particular committee is made up of a reasonable and cooperative group of individuals who typically do not allow their emotions to override their common sense. Without representation from the owners of facilities, people like you, we are missing an important voice at the codes and standards tables.

The bottom line is that we need to be paying attention to what is going on in the confusing world of codes and standards. As individuals we need to be watching publications that inform us of impending changes to the various and numerous codes and standards that impact our facilities and our institutions. We then should communicate these back to the APPA office so that we can disseminate information to the membership for possible action.

We need representation on committees that are important to our industry. We currently have opportunities for representation on NFPA 110 which deals with emergency power. This would be a good opportunity for someone to get involved and to have an impact on the cost of our facilities. We would like to have someone representing the interest of higher education on the NFPA 101—Life Safety Code and on several ASHRAE committees. Now is the time to let us know of your interests and we will begin the process to provide opportunities for involvement.

There may be a misconception that most codes only apply to new construction and they will not impact the responsibilities and work of those responsible for plant operations. Codes and standards do impact almost every feature of new construction, but they also impact our plant operations extensively. For instance, testing and maintenance of fire alarms, sprinkler systems, fire pumps, emergency power systems, means of egress and other parts of our built environment are all addressed in various codes and standards. The cost of operating a building is impacted significantly by the frequencies and procedures which are required. That is exactly the reason I chose to participate on the Testing and Maintenance Committee of NFPA 72.

Be knowledgeable about codes, be in compliance, and be a participant! If you wish to know more about how you can help APPA membership through participation in codes and standards, contact our Vice President for Professional Affairs Alan Bigger at alan.s.bigger.1@nd.edu or you can contact me at bbaker@fab.uab.edu.

Effective Leadership

by Jim Barbush, P.E.

What comes to mind when you think of being effective in anything? Without looking into a dictionary for a definition, I have considered this word "effective" as related to what I have been learning over the past few years after having attended various leadership seminars, read various books on leadership, and read articles that have been published in APPA's *Facilities Manager* since 1998. I have considered my effectiveness as a leader, the effect I am having on people and organizations.

The opportunity to write this article has caused me to do some additional soul searching to determine if I am indeed being an effective leader. In that searching, I also want to provide you with thoughts to consider for application to your life in your quest to be an effective leader.

So often, when I am reading a book about leadership, my first reaction after reading a thought is to apply it to my workplace, a place that includes the Pennsylvania State System of Higher Education, ERAPPA (Eastern Region of APPA), and APPA. These are places where I spend a major portion of my life. I have realized that it is so easy to overlook the application of learned principles to other areas of my life, such as the home front—my wife, our son at home, our son at college, our three grown daughters, our two sons-in-law, our church, and wherever else I am called to be. Therefore, I am making a conscious effort to lead in all areas of my life, not just at work.

The best place for me to start this soul searching is with the definition of "effective." The Merriam-Webster Online Dictionary provides the following definitions: an adjective that means 1) producing a decided, decisive, or desired effect, 2) ready for service or action, 3) producing or capable of producing a result. As we look at these definitions, we need to ask: Are we producing a decided, decisive, or desired effect in and from the people we are leading? Are we ready to serve the people we are leading? Are we prepared to take appropriate action when leading, whether easy or difficult? Are we producing or capable of producing a desired result in and from the people we are leading?

There, we have the definition of "effective" and have asked some questions related to that definition. Now what? Do I now give you five pointers on how to be an effective leader, or do I further inspire you to make your own self analysis as to whether you are leading in an effective manner or not? I choose the latter because I believe we need to make a conscious effort to answer questions like these for ourselves, rather than simply read someone else's pointers on how to be an effective leader.

There's a ton of excellent material out there on leadership—books, seminars, mentors, examples walking before us daily. I have read and continue to read books that have been and are vital to my growth as a leader. I've been to excellent seminars that have greatly impacted me. I've watched leaders to see what they do well and what they do not do so well. We must never quit reading and learning, adjusting and fine tuning. We never fully "arrive." There is always another level to pursue. I encourage you to read much, attend a suitable number of excellent seminars, watch other leaders, and have a mentor. I leave that part of your growth in leadership to you. If you are not doing one or more of those, consider that you may be limiting your growth and the growth of those you are leading, and those you are supposed to lead.

Reading, attending seminars, having mentors, and making observations are great, if we apply their content directly to our lives. If we read a book and then put it in our library without further thought, then what have we really accomplished? If we attend a seminar and then file our notes and display our certificate of completion, then what have we accomplished if we do not apply some of the learned principles? We must take the time after the book is read and after the seminar is attended to see if and how

***Jim Barbush, P.E., is the facilities contracts manager at the State System of Higher Education in Harrisburg, Pennsylvania. He can be reached at jbarbush@ passhe.edu. This is his first article for* Facilities Manager.**

I believe that the effective leader must look at the definition of "effective" and determine how he is going to cause the desired results in a descent and productive way.

we can apply the learned principles to our lives. We must assess what we have been doing well, what we have not been doing well, and what we have not been doing at all.

To evaluate our effectiveness as a leader in any arena we are positioned, we must determine if we are producing decided, decisive, and desired effects; or are we in a state of indecision and producing undesirable results in the people and organizations that we lead? We must determine if we have fully prepared ourselves to serve in our various positions and are we ready to cause action that is desirable; or are we unprepared and causing distress to people and our organizations? These determinations show what kind of a result we are producing, whether positive or negative, whether inspiring or deflating, whether encouraging or discouraging.

No one of us is perfect. Not one of us does it right all the time and always produces positive results in people and our organizations. Mistakes are made and negative results do appear. Sometimes the leader causes the results, sometimes the ones being led cause the results, sometimes the whole team.

The question then is, what does the effective leader do when those negative results appear? How does the effective leader bring the people and the organization out of the negative results and redirect the path taken to one that will produce desired results? Every situation is different and must be handled accordingly. People's needs differ in how they should be managed and organizational needs differ in what is necessary.

So, there may be no hard and fast rules. I believe that the effective leader must look at the definition of "effective" and determine how he is going to cause the desired results in a descent and productive way.

How many leaders really think about how they are affecting people and their organizations? How many leaders consider the impact of how they are leading? How many leaders make adjustments in themselves and their styles of leadership, adjustments that are going to cause desired results? These are question that leaders need to consider. No matter what arena we are in at a particular moment, whether at work, at an APPA function, at home, at church, in our neighborhood, or wherever else, we are leading in some fashion. We are causing something to happen in that arena, whether positive or negative. We need to be conscious of that. We all affect our surroundings in our own special way at a particular moment. We need to do that "effectively."

I want to leave you with this: In the past year, I have read many of the articles on leadership that APPA has published in *Facilities Manager*. I started with one article: "A Legacy of Leadership" by Lander Medlin, *Facilities Manager*, Jan/Feb 2005. From there I was led to numerous other articles that were written since the implementation of APPA's Leadership Academy in 1998.

I have found an excellent resource for leadership development in what APPA has been providing. APPA's focus on leadership development has helped to fuel my own search and growth in the area of leadership. I hope that you recognize the same and continue your own growth in being an effective leader.

An Effective Leader:

MAINTAINS HIS LEADERSHIP AND IMPROVES LEADERSHIP SKILLS BY

- Being a continual learner. Growing though the reading of various leadership books. Attending training seminars. Observing other leaders to see what works and what does not work.
- Recognizing and feeding off the leadership of others.
- Having a standard of truth and holding to that truth.
- Seeking to discover what is holding his followers back from receiving his leadership. Making adjustments so that the non-followers within his sphere of influence will be able to receive what they need to accomplish the vision and not what the leader wants them to need to accomplish the vision.

ACTS IN HER ASSIGNED SPHERE OF INFLUENCE BY

- Positively affecting the atmosphere around her by his actions, words, habits, and demeanor.
- Adjusting to problems that adversely affect her, whether by correcting the problem or determining that a new direction is needed to achieve desired results, and then seeks that new direction. Not necessarily a total change but at times only a partial change in what is being done.
- Holding herself and other people accountable for their actions.
- Considering an apparently impossible and unachievable vision to be a possible and achievable vision. Recognizing opportunities and taking action, though with some risk at times, to help reach the vision.
- Recognizing, acknowledging, and attempting to correct one's own failures.

MULTIPLIES WHAT HE OR SHE IS DOING BY

- Giving away what has been learned.
- Encouraging others to excel in their spheres of influence.
- Sharing the results of success.

Big Change on Campus: A Futurist Looks at Trends in Higher Education

by David Pearce Snyder

I've been in the forecasting business since the 1950s. And when you listen to a futurist, you want to listen to an old futurist. Old futurists are humble. We've had a chance to make 20-year forecasts and then live up to the end of them and see that, "Oh-oh, that didn't work out the way I thought it would; let me try this again." I'm on my third generation of 20-year forecasts and, like anything else, if you do something often enough, you're going to get better at it. After nearly 50 years, I've become a pretty good futurist.

And today I'm here to talk about the future of higher education. Not about the institution itself, but rather the powerful forces in its operating environment. What's going to happen in the demographics leading into higher education? And what's going to happen with the technology? Are we in a technological revolution, or not? After all, it's been over 60 years since the first computer was switched on. Over half a century since Tony Weiner said that we would have paperless offices and John Diebold said that we would have a cashless society. Now there's a joke.

What was the last thing you all did when you left home to come to this meeting? You went to the ATM and you got a wad of 20s. And since then you've spent a lot of time trying to get change for your 20 dollar bills from people who also have pockets full of 20s, right? They've installed 450,000 ATMs all over the country, and what do we use them for? To get cash. We've certainly not become a cashless society. And how many of you are in paperless offices? Let me see your hands.

So there's been a big noise at the top of the stairs, but nothing has come down yet. Certainly no "revolution." That is particularly the way that people in postsecondary education see this moment, because the university has great continuity. It is one of the oldest institutions in Western civilization; it's older than Christianity. The first universities were invented by the Sumerians in 2500 BCE. The schools themselves were called "houses of wisdom," and the standard curriculum of the University of ancient Sumer included linguistics, theology, astronomy, mathematics, and something they called "medicine and the other magic arts."

So it has been 4500 years since the first university was established. Professional graduate schools were invented by the Egyptians about 200 years later, in 2300 BCE. The first public universities were started in Rome around 75 CE. And finally, the Brits invented fraternities early in the 18th century. Since then, not much has changed on the world's college campuses except—of course—that they have grown in size and multiplied mightily in number. Small wonder that academics tend to regard their institution, the university, as a timeless institution—an essential enterprise that has been a part of Western civilization almost since its beginning.

Indeed, because of its great antiquity, academics are disinclined to think that the university needs to change. It hasn't changed so far, so why change now? As a consequence, this institution, whose timeless purpose is to compile information and disseminate human knowledge, remains rooted in its 4500-year-old classroom-based, teacher-mediated instruction-

David Pearce Snyder is a consulting forecaster and contributing editor for* The Futurist *and is based in Bethesda, Maryland; he can be reached at david@thefuturist.com. This article, his first for* Facilities Manager, *is adapted from his keynote address presented at APPA's 2005 Educational Facilities Leadership Forum in Orlando, Florida. Many thanks to Siemens Building Technologies for sponsoring this keynote address.

Snyder

al paradigm in the face of a cornucopia of powerful new information technologies (IT), and a growing torrent of new knowledge. And this poses a problem, not just for the university, but for society itself.

At a time when there is universal agreement that postsecondary education will be crucial **both** to personal success **and** national prosperity, our labor-intensive, capital-intensive colleges and universities have experienced a 300% rise in tuition over the last 25 years; twice the rate of inflation! Average college tuition today now amounts to two-thirds of the average annual income of the one-third of all U.S. households that earn less than $25,000 a year. As a result, a growing number of observers, including the Federal Reserve's recently retired Alan Greenspan in testimony before the U.S. Congress, have asserted that there is a growing gap between the haves and the have-nots—the rich and the poor—in the United States. In particular, the increasing concentration of income in the hands of the top 20% of all households is widely attributed to the soaring costs of college tuition. If Mr. Greenspan and like-minded economists are right, higher education has now become a *reinforcer* of economic class disparity in America, rather than, as it once was, the source of upward mobility in our society.

This perception has led some in Congress to demand that a cap be applied to restrict annual tuition increases to no more than the average national rate of inflation. Meanwhile, market-savvy for-profit postsecondary schools, using low-cost part-time faculty and conveniently-sited commercial buildings, have been capturing a growing share of the higher education market. From 1991 until 2001, the number of for-profit, two-year campuses in America went from 271 to 483, a 78% increase. By comparison, the number of public and nonprofit two-year schools rose from 986 to 1075, a 9% growth rate.

The number of four-year, for-profit schools in America rose from 79 to 194 during the 1990s; that's a 266% increase in ten years! The number of public and nonprofit four-year institutions rose from 595 to 613 institutions during the same period; an increase of only 3%. Degree program enrollees in all for-profit higher education rose from 230,000 students in 1991 to 366,000 students in 2001, a growth of 59 %. The number of degree program enrollees in all public and nonprofit higher education rose from 10.5 million to 11.2 million, a growth of 6%. And the for-profit share of the two-year associate degree market went from 19% to 29%.

Most strikingly, among all four-year degree students, the market share of for-profit schools rose from 3% to 10%. Since 2001, it has risen to 12%. So there are aggressive competitors out there—for-profit schools—that are going after a market that has traditionally been served by public and nonprofit universities and colleges.

Demography is Destiny

Higher education will also be confronted with several problematic demographic realities during the next 10 or 15 years. To begin with, as the Baby Boomers enter the *exit level labor pool*—workers over 55 years old—more than one-third of all postsecondary faculty and administrators are expected to retire in the decade ahead. In addition to that, one-third of all janitors, building maintenance workers and grounds keepers will also retire over the next ten years.

At the same time, the *entry level labor pool,* those 19 to 29, will grow very slowly because they will be drawn from the last half of the "Baby Bust" generation—those who were born during the low birthrate years between 1965 and 1984. As a consequence, the Bureau of Labor Statistics (BLS) forecasts that there will be a general labor shortfall in America of between 3 and 4 million warm bodies by the time we get to 2015.

Meanwhile, the Baby boom "echo"—the children of the Boomers, born from 1985 to 2002—will be entering college and swelling enrollments. The forecast is for a 2.5 million increase in students and a 600,000 increase in the number of new postsecondary faculty and administrative staff between now and 2015. You are in a growth industry. But in such a tight labor market, America's labor-intensive institutions of higher education will either have to import hundreds of thousands of new faculty over the next ten years, or replace their retiring faculty with some kind of instructional technology.

We commonly talk about how dependent the United States is on foreign oil, and worry that two-thirds of our petroleum is imported. Are you aware that one-half of all new hires in America during the last 15 years were foreign born? We have imported half of our workforce growth since 1990! So we are dependent on immigration. But since the September 11, 2001 attacks, the United States has instituted a number of visa restrictions. As a consequence, there has been a 25% decline in the number of foreign student visa requests since 2002. And that could be a problem for American higher education, because we are already heavily dependent on foreign graduates for faculty—especially in the sciences, engineering and mathematics.

