

January/February 1999

VOLUME 15

NUMBER 1

# Facilities Manager

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

MILLENNIUM

A Futurist  
Looks at  
Technology  
and Change

*Also in this issue*

- Space Standards, Part 2
- APPA's Research Agenda
- HBCUs in APPA
- Y2k Embedded Systems

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Volume 15 Number 1

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## From the Editor

Steve Glazner

The 1997-98 Comparative Costs and Staffing (CCAS) survey will soon be mailed to all Institutional members of APPA, as well as to a number of facilities administrators at K-12 school districts. APPA's biennial survey and report provide the most comprehensive data currently available in the area of educational facilities. Each school responding to the survey will receive a complimentary set of specialized reports as our "Thank You" for their participation this year.

We have made substantial corrections and improvements to the survey, the most critical being that we have reinstated and enhanced the questions that will provide more meaningful results you can use. These include specific questions that ask for total costs for each of several functional areas within the facilities operation. Users of the final report will be able to easily ascertain many cost-per-square-foot calculations that were not included in the 1995-96 CCAS report.

Joe Rubertone, director of facilities at Quinnipiac College and APPA's Vice President for Information Services, is to be commended for his leadership in the redirection and improvement of the Comparative Costs and Staffing survey. We also want to thank subcommittee members Phil Cox of Cornell University and Larry Givens of the University of California/Irvine, for their detailed work on developing the 1997-98 CCAS survey. The entire Information Services Committee spent many hours working on these improvements, and we also thank many CCAS users (including Jim Christenson, John Greene, and Terry Ruprecht among others) for their questions, concerns, and suggestions.

The final 1997-98 CCAS report will take several forms, providing a number of options for finding the comparative data you need in as quick and user-friendly a means as possible. First, we will again provide the reports and the complete database in electronic format, as we have over the past several years. This will allow you to quickly review several basic "canned" reports as well as to create customized reports based on your own query parameters.

Second, we listened to our customers and have decided to publish the 1997-98 report in book form. We had abandoned the printed report with the 1995-96 CCAS but found that many members and users of the report often prefer to flip to a report or figure for quick reference. In addition, a printed report makes it easier and quicker to cite an authoritative source to your board or administration when a budget memo or meeting is pending.

Third, we will create specialized information from the 1997-98 CCAS survey for use through APPANet, the association's website (<http://www.appa.org>). This will allow anyone free and immediate access to some of the key findings and trends found in the survey responses.

If you receive a copy of the 1997-98 Comparative Costs and Staffing survey this year, we urge you to respond as completely and accurately as possible. The final report will only be as valid and meaningful as the data reported by the institutions, and we are looking to increase both the number of survey respondents and the quality of the data received. We look forward to your participation. 🏠

# Regional Reports

## Eastern Region

Theresa C. Jordan

ERAPPA Newsletter Editor

Leaves were tinged in brilliant gold, orange, and red, and a touch of crispness prevailed as the Southern New England Chapter of the Eastern Region welcomed all attendees to the 48th Annual Meeting and Educational Conference. Providence, Rhode Island is an exciting city that is an inspiration for Facilities Management personnel. Master planning, capital construction projects, and funding took an area that was slowly dying and has moved it forward to a city that is alive and has a future. The theme "Power of an Idea" not only represented the success of a city,

but also encouraged all participants to learn all they could and take home many creative ideas back to their institutions.

A hearty thanks to all business partners participants who shared many new products, offered solutions to age-old problems and once again provided the financial support that is an integral part of the success of our annual conference. Sincerest appreciation is extended to our many business partners. We look forward to our future productive relationships.

Educational sessions covered technical, human resources, management systems and grounds. The factual information gained in classes coupled with the networking has proven suc-

cess in the facilities management field and this year was no exception.

Electrical distribution tops most facilities managers' concern list today. Many marketplace questions were answered and carried to another level in the role generators will play in the assurance of reliable services.

Human resource segments provided thought-provoking tools, from selling your ideas to change leadership to making a shift from maintenance to customer satisfaction to *Work Key Systems*. The University of Delaware presented a case study on the relationship between Residence Life and Facilities Management and the positive outcomes achieved.



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Management systems covered several areas from proactively managing environmental liabilities, to master planning, daily preventive maintenance support expanding boundaries, and managing disaster recovery.

Broadening Your Horizons & Expanding Your Resources was a dynamic "cookbook" presentation on partnership development. This was an exciting dialogue of how one state university overcame budget constraints, sought grants through partnerships with their university faculty, staff, students, and state agencies for additional funding and has managed to change the campus landscape.

Tours of Brown University and Bryant College capped off this fantastic education program. If you didn't have an opportunity to attend ERAPPA '98, mark your calendar and make every effort to be at the ERAPPA '99 in Ocean City, Maryland.

Special events and companion programs were superb! Foxwood Casino (coffers overflowed), Water Fire (a European flavor to a beautiful autumn night), An Afternoon Delight (how many calories), Angie & Aidan's Italian/Irish Wedding (and when is the divorce?), Newport, City by the Sea (a bit of nostalgia), Premium Outlet Shopping (every shopper's dream), and culminated with the Annual Banquet. From all comments each one of these events holds special memories for everyone.

I have written a summation of the ERAPPA Annual Meetings for the past three years as editor and production designer for ERAPPA News. This is my last article as I move away from my work in the facilities management area. I want to thank the APPA staff for their assistance and support. You have all been an integral part of my success. The knowledge gained during our association is a part of my fabric and future successes.

## Southeastern Region Jewell Frazier SRAPPA Newsletter Editor

The 47th Annual Meeting of SRAPPA '98 was held October 17-20, 1998 and hosted by the University of Alabama at Birmingham. Brooks Baker and his staff deserve kudos for a wonderful job in hosting and conducting an outstanding conference.

The educational sessions, "Control the Past—Manage the Future," covered several hot topics including: Planning Utility Upgrades; Customer Choice: Issues and Implications; Electric Utility Deregulation: Lessons Learned from "Leading" States; Benchmarking and Performance Measurement in Facilities Operations; and Y2K—Horror or Opportunity?

Special activities planned for conference attendees included an afternoon of browsing in Riverchase Galleria, the largest enclosed mall east of the Mississippi, a tour of the Alabama Sports Hall of Fame (Dreamland Ribs catered function), a Casino Party in the ballroom of the hotel, an evening of comedy at the Stardome Theater (T-Shirt Exchange was done before dinner), and a final banquet featuring the SRAPPA Leadership and Awards Presentation.

SRAPPA Officers for the upcoming year are: President, Mike White, University of Miami; President Elect, Brooks Baker, University of Alabama at Birmingham; First Vice President, David Anderson, University of Southern Mississippi; Second Vice President, Sam Polk, Tennessee State University; Secretary/Treasurer, Ken Symonette, Tulane University; Vice President at Large, Ron Brooks, University of Memphis; Vice President for Long Range Planning, Hope Hammonds, University of Alabama at Birmingham; Junior APPA Delegate, Dave Girardot, University of NC at Wilmington; and Senior APPA



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Delegate, Mike Besspiata, Georgetown College.

Nominations for APPA Office included Jack Colby, University of NC at Greensboro, for Vice President for Professional Affairs, and Ken Symonette, Tulane University, for Secretary/Treasurer.

Two special committees were developed. The new Conference Committee includes the Vice President for Long Range Planning, the First Vice President, the Second Vice President, and the Secretary/Treasurer. The Newsletter Committee consists of the Vice President for Long Range Planning, the Committee Chair (Jewell Frazier, Tennessee State University), State Reporters, and a Vendor Representative.

Mike White of the University of Miami assumed SRAPPA Presidency during the annual meeting and his agenda includes promoting the use of performance indicators, benchmarking, and "best in class" practices among SRAPPA member institutions; furthering the development of the SRAPPA homepage as a resource and information tool for the southeast region; increasing membership in APPA and SRAPPA for historically black colleges and universities (the goal is to bring the total number of HBCUs in the southeast region to at least 40 institutions); and continuously assessing APPA's effectiveness in meeting the needs of members. Mike welcomes comments and suggestions from all members. You can reach him at 305-284-3051 or e-mail [mwhite@miami.edu](mailto:mwhite@miami.edu).

The 1999 Conference is scheduled for October 23-26 in Biloxi, Mississippi at the Grand Casino Hotel and will be hosted by the University of South-

ern Mississippi. The theme for the 1999 conference is "Sail Into Success on the Mississippi Gulf Coast."

### Midwest Region Becky Hamilton MAPPA Newsletter Editor

The 1998 MAPPA Educational Conference and Annual Meeting, hosted by St. Thomas University, was held at the Thunderbird Hotel and Conference Center in Bloomington, Minnesota. The décor of the hotel, which was Native American, was a perfect setting for our membership to "Face the New Frontier" together.

The Keynote address was presented by Bill Daigneau, Associate Vice President and Chief Facilities Officer at the University of Texas, Anderson Cancer



**John Harrod receives APPA Meritorious Service Award from Maggie Kinnaman**

Center and his topic was "Partnering in the University and College Setting." He was particularly comfortable with our group as his roots are in the Midwest. He stressed the importance of being open to change—that we "can't plan to change, we have to be adept enough to change our plans." The educational sessions of the conference focused primarily on the importance of partnering and sharing information:

- *Commissioning in the University Setting*
- *Getting to "Yes" on Deferred Maintenance*

- *How to Attract, Motivate and Retain Tech Maintenance Employees*
- *Concepts and Opportunities in a Deregulated Energy Market*
- *Value Engineering*
- *How to Develop Effective Listening Skills*
- *"Old Order Index" Organizing, Prioritizing, Surveying Trends in Orders*
- *Effective Facility Stewardship for Small Colleges and Universities*
- *Internet-Intranet*

There were also information exchanges addressing small and large school issues, as well as a special—extremely lively—information exchange on Y2K issues.

The exhibit hall was another ideal place to foster partnerships. There was a record number of vendors participating this year, giving attendees a wonderful opportunity to meet the people and see first-hand the state-of-the-art products and services they have available to help us do our jobs better.

The social activities also enhanced our opportunities to get to know each other. A Monday night visit to the Mystic Lake Casino was enjoyed by all. (Some more than others depending upon how they fared at the tables and machines!) A delicious dinner and entertainment by a comedienne set the tone for the evening!

The Tuesday night banquet featured a jazz band and entrees typical to our Minnesota host site. A special highlight during the banquet was seeing John Harrod, University of Wisconsin-Madison, receive the APPA Meritorious Service Award from Maggie Kinnaman, President-elect of APPA. John was not able to attend the Annual APPA Conference in San José where APPA awards are traditionally given out.

New officers were also sworn in and welcomed by our membership during the banquet:

- *President: Greg Fichter, Indiana University*

- President-elect: *Terry Ruprecht, University of Illinois, Urbana-Champaign*
- Treasurer: *Clay Shetler, Goshen College*
- Secretary: *Phil Soule, The Ohio State University*

A special thanks to our hosts from St. Thomas who did an exceptional job of making the 1998 MAPPAs Conference a rewarding experience for all who attended! We look forward to visiting Notre Dame next year!

## Central Region

**Tom Jones**

### CAPPA Newsletter Editor

CAPPA's 46th Annual Education Conference and Membership Meeting was held in Little Rock, Arkansas, October 2-6, 1998, hosted by Jerrel Fielder, Director of Physical Plant, and his staff at the University of Central Arkansas. There were a total of 267 attendees (members, spouses, guests, and vendors) who enjoyed delicious food, important educational/technical presentations, topical roundtable discussions, excellent tours, sightseeing, shopping, and outstanding fun and fellowship. This was the second time that CAPPA has met in Little Rock—the first being in 1980 when Mike Dwyer and the University of Arkansas Medical Center hosted the Annual Meeting.