Now, while the demographers tell us that there is going to be a labor shortfall, most of us have read reports saying that the baby boomers don't plan to retire any time soon. AARP has surveyed its membership—folks in the workforce over the age of 50—and asked when they planned to retire. And two-thirds of the boomers told them, "What, retire?" Half of them said they intended to keep on working until their 70s, and a quarter of them said that they intended to keep working into their 80s. "And by the way," many asked, "why have you made me a member of the American Association of Retired

Persons, since I'm not retired?" (This explains why the Association recently changed its official name to *AARP*.)

So yes, the evidence indicates that the boomers are planning to "age on the job." And, as a consequence, we'll see that the average age of retirement will rise sharply. The average age at retirement in 1985 for the United States was 58. The average age at retirement today is 61. And the current projection from the BLS suggest that by 2015, the average American will retire at 67. So we're all going to work longer, and that's all right. Because we are not only living longer, we're living healthier. Our morbidity rates are down, as well as our mortality rates.

On the other hand, we also understand that the warranty will ultimately expire on the our parts and that the Boomer-faculty will eventually retire. At that point the issue of replacing them will become pressing. Now, as I say, we could import replacements, although the prospects for importing large numbers of graduate students have become problematic. The other alternative would be to use technology to improve the efficiency of higher education. In that manner, we might also be able to reduce tuition and make it possible for more Americans to afford a college education.

Coming Soon, To a Future Near You

There are numerous new, off-the-shelf technologies available to us at this moment. The fact of the matter is that the reason we aren't cashless and paperless yet is that technological revolutions simply take a long time. Historians tell us that it takes about 75 years between the invention of a new technology and its complete assimilation into a nation's economy. And during its first 50 years, a new technology has little positive impact on economic performance. In fact, a new technology actually serves as a drag on an economy's performance until it is mature.

New technologies typically mature in about 50 years, and we saw that happen with computers—right on schedule! Productivity improvement rates in the United States slowed between 1973 and 1995. And as a result of that, the actual compensation rates in America —average U.S. wages—fell 15% from 1971 to 1995. But the computer turned 50 in 1996, and U.S. productivity improvement rates doubled in one year. By 2002, productivity had doubled again and wages had risen sharply. Between 1970 and 1995, U.S. economic productivity rose an average of 1.3% annually. Today, we are running at over 4% a year productivity improvement—nearly a three-fold increase. This is a tip-off that tells us, "Aha!" Information technology has now reached maturity, and from now on we will experience high productivity-improvement rates and correspondingly large structural job losses as we get better and better at using IT to replace people. Let me just give you some examples of what I'm talking about.

Frictionless transactions—We know that when we make a transaction over the Internet, it has an overhead processing cost of 1 cent. The same transaction in the form of a check has an overhead cost of $1.07. This means that every transaction that you switch from a check to the Net saves you a dollar's worth of handling and overhead. And we know that the banks intend to do just that, because they got Congress to approve something called the "Check 21" rule. Check 21 went into effect in October 2004, and permits banks to eliminate returning your cancelled checks as soon as their regional electronic bank clearinghouse is able to handle the work flow. Indeed, many major banks have already done this, suddenly and with little notice. Instead of getting your cancelled checks, you now get a sheet of paper with rows of tiny photocopies of the checks.

We are also moving to make more transactions cashless. Within 24 months, both MasterCard and Visa will introduce a service that permits you to put your **credit card number on your cell phone.** You will then be able to use your phone—properly equipped with Bluetooth wireless technology—to communicate with cash registers and points of sale. You won't have to pull out your credit card. You just key in a special code, your credit card number appears in the window of your cell phone, you hit the right cell phone key, and the transaction is complete with no paper, no plastic, no signature. They are going to call these phones "electronic wallets" or "*e*-cash." This will be useful and productive because *e*-cash will eventually be used for all toll booths, vending machines and parking meters. It's already done that way in Japan and Europe where they have had electronic wallets for years. This will reduce the cost of any kind of coin-metered activity. You won't have to collect money from the parking meter, the Laundromat, or the coin-in-the-slot timer that controls the lights on the tennis courts. Everything will be electronic. (The government of Singapore has announced plans to make the entire nation *cashless* by 2008.)

Debit cards instead of paychecks—A growing number of employers, especially public institutions, are paying their staff with debit cards rather than checks, because it costs much less to issue a debit card than it does a check.

We will also see increased use of **biometrics**—fingerprint readers or retina scanners—to pay for meals at the school cafeteria or to check out books from the library. The use of biometrics is going to sweep across college campuses over the next five years, as a growing number of vendors offer cheap systems especially appropriate for serving closed communities—like a student body. These bio-pay operations are very cheap to set up, they cut the transaction costs for both vendors and purchasers, and speed up the transaction time. It's a good move.

Then there is **paperless procurement**. The average overhead cost of a paper purchase order in the private sector is somewhere between $50 and $75. The overhead cost of a paper purchase order in the public sector is around $125. There are online purchasing services specifically targeted at educational institutions that will take over a school's procurement of supplies and equipment. These services can reduce the average overhead cost of a paper purchase order from $125 to $25—saving $100 on each and every acquisition!

There's also **Web telephoning** now, using VoIP, or Voice over Internet Protocol. College campuses have been pioneers in using the Internet for telephony. When Dartmouth installed its Web telephone system, it told its students to call home as much as they want. "We're not going to charge you; the overhead cost of Web telephoning is so low that it would

Continued on page 32

Revolution

Introducing FacilityMAX™

MAXIMUS®


Evolution is inevitable...
Revolution is inspired...
Inspired by emerging technologies...
FacilityMAX™ relies on pure Java technology and the latest J2EE specifications to deliver a complete Enterprise Asset Management software solution. Its ultra-lightweight design and open architecture offer true standards-based interoperability, enterprise scalability, and ease of deployment.
Inspired by the way you do business...
FacilityMAX™ was developed in conjunction with an advisory council of more than 20 of North America's most influential institutions of higher education. The result is a solution that enables higher education facilities officers to more effectively manage, maintain, and extend the life-cycles of mission-critical infrastructure and physical assets.
Inspired by a tradition of success in higher education...
MAXIMUS solutions help more than 1,400 educational institutions throughout North America to improve operations and streamline business processes. Today, more Carnegie Research Universities rely on facilities management software solutions from MAXIMUS than any other vendor in the market.
Inspired to learn more?
Contact a MAXIMUS representative today at (800) 659-9001, or visit us on the Internet at: assetsolutions.maximus.com.
• A 100% J2EE-compliant Enterprise Asset Management software solution.
• Manage operations and maintenance, capital projects, real property, utilities, and much more.
• Maximize asset lifecycles, improve productivity, reduce operating expenses, and streamline maintenance management.
• Integrate CAD, GIS and mobile computing technologies to obtain a complete view of your enterprise.
FacilityMAX™

Continued from page 29

cost us more to keep track of your phone calls and bill you than it would be to just let you call home whenever you want, as long as you want, over the Internet." Students and parents love it!

In addition, this means that you don't have to replace your old PBX. In fact, nobody *makes* new PBXs anyway, and the old ones are beginning to wear out. So growing numbers of institutions are switching over to the hardware and software necessary to convert their entire campuses to Web telephony. Now, there is *one* problem with VoIP. As our phones become integrated with the Web, using the Voice over Internet Protocol, we will also start to get spam over our cell phones. They call it SPIT—Spam over Internet Telephony. The industry is already working on filters to stop it.

Grid computing—is made possible by free software developed by the National Science Foundation, the same folks who created the Internet. Grid computing software—called the Globus Toolkit—can be downloaded, free of charge, off the Internet at www.globus.org/toolkit. This software permits you to mobilize all of the unused capacity from all of the computers on a single LAN—like a campus—so that excess computing capacity on the network can be used to process a wide array of additional data processing tasks.

Is there likely to be much spare computing capacity on a typical desktop computer? In the business world, the average computer typically only ever uses somewhere between 20% and 60% of its capacity, including its operating system, its memory, and its software. Grid computing software continuously "polls" all of the computers in a single network to find out how much spare processing time and storage capacity each has. You give the "grid" server tasks, and it automatically organizes uncommitted software, time and disk space to accomplish the assignment, even while people are using their computers for their own purposes. Grid computing doesn't interfere with ongoing operations, and cuts the cost of acquiring additional computing capacity by 30 to 55%.

Even better is **open source software** (OSS)—chiefly represented by Linux. OSS is available free of charge, whereas the software you get from Sun or Microsoft is proprietary; you lease it, you don't buy it. You pay a licensing fee for it every year. The typical public school system in a big city pays Microsoft $1 million or more a year for their leasing fees on the software that they use in their computers, while open source software is free. There are no licensing fees. (Amazon.com reports cutting its IT operating costs by nearly 30% simply by switching its computer systems from proprietary to open source software.)

Open source software was created by a consortium of 300,000 students and practitioners on all seven continents working voluntarily over the Internet—

free of charge—to create a superior family of software. OSS *is* superior software because it is very reliable, very fast, and very secure. It is very hard to invade OSS with malware or viruses. Last year, approximately 40,000 cases of malware were launched against Microsoft and none were launched against Linux. The open source movement has been growing rapidly, gaining market share every month since it first became widely available in 2000. Over 75 countries, including most of the EU, have adopted OSS for all public sector computing, and Massachusetts has just enacted legislation to standardize OSS for all public institutions—including schools.

The battle between open source and proprietary software will go on for the next five to seven years. When the dust settles at the end of the "SoftWars," most commodity programs—routine repetitive standard use applications—will be open source. Only specialty application software, specifically designed for particular organizations, operations or purposes, will still be proprietary. By the way, there is a center at Utah State University called the Open Sustainable Learning Opportunities Group (OSLO). These folks are certifying open source applications for postsecondary teaching and learning. They have a clearinghouse at http://oslo.usu.edu for all kinds of OSS programs that are already in use by higher education, and for reporting new developments.

"Groupware"—Growing numbers of teachers, from elementary schools through colleges and universities, are using Web logs (blogs) to augment their classroom writing activities. And they are using **Wikis,** free software that enables students to create dictionaries of terms they have learned. (Wiki is the Hawaiian word meaning "quickly"). Where students are required to learn a lot of new materials, class members can collaborate, using Wikiware to create a glossary of terms that everybody agrees are accurate and understandable. The *Wikipedia*, a user-created encyclopedia at www.wikipedia.org, went online January 11, 2001. Today, it has over 500,000 entries, the vast majority of which are not only highly accurate, but remarkably up-to-date. For example, if you go to the *Encyclopedia Britannica* on-line and look up "tsunami," you will get a solid scientific explanation, but it won't say anything about the tsunami that killed a quarter-million people around the Indian Ocean in December, 2004. In contrast, the Wikipedia entry on tsunamis has both a clear technical description of the phenomenon, plus news reports and video-clips of the recent Indian Ocean catastrophe.

Encyclopedias update their entries at a glacial pace, after lengthy reviews by peer scholars; the Wikipedia is updated the minute something newsworthy happens to affect any entry. A growing number of academics—and students—say that this is what they want for their reference systems. They don't want something that is stuck in the past—they want something that is dynamically upgradeable and always up-to-date. By the way, Wiki software is also a product of the open source movement, and Wikiware is downloadable free from the Internet.

The evidence is mounting that groupware tools such as peer-to-peer file sharing, instant messaging, Web logs, and Wikis do, in fact, make it possible for instructors to dramatically transform how they teach their students and operate their classrooms. It makes the individual student's use of the computer much more meaningful and much more substantial, because groupware gives faculty, assistants, mentors and advisors an active *presence* in cyberspace—along with assigned readings and reference sources. Groupware will become the crucial *social* infrastructure for the classroom, as it has already become the crucial *technical* "info-structure" for distance learning. Distance learning, in turn, will give local U.S. campuses access to potentially huge foreign markets, while confronting America's colleges and universities with yet another wave of competition, this time from foreign institutions.

Globalization

The General agreement on trade and tariffs (GATT), the political basis of the free trade movement, is not new. It was entered into by the United States and the world's other major countries back in 1948, as an earnest effort to avoid future global conflict. The reasoning was perfectly straightforward: If we all traded with one another, and we all became dependent on each other for specific goods and services that we could not produce ourselves, we would be less inclined to go to war with one another.

Although GATT was put in place in 1948, international trade didn't begin to increase until the early 1960s. It took that long for people—and businesses—to get used to the idea. Over the decades, tariffs have gradually been dropped on varying parts of the world's trade flow, primarily in commodities and manufactured goods. Then, with the advent of the World Wide Web in the mid-1990s, firms from the developing nations could compete for white collar information work projects in Europe and North America. The looming techno-economic realities are perfectly clear. Now that we're integrating the telephone system with the Internet, over the next five to seven years 2 billion people worldwide—one third of the world's population—will suddenly have access to the Internet; up from about 700 million now. Free trade and globalized enterprise will continue to expand as a share of the world's gross domestic product. Right now, almost one-fifth of the world's gross domestic product is in international trade, and that can be expected to rise to about one-third by 2025.

The emergence of a single electronic global marketplace will foster the ongoing consolidation of goods producers and service providers in all mass markets, and that includes higher education. You know, postsecondary education is not a public service in the U.S. as it is in most of the world. In the U.S., postsecondary education is a discretionary consumer purchase. You are in a competitive marketplace, and over the Internet, there will be burgeoning competition as local colleges and universities offer their products to the world on the Web. Moreover, as barriers drop between the individual

economies, there will be a general oligopolization of all mass markets, and that includes education. Huge college and post-secondary enterprises—public and private—will emerge. There will be mergers of smaller colleges, some disappearing, and some becoming franchisees or branches of large national and international consortia of higher education systems. There will also be growing low-cost foreign competition across the entire range of consumer and commercial goods and services—including higher education—forcing all mature industrial era enterprises worldwide to continuously cut costs and increase productivity to remain viable.

Higher education will be under increasing pressure to be more efficient, to reduce the cost of acquiring high value skills, and to improve your ability to compete in the global electronic marketplace. There will be an acceleration of "info-mation"—the automated capture, transmission, integration, retention, retrieval, application and disposal of information. This will eliminate mountains of routine paperwork and millions of paper workers from the U.S. workplace over the next 15 years.

Outsourcing the Campus

Speaking of workers, property management is also a pretty labor intensive operation. And, as I mentioned before, one-third of the nation's 6 million janitors and grounds keepers are expecting to retire in the decade ahead. And, what is

"Info-mation—the automated capture, transmission, integration, retention, retrieval and application of information—will eliminate mountains of paperwork and millions of paperworkers from the U.S. workplace over the next 15 years."

the fastest unionizing employee group in America today? Janitors! Because building and grounds maintenance operations will predictably be faced with growing labor problems, many employers will want to get rid of them. "We're not a union shop, so we don't want to employ union janitors. We'll outsource them to somebody else."

Of course, campuses have increasingly been contracting out their buildings and grounds work in recent years. But there is now a real likelihood that a growing number of college campuses will look at their financial circumstances and decide to sell off the campus and its buildings to a private property management firm or real estate investment trust (REIT), from whom they will lease the property back. In the process, they will be sticking the new owners with the costs—and labor headaches—of maintaining and servicing their plant and facilities in the years to come. Corporations have been doing this for years, but for a college or university, it's a stunning thought.

Whether or not they sell off their campuses, colleges and universities of all sizes will surely begin to outsource their administrative services—HR, purchasing, facilities management, etc. Firms that have done this say that they experience a 15% to 2% reduction in their overall operating costs by outsourcing their administrative services. As colleges and universities come under increasing pressure to keep their tuition costs down so that more people can get high value degrees, this is what you will also have to do. And since electronically-mediated instruction is proving to be an increasingly cost-effective way to impart a growing array of skills, campuses will become centers of e-learning.

Post-Industrial Universities

By 2010, most postsecondary institutions will deliver the majority of their course content electronically, either as distant learning material or as an augmentation of the classroom ex-

perience, as I have just discussed. Those institutions that do not switch over to this more efficient way of teaching and learning will be quickly regarded in the marketplace as old fashioned, and they will cease to be competitive. This will be particularly true for institutions whose faculty do not embrace the learning simulations and games that will flood the market over the next five years.

Life-long learning—Colleges and universities will also be able to use the Internet to maintain lifelong relationships with their alumni, who will increasingly rely on their *almas mater* to maintain, upgrade and alter their career skills in a continuously changing workplace. Now, this will represent a truly transformational breakthrough. Think back to the first teachers; back to Socrates, who expressed great frustration at not being able to follow his students out into life, to see how well he had prepared them for the actual circumstances of adult life. What were the good learning components of a course? What were the lessons that ought to be changed, etc.?

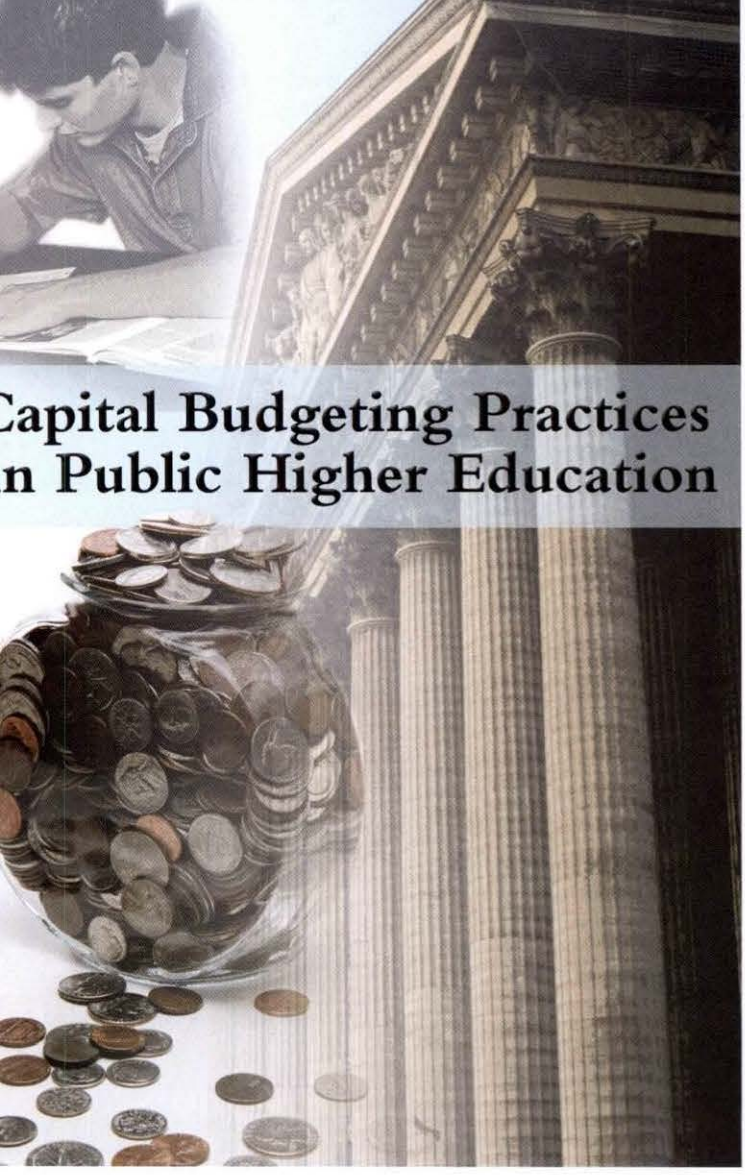
With the Internet, it is now possible for a teacher to maintain a co-learning relationship with his/her students into adult life. And, because we're going to be living through a period of massive workplace innovation and mid-career termination, there will be more and more people who will need to come back to school to get additional skills. And there will be more opportunities for graduates to offer experience-based feedback to their teachers. Most colleges and universities will seek to establish a lifelong learning *and marketing* relationship with their alumni, offering to up-skill them by distance learning or bringing them back to campus for summer refresher courses, etc.

In this respect, *higher education is about to become longer education*. But this is not the only fundamental transformation that higher education will experience over the next 2 decades. Maturing information technology (IT) will not only dramatically alter the delivery of higher education, it will even more dramatically alter its content.

A Technological Singularity

Some technology forecasters have concluded that the Information Revolution will be humankind's last techno-economic transformation *based upon a single technology*. All of the previous technology-based revolutions that have promoted human progress—beginning with the discovery of fire and the mastery of language, right on up to the present—have happened *one-at-a-time*. And each one of these innovations—including the steam engine and electricity—has produced a surge in productivity by changing the realities of the economic environment. This sequential historic scenario, some cosmologists believe, is about to "shift gears." Specifically, technophiles believe that once mature IT becomes ubiquitous and pervasive, it will permit us to "lift the veil of ignorance"

Continued on page 55



Capital Budgeting Practices in Public Higher Education

by Derrick A. Manns and Stephen G. Katsinas

This study finds that most states do not have a coordinated master plan for facilities to prioritize their needs given the limited resources that exist to address the economic and educational goals for public higher education. This is needed to address the potential numbers of new students, lifelong learning opportunities, and workforce development issues. Statewide priorities are needed to address the deferred maintenance challenge, especially in light of growing needs for upgraded laboratories, research equipment, and appropriate academic space.

Derrick Manns is associate vice chancellor for instruction, curriculum, and career programs for the Wayne County Community College District, Detroit, Michigan. He can be reached at dmanns1@wcccd.edu. Stephen Katsinas is director, Education Policy Center, at the University of Alabama, Tuscaloosa, Alabama; he can be reached at skatsina@bamaed.ua.edu.

If America is to provide sufficient access to higher education programs, a good infrastructure is essential, as the late Ernest L. Boyer of the Carnegie Foundation for the Advancement of Teaching recognized (Boyer 1981). Sadly, the sound practices that facilities experts have long suggested—comprehensive, periodic facilities audits, the creation of baseline data for institution and state master plans for facilities--is not occurring, despite the obvious need for such data to improve planning processes for chief executive officers, trustees, coordinating boards, legislators, and governors (Manns, 2001). Experts have also suggested that between 1.5% and 3% of the institution's operating budget should be devoted to facilities repair and renewal (Bareither, 1977; Kaiser, 1996). The conceptual approach of periodic, comprehensive audits starting at the institutional level and working up to the statewide master plan, may be termed the "rational" approach to facilities assessment, renewal, and funding. The budgetary and political processes that fund capital needs in public higher education are not always rational, however.

In 1989, APPA released a national assessment of the facilities challenge facing American colleges and universities. *The Decaying American Campus: A Ticking Time Bomb* (Rush and Johnson 1989) painted a daunting picture: The total replacement value of all U.S. higher education facilities was estimated at $300 billion, and 20 percent of these facilities required replacement costing $60 billion. One third of these replacement needs were classified as urgent (p. viii). A 1995 follow-up study estimated those urgent needs to have grown to $26 billion (Kaiser, 1996). Given the severity of the current recession's impact on public higher education resources, a conservative estimate is that deferred maintenance might rise by more than 25 percent (Williams June, 2003).

In 1998-99, one of this paper's coauthors, Derrick A. Manns, initiated a state level study to assess the facilities challenge. Manns (2001) study titled "A Fifty State Assessment of Capital Needs for Public Higher Education," was designed to complement the annual Grapevine survey of public higher education operating budgets initiated in 1958 by Illinois State University. The sources of Grapevine's data are the chief fiscal officers of state higher education agencies (SHEFOs). Founded by the late M.M. Chambers, and continued by Edward Hines and currently James C. Palmer. Grapevine is oldest independently collected, continuous longitudinal data set on public higher education in the United States (Palmer and Hines 2000). Its continuing popularity has much to do with its operational methodology that has as its base comparing state need to the relative ability and capacity of that state to invest in higher education. No effort has been made to gather information on private investments, grants, gifts, or bequests made to public colleges and universities. Although some capital funding may come from tuition and other sources, this study did not gather that information.

Methodology of the Present Study

The purpose of this study was to assess state budgeting practices for public higher education capital needs for the years 2000-2004. In Manns' 1998-99 study, A Fifty State Assessment of Capital Needs for Public Higher Education, SHEFOs were asked to report using the last available complete year, 1996-97. Since no major national study of its type had been attempted for several years, the 1998-99 study attempted to ascertain state policies, practices, and problems related to capital funding for public higher education. That study had an excellent response rate of 82%, or 41 states. In the fall of 2003, that study was updated, with some changes in the questions. Again an excellent response was obtained from 40 states (See Appendix A). The updated study also gathered data from the intervening years of 2000 to 2004, so as to provide a more complete picture of changes over time. As with the 1998-99 administration, the data collected on state tax appropriations for capital budgets were collected in a manner designed to complement the existing Grapevine database (Palmer and Hines 2000).

This study was limited to public higher education in the 50 states. Data were requested for all fiscal years from 2000 to 2004, to provide a more complete picture of changes over time, but many could not or did not provide 2004 data. The state higher education finance officers (SHEFOs) were designated as the officials most likely to respond to this study, as each state must have a designated person or staff responsible for collecting higher education information according to the Higher Education Facilities Act of 1963, as amended. When no SHEFO could be identified, the survey was sent to the chief executive officer.

A methodological approach modeled after the Grapevine studies was chosen for the following reasons: first, to allow for nationwide comparisons of the operating and capital budgets; second, to lay the foundation for a longitudinal database of state appropriations for capital needs that builds on the strengths of the Grapevine methodology, most notably the ability to compare funding effort and overall state capacity. The authors were also interested in the investments in capital needs of "fast growth" states—with double digit increases in high school graduates—since serving Tidal Wave II students is a major challenge faced in many states. It is important to note that this study collects only capital needs data provided by state or public funds. The two research questions addressed in this study are: 1) what decision-making, funding, and allocation processes are used to meet capital needs for public higher education across the U.S., and 2) to what degree are sound practices as described by experts in the field facilities management actually occurring in the states?

Results

Questions to obtain basic information about the decision-making processes for meeting capital needs for public higher education at the state level were initially asked. The majority of respondents indicated that:

- Their states do not mandate that their public institutions of higher education set aside general operating funds from the annual operating budget appropriations for renewal and replacement (90%);
- A majority of the states do not have a statewide facilities master plan (65%);
- Overwhelmingly, funding formulas are not used in the request phase by state higher education agencies to request funds for public higher education capital needs. Funding formulas are more likely to be used in the budget request phase for *operating* needs than for *capital* needs in a large majority of states (75%); and
- States lack comparative data.

The majority of states use some common mechanisms for deciding, funding, and allocating for capital needs in public higher education. No two states are alike, however, and legislatures generally allocate capital funds directly to higher education institutions without the use of formulas to allocate

these funds. When respondents were asked about the process used to allocate capital appropriations at the state level, the majority indicated that all or most of capital funds were given directly to the campuses from the state legislatures.

While legislatures in most states are willing to statutorily assign responsibility for preparing a unified operating budget request to state higher education agencies, they appear unwilling to relinquish a proprietary role over the budgetary request and allocation of public higher education capital funding. It may also reflect a desire on the part of state legislators to not delegate to the state higher education agency (and governors) political credit associated with investments in capital budgets.

Decision-Making Process. Of the 40 responding states to the question "Does your state mandate that its public institutions of higher education set aside general operating funds from the annual appropriation for renewal and replacement?", four states or 10% indicated that they did, but 36 states or 90%, did not.

Operating Funds Set Aside for Public Higher Education Capital Needs. The literature on facilities has long suggested that setting aside a dedicated percentage of operating funds for capital needs to be good management practice. In Kaiser (1982) suggested that institutions should set aside between 1.5% and 3% of their operating budgets for facilities renewal and replacement. When asked the question " What percent of operating funds are set aside for renewal and replacement in your state?" 25 of the 40 states (63%) responded. Of these 24, 20 states or 80%, set aside between 0 and 1.5% of their operating budgets at the state level for facilities, and 17 of these 20 set aside less than 1.0%, below what the literature suggests. Five states (21%) [MN, IL, MO, ND, VA] set aside 2.0% or more of their operating budgets for renewal and replacement of facilities. One state (VA) indicated that setting aside more than 5.1% of their operating budgets for facilities renewal and replacement.

Process Used for Capital Funding Allocations. There are many differences across the states with regards to appropriating funds for higher education facilities. Some legislatures appropriate all funds directly to the higher education agency (HEA), while others do so to individual campuses. If funds are given to the HEA, then to what extent are the funds allocated to the campuses? States were asked to respond to the question, "What best describes the allocation process in your state?" Thirteen states (33%) indicated that all or most of the funds allocated for capital needs at the publicly controlled institutions in their states were given to them by the designated state agency. Twenty-seven (68%) indicated that *all* or *most* funds for capital needs at the campus level were given to the institutions by the legislature.

Long-Range Facilities Planning and Facilities Audits. Facilities experts also advocate the need for long-range facilities master planning (Kaiser 1996). Instinctively, it seems logical that statewide facilities master plans would be good

TABLE 1 CAPITAL APPROPRIATIONS 2000-03

State	2000 Capital Appropriations	2001 Capital Appropriations	2002 Capital Appropriations	2003 Capital Appropriations
AL		26,284,404		
AK	3,450,000	69,424,100	2,965,500	29,665,500
AZ		0		0
AR	28,607,500	28,607,500	10,589,906	10,589,906
CA				
CO	123,908,000	61,000,000	6,722,806	519,779
CT	290,810,473	270,708,960	257,787,827	190,358,100
DE	30,500,000	29,000,000	20,000,000	13,000,000
FL				
GA	149,309,208	204,260,000	139,290,000	92,025,000
HI		219,515,000	84,044,000	22,804,000
ID				
IL	302,288,400	205,159,700	369,372,900	282,397,600
IN	169,609,029	175,329,908	153,266,181	178,266,181
IA	19,500,000	25,115,000	28,243,000	54,197,300
KS				0
KY				
LA				
ME				
MD	152,569,000	290,314,000	217,485,000	294,969,000
MA				
MI	175,100,000	235,400,000	138,900,000	41,600,000
MN	131,100,000		158,800,000	
MS				63,760,000
MO	92,843,020	140,042,937	0	0
MT				
NE	27,347,870	18,010,547	16,338,222	12,638,681
NV	62,307,996	62,307,996	64,137,442	64,137,442
NH				
NJ	0	0	0	0
NM				
NY				
NC	0	2,500,000,000	0	0
ND	8,155,000	8,155,000	7,660,000	7,660,000
OH	252,755,028	248,110,441	248,110,441	249,485,234
OK				
OR				
PA	40,000,000	65,000,000		65,000,000
RI	5,456,000	6,500,000	5,646,922	7,486,654
SC	89,000,000	0	0	0
SD		11,034,832		16,648,664
TN	83,000,000	15,400,000	49,500,000	18,000,000
TX				
UT	60,413,700	10,880,800	90,050,400	113,721,500
VT	3,000,000	1,000,000	3,000,000	1,000,000
VA	133,002,000	26,811,000	26,811,000	429,000,000
WA				
WV	33,570,000	35,337,000	37,197,000	39,155,000
WI				
WY	0	0	125,000	12,740,000

policy at the state level as well. When asked, "Does your state have a long-range facilities master plan for public higher education?," 14 states (35%) indicated a facilities master plan existed, while 26 (65%) did not. When asked "How often does your state conduct facilities audits?," 4 states indicated conducting facilities audits yearly, 5 states indicated conducting facilities audits every 2-3 years, and the vast majority, 30 states or 77%, indicated that they did not conduct facilities audits on a regular basis.