Prior to the start of the conference, the Executive Committee held its semi-annual business meeting, which was followed by the Annual CAPPA Golf Tournament (this year called the "Toad Suck Classic") where members, vendors, and guests enjoyed a wonderful afternoon on the beautiful Cadron Valley Golf Course in Conway. Again, this year CAPPA may not be able to claim a large number of PGA tour-type golfers, but they certainly can be proud of the high quality of friendship and support that occurs between its members!

The conference started Saturday morning with breakfast with the ven-

dors followed by the beginning of a variety of excellent educational sessions addressing the following topics: Mega Trends in Technology; Accreditation Self Studies; Campus Design—Assets Hidden in Plain Site; EPA—Energy Star Buildings and Green Lights; Electrical Deregulation Impacts; CAD You Can; Procurement Specifications; District Cooling Pumping Systems; Fiberglass Piping Systems for Chilled Water Distribution; Injury Reduction Exercise Program; CAD Single Line to 3-D; FRP vs. Steel in HVAC Applications; Y2K Panel Discussion; Cross Training in Housekeeping; New & Retrofit Lab Projects; and Physical Plant Benchmarking Project. Also, topical presentations were given by the following vendors: Acadian Fiberglass; AEC Data; Alpha Building; American Thermal; Cutler Hammer; Energy Masters; Grainger, Paric; Portable Pipe Hanger; Scaltrol; Segal; Smith Fiberglass; Southwest Contract; Tedco; and The Watt Stopper. In addition to all of the above sessions, four hours of a wide variety of subjects were provided in topical roundtable discussions. With all the information provided in these sessions, together with all the hours spent with the 43 exhibitors and the face-to-face interaction with each other, it was a great learning experience for all attendees.

As is tradition with CAPPA, an active, involved, and fun time was provided for the spouses and guests, who enjoyed a guided tour of Morris Antiques (eight large showrooms) in Keo, Arkansas, lunch at Cothan's Mercantile (home of "The Hubcap Hamburger") in Scott, Arkansas, and a tour of downtown "Old Conway" and Pickles Gap.

In addition, all attendees enjoyed tours of the University of Central Arkansas campus and Hendrix College campus, together with dinner and entertainment at Old Gin, great meals at the Doubletree Hotel, and an outstanding speaker at the banquet—Ben Burton. Incidentally, if you enjoy

good, clean humor and ever have a chance to hear Ben Burton, I highly recommend him.

It is safe to say that everyone had a great time, both as an educational experience and as a time of fun and fellowship. Additionally, all attendees can now say that they have been to Toad Suck and Pickles Gap, Arkansas!

The Annual Business Meeting was held on Monday afternoon, at which time it was announced that Rich Hoback had asked to be replaced as Membership Chair due to health problems and upcoming surgery. Rich had done an outstanding job over a number of years and in recognition and appreciation he was given a standing ovation. Neal Swarnes of Coney College was elected to the position of Membership Chair. John Skubal of Johnson County Community College was elected Second Vice President and will host CAPPA's 48th Annual Meeting in the fall of 2000. Also, Al Stoverink, Southeast Missouri State University, was elected Third Vice President and will host CAPPA's 49th Annual Meeting in the fall of 2001.

CAPPA's 47th Annual Education Conference and Membership Meeting will be held in San Antonio, Texas, October 10-14, 1999. The host will be CAPPA's First Vice President, Jack Pellek, Director of Facilities, Alamo Community College District. For the conference center, Jack has reserved the Radisson Hotel which is conveniently located only moments from the San Antonio River Walk, the Alamo, and other downtown attractions. Jack is well on his way in planning and preparing for the meeting and no doubt it will be another excellent learning and socializing opportunity for everyone who attends. All of you are cordially invited to San Antonio to participate in this enjoyable, educational experience!

**Rocky Mountain Region**  
**Charles N. Andersen**  
**RMA President**

Prescott, Arizona's "Mile High City," was the setting for RMA's 46th Annual Educational Conference, held September 16-19, and hosted by Yavapai College's Facilities Management Department. The theme this year was "Searching for Gold." Golden opportunities can be found in many places and in the people with whom we work, but education, training, development, and caring are critical to finding the true gold in people. Gold potentially can be found in electric deregulation, planning, and sometimes in the facilities we build, maintain, and operate. All it takes is desire, leadership, and creativity to find it. With this in mind, the host committee selected discussion topics, presentations, activities, and our entertainment for the conference.

We started the conference by providing two great activities for the day. The golf enthusiast had the annual golf tournament at Antelope Hills Golf Course. As they say, "drive for show and putt for gold." In Prescott, golf is a year-round passion and at 5,300 feet elevation, the air is sweeter and the ball flies farther. The "yellow ball" tournament was a big hit again this year. As we tallied the scores, it was very apparent who was driving for show and who was putting for the gold. More than 70 participated and even if some of us had more opportunities to see more of the course than just the fairways, all had a good time.

For those who preferred a more relaxing time we provided a tour to Sedona's majestic red rock country. Inspirational natural splendor, diverse recreation, and delightful southwest hospitality made this a place to experience. Among other attractions, the pleasure of shopping is unique with a variety of art-filled plazas interspersed with one-of-a-kind collections. They also took a trip back in history to the old mining town of Jerome—perched

high on Cleopatra Hill. The Jerome State Historic Park recounts the mining history so important to Arizona.

After the annual business meeting, it was time to get reacquainted with old and new friends, enjoy some great entertainment, food, and ice cream and to interact with our wonderful sponsors. Our partners were very instrumental in making this a great conference. Their services and products were on display and interaction was encouraged throughout the conference.

Attendees had two more opportunities to go searching for gold in the morning on Friday. They either went to the Electric Deregulation Panel Discussion with panelists Alene Bentley from PacifiCorp, Vicki G. Sandler from APS, Scott A. Gutting from Energy Strategies, Inc. and John C. Tysseing, E3c, Inc. or they went to listen to Dr. James H. Davis from the University of Notre Dame lead a discussion on "Becoming More Relevant or Transformational Management and How to Manage Change Effectively." Three more sessions were provided that afternoon on "Optimizing the Operation of Central Chilled Water Production and Distribution Systems" by William I. Nelson from GLHN. Jan Plank presented ME, Inc. and Robert King and Mark Davidson from Sunrise Engineering presented on "Geographic Information System Advantages to University and College Campuses." Many sponsors also provided Optional Technical Sessions. After dinner, conference attendees experienced the Arizona Jamboree, a wonderful variety show, where all had a great time (especially Val Peterson from Arizona State University).

Saturday started concurrent sessions on the topics of "Expanding Emergency Response and Disaster Recovery Plans to Address Institution-Wide Business and Service Continuity Issues" by Pat Moore from Strohl Systems. Other sessions included "Project Specific Web Sites" by Ward

Simpson from 3D/International, "Landscape Water Management and Environmental Water Technologies" by Christopher A. Larson from Xeris Companies, "Master Planning" by Dave Kenyon and John Jennings from Kenyon Architectural Group and "Defining and Evaluating Facilities Performance" by Manual Marti from Facilities Planning and Research.

This year's conference goal was to create plenty of opportunities to search for gold. Great educational programs, good food and entertainment, a beautiful setting, and a region full of wonderful people helped us to achieve this goal. Thanks to all participants for a wonderful conference.

**Pacific Coast Region**  
**Chris Christofferson**  
**PCAPPA Newsletter Editor**

PCAPPA members recently enjoyed one of the most productive annual meetings ever held by the organization. The meeting, hosted by Jim Hansen of California State University, San Bernardino, was held in Rancho Mirage (near Palm Springs) and attracted a turnout of 125 registrants and 24 major vendors. In addition to great golf weather, there was an educational session focused on personality types, interpersonal relationships, and management styles led by Anita Zimmerman.

In another significant development, one of our vendors made an additional contribution to a PCAPPA Scholarship fund established by their initial donation one year ago. This fund will directly support the strategic efforts by President Johnny Torrez and Education Chair Hildo Hernandez to significantly increase the support for educational activities within the region.

We are all looking forward to next year's meeting, hosted by John Amend of the University of Nevada, Las Vegas and located in Las Vegas, and in the Los Angeles/Long Beach area the following year.

## Australasian Region Neville Thiele

### AAPPA Board of Directors

**A**t the 1997 Annual conference in Sydney, AAPPA 2000, our strategic plan for the future, was launched. This was the first time that AAPPA had articulated its vision, purpose, goals, and strategies to its members. The plan identified key strategic issues that would help shape and direct the AAPPA into the next millennium.

Possibly the key recommendation in AAPPA 2000 was recognition of the need to partner with key facilities organizations, associations, and for-profit companies outside of the tertiary education sector, to forge strategic alliances with others that in the past we may have regarded as our competitors. Growing the association in all membership categories and creating the right climate for the exchange of ideas, experiences, know-how successes, and benchmarking data also were seen as critical to the success of the association.

**Strategic Partnerships:** In 1998, AAPPA established close ties with two key strategic partners. We worked closely with the OECD's Institutional Management of Higher Education Program (IMHE) and have formally agreed to collect and share benchmark data, to collaborate on research work in the facilities management field, and to actively promote the work of each other's organizations. AAPPA and the

FMA have joined hands and will be working together to provide both memberships with improved services. The search for further strategic partners will continue.

**Membership:** This year the association enjoyed a mini boom in membership. First, the number of associate members grew by an impressive 46 percent to almost 400. Second, the board set itself a target of 25 new subscribing (i.e. corporate, for-profit) members, a target that has been 80 percent met. This represents a 1,000 percent increase in existing subscribing members. Third, while the institutional membership retention rate was marginally above 92 percent, the total number of institutional members was maintained by attracting new members. And finally, a number of affiliate bodies (e.g. local councils, private schools) expressed an interest in joining AAPPA and this will be pursued in the coming months.

**Education:** Providing outstanding training programs for members is a primary objective of AAPPA. The education committee reviewed many varied FM training programs available in the Australasian region. The aim has been to develop a training model that would allow members to accumulate credit for training received from different accredited providers. This is a major task and will continue into 1999.

#### AAPPA's Facilities Management

Program at Little Bay was revamped this year and attracted a record of 32 participants, a 40 percent improvement on the previous best attendance figure. The program continues to attract very positive feedback from almost every attendee. And, in the area of scholarships, AAPPA

received a record numbers of applications this year.

**Information Services:** There were a number of highlights in the area of information services in 1997-98. A much-improved website, providing an outstanding resource to members, was released in April. In addition, subscription to the association's discussion group, AAPPA-list, grew by almost 50 percent with an increase in list traffic of 240 percent. AAPPA's newsletter has also vastly improved. Both the quality and the number of articles submitted have been a real credit to those involved.

Finally, participation in AAPPA's annual benchmark survey grew yet again, this year by 15 percent, with 63 returns submitted.

**Finance and Administration:** On the financial front, AAPPA remains extremely healthy with current cash reserves and remains financially sound due to a solid membership base and education programs. Identifying, establishing, and funding innovative research activities and special interest groups (e.g. a futuring group) will be a challenge.

**Annual Conference:** The AAPPA Annual Conference was held in Darwin, September 2-4, in conjunction with the Conference of the Association for Tertiary Education Management. The conference theme "Walking the Tightrope Competition-Collaboration?" was emphasized throughout the conference with campus tours, experience exchanges, and panel discussions. AAPPA members appreciated the hospitality of the Darwin people which made for an enjoyable conference experience.