The study revealed that roughly two-thirds of all states possessed no long-range master plan for facilities, and just 9 states conducted regular periodic facilities audits. *The vast majority do not conduct facilities audits on a regular basis or at all.* These findings—that master planning and facilities audits were not widely conducted, is probably not surprising given the limited role most designated state agencies have related to appropriating funds for facilities. Still, this finding is troubling, because the size of the problem as documented in the APPA, NACUBO, and other studies indicate that a comprehensive statewide approach will be needed to address the facilities challenge.

State Appropriations for Operating and Capital Budgets. Table 1 presents the responses from states regarding appropriations for capital budgets for fiscal years 2000-2003. Data for capital budgets were obtained directly from the survey respondents using the question, "What was your state's funding amount for capital appropriations for public higher education? If funding in your state is provided biennially, take the biennial amount for the period and divide by two." Table 1 clearly shows a wide disparity exists among and between the states, in terms of capital appropriations for public higher education.

Not surprisingly, the amount of state appropriations for capital needs is far less than for operating needs. This is not to suggest that these numbers should be the same, or even close to the same, since there are inherent differences in the uses of operating and capital funds. Still, funds must be available for capital needs if instruction, advising, research and other common functions in higher education are to take place.

Deferred Maintenance of Facilities. States were asked to respond to the question, "Does your state higher education governing or coordinating board have an estimate of the amount of deferred maintenance currently existing for public institutions?" Of the 39 responding states to this question, 30 (77%) indicated they possessed an estimate of the amount of deferred maintenance, while 9 (23%) did not. Table 2 shows the most recent data available listing the amount of deferred maintenance and the replacement values for states that reported this data.

Facilities Condition Index. Harvey H. Kaiser in his 1996 APPA study discussed the "Facilities Condition Index" (FCI), which compares the estimated replacement value of facilities to the estimated deferred maintenance. Table 3 represents the Facilities Condition Index for this current study. Kaiser sug-

TABLE 2

Estimated amount of Deferred Maintenance And the Current Replacement Value (FY 2003)

State	2003 Replacement Value	2003 Deferred Maintenance
Alabama		1,090,717,378
Alaska	*	150,000,000
Arizona	4,500,000,000	216,000,000
Arkansas	3,000,000,000	1,300,000,000
California		
Colorado	7,200,000,000	388,757,000
Connecticut	2,700,000,000	
Delaware		
Florida		
Georgia	5,900,000,000	
Hawaii	1,600,000,000	180,000,000
Idaho		
Illinois	15,000,000,000	1,600,000,000
Indiana	9,600,000,000	
Iowa	5,900,000,000	145,700,000
Kansas	4,049,134,000	682,700,000
Kentucky		294,381,000
Louisiana		
Maine	5,968,587,157	
Maryland		73,000,000
Massachusetts		
Michigan	3,100,000,000	
Minnesota		625,000,000
Mississippi	4,793,535,685	
Missouri		
Montana	3,011,500,000	
Nebraska	2,080,000,000	
Nevada		59,000,000
New Hampshire	3,600,000,000	
New Jersey		200,000,000
New Mexico		
New York		
North Carolina	1,089,400,000	605,000,000
North Dakota	15,300,000,000	72,000,000
Ohio		2,300,000,000
Oklahoma		1,783,658,443
Oregon	4,000,000,000	
Pennsylvania		700,000,000
Rhode Island	2,500,000,000	48,500,000
South Carolina	800,829,483	603,000,000
South Dakota	3,705,420,500	26,588,374
Tennessee	14,385,866,350	1,000,000,000
Texas	3,300,000,000	523,308,780
Utah		300,000,000
Vermont	4,722,869,000	
Virginia		602,000,000
Washington	1,125,000,000	
West Virginia	6,000,000,000	95,000,000
Wisconsin		645,000,000
Wyoming		53,000,000

**Dollar value was reported but is inconsistent with previously reported data.*

TABLE 3

2003-04 Facilities Condition Index: Estimated Deferred Maintenance Divided by Estimated Replacement Value (in thousands) expressed in (%)

State	2003 Replacement Value	2003 Deferred Maintenance	FCI
Alabama		1,090,717,378	
Alaska	*	150,000,000	
Arizona	4,500,000,000	216,000,000	4.8
Arkansas	3,000,000,000	1,300,000,000	43.3
California			
Colorado	7,200,000,000	388,757,000	5.39
Connecticut	2,700,000,000		
Delaware			
Florida			
Georgia	5,900,000,000		
Hawaii	1,600,000,000	180,000,000	11.25
Idaho			
Illinois	15,000,000,000	1,600,000,000	10.66
Indiana	9,600,000,000		
Iowa	5,900,000,000	145,700,000	2.46
Kansas	4,049,134,000	682,700,000	16.86
Kentucky		294,381,000	
Louisiana			
Maine			
Maryland	5,968,587,157	73,000,000	1.22
Massachusetts			
Michigan			
Minnesota	3,100,000,000	625,000,000	20.16
Mississippi			
Missouri	4,793,535,685		
Montana			
Nebraska	3,011,500,000		
Nevada	2,080,000,000	59,000,000	2.83
New Hampshire			
New Jersey	3,600,000,000	200,000,000	5.55
New Mexico			
New York			
North Carolina		605,000,000	
North Dakota	1,089,400,000	72,000,000	6.6
Ohio	15,300,000,000	2,300,000,000	15.03
Oklahoma		1,783,658,443	
Oregon			
Pennsylvania	4,000,000,000	700,000,000	17.5
Rhode Island		48,500,000	
South Carolina	2,500,000,000	603,000,000	24.12
South Dakota	800,829,483	26,588,374	3.32
Tennessee	3,705,420,500	1,000,000,000	26.98
Texas	14,385,866,350	523,308,780	3.63
Utah	3,300,000,000	300,000,000	9.09
Vermont			
Virginia	4,722,869,000	602,000,000	12.74
Washington			
West Virginia	1,125,000,000	95,000,000	8.44
Wisconsin	6,000,000,000	645,000,000	
Wyoming		53,000,000	

**Dollar value was reported but is inconsistent with previously reported data.*
Note: Only 22 states provided enough data to calculate the FCI.

gested that "the FCI should be held below 5.0% and, under certain conditions, closer to 2.0%" (Kaiser, 1996, p. 43).

In other words, the FCI represents the depleted value of a given states' physical plant. Once established as a reliable number, it can be used regularly for planning and budgeting purposes as a tool to address and improve unsatisfactory conditions. Kaiser, and other facilities studies found in the literature, suggests detailed facilities audits as the best method by which to determine that desired target, and to evaluate opportunities to accomplish remedial work in a cost-effective manner. It is very important, Kaiser argues, for facilities audits to be completed and updated regularly so that reliable results can be obtained from year-to-year (Kaiser, 1996). This data can only be used if the data collected are accurate and consistent.

Discussion

It is clear that an overwhelming majority of states do not set aside operating funds for renewal and replacement of public higher education facilities, as suggested by facilities experts. It is undeniable that the current economic situation in the states, and the limited recovery to date, will only add additional billions to the growing backlog in public higher education infrastructure investment, to say nothing of the additional investment needed to meet the facilities needs of "Tidal Wave II."

The vast majority of states do not deploy practices recommended by facilities management experts, including the allocation of a small percentage of operating funds for deferred maintenance. Similarly, a majority of states do not set aside the minimum of 3 percent of their operating budgets for renewal and replacement of facilities in public higher education. States could make use of successful models in other states and at other public institutions. It should be noted that some states have been quite creative in addressing these needs through dedicated funds, special line items, or other programs.

Recommendations

To address some of these concerns and issues, this study offers the following recommendations.

Comprehensive master plans for facilities. The first and most logical step is to collect useful, consistent data for master planning at both the institution and statewide levels. Statewide facilities master plans for public higher education built from the "bottom up" are needed. This requires consistently collected data across all institutions and sectors of public higher education. While some states require their local community college boards to fund facilities renewal, replacement, and new construction, community colleges should not be excluded from any statewide facilities master planning process.

STATES RESPONDING TO THE SURVEY, 1998-1999 AND 2003-2004 ADMINISTRATIONS

	1998-1999 SURVEY			2003-2004 SURVEY			
Region	**Responding States**	**Non-Responding States**	**Total**	**Region**	**Responding States**	**Non-Responding States**	**Total**	**States that Responded in 1999 & 2004**
Northeast	CT, IL, IN, ME, MA, NH, NJ, OH, PA, RI, VT, WI	MI, NY,	12 of 14 86%	**Northeast**	CT, IL, IN, MI, NJ, OH, PA, RI, VT, WI	NY, ME, MA, NH	10 of 14 71%	CT, IL, IN, NJ OH, PA, RI, VT WI *(9 of 14, 64%)*
Southeast	AL, DE, GA, KY, MD, NC, SC, TN, WV	FL, MS, VA	9 of 12 75%	**Southeast**	AL, DE, GA, KY, MD MS, NC, SC, TN, VA, WV	FL	11 of 12 92%	AL, DE, GA, KY, MD, NC, SC, TN, WV *(9 of 12, 75%)*
Northwest	AK, IA, ID, MN, NE, ND, SD, WY	MT, OR, WA	8 of 11 73%	**Northwest**	AK, IA, ID, MN, NE, ND, SD, WY	MT, OR, WA	8 of 11 73%	AK, IA, ID, MN NE, ND, SD, WY *(8 of 11, 73%)*
Southwest	AR, AZ, CA, CO, HI, KS, LA, NM, NV, OK, TX, UT	MO	12 of 13 92%	**Southwest**	AR, AZ, CA, CO, HI KS, MO, NV, OK, TX, UT	LA, NM, OK	11 of 13 85%	AR, AZ, CA, CO HI, KS, NV, OK TX, UT *(10 of 13, 69%)*
Total:			**41 of 50 82%**	**Total:**			**40 of 50 80%**	

Notes: 1. Regions were determined using GRAPEVINE methodology, some percentages were rounded.
2. Some states have more than one state agency responsible for some level of higher education, so it is possible to have multiple state responses. For example Wyoming submitted a state response for both 4-year and 2-year schools.
3. 1998 –1999 survey was doctoral dissertation by Derrick Manns. 2003-2004 survey was an update.

Increased cooperation. State legislatures should use their latent convening power and near unlimited investigatory power to study and bring attention to this issue. Professional organizations within higher education, and civic organizations external to the academy, should be encouraged to participate. It is clear that legislative leadership is essential. Sadly, the 2004 meeting of the National Conference of State Legislatures did not include a single session devoted to the issue of funding public higher education facilities.

Develop a longitudinal database. No longitudinal database on facilities funding for public higher education currently exists. This study attempted to provide a multi-year snapshot of state tax appropriations for public higher education facilities. A longer term view is clearly warranted. The U.S. Department of Education, the Education Commission of the States, and the State Higher Education Executive Officers (SHEEO) all have a vested interest to ensure that a longitudinal data set is developed.

Strengthen role of higher education agencies. The role of state higher education agencies in collecting good facilities information should be strengthened. State HEAs should routinely collect facilities data that is directly tied to their long-term state policy enrollment and success objectives for public higher education.

Conclusion

New public higher education facilities that are constructed or upgraded today will likely be around in 2040, decades after any bond issue is retired. Policy-makers should consider creating dedicated, permanent revenue streams to fund the construction, renovation, and rehabilitation of the physical infrastructure of public higher education. Currently, it appears that only an extremely limited amount of funding can be allocated on an annual basis, which tends to emphasize the improvement of existing space (patching), and deployment of limited resources now available to match available federal and private funds (attracting). Sadly, the long "to-do" list of things to be repaired seems only to get longer (Williams, June 2003). As Gratto et.al. note, colleges and universities must "maintain environments, places, and spaces that demonstrate concern for safety, comfort, and enjoyment of people" (2002, p. 24).

As institutions grow to meet a dramatic increase in the size of the college-eligible student pool during the first decade of the 21st century, so too will the demand for physical facilities. Over the next several decades, the higher education enterprise will continue to require the construction, renewal, and replacement of its facilities. Without adequate facilities, the academic enterprise will have difficulty meeting its fundamental societal purposes to develop talent and promote the cause of equity (Astin 1985). Furthermore, developments in science and technology will require new investments in the research facilities on many college campuses.

Facilities will continue to be the backbone of American higher education and without adequate buildings; research, teaching, and service could be impaired. The capital needs of public higher education must be formally and consistently addressed if the states are to effectively utilize all their human resources to meet the educational and social needs of the 21st century (Amaratunga and Baldry 2000).

Facilities will continue to be the backbone of American higher education, and without adequate buildings, research, teaching, and service could be impaired.

References

Amaratunga, D., and D. Baldry. 2000. Assessment of facilities management performance in higher education properties. *Facilities Bradford* (7/8) 18: 293–304.

Astin, A. W. 1985. *Achieving educational excellence.* San Francisco: Jossey-Bass.

Bareither, H. 1977. *Space realignment, renewal, and replacement: A concept for budgeting the necessary funds to prevent deterioration for physical facilities.* Urbana, Ill.: University of Illinois Press.

Boyer, E. 1981. *Control of the campus.* Lawrenceville, NJ: Princeton University Press.

Gratto, F., Gratto, K., Henry, W., & Miller, T. (2002). The impact of facilities on community: An application to Greek Housing. *College Student Affairs Journal* 22 (1): 23–33.

Kaiser, H. 1996. *A foundation to uphold: A study of facilities conditions at U.S. colleges and universities.* Alexandria, Virginia: APPA.

Manns, D. 2001. A fifty state assessment of capital needs for public higher education. Unpublished Doctoral Dissertation, University of Toledo.

Palmer, J., and E. Hines. 2000. Appropriations of state tax funds for operating expenses of higher education in the 50 states for fiscal years 1988–89, 1996–97, 1997–98, and 1998–99. Retrieved October 9, 2003, from the World Wide Web: www.coe.ilstu.edu/grapevine/Information.htm.

Postsecondary Education OPPORTUNITY. 1998. State tax fund appropriations for higher education, FY 1999. Oskaloosa, Iowa: *Postsecondary Education OPPORTUNITY.*

Rush, S. C. 1990. *Campus at risk.* Washington, D.C.: National Association of College and University Business Officers (NACUBO).

Rush, S. C., and S. Johnson. 1989. *The decaying American campus: A ticking time bomb.* Alexandria, Virginia: APPA.

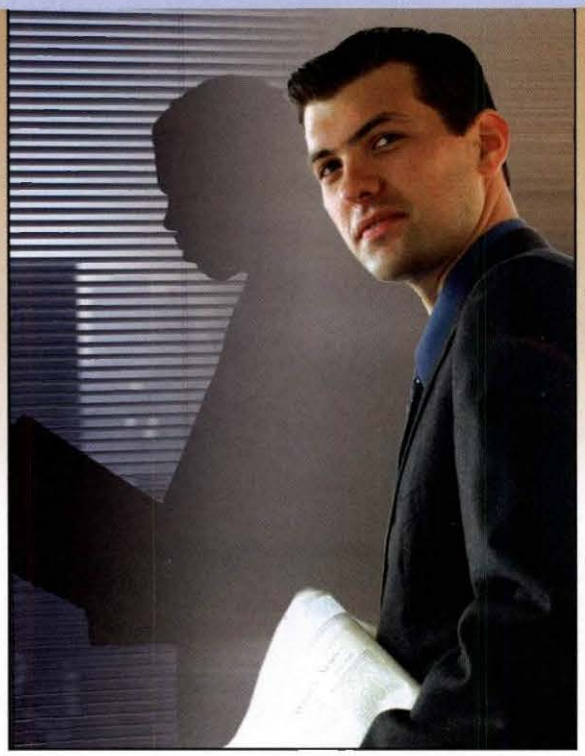
Williams June, A. (2003). More than just maintenance [Electronic version]. *Chronicle of Higher Education,* 7, A27.

Windham, P., G. Perkins, and J. Rogers, 2001. Concurrent-use campuses: Part of the new definition of access. *Community College Review* 29 (3): 39–55.

After-Action Review:

A Process for Improvement

by Roger E. Rowe



Developing a process for continuous quality improvement in an organization can be both time-consuming and expensive. Use of this simple after-action review can jump-start a continuous quality improvement process with minimum training and expense.

This process has been formatted as a standard operating procedure for use by any facilities services organization to improve their work processes. The AAR concept was originally developed by the U.S. Army in the 1970s to review and improve combat operations and related military training. Dave Grimes, a trained continuous quality improvement (CQI) facilitator, helped to develop and implement the facilities-oriented AAR process at Miami University of Ohio in the early 1990s.

Standard Operating Procedure for After-Action Reviews

Purpose and Scope: To establish a policy and procedure to determine when a Facilities Services Department After-Action Review (AAR) will be conducted and the format for conducting departmental AARs. The purpose of an AAR is to capture lessons learned from a project, event, or incident. A lesson learned is a "good work practice" or innovative approach that is captured and shared to promote repeat application. It may also be an adverse work practice or experience that is captured and shared to avoid recurrence.

Policy: AARs can be held on any project, event and/or incident. However, as a minimum, departmental AARs should occur on:

- Closeout on all construction/ renovation over $10,000 and/or multi-disciplined projects involving numerous departments.
- Recurring activities, incidents and/or events that could be improved by conducting an AAR.
- Safety accidents, injuries, and/or incidents that resulted, or could have resulted in death or serious injury.
- Weekly shop-area review of operations, activities and events.

Procedures

What is an After-Action Review: An AAR is a structured review process that allows participants to discover for themselves what happened, why it happened, and how it can be

Roger Rowe is specials projects manager for architectural and engineering services at the University of West Florida, Pensacola, Florida. He can be reached at rrowe@uwf.edu.

improved. An AAR is not a critique—the objective is to identify methods for improvement.

Types of After-Action Reviews:

- **Project AARs:** Attempt to capture the successes and experiences of project managers, architects, engineers, construction personnel, participating departments, customers, and users. The issues and actions generated from the AAR can have a dramatic impact upon future projects.
- **Safety AARs:** Are an important tool for reducing the risks associated with our work activities. They assist in identifying administrative and engineering procedures, training, and personal protective equipment requirements. These AARs should occur whenever a serious accident/injury occurs or the potential for serious injury is discovered.
- **Weekly Shop/Area AARs:** Are a tool for continually improving the operations, receive "input" from employees and in many cases provide immediate feedback in order to change/improve the way we go about business of providing top quality to our customers.

Guidelines for Formal After-Action Review

Who should be involved in the AAR? A representative group of participants, who were directly involved in the incident, project, or event should be involved in the project AAR. All viewpoints are relevant and beneficial.

Specific Project AAR Session Deliverables: To capture improvement opportunities, two questions should be answered:

- What went well in the project/event? How can we institutionalize the success?
- What went poorly in the project/event? How can we ensure it doesn't happen again?

Action Items: Capturing action items is the most important reason for holding an AAR! The outcome of an AAR should be either an action plan to remedy an issue or the identification of issues or problems that require further study before a corrective action can be implemented. The resultant actions will either prevent recurrence of a less than desired act or institutionalize a success.

These actions must be identified and then monitored until completion. Other issues are more complex, requiring discussion among many people. These issues should be captured and forwarded to the associate vice president for prioritization and coordination.

The far-reaching nature of some of the concerns raised in the AAR may necessitate further study by a cross section of Facilities Services Departments. Once again, send to the associate vice president.

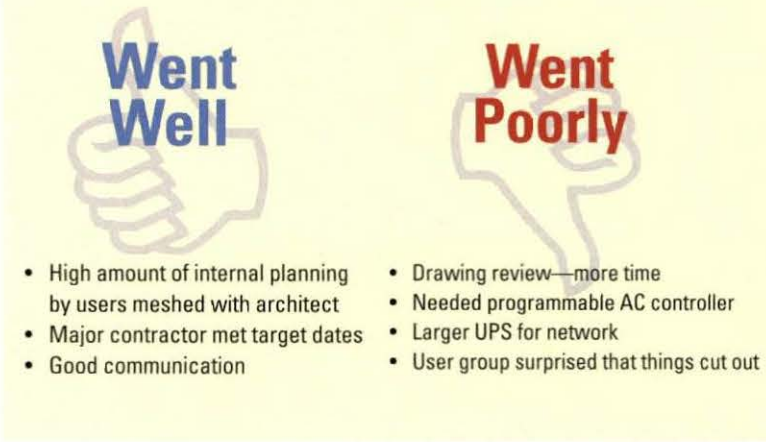
Different Methods for Conducting an AAR

The number of participants will determine the method to conduct your AAR. For smaller groups (five participants or fewer), preparing an agenda for discussion may be all that is needed. For larger groups (more than five participants) or projects, storyboarding may be the best method to conduct the session.

Small Group AAR (5 participants or less)

Even though you are dealing with a smaller group or project, there are still valuable lessons to be learned from an AAR. It is important that all action items and issues be captured and followed through on. To help keep the discussion focused, consider using flipcharts. Refer to Figure 1.

FIGURE 1



Large Project or Group AAR (over 5 participants)

Meetings involving larger groups of people must be carefully thought through. The success of your meeting often depends upon the amount of time you spend in *planning* for the meeting. In general, plan to spend approximately the same amount of time planning for the meeting as the meeting is long.

Making your AAR go more smoothly

- Consider using a facilitator. The facilitator should be neutral. A neutral facilitator will work to ensure that all viewpoints are expressed. A facilitator's job is to keep the meeting focused and moving. The facilitator does not critique nor judge the success or failure of the incident being discussed.
- Consider what supplies will be needed? (flipchart, storyboard and supplies, handouts, etc.)
- One of the hardest aspects of dealing with large groups is keeping the meeting focused. When generating improvement ideas, discourage debates. Because of the nature of the meeting and the individuals involved, some people may feel threatened. Your focus should be on how to improve the situation. Most problems are system or process related. It is never productive to try to "single" an individual out as the cause of the problem.
- Encourage everyone to participate.

- Let the participants identify the situation for themselves (including their mistakes and successes), the facilitator/leader does not critique.

- To encourage participation, the facilitator should use leading questions such as:
  - ☐ "What would you like to see happen again?"
  - ☐ "What would have been a better way of handling the situation?"
  - ☐ "In your opinion, what would have been the ideal way of doing that?"
  - ☐ "How could communication have been better?"
  - ☐ "What is the root cause of the incident?"
  - ☐ "Next time, what would you do differently?"
  - ☐ "What are some ways we could have prevented the incident from occurring?"

- In order to prevent an issue being brought up more than once, use "group memory." Group memory is simply some method for visually capturing the ideas as the meeting progresses. Storyboarding is an excellent group memory technique. People will continue to reiterate their viewpoint until they feel the audience has "gotten the message." The quicker you validate them, the quicker the issue can be put to rest.

Sample AAR Agenda

1. Introductions
2. Explain Session Rules ("rules of the game")
3. Review the agenda
4. Work through Main Header Cards
5. Draw out any action items in process (Person responsible, Task, Target date)
6. Identify any issues that an action plan can't be made for during that meeting; forward them to the associate vice president.

Guidelines for an Informal After-Action Review

Purpose: An informal AAR is much less structured than a formal AAR. An informal AAR is simply a review of the week's activities and a discussion of improvement ideas between you and the staff. The purposes include:

- To allow your staff input on how to improve the effectiveness of your operation.
- To help the department take meaningful actions that are "ground-level specific" so the employee can see improvements occurring within their own area.
- To generate improvement actions that will be monitored for completion.

Time Commitment: The time to conduct an informal AAR will vary week to week but, on average, should take only between 10 to 20 minutes.

Session Outcome: The ideas generated during the review should be captured and actions should be generated on improving your area.

Project AAR Headers (Example)

Construction Project AARs

- ❑ Planning Phase (POR through Design):
  - What Went Well
  - What Could Be Improved
- ❑ Construction Phase:
  - What Went Well
  - What Could Be Improved
- ❑ Move-in:
  - What Went Well
  - What Could Be Improved
- ❑ Hand-off/Close-out:
  - What Went Well
  - What Could Be Improved
- ❑ Difficulties Meeting Customer's Expectations
- ❑ Issues to take back to Facilities Services

Safety AARs

- ❑ How did the accident/injury occur
- ❑ How could the accident/injury have been avoided
- ❑ What training could have prevented the accident/injury
- ❑ What personal protective equipment should have been used
- ❑ What procedures or policies should be developed

Who should be involved in the AAR: Informal AARs should be conducted at every level in Facilities Services Departments. Every manager and supervisor should hold an informal AAR with their direct reports.

Frequency of informal AARs: Ideally, each work week would conclude with an after-action review. Informal AARs should be held on a regular basis. As a minimum, an informal AAR with our staff should be held monthly.

How to conduct an informal AAR: An AAR can be done at the end of regular staff meetings. The ideas generated should be captured to enable them to be prioritized and acted upon. Some of the key questions to ask are:

- What went well this week? How can we institutionalize (continue) the success?
- What went poorly this week? How can we ensure that it doesn't happen again?

Some different methods for capturing the ideas are:

- On flipcharts (happy face or plus sign for things that went well; sad face or minus sign for things that went poorly)
- Writing the ideas under the proper titles
- Use storyboard cards

The following format is an effective way to list and manage action items:

ACTION ITEM LIST

PERSON	ITEM	DEADLINE

ENCLOSURE 1 (EXAMPLE OF AFTER-ACTION REVIEW)

Sample Project After Action Review Minutes

AAR for: Community Resource Center
Date: April 14, 2006
Location: Commons
Time: 2:00-4:00
Session Owner: Iam Smart

ATTENDANCE			
NAME	PRESENT	NAME	PRESENT
Jim West	Yes	J. Paladin	Yes
Josh Randal	Yes	Gil Hanley	Yes
William Kirby	Yes	Bret Ponset	No
Jack Moffitt	Yes	Don Blake	Yes
Artemus Gordon	Yes		

Issue Generation Phase

How could communication have been better?

- Did not have enough time to review drawings
- Furniture company shipped earlier than agreed
- Tile subcontractor did not notify of extended setup time of tile
- Users in East Wing should have been notified that garage door needed to be left open

What went well?

- Users involved in process
- Project scope well laid out
- Project manager burned midnight oil to see job done on time
- Move schedule well planned
- Landscape people notified well in advance—saved tree
- Contractor site kept clean

What could be improved?

- Fish aquarium should have been left to experienced personnel
- Low light in foyer
- Safety barriers not put up around all construction areas
- Room numbers not specified in a timely manner
- In the very beginning get the plat done as soon as possible
- Consider if doorbells are needed for side entrances and if a louder bell or bells in different location are needed (e.g., think if there is committee meeting held in the fellowship hall with no one in the office to answer the door in the evening or at night)

- Do not assume that all the COLD water pipes in the attic or above the ceilings will be insulated. Doublecheck the contract or drawings
- If garbage disposal is not included in the construction contract, make sure the drain pipe under the kitchen sink is low enough for later installation. Likewise for other appliances not roughed in by the contractor
- If there is a serving window opening to the fellowship hall from the kitchen, make sure the counter top extends beyond the edge of the wall and tile floor is installed under the window. Consider painting the wall with semi-gloss paint
- If sprinkler system is to be installed, make sure sleeve pipes (e.g., 4" PVC) are laid under the parking lots or walkway during construction for later installation of the sprinkler system
- Take full pictures and/or video of all areas inside the building right before insulation. It will help to locate wires and pipes if anything goes wrong in the future
- As soon as framing for partition has been completed, "feel" the size of all rooms and closets and then determine

In summary, the use of the after-action review not only identifies improvements in work processes, but also involves your key people who participated in the project, event, or incident in a positive, action-oriented manner. The AAR really is a process that will jump-start any CQI initiative!