The Annual General Meeting, held in conjunction with the conference, included comments and input from Maggie Kinnaman APPA President-Elect (USA). Maggie was a lead speaker at a plenary session with the theme "Technology—Friend or Foe in our Race to the Future," and her insight on the topic was excellent. ♀



# Executive Summary

## APPA's Cutting-Edge Initiatives

by E. Lander Medlin

**This past fall** I had the opportunity to visit with a great number of members at their respective regional meetings. The experience continues to be invaluable providing insight in the direction of the profession and feedback on your needs and issues. Each regional president and their board members, and educational meeting host should be very proud of those volunteers from the institutions hosting the meetings who actively attended to every detail and worked tirelessly to deliver such memorable experiences. I continue to be impressed by the quality of the educational programming and the importance each region places on building strong relationships with our business partners. In this high tech world of e-mail, voice mail, websites and faxes, it is a welcome pleasure to make personal contact with so many of the members. Besides renewing old friendships and making new acquaintances, I had the opportunity to speak to the regional board and all attendees about APPA's past accomplishments, present activities, and the future direction of the facilities profession. Although most of our past accomplishments and present activities have been and will continue to be reported on by the Presidents (past, present, and president-elect) and the Vice Presidents, it is important to emphasize a few of our new, cutting-edge initiatives so you will remain well-informed about what we are doing on your behalf. I urge you to visit APPA's website ([www.appa.org](http://www.appa.org)) under the new "Board Minutes" section for further details and status on these and

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many other projects and initiatives completed or underway.

As an association's purpose is education, research and recognition, I will outline these cutting-edge initiatives accordingly:

### EDUCATION

- The development of the curriculum for the third leadership program of the Professional Leadership Center's Academy called "Professional Development Skills" is complete. Delivery of this program will occur at the University of Maryland in College Park from February 7-12, 1999. You won't want to miss this capstone event!

- A utilities deregulation workshop will be offered in Washington, D.C. this spring. For more immediate information, our book on this topic is available through APPA's Publications Department.

### RESEARCH

- The Information Services Committee has significantly streamlined and further refined the 1997-98 Comparative Costs and Staffing survey which has already been disseminated with an expected return to APPA in February 1999.

- A Strategic Assessment Model (SAM) handbook will soon be available as a new publication with specific individual information already provided to each institutional participant.

- A Grounds Staffing Guidelines Task Force has been formed with, and jointly chaired by, the Professional Grounds Management Society (PGMS), one of APPA's elite strategic alliance partners, established to prepare a set of costs and staffing guidelines for grounds maintenance in educational facilities. We envision guidelines similar to those established

for custodial operations which encompass tasks, frequencies, costs, staffing and cleaning levels or service categories for various types of facilities.

- A Technical Trades Staffing Task Force has been formed jointly with the Construction Market Data Group (CMD Group/ R.S. Means), another elite strategic alliance partner of APPA's, to determine the feasibility of developing a set of costs and staffing guidelines for the technical trade areas of facilities operations and maintenance. Although many tools and much data exist within the construction and repair industry for staffing and cost estimation, no industry guideline has been established for the facilities operations and maintenance trades.

### RECOGNITION

- Criteria for the achievement of the "Fellows" designation is nearing completion. Look for an article this spring outlining the criteria to achieve the "fellows" status designation.

- A new "Pacesetter" award has been approved by the Board as outlined in the November/December 1998 issue of the *Facilities Manager* magazine and on APPA's website. Make sure you "recognize talent when you see it" by submitting a name(s) for APPA's awards.

Although this represents a great deal of activity, it is not without focus and alignment with APPA's strategic plan and the needs of the facilities profession. Yet I recognize your needs are continuously changing and evolving, which further emphasizes the need we have for constant and continuous feedback, advice and guidance from you to stay in touch and in sync with those evolving needs.

For example, we desperately need your feedback as we revisit the

facilities profession long range plan of the early 1990s with the goal of updating, even reinventing, the profession as we enter the new millennium. Each of you can provide tremendous assistance toward this specific effort over the coming months by 1) responding to a Member Opinion Survey if you are randomly chosen to do so, and 2) providing feedback to me or any staff member on the needs and direction of the profession.

As you think of the future of the facilities profession, consider Bill Daigneau's article from the September/October 1997 *Facilities Manager* magazine entitled "The Future of Facilities Management" where he outlines the critical driving forces affecting society, higher education, and correspondingly the facilities profession and their impact on changing the roles of the facilities professional in the 21st century.



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### Five Driving Forces

1. Information Technology
2. Resource Scarcity
3. Societal Changes
4. Role of Government
5. Environmental Deterioration

### Six New Roles for the Facilities Professional

1. Operations Coordinator
2. Strategist
3. Industry Partner
4. Asset Manager
5. Information Technologist
6. Executive

This feedback will be used to develop a new long range plan for the facilities profession which will serve to drive APPA's future programmatic activities and research agenda. As author Gary Hamel aptly points out, "There is no telling where the next revolutionary idea will come from; certainly no one should assume it can emerge only from the boardroom."

Continuous feedback is so important because the association exists to serve you. We cannot serve you well unless we know what your needs, wants and issues are now and well into the future. So feedback serves us both by providing the opportunity to create meaningful programs, products, and services that are of value to you.

Second, your feedback helps us understand what you want the association to do on your behalf. In the words of a number of the members from the previous membership survey, "the international association has a greater opportunity to promote the awareness and recognition, and increase the viability and visibility of the facilities profession with senior institutional officers and the media where a single institution cannot."

We heard this message loud and clear. This message represents one of the five strategic initiatives of APPA's strategic plan which states "to increase the awareness of the facilities profession with senior institutional officers." Therefore, a significant amount of my time, effort, energy and

attention is purposely focused on this important initiative. Understanding where the profession is now and maybe more importantly where the profession is going is essential for my effectiveness in doing this.

Finally, your direction and guidance in setting the direction of the facilities profession has taken on new significance as the world has changed most dramatically and continues to change at an extremely rapid pace. It is the rate and pace of change that I cannot emphasize enough. Kevin Kelly, who wrote the book *New Rules for a New Economy*, put it best as he recounted a parable rooted in biology.

*In a pond one summer a floating lily leaf doubles in size every day until it covers the entire surface of water. The day before it completely covers the pond, the water is only half covered, and the day before that, only a quarter covered, and the day before that, only a measly one-eighth. While the lily grows imperceptibly all summer long, only in the last week of the cycle would most bystanders notice its "sudden" appearance.*

The impact of the rate and pace of change on the facilities profession is like that of the lily leaf as it seemingly, imperceptibly covers the lily pond. "Most of the pond looks empty, but a few lilies are doubling in size." Most of the change seems so far removed, but indeed it's doubling in size. For you to keep ahead of that change curve you must think strategically about the care and use of your facility assets; you must embrace the need for organizational change; you must ensure the productive use of your staff; you must skillfully meet your stakeholders' needs; and, you must align your operations with your institution's vision, mission, and objectives.

In the words from the film *Jerry McGuire*, "HELP ME HELP YOU!" By providing continuous feedback, advice and guidance concerning your needs and the direction of the facilities profession, APPA can more directly and instantaneously assist you in keeping ahead of that change curve. 🏠

## Moments of Truth

by H. Val Peterson

Each of us in our personal lives experience incidents that tend to be "moments of truth." These moments arise when we must make a difficult decision or ethical judgments, when a personal tragedy hits, or when faced with a medical crisis. During these occasions, we are called upon to take decisive action, make timely decisions, or convey appropriate remarks that reveal our "real self." These moments of truth identify us for what we truly believe and stand for as a person. These periodic moments substantiate how we measure up. In the same manner, every business and organization that provides a service or a product has "moments of truth" with its customers.

Moments of truth vary from business to business and organization to organization. For a retail establishment, a moment of truth happens when the customer asks a sales clerk for assistance. For a bakery, the moment of truth happens when the customer bites into its product. The moment of truth for a nurse is how painless a shot can be administered. Moments of truth happen within every organization over and over again on a continuous basis.

For each of us in a facilities management organization, that moment of truth comes when we answer the telephone, or personally greet a departmental secretary, clean an office, adjust a thermostat, or 101 other tasks performed each day.

*Val Peterson is director of facilities management at Arizona State University, Tempe, Arizona, and a past APPA President. He can be reached at [valpeterson@asu.edu](mailto:valpeterson@asu.edu).*

During these brief encounters with our customers (students, staff, faculty, and visitors), they are exposed to what we do and how we do it. As a facilities management organization, our services touch each and every person that comes and goes (or even stays) on campus. How we respond—directly or indirectly—to our customers determines how they feel about the organization. And in fact, how the customers of the facilities management operation view the organization determines, to a degree, how they feel about our college or university.

Consider the following universal moments of truth:

- **How fast and how well the phones are answered.** Unanswered phones that ring and ring, and curt or unhelpful responses once they are answered, turn people off or make them angry. Prompt answering of phones and courteous and friendly responses make for satisfied customers.
- **The appearance and cleanliness of the buildings and grounds.** While we sometimes blame the inadequate budget for less than desirable conditions, people typically make the difference more so than the dollars spent. Instances can be cited where two maintenance organizations were provided nearly identical resources and yet the condition of the facilities at one institution was far superior to the other. Why the difference? It was the work of a motivated and caring staff.
- **The appearance of employees.** The appearance of individuals creates initial impressions that go beyond just having neat and clean clothing and good grooming. The demeanor an individual carries with them can

tell the customer a lot about the person. An employee that enjoys what he or she is doing demonstrates that attitude in their appearance. The opposite is also true.

- **Whether employees smile and appear to be pleasant.** On occasion, each of us may have been accused of being "mad" at someone because we failed to smile at them. Our smiles and a pleasant demeanor are important to our customers.
- **How promptly customers are helped or served.** When considering this item, we typically think in terms of retail establishments, but there are parallels within the facilities management organization. Some examples: Do we promptly return telephone calls? Are routine trouble calls addressed in a timely manner? How long does one wait to have an overly hot room restored to acceptable temperatures? There are numerous examples that could be used.
- **How routine customer questions are handled.** How we address complaints, trouble calls, and project and billing status inquiries are critically important. We deal with a wide variety of technical issues on a daily basis and our customers should not be expected to understand the technical side of operations. But many times inquiries are made because they need to know or they are genuinely interested in what is taking place.
- **The cleanliness of restrooms.** The greater part of a building might be spotless, but a dirty restroom leaves a bad overall impression of the facility, as well as the maintenance operation.
- **The effectiveness of signs.** Many institutions have committed considerable time and resources to

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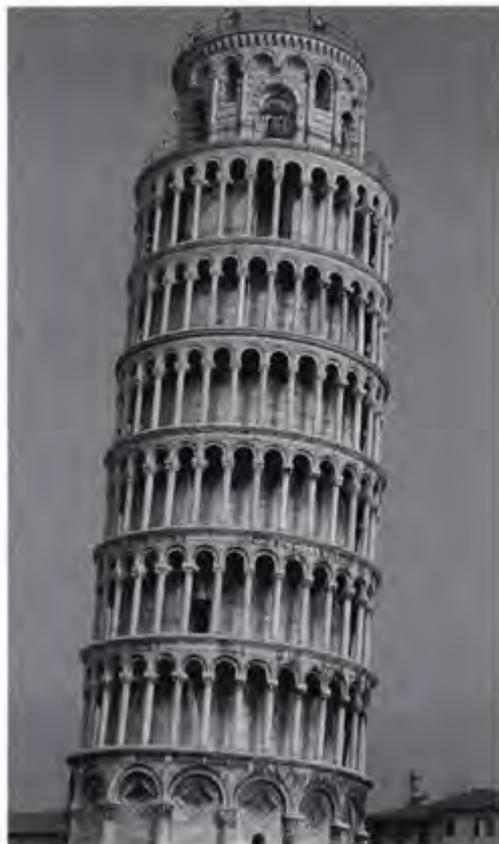
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develop and maintain an attractive and effective system of signage. Signs are critical from a "wayfinding" standpoint. Signage should not only help first time visitors find the campus, but should also help them find parking, a particular building, and then a room within the building.

• **How problems are handled.** Problems will always arise even though we make concerted efforts to prevent them. Just as important as preventing problems, however, is how we respond to them. Problems should always be addressed in a courteous and timely manner.

In our own organizations we need to pay attention to what happens when these "moments of truth" occur. We need to sensitize staff to understand the importance of these moments and then expect them to respond in such a manner that puts both the facilities management organization and the institution in a favorable light. 🏢



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# A FUTURIST LOOKS AT TECHNOLOGY AND CHANGE

by Dr. James Canton

The world is changing in very fast and dramatic ways. Do you remember when your job revolved around keeping the lights on and making sure the buildings are warm during the winter? You never saw or heard from the dean too much, you did your job, and you kept out of the spotlight as much as possible. Remember that job description? Well, that's history!

Why? Because we're faced with a variety of new complex technologies, market drivers, and economic shifts in the world that are reshaping every single organization, every single industry, and I'm here to give you a strategic heads up of exactly what those changes are, what those technologies are,

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*Dr. James Canton is president of the Institute for Global Futures, a San Francisco-based international think tank and strategic planning group. His website is [www.technofutures.com](http://www.technofutures.com). He is editor-in-chief of 21st Century Online, an award-winning digital magazine on the Internet, and his new book is called Future Smart: Business Intelligence for the 21st Century. This article is taken from Dr. Canton's keynote address to the APPA membership at the 1998 Educational Conference in San Jose, California. APPA is pleased to acknowledge the CMD Group for its generous sponsorship of Dr. Canton's speech.*

and how they may affect you in the future. My definition of the future may be one minute from today, not necessarily five years from today, though I will give you some forecasts.

Are you ready for a world where supply doesn't equal demand? Are you ready for a world where companies spend hundreds of millions of dollars to build products to then give them away? Are you ready for a world where less than 50 percent of all the products that will have superior market share in the 21st century haven't even been invented yet? We're living in a time of accelerated change. But what does that mean and how might it affect your world?

I'm going to talk on two different levels today. I'm going to talk on a level of how our larger society and economy is going to be reshaped by technology and what those key technology trends are. I'm also going to drill down on how it may affect you.

Imagine that the year is 1900, and I come to you with an idea about a new device that's going to sit in everybody's home, and it's going to tell stories and have pictures and music, and it's going to fundamentally change commerce as we know it. It's going to fundamentally change even education as we know it. It's called the television. If I came to you in 1900 with an invention that sounded completely outrageous, revolutionary, impossible, a miracle, how many people would have believed me? Very, very few. Let's go back even further. The year is 1400, I've got this terrific friend

who's developed this thing called the printing press. Up to then, publishing was a nice little niche business for monks who were forced into making liqueurs after that.

So would you believe me if I tell you today that we're on the edge of a global digital culture, one that includes smart robotic systems, low orbiting satellites scouring the planet, the Internet, and virtual education—that we are at the edge of a convergence of a variety of new technologies that are going to fundamentally change culture, society, and certainly education as we know it? What was blasphemy yesterday is reality today. Digital culture is a force that is changing all generations.

Want to hear about your customer? The students as well as the faculty and other staff members who walk through your halls? There have been more breakthroughs, more innovations in terms of technology, more inventions in the past hundred years than the previous 2,000 years. What's happening? We're developing a variety of new super tools that are changing our culture. My 75-year-old mother has e-mail. This is a cultural force.

### **New Business Model**

There is a new business model that is going to affect you. How many of you in facilities management have been or are involved in your institution's strategic planning for not just the facilities and the infrastructure, but for the other stuff, the virtual education, teleconferencing, and scanning that goes on there? How many of you are in those conversations of strategic planning? Now, how many of you are *reactive* to other parts of the college or school system making those decisions and then planning upon you?

You need to be in the conversation about strategic planning, and it's a lot bigger than the facilities. Why? Because the student of the future is going to be looking at how wired and how ready your facility is for the 21st century. So what does that mean? It means that all of a sudden you have been relegated as part of the strategic thinking team at the university to help plan a 21st century-ready facility. If you don't, it's going to have a big impact on the quality and the number of students and faculty who choose to come to your institution.

All of a sudden you're involved in a competitive road race for the 21st century. And you've still got to keep the lights on and the buildings cleaned and maintained. But it's a more competitive environment where students can go to 5,000 different universities—and more than 150 of them are virtual, and possibly doubling in number in the next few years. Prospective students are going to start looking at how smart those rooms are, how smart is the facility, how available is it, how Internet-deployable is it.

The new business model in every industry, not just yours, is the network economy. Enterprise-wide, global connectivity drives opportunity, and it will drive yours in educational facilities. I was in Idaho recently giving a presentation to the

Idaho Business and Trade Industry Association. The fellow who spoke before me was a dean at the University of Idaho. He showed all kinds of new technologies and made a great facilities presentation. But really, what was his message? I asked him, "How are you going to grow your university? You don't have that many bodies in Idaho." Of course, I knew the answer, but I wanted to see if *he* knew the answer. He was way ahead of me. "Virtual," he said. "Our market is for students is China." China? He was telling this to a crowd of Idaho senators and business leaders, and they were scratching their heads. How come China? "Well," he said, "we may not have a lot of people in Idaho, but there are a couple billion people over the next five to seven years in China who'll be ready for school, and who's going to take care of them? We've got tremendous technical and engineering capability, tremendous science capability, so we're building a virtual infrastructure." Who's his partner in crime at the university? The facilities people.

The new value chain is virtual integration. In every single industry, we are finding that the folks are connecting the people that make stuff with the people that buy stuff. The more that can be done through the Internet, the more people are squeezing better efficiency and more profitability out of their operation. Now virtual integration is, in one way, causing what we like to say as future's disintermediation. What does that mean? It means that a whole lot of industries and businesses are going to be reshaped, and a lot of bodies are going to be disappearing from the traditional workforce. There's a reason that AT&T and IBM and others have offered early retirement. They had ten times the people interested in early retirement. Why? Because people are looking for greater opportunity in the market place and are leveraging off of these new technologies.

Real-time agility is the new approach for doing business and for running organizations, nonprofit or profit. How fast can you get me that information and make a decision? How fast can we transform our infrastructure to be able to provide the services so that our customers—students and faculty—can make faster and better decisions?

We do major studies for corporations worldwide. What do we find? Tremendous failure about how to roll out new technologies. Tremendous technologies that, at the same time, work with big companies, and small ones. What stopped people from adopting new technology? Fear of change!

I'm going to give you a model you can use to dissect your organization, the people you work with, and your future. We did a study for Fujitsu on why people weren't adopting new computer products. There are four styles about how people manage technology adoption and how they manage change when it comes to embracing new technologies that are intended to enhance peoples' lives and productivity. By the way, none of us like change, so this isn't good or bad, this is just the way it is. There are, in virtually every group of people, representations of all four styles.

The first style is the **traditionalist**. The traditionalist is an overt resistor of change. This is the individual you go into a meeting with and he or she says, "You know, this is a really bad idea giving all the students free Internet access! That is crazy!" A traditionalist's motto is "if in ain't broke, don't fix it." They might say, "Hey, we've been running the facility for so long like this that I just don't see any reason to change this." Traditionalists tend to be the boss or key decision maker; they've been around a long time.

A **maintainer** is a covert resistor of change. The maintainer says yes but means no. You always know you've got a maintainer because they say, "That sounds like a great idea, Bob, I'll send you some e-mail on that." You find out later they never had e-mail. What's wrong with this picture? Maintainers don't like to make waves. "Oh, you've got an idea about how you want to form an alliance with the local ISP and offer Internet service and get the telco to subsidize it and produce a consortium so we can offset these costs and provide it to the students? Great! Give me a report on it." Why? So he can forget about it. That's a maintainer.

**Adapters**, the third style, tend to be willing to learn. Are they afraid of change like all the rest of us? Yes. But they're willing to learn and to try new things. Adapters are willing to do what? Adapt. They're willing to change. They recognize

that "I need to fight these battles by being smarter, more creative, and coming to conferences to network with my peers."

The fourth style is the **innovator**. You can always tell an innovator in a meeting. He or she is the champion of change. The innovator is the *early* adopter of the change. Innovators tend to innovate. Why? Because they recognize you're in an increasingly competitive environment. You *do* have customers, there is competition. What you do does make a difference. It is important. And your role needs to get bigger! You need to advocate for a more strategic relationship within the organization. It's not just about being reactive to building out the infrastructure, it's about being involved in decision making for what that's going to look like and all the different aspects of it.

So what does that mean? You've got to get smarter about the future. You've got to learn a bunch of new things yourself. You've got to leverage off of other people who are smarter around you. Surround yourself with people who are smarter than you. Despite all of this technology stuff, you don't need to know it all yourself—you need to surround yourself with people who get it.

I want to tell you about another aspect of real-time agility. There's two models on the Internet that represent very interesting new business models that I think are going to have an impact on your particular market. Think about an environ-



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ment online where you can bid on any product and service that you want. How about an education? I'm willing to pay "X" number of dollars as a student for a four-year education or an MBA. Who wants to compete for that business? Think about that as a business model.

What about infrastructure? I'm willing as a facilities manager to pay a company to build out my infrastructure, to lay out fiber, make it videoconferencing capable, and put fiber nodes all over and ATM switches, and all kinds of cool stuff. "X" number of dollars for this facility. Who wants to bid on that? By the way, all this bidding will be done in real-time. How ready for real-time agility are you or your organization? Or are you just keeping the lights on? Are you just keeping the buildings warm?

## Digital Convergence

Have you noticed all of a sudden that computers, telephones, and TVs are starting to do some of the same kind of things? There are approximately more than 8 million personal digital assistants available today. People are walking around with these little PDAs, pilot organizers, and other useful devices. Soon you'll find more and more of them will be wireless. They'll be connected to telecom systems.

It's a tremendous opportunity for you to play a role in creating alliances. You can leverage off of the needs of students and faculty on one side of the equation with you as the facilitator of a gateway in the university system, the gatekeeper of that infrastructure.

On the other side of the equation, all the corporations are at a level of crisis and are looking for high-tech, career-oriented graduates. And we've got a crisis in the United States about this. Why? When you've got corporate America banging on the doors of Congress to let more immigrants into the United States because they do not have the confidence in the educational system to produce high-tech executives fast enough for them, you've got a problem.

Now you may say, what does that have to do with me? Hey, I'm managing the facility. That's the people who are managing the education's problem. Is it? Is it really? Maybe not. *Mass customization* is the next key trend. More and more, whether it's an educational program, a telecom service, or a smart-card deployable product, the ability to be able to mass customize information on demand is going to be a critical way that

people are going to be competing more and more. So mass customization is a key trend for the future.

We as a culture are embracing new technology faster than ever before. Let's talk about your customer of the future. Twenty-first century customers, and I mean both the faculty, the administration, your external customers, and students with higher stress, and a high expectation for quality service. More and more, as new technologies come out and they change the economy, whole industries and markets are going to be reshaped. It's already going on. It's happening just faster because within a generation you can see it now: Forty-plus percent of Americans will be telecommuting—they won't be at the office, they'll be in the market place.

I would predict that the next evolution in higher education is going to be people that never stepped inside the university, totally matriculated outside of it, and are living thousands of

miles away in China, South America, and other places. Your customer base is going to expand; it's going to be transglobal. More and more customers are going to be looking for infrastructure that can link them to a wired universe. Are you ready for those challenges? Are you in that conversation? Are you part of that strategic planning? Or are you in a reactive mode?

Customer relationship management is critical to all of this. Another key uptrend in business and in



organizations is how you're managing those relationships, what kind of technology are you using to do that? What's your customer relationship strategy? Or are you just keeping the lights on? Knowledge value management is a major key uptrend which I'll finish with before we move into technologies. I would say this is, and again, this is a heads-up for you because it may not be touching you as much as it will—every organization is facing a challenge between being able to extract knowledge out of all the data they collect on customers, all the data they collect in the market place, and all the data that they buy.