ACTION ITEM LIST

Assign Action Items for the implementation of the lessons learned

PERSON	TASK	DEADLINE
Ralph M.	Talk to city about speeding up permit process	April 24, '06
Richie C.	Repair the main door to side room	April 24, '06
Potsie W.	Contact contractor for replacement tiles	May 24, '06
Howard C.	Negotiate cost to install new sink fixture	May 4, '06
Arnold	Change out to bigger disposal unit	April 28, '06

ISSUES REQUIRING PRIORITIZATION AND FURTHER CONSIDERAITON

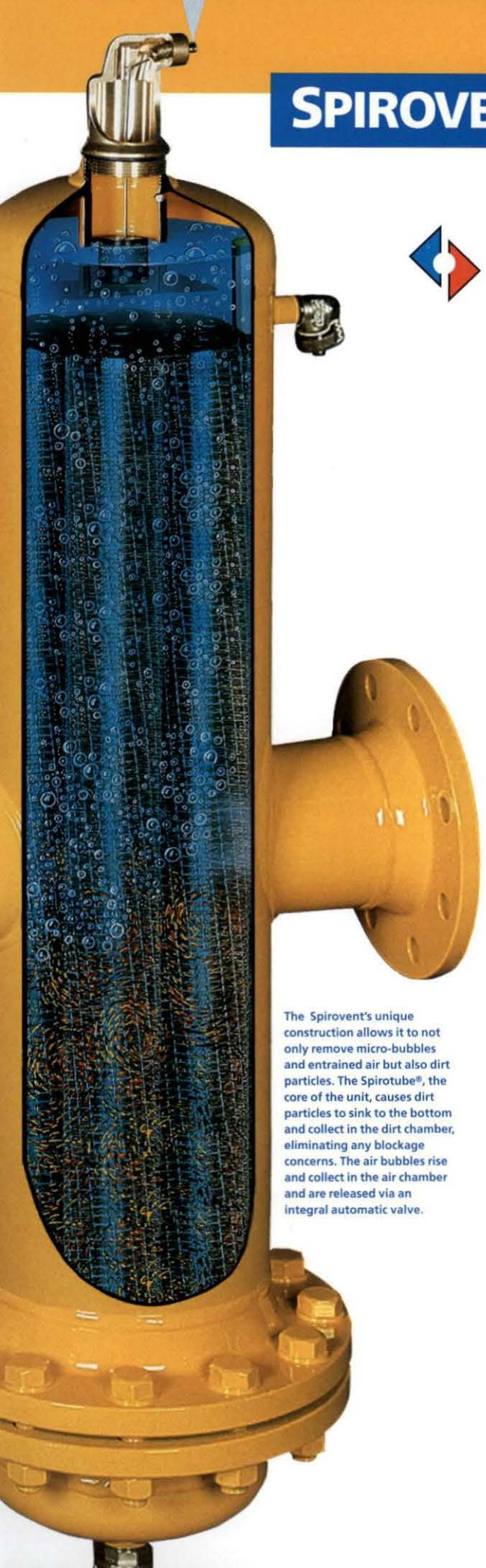
Assign Action Items for the implementation of the lessons learned

ISSUE
Designing for maintainability—how to coordinate divisions?
Itemized billing for users
Which services to charge back for?
Contractor screening—how to keep records?
Drawing review process needs improved
Who is the real customer? How to decide between competing interests?
Training for new equipment put into contract
OEM manual process

SPIROVENT®

Condition the water to condition the air.

Protect your investment by removing the air and dirt from your hot or chilled water system.



The Spirovent's unique construction allows it to not only remove micro-bubbles and entrained air but also dirt particles. The Spirotube®, the core of the unit, causes dirt particles to sink to the bottom and collect in the dirt chamber, eliminating any blockage concerns. The air bubbles rise and collect in the air chamber and are released via an integral automatic valve.

Air and dirt in large volume fluid systems cause many problems. The life and the efficiency of a large volume fluid system are greatly dependent on clean system water. Air and dirt problems cause frequent breakdowns and increased customer complaints. Corrosion, cavitation and wear are only some of the consequences of system water filled with air and dirt. Recurring problems and increased maintenance result in unnecessary costs and dissatisfied owners.

There is a solution! A large volume fluid system without air and dirt is possible. Spirovent® is a unique dual-purpose device that will remove air and dirt down to the smallest particle, eliminating the need for frequent venting and purging. It is low-maintenance and works without strainers or filters. Less maintenance, fewer costs, satisfied owners!

Case Study: Spirovents Solve a Series of Problems

Cottey College in Nevada, Missouri is a private two-year liberal arts college for women. Robertson Hall, Cottey's dining hall and largest residence hall, had air and dirt in the chilled water system that caused numerous problems, including pump cavitation. This resulted in very noisy and inefficient operation.

To solve the problems, the existing centrifugal separator was replaced with a 6" high velocity Spirovent combination air/dirt separator. Within one week of installing the Spirovent, the problems were solved. "The product certainly proved itself," states Neal Swarnes, Cottey's Director of Physical Plant. "It works effectively, and we will continue down that path."

The President's house was another challenge. Constant air lock and noise drove the maintenance staff to replace the existing air separator in the house with a brass Spirovent 1¼" Junior. Swarnes explains, "We had been battling system problems forever, and the Spirovent solved them."

To date, there are several Spirovents installed or waiting for installation with even more planned for the future. When asked how the Spirovents have made his job easier, Swarnes had this to say: "They have worked very well, and that always makes our jobs in the maintenance field easier. They removed the excess noise and pump cavitation, and cleaned up the water. This has given us peace of mind knowing that the dirt and air are gone from these systems. We look forward to having Spirovents in all of our systems."

- The only high-efficiency units available for full-flow high velocity systems such as central plants and district heating/cooling.
- No change to piping required. Units often match pipe size.
- Large shell and coalescing/ barrier medium provide high efficiency.
- Dirt can be flushed while system is fully operational.
- Reduced oxygen-based corrosion and pump cavitation.
- No bypass, isolating valves or filters to clog and reduce flow.
- Available to 36" pipe size.
- Minimal pressure drop; always constant.

For more information on how Spirovents can protect your hot or chilled water system and save you thousands in maintenance costs, contact Spirotherm or visit our website.

SPIROTHERM
A SPIRO RESEARCH COMPANY

Spirotherm, Inc.
25 N. Brandon Drive
Glendale Heights, IL 60139

Tel.: 800-323-5264
Fax: 630-307-3773

Website: www.spirotherm.com
E-mail: info@spirotherm.com

APPA'S 2006 *Awards & Recognition* PROGRAM

Each year, APPA recognizes outstanding individuals and institutions for their contributions to the education facilities profession. APPA is pleased to announce it is now accepting awards for 2006.

Award for Excellence

The APPA Award for Excellence is designed to recognize and advance excellence in the field of educational facilities. Originally established in 1988, the Award for Excellence is APPA's highest institutional honor and provides educational institutions the opportunity for national and international recognition for their outstanding achievements in facilities management. The award is designed to encourage a systems perspective of facilities operations as a critical contributor to the overall institutional mission and vision. The Award for Excellence designation is valid for a period of five years. **Award submissions are due no later than February 15, 2006, midnight Greenwich Mean Time.**

Effective & Innovative Practices Award

Sponsored by Sodexho USA, APPA's Effective & Innovative Practices Award recognizes programs and processes that enhance service delivery, lower costs, increase productivity, improve customer service, generate revenue, or otherwise benefit the educational institution. Entries can describe either a new program or significant restructuring of an existing program or process. Up to five ranked submissions will be eligible for a cash award of $4,000. Winning entries will receive special recognition on both APPA's website and in APPA's *Facilities Manager*. **All entries are due no later than February 15, 2006, midnight Greenwich Mean Time.**

Meritorious Service Award

Each year, APPA members bestow the Meritorious Service Award upon the individual member or members who have made significant, life-long contributions to the profession of higher education facilities management. APPA's highest award for individual service, the Meritorious Service Award is given to no more than three individuals a year. Individuals must be an active member of APPA for a minimum of five years; attended and participated in meetings and other functions at the international level, and demonstrated continued and distinguished service to the association. **All entries are due no later than February 15, 2006, midnight Greenwich Mean Time.**

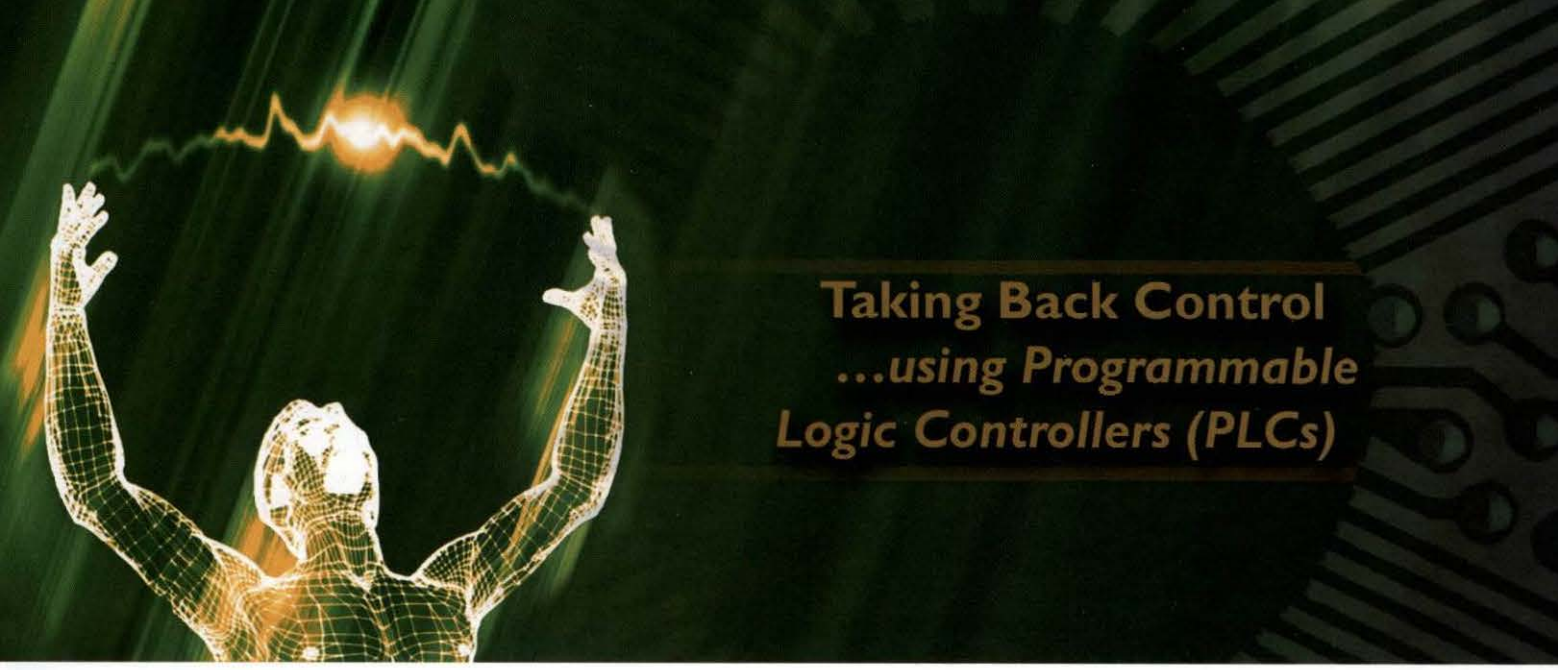
APPA Fellow

While most awards recognize past achievements, the APPA Fellow designation brings with it both recognition or specific accomplishments to date and expectations for continuing involvement in APPA's leadership program through research and mentoring. This is APPA's highest individual achievement award. Individuals must be an active member of APPA for a minimum of ten years; graduated from APPA's Institute for Facilities Management; completed APPA's Leadership Academy; and completed an approved research project under APPA's Center for Facilities Research. **All entries are due no later than February 15, 2006, midnight Greenwich Mean Time.**

Pacesetter Award

The Pacesetter Award is designed to encourage further participation in APPA among those who have already made significant contributions at their regions or chapters. Up to seven Pacesetter Awards may be given each year. **All entries are due no later than February 15, 2006, midnight Greenwich Mean Time.**

APPA encourages you to contact your regional representative to discuss how you can apply for an award. To receive an application and guidelines, visit www.appa.org for additional details. All award submissions are due no later than February 15, 2006, midnight Greenwich Mean Time.



Taking Back Control ...using Programmable Logic Controllers (PLCs)

by Linda Hafar, P.E., CEM and Daniel A. Leon, P.E.

Are you tired of being "over promised and under delivered?" Are you fed up with controls companies gouging you for their proprietary products? Is your current relationship with your controls service provider a bit strained? If you answered yes to any of these questions you may benefit from this article. If you are completely happy with your controls service company, then turn the page—this article isn't for you!

At California State University, Sacramento (Sacramento State) we have taken the plunge moving to programmable logic controller (PLC) technology for HVAC control, lighting control, domestic booster pump monitoring, electrical substation monitoring, and sewer flow monitoring to name a few applications. In fact, we are open to using PLCs on nearly anything that can be monitored or automated.

Why Even Consider PLC Technology?

Our engineering services department embarked on a journey to automate the campus more completely in the late 1980s. We installed a Barber-Colman Net8000 system with a QNX operating system in the Host or graphical user interface (GUI) computer. Global Control Modules (GCMs) and Local Control Modules (LCMs) ran sequences of operation that met occupant comfort needs and maximized energy conservation including extensive time clock control. As time went on, as all things do, the system grew old and became outdated. It is now referred to as a "legacy" system.

Linda Hafar is director of facilities and utilities at California State University, Sacramento; her e-mail is lindah@skymail.csus.edu. Daniel Leon is formerly with CSU, Sacramento and can be reached at leoncontrols@centurytel.net. This is their first article for* Facilities Manager. *Additional assistance was provided by David O. Davis.

The term "legacy" means if you want to purchase replacement parts, they are probably only available from brokers specializing in used parts or by scavenging from "donor" buildings as they are converted to more current technology. Furthermore, the company where you bought the system may no longer have technicians who are familiar with it.

In some cases, a building was newly constructed with a legacy system. That is, the controls company was transitioning to new and improved technology just after your project was bid. The old system was specified and was installed. Never mind that it was already on its way to becoming obsolete.

We still have the Net8000 system in most campus buildings. We have made efforts to bring in competing systems. As you can probably guess, each system must be monitored and controlled through its own proprietary GUI. There are now several computers or "islands of control" at the operator's workstation.

We thought we found the ultimate solution with a flat LON system architecture. At first it appeared the LON product would provide great interoperability along with a more competitive bidding environment. We thought we could easily integrate a variety of LON systems. However, we found three major shortcomings for our application:

1) Contractors on various projects were not willing to extend the existing system due to integration and compatibility issues.
2) The flat LON network proved to be inadequate to handle the volume of communication necessary to control the entire building HVAC system.
3) The open LON protocol has very limited data access. Therefore, proprietary protocols are used to access expanded data values and setpoints. For example, optimal start-stop time clocks are a vendor specific function. They are difficult to integrate into the flat LON architecture.

Moving Toward Programmable Logic Controller (PLC) Technology

All of the above factors have driven the decision at Sacramento State to use PLC technology for controlling HVAC systems. The use of PLCs is adaptable to more unified facility and utility controls integration. The technology has been in use for industrial processing applications for many years. There are challenges in implementing PLCs for HVAC and facility control. However, they are by no means insurmountable. In fact, you may find implementation is much easier than you thought. We have identified the following challenges and their solutions:

Challenge #1: What are the compatibility issues between the legacy systems and the PLC systems?

We could not get rid of our legacy hardware all at once. We needed a GUI that would be compatible with both the legacy and PLC systems and one that could efficiently monitor and control both the legacy and new PLC systems. We determined the best solution for our application was a GUI software that has a large library of drivers and is compatible with a number of third-party protocol drivers.

There are challenges in implementing PLCs for HVAC and facility control. However, they are by no means insurmountable.