Knowledge is smart, just data is dumb. How much of what you have in your organization, your database if you will, is smart? But the idea of extracting knowledge that empowers people to be successful, empowers students, faculty, and administrators to be successful. This may be the real business you're in. Maybe you're not in the facilities planning and managing business anymore. Maybe that business, maybe that value proposition has completely changed. Maybe you're a

knowledge value engineer. Because really what you're doing is managing the knowledge in this space and making it available through the pipes, the systems, the wires. Maybe you're facing fundamental changes, and we'll take a look at what some of those technologies are.

Okay, those are the key uptrends. Now I'm going to drill down on the specific technologies to give you a sense of what and how this is going to change you. The four major forces of technology that are reshaping our planet include quantum physics, which gave us the principles and paradigms to be able to build computer chips. If we didn't have the principles of quantum physics, we wouldn't be able to build chips in computers, it's that simple. Quantum mechanics gave us the variety of new principles and paradigms to be able to build chips. Okay, first force, quantum mechanics. Second major force, computers. All of a sudden we now have the principles, we built a variety of computer chips. Real fast chips. These chips are the foundation and computers are the foundation of super tools to build what? What's the third major force? Biotechnology. Real simple. Again, here's another major take-away. Take away these three forces, you got it. Biotechnology could not have happened, would not have happened without the second force: computers. Quantum mechanics gave us the principles to build computers; computers gave us the tools to be able to create biotechnology.

So what the computer's worth in the 20th century, biotechnology will be to the 21st. I'll show you what it means.

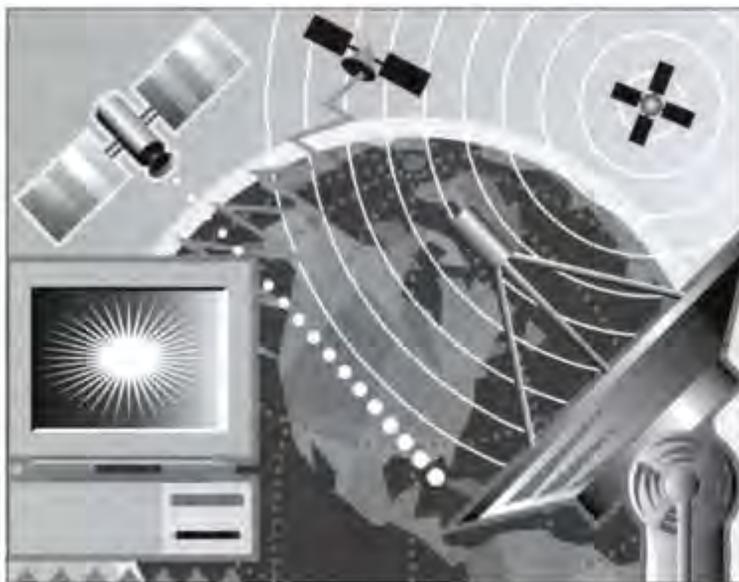
And the fourth force, which will show up more and more over the next five to eight years, is nanotechnology. Nanotechnology, quite simply, before we get to some examples of it, is a combination of computers and biotechnology. Now you may say what do these four forces—quantum mechanics, computers, biotechnology, and nanotechnology—have to do with me?

These are the four forces that are going to completely reshape our planets very quickly. Not in four generations, not in two generations, in one generation. Why? Because you're all going to be living longer. So let's go back now that you've got it. You have a change model, you can take the dissector organization, and you've got the four forces. Now I'm going to give you the specifics around that.

By 2008, probably beforehand, we'll have a one billion transistor 10 gigahertz chip. Now what does that really mean? You've got about 200 megahertz on your desk today. But Gordon Moore, who gave me this number, what it means is you're

going to have very smart, new chip technology. His example, the first silicon DNA chip, very fast, smart, intuitive technology.

I know you're all Y2K compatible, right? We've got about 200 million PCs on the planet, but we've got 7 billion other non-PC chips. In your space, all those embedded chips in the walls that is the biggest problem when it comes to Y2K. Don't focus just on the computer systems. Don't focus just on remediating the data stuff. And I know in terms of the hierarchy, the dean will want X, Y, and Z. Make sure all of the alumni are remediated. Take care of that database. And admissions and billing systems and all that because that's where the bread and butter comes. But if you don't handle this chip problem and go back to the vendors, and you don't handle the networking problem surrounding that, you won't have an organization functioning when the clock strikes 12:00:01. Sensors are everywhere.



And imagine what's going to happen here when we've got these even half a billion five gigahertz chips. You're talking about very intuitive systems, wearable computers with voice activation, forget about the keyboard, distributed smart systems and visible computers that disappear into the architecture. But to get a sense of just how far out this may go, here is your phone call. Here's what it's going to look like. You're concerned about the Y2K problem, you go ahead and you call the dean and this is

what happens. Visualize this. You're on the other end of the phone. "But Dean Whitley, I have a letter from my vendor..." Will that dean be impressed or placated?

Amazing things are being done with virtual reality for meetings, for health care, and for training. But I would say that everything from embedded knowledge, this is a student at MIT who's walking around with an embedded computer. All of a sudden, with 40-plus percent of Americans commuting over the next five years, the smart-card ready car, and the car as an information and communication delivery system will be part of your menu. Then imagine advanced wireless tele-health systems—every clinic, hospital, and emergency room tied to the same Internet system and the same video-conferencing system. And of course, as we know, we're all going to have health pins, personal information numbers, as soon as Congress gets to passing that.

Is that going to create a major privacy issue in America? The aggregation of all this? On one side of the equation, we're networking, connecting everything, right? On the other side,

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we have not spent as much time considering the social impact of all this. You think you should be involved in those conversations? Are any of you part of the privacy committee at your institution?

When it comes to curriculum development, we're seeing more uses of artificial intelligence and super-smart computers. There is on-demand publishing.

A lot of people like to say that the Internet is the future, period. I think it's just part of it, a big part of it. We're looking at approximately moving toward 200 million people on the Internet. We'll have half of billion on the Internet by the year 2000.

Now, you may ask, where is all this going? It's the enabling of digital communities that will drive the Internet to be in your dorm room, your home, or at office and allowing you to communicate with people with your interests. What people are using the Internet for today, particularly the private intranets, more and more it's not just database access, managing products and services, but particularly it's customer service of some kind. Being able to provide information on demand and more and more of that will be education on demand.

We're living in a time of accelerated complex change. It will affect you and everything you do. Secure electronic commerce is on its way. Different kinds of information services: tele-health security, home banking, and education, of course. Much of how we get information will change. When I'm talking about the Internet here, I'm talking about the Internet as a back-end distribution for information and education, that will be accessible through personal digital assistants, telephones, televisions, wearable clothing, embedded microprocessors in landscapes, bus stops, etc.

Virtual education will be a \$100 billion market place. These are pretty big numbers. If you're not in the conversations of how we can address the virtual student and what the virtual curriculum would look like, you should consider getting into those conversations because this will be a major upswing. I would predict probably in less than five to eight years a key revenue driver for most successful universities will be their virtual student. But imagine, I'm up in the



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mountains, in Timbuktu, and I want to tune into my physics course with my professor and I also want to have interaction, I'll be able to do it at 30 frames per second. With Digital TV, you'll have 70 percent of consumers teleshowing. Over a third of those will be aging baby boomers that want to go back to school, but don't want to necessarily move from their home in Palm Beach or Palm Springs or Palm whatever. So they'll be going to school through their digital TV. Over the next 36 months you'll see this rolled out.

Digital cash, the death of money, the new smart-cards—are you ready? With stored values of ten bucks, hundred bucks, thousand bucks, microprocessor-based smart-cards will have all kinds of memory. But then smart-cards will emerge where you'll combine smart-cards with a digital wallet and have videoconferencing.

When you've got robotics, talk about cleaning up the facilities. Aren't you tired of cleaning up all those facilities? Wouldn't you like to have a smart robotic system? Telerobotics for surgery systems like this are already being deployed right now. Will we have robocops that go into areas we won't want to send real human beings? Robo doctors to operate on us? Will we finally have robot teachers? Definitely. Why? Because we can. Smaller, faster, cheaper technology. Computer power doubles every 18 months, and decreases in price by 50 percent. That's why every computer that gets made on Wednesday, by the time it gets shipped, it's already decreased in price by 3 percent. Every day it sits on the inventory, it decreases by 4 percent. We're living in a time of accelerated change.

Biotechnology, virtual drugs, and human enhancement will be the largest industry in the 21st century. Now who doesn't want to live an extra 50 years with the vitality of a 25-year old? The human genome will be mapped over the next five years. We will know your unique footprints. Nanotechnology, being able to enhance your health, your well being and your longevity, is where we're all going. Longer life spans, and believe me, the pharmaceutical companies know it.



So what's my summary? You really have a 21st century digital organization in the making now. The question is, are you going to take up the challenge and build it? Redefine your role in the future. Are you really just in facilities? Or are you in a larger conversation? And that larger conversation, I think, is knowledge value management. Managing knowledge is the new competitive edge. Providing

knowledge value solutions and alliances to empower your customers. But to manage your virtual customer relationships, you've got to have a strategy.

Let me leave you with this thought. The universe is changing very quickly around you. But if you approach this as an innovator, as an adapter, and you start to look outside of the paradigm of your particular space to see what's going on in the outside and getting a sense of how you can play a greater role in your organization for ushering in the 21st century, I feel that you will be ready to meet this challenge. I look forward to seeing you again in the future. 🏠

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# Throwing Space Standards Out the Window (Part 2):

## Using Benchmarking to Predict Space Needs

By Ira Fink, Ph.D., FAIA

*The first part of this series appeared in the November/December 1998 issue of Facilities Manager. In the first article, traditional numerical methods of space projections were examined, some of the fundamental assumptions about space projections were questioned, and the need for a change in methodology for predicting space needs was presented. The first article also set forth the framework for an alternative approach to space projections based on a new, straightforward space benchmarking methodology, which is described in this, the second of the two-part series.*

One of the primary interests of space management on a campus is to create an equitable system of projecting future space needs and allocation among academic and administrative units. This article concludes the examination of traditional numerical methods and presents an approach based not on space projections derived from fixed space guidelines or standards, but instead on space per faculty member.

This article also presents results of a unique national space benchmarking study that was part of the projection methodology. The results, covering a range of disciplines, provide data on space per faculty member in nine Research I universities.

The project began at the Georgia Institute of Technology in 1995 as a result of a institutional change in leadership. There was a concern that space was inadequate, but this research rich institution did not have a factual basis to support this concern. The new President, Wayne Clough, inherited this concern and it became a high priority for the new Senior VP for Administration, Bob Thompson, to test this concern. At the same time, a related concern was to know the condition

of Georgia Tech facilities. (The Georgia Institute of Technology is one of the 34 campuses on the University System of Georgia. It has an enrollment of 13,000 with approximately 30 percent at Masters and Ph.D. level. Tech has 24 separate academic disciplines, two-thirds of which are in science or engineering.)

As part of a prior master plan at Georgia Tech, one study element was a series of space projections based on national standards, by college. In that study, and with outside consulting assistance, the CEFPI formulas were used to determine the space needs of each college, to compare them to what Georgia Tech had, and then project individual college growth according to the standards. This effort led to building footprints for a 1994 master plan and helped to identify whether or not Georgia Tech had enough land to meet its future program needs. However, some of the colleges took issue with the standards as not reflective of their needs, even though a range of space guidelines were used to cover the various disciplines.

### Implementing The Benchmarking Process

As a result of Georgia Tech's prior experience using "standards" to project space, we wanted to test a new space

*Ira Fink is president of Ira Fink and Associates, Inc., University Planning Consultants, Berkeley, California.*

projection methodology based on space per faculty rather than space-per-student. To accomplish this goal, we started with a series of one-on-one interviews with the deans, directors, and chairs of each Georgia Tech academic unit, including the library, computer center, and interdisciplinary studies, regarding specific space needs of their individual programs. Their identified needs could be adjacency related, area related, technically related, program related, code related, as well as covering any facility aspect of the unit's instruction, research and public service mission.

During these interviews, we also asked each of the deans, directors, and chairs to identify those institutions with whom their unit at Georgia Tech either compared itself, recruited faculty from, desired to be like, or which had the best facilities, on a department-by-department and college-by-college basis. Altogether departments representing more than 40 institutions were identified. We arrayed this list by department and institutions then narrowed this list, based upon the number of times departments within one institution were identified. This resulted in what we collectively identified as the eight comparison campuses to be used for the benchmarking space needs projection.

Together with representatives from Georgia Tech, we visited each of the eight campuses. We asked if they would share with us academic appointment counts and facility space allotment data on a detailed unit-by-unit basis, on forms we prepared for the purposes of benchmarking. Each of these eight research universities agreed to do so: Carnegie-Mellon University; North Carolina State University; Purdue University; University of California, Berkeley; University of Illinois, Champaign-Urbana; University of Michigan; University of Texas, Austin; and Stanford University. Together with Georgia Tech, they make up the nine Research I institutions whose data is included in this article. In addition, we are now collecting data for a similar benchmarking study for the University of California, Davis which will include data from the University of California, Irvine; UCLA; University of California, San Diego; and University of California, Santa Barbara.

While we gathered data from the comparative institutions, we needed a current database to represent accurately the space assigned to academic units at Georgia Tech. We updated the Georgia Tech facility database and developed a measure of ASF per faculty by academic unit. We first calculated the number of faculty by department. For purposes of this analysis, we included only tenure track faculty, excluding post docs,

lecturers, adjuncts, and instructors. We also included funded, but vacant, positions.

This also resulted in updating the existing Georgia Tech database of 3,900 rooms used for academic purposes, creating new data fields, and developing a relational database to merge the room data with data on the 53 academic buildings with departmental data. Among the interesting results was the discovery that while interdisciplinary faculty belong to a home department, ten percent of identified academic square footage at Georgia Tech was in interdisciplinary use.

### Reconstructing Space Needs

While developing the ASF per faculty measure for the Georgia Tech academic units, we were simultaneously receiving faculty count and academic unit space data from each benchmark institution. We then mathematically "reconstructed" or modeled each comparison campus to understand what space they would need if they had Georgia Tech's mix of faculty and academic units. From this institutional "rebuilding," we derived a measure we called the "comparison campus assignable square feet per faculty member" guideline. This reconstruction, we felt, removed any space "bias" or "weighting" due to one institution having departments larger or smaller than another. We then used this measure or guideline as a benchmark to compare existing assignable square feet per faculty member in each of

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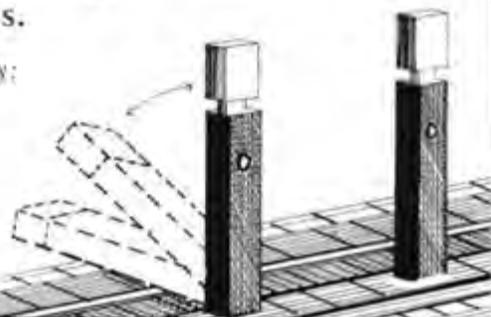
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the academic units at Georgia Tech with this nationwide list of peer institution comparable benchmark campuses. (This process is summarized in Table 1.)

## RESULTS

### Assignable Square Footage per Faculty

Table 2 describes the cumulative results of the benchmarking analysis. Data from all nine institutions, including Georgia Tech, are included. The first column describes the average assignable square footage per faculty member by discipline. The second column describes the range of values from the institution with the least amount of square footage per faculty member to the institution with the highest amount. What is important to note and cannot be seen in this table is that there was no single institution that was consistently low in all disciplines, nor was any single institution consistently the largest in terms of square footage per faculty.

The average ASF per faculty measure itself allows an institution to have a gauge of where it stands relative to its peer institutions. It also allows senior officers of an institution a get a quick sense of how much space would be needed should they choose to build a department, enrich an existing activity, or seek to excel by matching those institutions with comprehensive facilities.

As Table 2 indicates, there is a range of average values within each major discipline block, such as within engineering or science. A research campus, for example, that wants to increase faculty in the area of chemistry or biochemistry should not be surprised to find that the cumulative impact of adding a new faculty member would result in the need to provide 3,000 or more assignable square feet. This is the average of all nine benchmark institutions in chemistry and biochemistry, with a range from a low of about 1,500 assignable square feet to a high of nearly 5,000 assignable square feet per faculty. At the same time, if a campus were to add faculty to the economics department, the average ASF per faculty member at a Research I university, based on this analysis, would be approximately 600 ASF, with a range from 400 to nearly 1,100 ASF per faculty.

### Projections Model

We used this data as input to build a space allocation and space projections model for Georgia Tech. The benefit of this macro model, which describes space needs on an assignable

square footage per faculty member, is that it will allow a campus to view quickly the space needs of units it is encouraging to grow through its academic planning process by the addition of faculty positions. The Georgia Tech Provost, Mike Thomas, provided a series of faculty growth projections by discipline, to test how much space would be needed as Georgia Tech moves forward into the 21st century.

### Research Space

Regarding typical university questions on departmental research space and sponsored research space, we began with the premise that faculty are entitled to a basic amount of research space. In some instances, the research space is within the faculty member's office. In other instances, it requires dedicated laboratory space. Departments may have some faculty who do desk research and some who conduct bench research. This research space need was built into the data base upon which the ASF per faculty was developed, as an average across all faculty. In our benchmarking approach we computed a space

allotment per faculty member, excluding classroom space, based on space as classified by the National Center for Education (NCES) codes 200 to 800, except libraries. Thus, the ASF per faculty includes research space assigned to departments. The total allotment includes office space for faculty and graduate students, research labs, class labs, storage, shops, etc.

Using this type of projection, a department chair or school dean could, within their space

allotment, provide space as they saw fit for new research programs and reduce space from research programs whose funding had declined substantially, or in which the principal investigators had moved on to other activities.

### Findings

In a few cases, we found some Georgia Tech academic units which were slightly larger than our national comparison institutions. At the other end of the scale, we found the College of Computing and the College of Science to be short on space.

We have proposed, and Georgia Tech has now accepted, a series of space projections on a college-by-college basis that should carry Georgia Tech well into the next century. These projections include providing additional space to Georgia Tech units to allow them to match their comparison institutions, providing additional space to enhance their academic programs, allocating space to increase enrollments, and



**Table 1**  
**STEP BY STEP BENCHMARKING METHODOLOGY**

- 1. Identify Selected Institutions:** Identify comparable peer institutions for the benchmark program analysis.
- 2. Identify and List Standards:** For each of the selected institutions, and to the extent that comparative facility and space documentation is available, identify and list the types of space standards and utilization standards that may currently be in place at the institution, including a discussion as to whether or not the standard as listed is actually being applied.
- 3. Qualitative Assessment:** In addition to the above quantitative assessment, arrange site visits to the comparative benchmark institutions. One purpose of the site visits is to provide a first hand review of facility changes, facility concepts, and facility directions at these institutions.
- 4. Benchmark Questionnaire:** In addition to the site visits, prepare a questionnaire to distribute to each of the benchmark institutions. The questionnaire would elicit data from each institution on faculty counts and square footage assignment by unit or department.
- 5. Benchmark Analysis:** Tabulate the data to create the benchmark measures of assignable square footage per faculty member.

**Table 2**  
**ASSIGNABLE SQUARE FOOTAGE (ASF) PER FACULTY**  
**AT COMPARATIVE RESEARCH I UNIVERSITIES**

<i>Research I Universities Discipline/Department</i>	<i>Average ASF Per Faculty Member</i>	<i>Low To High Range ASF Per Faculty Member</i>
<b>Architecture and City Planning</b>		
Architecture	1,950	1,350 - 3,000
City Planning	660	630 - 700
<b>Computer Science</b>		
Computer Science	1,620	870 - 2,020
<b>Engineering</b>		
Aerospace Engineering	1,930	1,600 - 3,160
Chemical Engineering	2,820	1,660 - 3,280
Civil/Environmental Engineering	2,280	1,510 - 4,330
Electrical Engineering	1,590	1,150 - 2,900
Industrial Systems Engineering	1,080	670 - 1,390
Materials Science Engineering	2,060	1,240 - 3,000
Mechanical Engineering	2,160	1,290 - 3,040
<b>Science</b>		
Biology	2,720	1,530 - 4,700
Chemistry/Biochemistry	3,020	1,560 - 4,960
Earth/Atmospheric Science	1,750	890 - 3,480
Health/Performance Science	2,160	670 - 3,460
Mathematics	510	260 - 920
Physics	1,820	1,260 - 2,810
Psychology	1,300	680 - 1,900
<b>Liberal Studies</b>		
Economics	620	410 - 1,080
English/Literature	360	180 - 670
History	290	170 - 650
Management	930	290 - 1,520
Modern Language	410	240 - 650
Public Policy	570	210 - 800

All numbers rounded to the nearest ten square feet  
Source: Ira Fink and Associates, Inc., University Planning Consultants, Berkeley, California

increasing space to achieve excellence. Each of these needs will add faculty and thus square footage. Georgia Tech is now in the process of seeking funding for these capital needs. A new master plan at Tech incorporates the projected space as building blocks.

What was of most importance to us was that this process and the resulting product were embraced by Georgia Tech as a workable method to solve their thorny space issues. (In addition to the programmatically driven space analysis, a facilities condition assessment was simultaneously completed for Georgia Tech by the ISES Corporation and the cost of continuing to use a building or to renovate it was factored into our space allocation process.)

## Lessons Learned

We learned a number of lessons by conducting this space benchmarking survey and applying it. First, to be useful, the process requires good institutional information, both in terms of space data and faculty counts. Using the National Center for Education Statistics coding system for rooms provided us with assurance that we were conducting an apples to apples comparison, across this national range of universities. Second, we have coined a new use for the term "hard" data. This does not mean that the information is irrefutable, but rather that it can be damn hard to get.

Third, we acknowledge that there is an opportunity for error in this type of analysis. We relied on the generosity of the institutions that provided the data to supply accurate information and we believe they did, although there is no mechanism to verify this. At one institution, the data provided for one discipline seemed out of balance in comparison with others. We reviewed this with the institution and indeed they had made an error that was highlighted by the comparison data. (We should point out that we knew facilities' staff at all these institutions, thus our requests did not come from out of the blue and the institutions were willing participants.)

Fourth, space data at individual institutions are constantly changing. This type of activity is a snapshot, and there are institutions in the group that are adding more space and those who are not. Thus, using the data averaged across institutions provides a useful benchmark.

Fifth, the data we used in this project are from a selected group of research institutions with which Georgia Tech wanted to compare itself. This eliminated the concern of including institutions that were not operating at the level of Georgia Tech or did not have a similarly important research mission.

Sixth, this database provides a good first estimate. It is helpful in projecting how large a unit needs to be when conducting master planning. When engaged in projecting the specific needs for a new building or renovation, the data provide some outside guidance, but the specific building programming activity needs to be based upon specific design data for offices, laboratories, teaching spaces, etc. required for the particular program.

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Lastly, and most importantly, space data based upon total departmental or discipline use and faculty count is easier to obtain and easier to use than that based upon enrollments. Students take courses across departments and disciplines, as part of graduation requirements, as part of major requirements, and as part of service courses. Faculty, by contrast and with relatively few exceptions, are within one home department.

Our work was a fairly straightforward field research activity. The results provided the ability to have one institution directly compare itself to others and to allow that institution to choose at what level it wishes to be in terms of availability of space.

### The Future

What does the future hold? Will this methodology work everywhere? We believe it will. Will others follow suit? Hopefully. To do a benchmarking study takes time and work. It takes cooperation. It challenges the status quo. The real need is to create a national database.