Challenge #2: What about higher costs and are PLCs effective in HVAC applications?

a. Costs for PLCs. If considered without understanding how to effectively utilize them, PLCs appear to cost 20 to 50 percent more than the typical HVAC-specific field controllers. One reason for this extra cost is controlling variable air volume (VAV) systems. The cost of using a PLC for every VAV terminal unit is prohibitive. This expense is due to the distributed nature of VAV input/output (I/O). On the other hand, there are alternatives that neutralize higher installation costs for PLCs and actually make them more practical than proprietary systems. By running wiring strategically, it is possible to operate an entire floor of VAV terminal units with one PLC. Sometimes a floor may require up to three PLCs, depending on the configuration of the floor plan. Major systems such as air handlers need a dedicated PLC. In this application the cost of a PLC is competitive with proprietary HVAC controllers. Programming tool costs are comparable. Software for the GUI and other computers

(where required) are also comparable. Ultimately, due to their reliability, availability, flexibility, and longevity, PLC systems can cost less than proprietary systems over the life of a building.

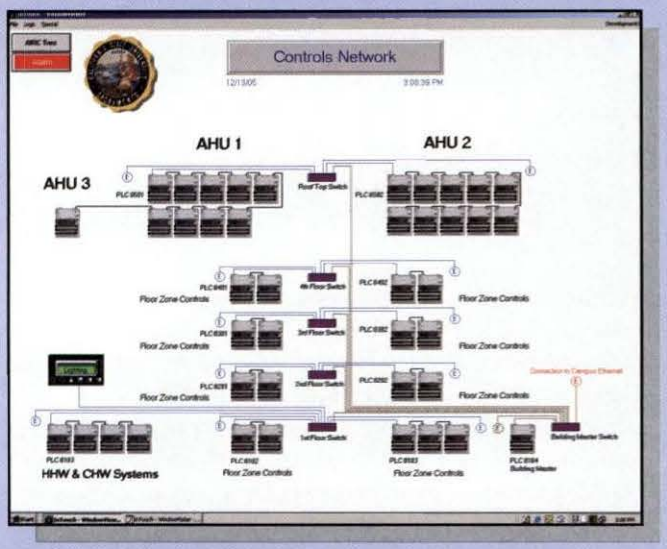
b. *PLCs are robust in their ability to control.* They were originally designed for industrial applications such as manufacturing facilities, water and wastewater treatment plants, power generation, and distribution systems. PLCs possess qualities and attributes that make them effective for HVAC applications. These qualities and attributes include a high degree of reliability, the ability to process large amounts of data, and a high degree of executing speed and precision.
c. *PLCs have extensive breadth of control available.* They have a large amount of user memory, are capable of processing thousands of register values such as setpoints and digital status points, and can execute thousands of instructions. Air handlers, pumps, and zone dampers are easily interfaced with PLCs. VAV controls require slightly more I/O points. Because PLCs are not inherently designed to receive a 4-20 mA signal, the use of a thermister requires more programming than is typically encountered.
d. *PLCs have an extended life expectancy and higher reliability.* They can operate at least two to three times longer than HVAC-specific controllers. Most manufacturers of name brand PLCs will support their system hardware for 20 years.
e. *PLCs are highly expandable.* A single PLC controller can be connected to hundreds of I/O points. The amount of user memory is the only limiting factor.
f. *Some PLCs have proprietary communication protocol versus others that have open protocol.* Some brands of PLCs use proprietary communication protocols. We evaluated a number of the industry manufacturers and ultimately chose a brand that uses a common and "open" communication protocol.

Challenge #3: What resources are needed for this conversion?

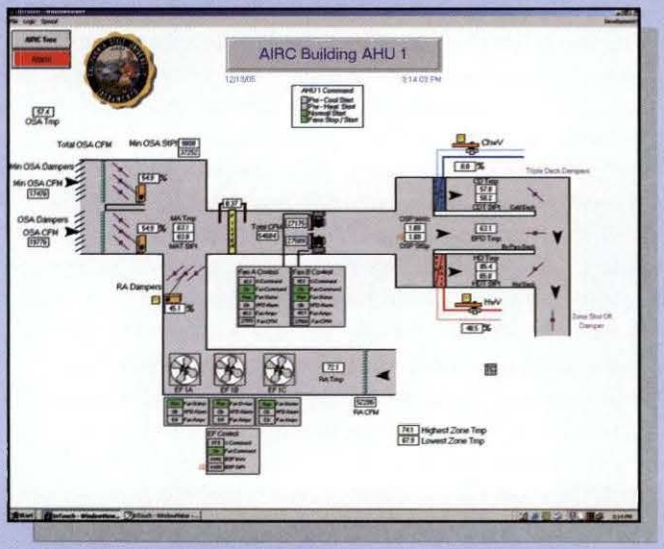
a. *Appropriate staffing including controls specialists with strong computer savvy, an analyst-programmer, and an open-minded management team, are all essential.* Our controls specialists, analyst-programmer, and others have worked together to design and implement conversions for existing buildings. We have programmed and installed PLCs to control various HVAC equipment including air handlers, zone temperature, airflow controls, and pumps. We have also participated in the design phases of several new projects and are incorporating PLC-based controls in those buildings as well. Having dedicated staff for controls work enables the campus to benefit a number of ways: 1) technical expertise is available at all times; 2) we avoid price gouging for contracted labor; 3) we avoid expensive service agreements; and 4) a high level of attention is given when developing and reviewing engineering specifications. This activity reduces contractor's addition of large contingency amounts to their bids.

It is a straightforward process to connect PLCs to field equipment such as air handlers, valves, dampers, and variable frequency drives (VFDs).

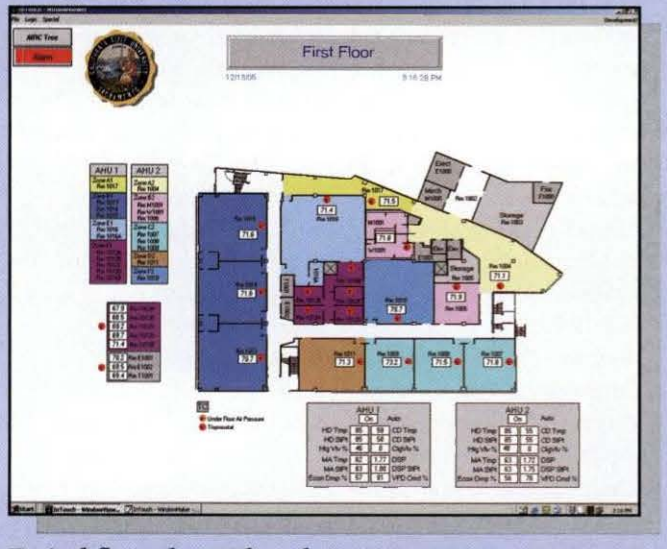
b. *Interface devices that allow communication from existing field devices to PLCs.* It is a straightforward process to connect PLCs to field equipment such as air handlers, valves, dampers, and variable frequency drives (VFDs). In most cases, the existing field wiring is reused and connected to a PLC control panel. Interfacing to standard HVAC thermisters presented a challenge because PLCs are not inherently designed to accept a thermister signal. We have, however, successfully implemented a method of installing a resister, thus converting the 4-20 mA signal to an analog voltage signal. This installation, along with a programming module, allows the PLC to measure and control from that signal. Literally hundreds of thermisters are used throughout the campus. Finding this solution saves thousands of dollars by allowing standard technology HVAC thermisters for use with PLCs.
c. *A solid communications network including Ethernet and a dedicated virtual Local Area Network (LAN) established to reduce virus infections.* We have several types of proprietary control networks within buildings. Unfortunately, most of these networks can only be used for one type of protocol and cannot be connected to devices using different protocols. Given our past experiences with proprietary networks, we realized the importance to selecting an "open" control network, that is, one that is compatible with the most types of control hardware. We chose to use Ethernet as the control network for our application. Most of the campus Ethernet is interconnected with fiber optic cable. The campus Ethernet network has been highly reliable and has backup power sources. For our control network, we are using a sub-network, or virtual LAN, to isolate the control network from the main campus network. For further protection from virus infection, we have installed and commissioned a firewall router between the control network and the main campus network.
d. *Definition of the communication protocol.* There are a number of different PLC communication protocols, some are proprietary while others are published and "open." We evaluated several and chose Modbus communicating over TCP/IP for our campus control network backbone. Modbus is a common communication protocol that transmits over the Ethernet TCP/IP network. It is used by several different manufacturers of PLCs. In selecting an open communication protocol, we again attempted to select one that is compatible with the most types of control hardware. It is used for peer-to-peer and master-slave communication between PLCs. It is also used between PLCs and I/O server computers.
e. *A library of sequences of operation for HVAC system equipment such as air handlers, VAV terminal units or zone*



Typical air handler graphic with several real time points.



Typical network configuration for building.



Typical floor plan with real time temperatures. Lower right corner provides real time information about the two air handlers serving the floor.

control, heating and cooling control loops. The development of this library can be supplemented by programming the PLC with known HVAC function blocks that are already in use. We are currently developing, testing, and commissioning custom PLC function blocks that replicate the commonly used function blocks. Some examples include AHU timeclocks, AHU optimal start-stop, overrides for digital and analog signals, thermister conversion, reset schedules, damper control, and zone control.

f. *System maintenance.* In-house staff maintain the existing PLC systems. By using "open architecture" systems, we are not reliant upon a single proprietary controls company for maintenance and spare parts. Additionally, PLC control systems can be installed, serviced, and maintained by several local controls companies.

g. *Technical support.* There are several choices for PLC technical support, including service agreements with manufacturers of PLCs, local vendors, and local controls companies. Growing competent internal expertise is our ultimate goal. Thus, even further reducing dependency on outside service providers.

Challenge #4 When to implement the change?

While it is most desirable to convert to PLC technology all at once, this is not usually feasible for most campuses. The beginning of conversion can occur with the next new building scheduled for design and construction. The graphical user interface (GUI) software should be selected for the best interoperability with the old and new systems. With each new building the PLC-based system can be expanded.

As for existing buildings, when remodeling projects are funded, they can be converted incrementally. Additionally, as the legacy system continues to fail, in-house staff or controls contractors can install and program PLCs instead of continuing to reinstall the legacy system. In some cases the buildings have simple control strategies. In these buildings the main controller can be replaced relatively easily with a PLC.

Blazing the Trail

There is a terrific business opportunity if PLC manufacturers were to build a small VAV controller. There is potential to use this same controller with a common protocol such as Modbus TCP/IP for other small industrial type applications. The manufacturers could sell thousands of these small-application, low-cost controllers for chemical feed control, feedback and monitoring, lighting control, security, and access. All of these components could become more integrated and provide facility and utility monitoring through one central computer.

Sacramento State has been complimented for our forward thinking. We have also been criticized for such a crazy notion as using programmable logic controllers in an HVAC application. This technology may not be suitable for every campus. But for those of us who want to get closer to truer interoperability, it is the right choice!

Big Change on Campus

Continued from page 35

on every frontier of inquiry all at once. There will be an avalanche of new knowledge. There will be a cornucopia of new technology from now on in every field. To coherently assimilate this explosion of discovery, higher education will have to restructure itself. It will have to invent new disciplines, while old disciplines will have to be redefined, as we fill them in with newly-discovered knowledge.

We are now granting more and more joint degrees and we are having to change traditional degree programs. Ultimately, colleges and universities are likely to spin off their current professional schools to be independent institutions, competing in the marketplace with the for-profit sector. (Yes, I am talking about schools of architecture, law, engineering, management, medicine, education, and accounting, etc. They wouldn't have to move off-campus, but they would have to be separate enterprises with separate business plans.) Universities will do this so that they can concentrate on creating new hybrid disciplines, like nano-ecologists, isotope hydrologists, forensic accountants, and environmental sociologists. In this process, *higher education will, over the next ten years, also become fuller education*, because there will be more and more different kinds of degrees reflecting the explosion of new knowledge.

Finally, the easy—and increasingly free—availability of scientific knowledge, research findings and technical data over the Internet will enable a growing diversity of independent scholars and non-traditional disciplines to flourish and to gain legitimacy. Alternative medicine, noetic sciences, exotic cosmologies will arise, which online open knowledge networks will assess, dismiss, or assimilate into the formal body of human knowledge. As a consequence, getting a PhD in the future will have to be different from today. In the past, PhDs were earned by writing a dissertation and defending it to a panel of five experts. Now that there will be so many exotic and special niche fields, the way to get a PhD will be to post a Blog on the Internet and defend it against all comers for 90 days.

If a scholar can successfully survive such a dialogue, and an oversight committee certifies the defense and any emendations to the original thesis, a PhD would be awarded. And by the way, PhDs almost certainly won't be permanent. Every ten years, you'll have to go back and re-earn your degree, or you'll become a *PhD emeritus*. By expanding its domain to acknowledge skills or knowledges acquired by any combination of experience, study or observation, traditional *higher education will become further education.*

A New Economic Necessity

The three great macro economic theorists of the 20th Century—John Maynard Keynes, Thorstein Veblen, and Joseph Schumpeter—all died in their 50s, while they were still writing their speculations on the post-capitalist economy. And, although we don't know what their detailed descriptions might have been, we do know what all three of them said in general. They all agreed that *capital*, the source of new economic growth during the industrial era, would no longer play that role in the post-industrial future.

Higher learning has crucial functions to perform in searching for, certifying, and disseminating new knowledge.

The new basis of economic growth and added value from now on, they all believed, *would be science and new knowledge.* Universities must become the mines that will be the source of new value for post-industrial enterprises. Higher learning has crucial functions to perform in searching for, certifying, and disseminating new knowledge. To fulfill these functions, academia will have to aggressively exploit the productive potential of innovative IT. Universities cannot afford to dissipate their scarce resources and focused attention on simply teaching routine skills, which is why they will have to spin off all that career instruction.

Welcome to Revolutionary Times

We are in the middle of a genuine techno-economic revolution. This is the kind of moment that takes up whole chapters of history books. Fifty to 60 years from now, entire history chips will be devoted to this decade, recounting how well—or how badly—the great institutions of the mature industrial economies were able to reinvent themselves for the Information Age. Of all those institutions, the one whose successful reinvention will be most important, is the oldest institution. Older by far than democracy or capitalism, the university and higher education will go through truly revolutionary times over the next 5, 10, 15 years. And in order to succeed in revolutionary times, they will have to be revolutionary themselves.

The Bookshelf

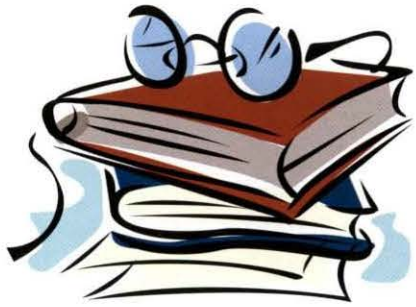
Book Review Editor: Theodore J. Weidner, Ph.D., P.E., AIA

We start a new year with a different version of the Bookshelf column. While some members read every article, others peruse or skim because the life of a facility manager is never dull or quiet (very long). To help those who never seem to have enough time to read a complete book review, I am introducing a column of shorter reviews of more books. This version of the column will alternate with the more traditional, longer reviews. My intent is to solve more than one problem and reach the busy reader as well as the busy writer. Now that a shorter review is possible, I hope fellow facility managers will come forward and provide a single paragraph on a book of interest. It will be a great way to become published, adding to your resumé, without requiring much time or effort. So don't let a busy workday keep you from reading or writing.