### National Space Benchmarking Project

In addition to the data we have from the institutions involved in our past and current benchmark studies, we have now received commitments from 20 other community colleges, colleges, universities, and medical centers nationally to share with us their space and faculty data. We are moving forward and creating a national space benchmark database. Our goal is to create a database for use in comparing and projecting the requirements of assignable square footage per faculty by discipline, across an identifiable range of colleges and universities. Campuses who are interested in participating in the National Space Benchmarking Project can contact me at Ira Fink and Associates, Inc., in Berkeley, California at 510-843-1900. 🏠

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A man in a dark suit and tie is walking on a thin wooden pencil that is balanced horizontally across the top of a desk lamp. The lamp has a silver adjustable arm and a white shade. The background is a blurred office setting with a computer monitor and other desk items.

# Charting the Future:

By William A. Daigneau

## A Research Agenda for APPA

What a dilemma! Sandwiched between the faculty and students who rely upon them to provide the best possible environment for learning, and the chief business officer whose mission is to balance limited revenues with ever increasing expenses, facilities managers' loyalties have been severely tested. On the one hand the higher education facilities executive intimately understands the critical importance of modern, well-designed and operated facilities to a quality educational experience. On the other, as responsible captains for a major expense line in every college or university's capital and operating budget, facilities managers have been challenged to continually reduce expenditures in order to free resources to support growing expenses in other areas such as student services, new technologies, or regulatory compliance.

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*Bill Daigneau is associate vice president and chief facilities officer at the University of Texas M.D. Anderson Cancer Center, Houston, Texas. His article, "Product Based Management," received APPA's Rex Dillow Award for Outstanding Article in 1998.*

In the late 1970s, facilities managers became alarmed over the deteriorating condition of campus facilities. In his seminal piece entitled *Crumbling Academe*, Harvey Kaiser openly questioned higher education's practice of balancing the books by under-investing in capital assets. Yet while the prescription to address this problem was self-evident (provide more funds for plant), its actual execution was nonetheless elusive. While some gains have been made over the past two decades, the problem still remains for many colleges and universities. This has led some facilities managers to the conclusion that a fundamental reexamination of higher education's administrative practice and decision-making structure is needed. Somehow the daily needs of students and faculty must be better integrated with the longer-term issues of providing the space needed to conduct the educational process.

With the encouragement of Gary Reynolds, APPA's vice president for educational programs, an effort was initiated to find ways to gather the information and tools necessary to help APPA and its members assume a more effective leadership role in higher education. Led by Doug Christensen of Brigham Young University and myself, APPA's Task Force on Leadership Programs undertook a work session in April 1997 to explore the future of higher education and the leadership

role that facilities managers should play in that future. A group of senior facilities managers, higher education administrators, and industry representatives met and identified several driving forces that would most likely shape higher education's future. The product of that work session was detailed in a September/October 1997 article in *Facilities Manager* magazine, "The Future of Facilities Management."

The major driving forces the group identified were:

- **Information Technology.** This single issue may dramatically impact higher education in ways yet unimagined and unexpected.
- **Resource Scarcity.** Higher education will continue to compete for resource allocation amongst a host of societal needs and wants.
- **Societal Changes.** The growing diversity of national and world populations will place new demands on who and what we teach.
- **Role of Government.** Increasing oversight and involvement of government (federal, state and local) will steer higher education to address the above-mentioned changes in society.
- **Environmental Issues.** The need to extract more benefits with less waste and damage to our earthly environment will continue to grow in importance.

The Atlanta work session also identified various areas in which facilities managers themselves must become knowledgeable if they are to provide critical leadership for higher education in the future. These issues included improved knowledge and skills in Information Technology, Operational Effectiveness, Strategic Planning, Partnering, and Asset Management. In addition, facilities managers of the future must have executive level skills in order to function well as a member of an institution's executive team.

This led to a very profound but troublesome realization. While APPA's programs of the past had prepared facilities managers to function well in their traditional supportive role, APPA was not well equipped to help its members rise to a new level, that of leadership within higher education.

The Task Force subsequently determined that a new, three-prong initiative was needed. First, it proposed a revamping of APPA's programs in Executive Development and Facilities Finance into a three-session institute structure teaching skills in Personal, Organizational, and Professional Leadership. Second, it suggested development of a Fellows program to encourage and recognize facilities management leaders. And third, it determined that APPA must undertake the discovery and evaluation of new information that would lead to improved higher education management practices, particularly as they pertained to capital assets. This latter element, one of *researching* new information methods, was vital to provide facilities managers, and higher education with the information needed for innovative and improved decision-making and management.

The question then arose as to research what? To address this question, the Task Force once again convened a work group. Composed of representatives from higher education and industry, and supported by a generous grant from Nalco Chemical Company, the work group spent two days in Chicago addressing the following fundamental questions:

- What information might help higher education prepare for the impact the above forces might have over the next decade?
- What knowledge would help us improve facilities management practices?
- Which management tools or techniques, if available, would materially improve the ability of higher education to better manage or prepare their institutions for the future, as it pertains to capital assets.

In an effort to address these questions, the work group developed a more specific list of problems or issues. This list of problems/issues forms the potential research agenda for APPA over the coming years. This was the primary product from the Chicago meeting.

In total, the work group developed a list of 20 potential research topics. For each topic (all of them posed in the form of a question) the group defined the objective of gaining more knowledge or information in this area, and the hoped for result if that information did become available. These topics were then prioritized on their degree of importance (in the view of the workshop participants) to higher education and facilities managers. The group worked both enthusiastically and tirelessly. One could sense the growing urgency amongst the members as they discussed and debated the implications of the various topics. As in Atlanta, I was impressed with the power of a diverse group of educated and informed professionals to grasp and then tackle very complex issues, given the proper conditions and tools.

Space does not permit us to print the entire list of research topics developed by the group. A brief sampling of some of them, however, will give you an idea of the types of topics the Chicago group felt worthy of further research.

Under the category of Information Technology, the following question was posed:

**How do we integrate information technology with the facilities infrastructure?**

Several years ago, many of us installed telephone switches that were capable of handling data as well as voice. Before we could get the final equipment inspections completed, we found ourselves laying broadband cable and fiber optics alongside the phone cable we had just installed. Why? Information Technology is fundamentally altering its platform every five to seven years, much faster than we can build or change the infrastructure to support it. How do we anticipate such change in the built environment? What should we be doing today to better respond to a technology that may radically reshape the face of higher education? Can we avoid the terrible costs of major mistakes, like the money we paid for

those high tech, but quickly obsolete telephone switches? The objective of researching Information Technology is to develop information which will lead to more sustainable infrastructure design and longer-term effectiveness. This in turn might lead to the better delivery and incorporation of information technology services and systems in our educational infrastructure.

In the area of Strategic Management, several intriguing questions were developed:

1. What are the elements of a facilities strategy/strategic plan?
2. How do you develop a facilities strategy without an overall institutional strategy?
3. How does the facilities management team prepare for the future challenges?

On this last question, the group's discussions centered on how we would determine which emerging issues would truly be mission critical. For example, given the myriad of details and management issues with which most higher education facilities managers must deal, which of those are most important to the short term and long term success of their institutions? Should we be preparing our management team for the impact of information technology, or should we be better equipping them to deal with resource scarcity and maximization of objectives in an environment of long term capital rationing? What strategy should we employ today to deal with the uncertainties of the future? Research in this area would hopefully provide us with better management tools to translate higher education issues into facilities strategies.

The Industry Partnership category raised two particularly interesting questions:

1. How do we align the objectives of the institution with an industry partner?
2. What are the partnership opportunities for facilities management and which ones have proven beneficial?

Partnering as discussed by the group is more than simply outsourcing. We traditionally have maintained close long-term relationships with many external suppliers of goods and services and have relied on their innovation and technical expertise to help us solve our problems. How can we in higher education better integrate these for-profit providers in our quest for better facilities management practices and outcomes without compromising our ethics and honesty, or the oft-unproductive

relationships of our usual "arms-length" transactions? Research in this arena might help us discover ways to better tie their fate with ours.

The growing need for improved Asset Management practices raised this question with the group:

#### **What are the methods and criteria for measuring asset productivity and utilization?**

If we were managing office buildings or hotels for profit, one measurement we would check daily is our occupancy rate. Higher education however has rarely examined its utilization factors once a building is built. This has raised the impression with many business-minded legislators and

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Under the category of Operational Effectiveness under conditions of continuing Resource Scarcity, the group thought the following information would be helpful:

1. What are the distinctions between outsourcing, out-tasking, contracting, privatization, or strategic alliance?
2. How does a facilities management organization structure promote the following: responsive and timely services delivery; consumer feedback; and communicating results?

The latter question takes a deceptively interesting angle. We have traditionally organized ourselves around production efficiency. But what would be the changes if we organized around a customer service focus? Would we have the same structure? What are the compromises to efficiency, if any, to develop a structure which puts the customer first?

The outcome of such research might be the development of alternative organizational models and processes, each perhaps designed to optimize specific, but differing objectives.

Several topics for research were provoked in the area of Executive Development:

1. What are the core competencies required for an effective facilities manager?
2. How do we attract and retain the right people?

All of us are confounded by the scarcity of high-quality, innovative facility managers. Colleges and universities have a unique set of facility issues which requires a good dose of creativity, communication skills, and intelligence. Identifying the core skills which lead to success in this often difficult environment, and the identification and development of a pool of managers possessing such skills, will continue to be an imperative if we are to successfully lead higher education in the next millennia. Research in this area may help guide us and our colleagues in human resource management.

Besides the above six areas, the group also identified Personal Effectiveness as an area where facilities managers must excel in the future. To do so, the following topic was believed worthy of increased investigation:

#### **How do we create a learning organization to promote and lead change?**

The future will undoubtedly challenge us to adapt our processes and organizations to meet a changed world. How can we lead such change without the incumbent upheaval and the personal toll that rapid change often incurs? While we must of course have a focus on doing what is necessary to

help higher education itself adapt, we cannot do it callously leaving in our wake ruined lives and damaged attitudes. Further investigation of the techniques that promote change and encourage healthy organizations will be increasingly important to our success as leaders in higher education.

Of course, there are many additional questions in all of the areas discussed that will come to mind to those reading this article. Obviously, the list of topics developed by the Chicago work group is not an exhaustive list. To expect such would be unrealistic. But the point of this is not whether they have thought of every issue imaginable, but whether or not this is a good place to start. One must ask, "Are not these important issues to address for the future of higher education, and if addressed, will the information gained help us improve the management of facilities?" If the answer is "yes," then our next task is to determine how to gather the information and test various theories in order to address this list, or any other list, of research topics.

The Chicago work group did discuss how a program to encourage research on the various topics might be implemented. One thought was to contract with governmental agencies, or partner with industry to pursue some of the topical areas. Another was to create a separate entity within APPA to sponsor and conduct such research, sort of like an internal think tank. But the most promising idea was to tie the research program into the development of an APPA Fellows program. To receive recognition as a facilities leader, the group reasoned that a candidate should do original research into a topic of interest to the profession. While this would not be the sole source of our research fellows component (in conjunction with the other ideas), it would be a valuable and steady source of information and could stimulate the entire research effort.

It was also thought that APPA should play a number of critical roles in initiating such a research program. First, APPA is in a key position to manage the overall research effort. This role would consist of identifying researchers and prioritizing topics, setting standards and formats for the research, conducting edits and peer reviews, and providing a database of information and references sources. In addition, APPA is in the best position to identify and solicit research interests with governmental agencies, private foundations, and industry. This might include either funding or the conduct of the research itself. Finally, APPA should be the primary communicator and disseminator of the results of the research, not only to APPA's members, but also to higher education in general.