* * *

A Whole New Mind: Moving from the Information to the Conceptual Age, by Daniel Pink, Riverhead Books, New York, 2005. 253 pages, $24.95, hardcover.

Those who attended the 2002 APPA Forum in Phoenix may remember Daniel Pink speaking about the development of free agents and the advantages/challenges of striking out on one's own. His book, the *Free Agent Nation* presented the rationale and issues. In *Whole New Mind,* Pink breaks into new territory looking at what it means to 'think outside the box' and tackle problems from a completely different perspective from the linear process than many facility managers may use. Different from scenario planning, he suggests a more 'liberal' perspective, i.e, great books, great music; the sorts of things you might have missed if you did not get a traditional liberal arts education. Similar to some self-help books, *Whole New Mind* provides 'homework' to bring one to new opportunities at work.



* * *

Access for Everyone: A Guide to the Accessibility of Buildings and Sites with References to ADAAG, by Arvid E. Osterberg and Donna J. Kain, Iowa State University, Ames, IA, 2005, $24.95, softcover.

Updated and reformatted, *Access for Everyone* continues to provide the reader with essential and useful information to make facilities accessible through new construction or renovation projects. Changes include 8.5 x 11 format size, clearly identified chapters and sections, color, and a reference key on the inside front cover. The best elements of the original edition were retained so the revised 2005 edition is more appealing. Continued thanks are extended to our facility management colleagues at the ISU Facilities department; just one more example of how APPA members are *global partners in learning.*

* * *

The Oil Factor: Protect Yourself—and Profit—From the Coming Energy Crisis, by Stephen Leeb, and Donna Leeb, Warner Business Books, New York, 2004, $24.95, hardcover.

Two summers ago, this column reviewed two books about the impending oil crisis; who would have thought it would be as bad as it was last October? Now facility managers everywhere are scrambling to find a solution to utility budgets that are ballooning by 25 to 50 percent in a single year. Also affected are construction costs and the availability of many modern materials. While *The Oil Factor* focuses on what investors need to do to protect their financial future, it can also be used by facility officers to identify potential solutions and/or opportunities that will be required in the future as oil prices approach triple digits! Of course, we would all like to find solutions and profit, from some of the advice appearing in *The Oil Factor;* therefore creative thinking by exploring all sides of the energy equation will be required. Here's one opportunity. Happy New Year!

Ted Weidner is assistant vice chancellor of facilities management & planning, University of Nebraska-Lincoln, Lincoln, Nebraska and president of Facility Asset Consulting. He can be reached at tweidner@unlnotes.unl.edu.

New Products

New Products listings are provided by the manufacturers and suppliers and are selected by the editors for variety and innovation. For more information or to submit a New Products listing, contact Gerry Van Treeck, Achieve Communications, 3221 Prestwick Lane, Northbrook, IL 60062; phone 847-562-8633; e-mail gvtgvt@earthlink.com.

CPG Northeast, Inc. has developed the C-05 Concrete Repair Kit (Schmooze Kit ™). It is a self-contained system used to repair and renew surface-damaged concrete. It is formulated on a 100 percent solids epoxy resin system designed for outdoor weather-exposed use. The product repairs salt and freeze-thaw damaged concrete that is in otherwise good condition and meeting the original design strength. The C-05 Kit will allow the areas that are coated to be returned to service typically within 24 hours of application. For more information contact CPG Northeast, Inc. at 215-783-2916.

Accessmount LLC introduces its Ladderless™ removable light fixture designed for hard-to-reach areas including stairwells and high ceilings in commercial, educational, municipal, hospitality and multi-family facilities. The Ladderless system consists of a base, which mounts to a standard junction box; a 14-inch diameter fixture; and a two-prong removal fork, which fastens to the end of a pole. The Ladderless fixture reduces maintenance time and costs associated with routine relamping, cleaning and making repairs, especially in high-traffic or access-sensitive areas. For additional information contact Accessmount LLC at 330-487-0210.

Allsteel Inc.'s #19 task chair has recently had featured "roles" in television and movies like *The West Wing, Entourage, Be Cool* and *Spiderman* 2. Why? The #19 task chair regulates body temperature, enhances circulation, eliminates muscle tension and distributes pressure evenly, all of which help for those long days on the set. And #19 is made of 88 percent recyclable materials and has an "extendable life" which refers to the company's strategy of offering upgrades on #19 parts and materials. Allsteel Inc. designs, builds and delivers workplace furniture solutions with advanced functionality and lifetime durability. For more detailed information call Allsteel Inc. at 563-262-4800.

Miller Electric Mfg. Co. presents the new PowCon® Arc Stud™ 625 stud welder. Where other arc stud welders can weigh hundreds of pounds, the Arc Stud 625 is designed for maximum portability, weighing only 75 lbs., enabling manual portability on the work site. The Arc Stud 625 has an output range of 500 to 1000 amps and a rated output of 1000 amps/32 volts at a 7 percent/4 studs per minute duty cycle. Stud diameters range from ⅛ in. to ⅝ in. and welding a ⅝-in. stud requires only 950 amps and takes ¾ seconds. For additional details contact Miller Electric Mfg. Co. at 920-734-9821.

Stockton Infrared Thermographic Services, Inc. provides state-of-the-art infrared thermographic testing services to top-500 companies and government agencies in the US, Canada, Central and South America. Founded in 1989 and with a fanatical focus on technical excellence and customer service, SITS has created a line of services and applications unparalleled in the infrared service industry. The use of infrared thermography as a Predictive/Preventive Maintenance (P/PM) inspection technique has become widely recognized as an effective non-destructive tool for checking electrical switchgear, mechanical systems, buildings and roofs. For more information call Stockton Infrared Thermographic Services, Inc. at 800-248-7226.

M.A.G. Manufacturing recently launched Kleer Drain, a truly effective instant drain opener. Kleer Drain is a must-have tool for any facility manager. It takes a clogged drain from a time-consuming expensive ordeal to a minor one-minute inconvenience—thus increasing the staff's productivity. It works similar to a plunger, but instead of pumping it up and down, you push once and it sends a powerful burst of compressed air into the backed-up drain unclogging it instantly. Kleer Drain, the world's first truly effective, no-hassle, no-poison, low-cost drain opener. For full details visit M.A.G. Manufacturing online at www.magsecurity.com.

Coming Events

Coming Events

For more information on APPA seminars and programs, visit our website's interactive calendar of events at www.appa.org./applications/calendar/events.cfm.

APPA Events - 2006

Jan 22-26—*Institute for Facilities Management.* Fort Worth, TX.

Jul 8-11—*Campus of the Future.* Honolulu, HI. Joint conference by APPA, NACUBO, and SCUP. Visit www.campusofthefuture.org for more information or to register.

Sep 10-14—*Institute for Facilities Management.* Indian Wells, CA.

APPA Regions - 2006

Sep 30-Oct 4—*PCAPPA 2006 Annual Meeting.* San Jose, CA.

Sep 30-Oct 4—*CAPPA 2006 Annual Meeting.* San Antonio, TX.

Oct 1-4—*MAPPA 2006 Annual Meeting.* Indianapolis, IN.

Oct 12-17—*SRAPPA 2006 Annual Meeting.* Durham, NC.

Oct 15-18—*ERAPPA 2006 Annual Meeting.* Mystic Seaport, CT.

Oct 18-22—*RMA 2006 Annual Meeting.* Billings, MT.

Other Events - 2006

Mar 7-9—*Maintenance Solutions Expo.* Baltimore, MD.

Mar 7-9—*National Facilities Management & Technology Conference/Exposition.* Baltimore, MD.

Mar 20-21—*Management Models for Capital Projects and Facilities Management Conference.* Hilton Head, SC.

Mar 27-28—*2006 International Conference on Biocontainment Facilities*. St. Petersburg, FL.

Apr 10-11—*Summit on Facilities for Emerging Sciences 2006.* St. Petersburg, FL.

Apr 19-21—*National Conference on Building Commissioning.* San Francisco, CA.

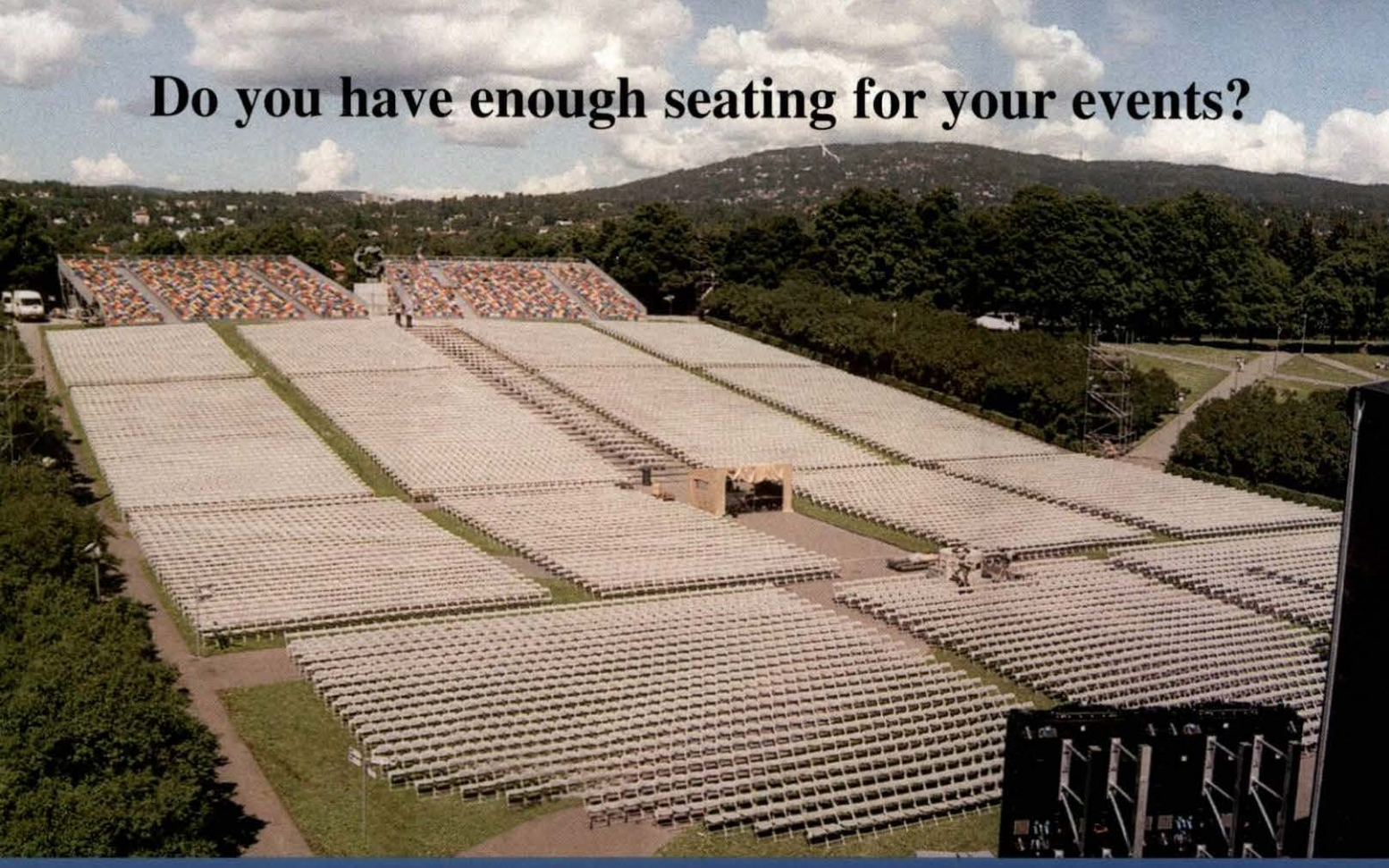
May 1-2—*Research Buildings 2006.* Boston, MA.

Jul 17-18—*Science Buildings Canada 2006.* Vancouver, B.C. Canada.

Jun 25-27—*ACUHO-I 58th International Conference.* Atlanta, GA. Contact Jennie Long, jennie@acuho-i.org.

Index of Advertisers

Do you have enough seating for your events?



Series 5 Stackable Folding Chair

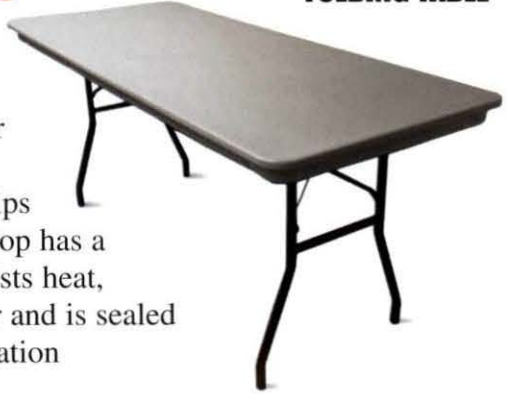
MADE IN THE USA
WITH AMERICAN STEEL, PLASTIC AND LABOR!

- Light weight - 7 lbs
- Polypropylene seat and back in 13 colors feature handle & drain holes
- Steel frame in 7 colors
- Free hot stamp ID
- Sample available
- 5 year warranty

Get Commercial Quality
Get Commercialite®

THE HEAVY DUTY PLASTIC FOLDING TABLE

- Light weight folding tables hold over 3500 lbs!
- Top & frame bolted together using locking nuts
- Accepts standard skirting clips
- Polyethylene blow molded top has a smooth writing surface, resists heat, stains, chemicals & weather and is sealed against biological contamination



McCourt Manufacturing

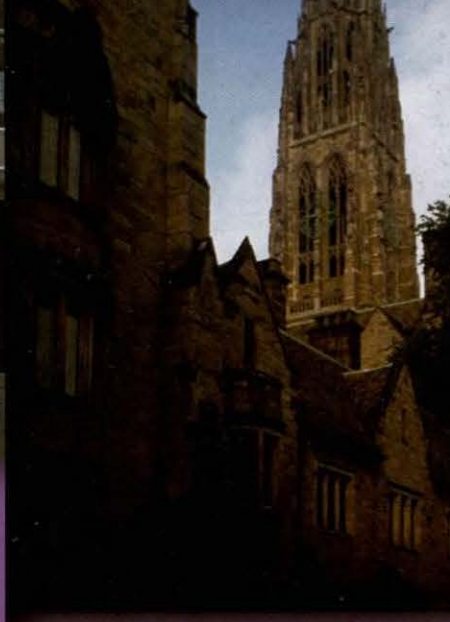
Call Terry

800.333.2687

www.mccourtmfg.com

TOLL FREE FAX 800.982.2530

Fort Smith, Arkansas
Phone: 479-783-2593 • Fax: 479-783-7608



Adapting...

to your facility. to you.

FAMIS, the only integrated Enterprise Facilities Management solution available today, can unite all aspects of your facilities management into one, fully adaptable system. The entire facilities lifecycle is managed by a single suite of software, adapting to your changing IT environments, business processes and global technology.

famis™

Maintenance and Operations • Facilities Management • Real Estate • Project Management • Performance Management