Armed with a list of potential research topics which could significantly benefit higher education and facilities management, and with some ideas on how to implement such an effort, what are the next steps? The Leadership Task Force and APPA's Executive Vice President discussed with the APPA

Continued on page 36

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Board of Directors the development of a more detailed proposal for the creation of the Fellows program. In addition, final preparation for the third leg of the Leadership Institute, the one dealing with professional development, is underway with the University of Maryland. Further details of the research program are now under discussion by the Task Force. All members of APPA are encouraged to share their ideas and suggestions with APPA's officers, Doug Christensen, or myself.

We all recognize that the first cornerstone of Leadership is to have the will and the ability to lead. Through the three newly designed leadership institute sessions, APPA is attempting to equip facilities managers with the skills needed to lead. But the second cornerstone, that of research, is the area that requires major work and must be the focus of our next efforts. The underlying importance of Research is the need for any profession to constantly improve itself through innovation. Innovation itself is spurred by knowledge. And knowledge is derived from systematic investigation into the fundamental workings of a system, in our case, higher education and facilities management.

The fundamental method of such investigation is research. Therefore, if we are to truly lead, we must do more to foster research, which hopefully will provide the knowledge on which future innovation and improvement will be based. That is the key not only to the future of higher education, but to our futures as well. 🏛️

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### Multiple Benefits for You

Attending the APPA Educational Conference is a solid investment in your future. Many networking events offering opportunities to share ideas and knowledge, a large exhibit hall filled with the latest in products and services and more than 30 educational sessions conducted by top speakers make this the one conference you won't want to miss.

### Expand Your Mind

One highlight is certain to be Privatization: Conspiracy or Collaboration, an open debate examining the pros and cons of outsourcing. Gain new perspectives and insights into this perplexing issue, and get a better idea of how to manage outsourcing on your campus.

### Collaborative Learning Labs:

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### Keynote

Prepare to be inspired by keynote speaker Michael Gelb, at Sunday's 8 a.m. breakfast session. Author of *How to Think Like Leonardo Da Vinci*, *Mind Mapping*, and several other books on creative thinking, Mr. Gelb is a recognized pioneer in the fields of creative thinking, communication, and leadership development. Using Leonardo's life, Mr. Gelb provides examples of qualities that we can develop to make a real difference in our own lives.



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Make plans to attend the opening reception, on Saturday evening, 19 June 1999, generously sponsored by Johnson Controls Inc. This fun, casual event is the official "kick off" of the conference, so be sure to bring the whole family. Renew acquaintances and make new friends while you enjoy delicious appetizers, drinks, and entertainment.



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This year's banquet speaker is Les Brown, renowned public speaker, television personality, and author of *Live Your Dreams* and the newly published, *It's Not Over Until You Win*. You are sure to enjoy this special evening at the APPA conference as you gather with friends and colleagues...so be sure to attend!

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As you can see, Cincinnati offers something for everyone and for all ages, so make plans to arrive early and enjoy some of the sightseeing and highlights that Cincinnati is famous for.

You'll want to enjoy APPA's educational sessions and exhibit hall that is being conveniently held at the Cincinnati Convention Center, in the heart of downtown. APPA hotels are the Omni Netherland and the Crowne Plaza Cincinnati.

We're working hard to make sure that this year's annual meeting will be the best one yet! Stay up to date with new developments on APPA's website <http://www.appa.org> and watch your mail for the Preliminary Program and registration materials...coming in March.

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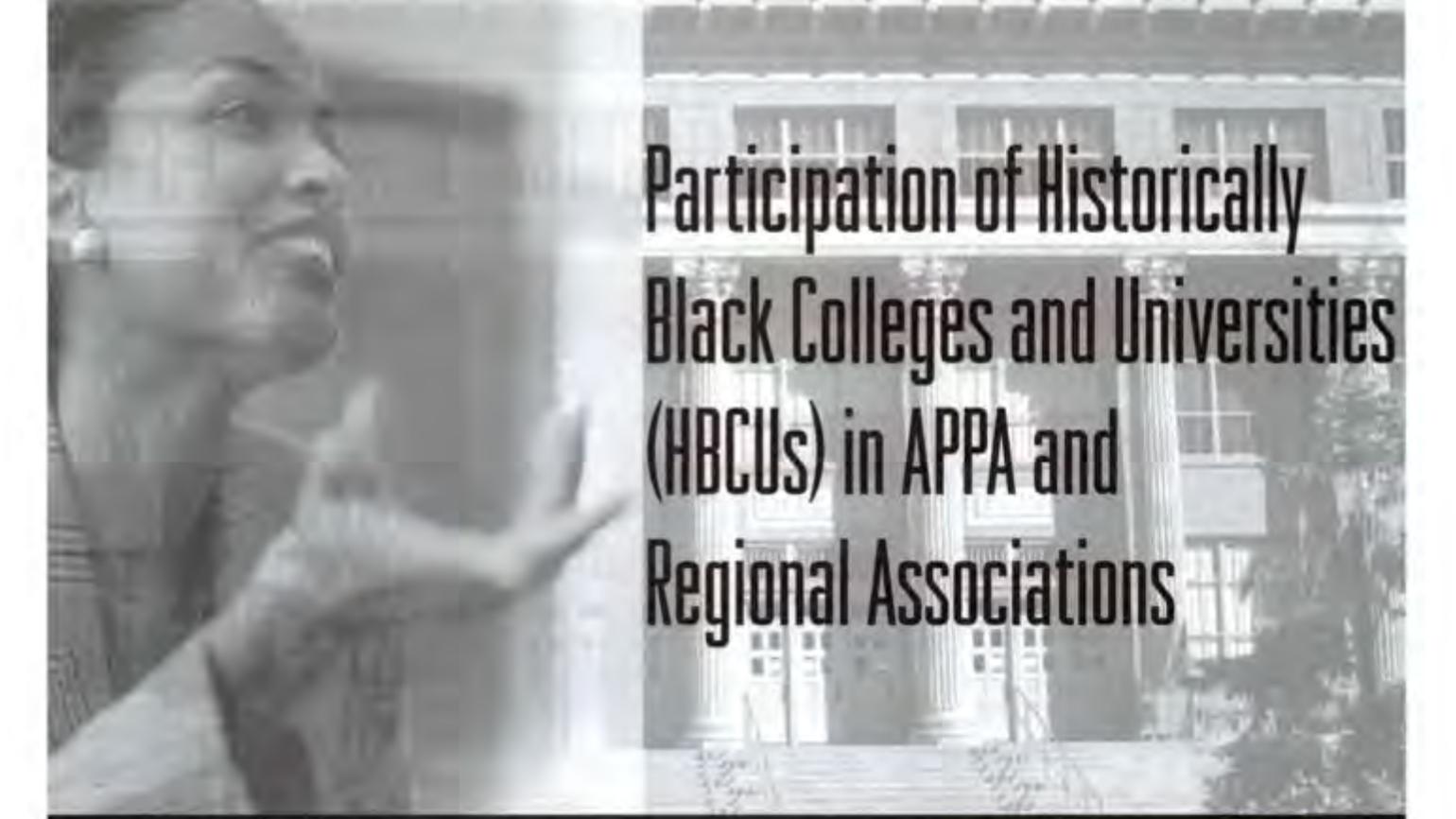
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# Participation of Historically Black Colleges and Universities (HBCUs) in APPA and Regional Associations

By Dr. Sam L. Polk Sr.

Focusing on APPA's vision, *Global Partner in Learning*, and one of its strategic objectives to become the "Association of Choice" is certainly one of visionary and commonly shared goals by APPA leaders and members. I am cognizant of the focus concerning the planning which leads to this position. Through careful evaluation of strengths, weaknesses, opportunities, and threats, this position is deemed to be of critical importance.

Specifically, these objectives are:

1. To increase the effectiveness of education of APPA stakeholders.
2. To forge stronger links between the regions and APPA.
3. To enhance the use and services of APPANet to ensure its growth as a major resource for members.
4. To promote awareness of APPA among senior officers of the institutions served by facilities management personnel.
5. To establish a process through which stakeholders' needs can be identified and understood.

I agree with Doug Christensen, APPA's 1996 President, that all of these objectives can increase the value of APPA and provide programs and services that are of value to our

members. During my tenure in APPA, I've become more and more concerned that little effort has been directed toward the participation of Historically Black Colleges and Universities (HBCUs). Currently, 31 out of 119 HBCUs hold membership in APPA, whose total institutional membership consists of about 1,450 institutions. The fourth and fifth objectives stated previously provide an excellent opportunity to take a serious look at the present status and actively seek the participation of historically black institutions.

## The Research Problem

The purpose of this study was to evaluate HBCUs' participation in the international association of APPA and its regional associations. To accomplish this purpose, answers to the following were sought:

1. Current membership and perceived value of membership.
2. Former membership and perceived value of membership and reason for discontinuation of membership.
3. Future membership and incentives for membership consideration.

## Research Method

This descriptive study used the ex post facto method to investigate possible cause/effect relationships by observing some existing consequences and searching back through the data for plausible causal factors. Additionally, the researcher

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*Sam Polk is director of facilities management and associate professor of technology at Tennessee State University, Memphis, Tennessee. He also serves as second vice president of APPA's Southeastern Region.*

*Continued on page 43*



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Continued from page 41

wanted the systematic empirical inquiry to be verified for not having direct control of variables. In this regard, inference about data could be made without direct intervention. Basically an inherent weakness of this method is the lack of control of variables and the researcher must take things as they are and try to disentangle them.

To gather data addressing the questions listed in the research problem, a survey instrument was designed (see Appendix 2). This survey required responses based on unique and specific questions and concerns of HBCUs.

The survey was conducted during the months of February and March 1998, with an initial mailing and a followup mailing over a 45-day period. There was a relative small (21%) survey return. Contributing was a surprising "no response" from the Midwest and Pacific Coast regions, the percentage of returns for the Eastern region was 28 percent, the Southeastern region was 23 percent, the Central region was 26 percent. The Rocky Mountain and Australasia regions have no state HBCU institutions.

### Subject

The population sample for this study consisted of the U.S.'s 119 historically black colleges and universities. Thirty-one presently hold membership in APPA, 75 do not hold membership in APPA, and 13 represent other equal opportunity educational colleges and universities not holding membership in APPA. The total distribution of HBCU by state and regions are listed in Appendix 1.

The number of subjects by region participating in the study are graphically shown on

### Results and Discussion

Research question number one requested information on current membership and perceived value of membership. The summary of this data is shown in Tables 1 and 2. As observed in Table 1, 69 percent of HBCUs responding currently hold membership in APPA and 33 percent regional associations and are four-year public and private institutions with 1,000 - 20,000 FTEs. Of these institutions, 58 percent are very knowledgeable of APPA, 26 percent are somewhat knowledgeable, and a relatively large 16 percent has no knowledge of APPA. Considering the percentage of "past," "never," and "not sure" membership in APPA and regional associations suggests that this could afford an opportunity for recruitment. Additionally, the number of years HBCUs are holding members (especially ten plus years) is an indication that these current institutions could also be an instrument for recruitment.

Consistent membership is contingent on participation at annual conferences and value of services rendered. The result of this data is shown on Table 2. Attendance at both APPA and regional annual conferences appears consistent. The high percentage of "no attendance" should be of great concern. Institutions should be encouraged to send representatives to conferences which afford perhaps the best showcase for showing and selling our story. Equally, while the opinion of APPA and regional services is reasonably

good for those who attend, the percentage of no opinion is directly related to lack of attendance at the annual conferences.

The success of any professional organization is the satisfaction of current members; the neglect or disregard for past members could lead to destruction. Equally, giving potential members inadequate attention certainly affect growth and longevity. One hundred nineteen HBCU institutions represent a large and significant group, and 26 percent current APPA membership should be considered unacceptable. We can and must do more to right this inequity.

Research question number two requested

**FIGURE 1**  
Numbers of HBCUs in APPA regions and number of survey responses

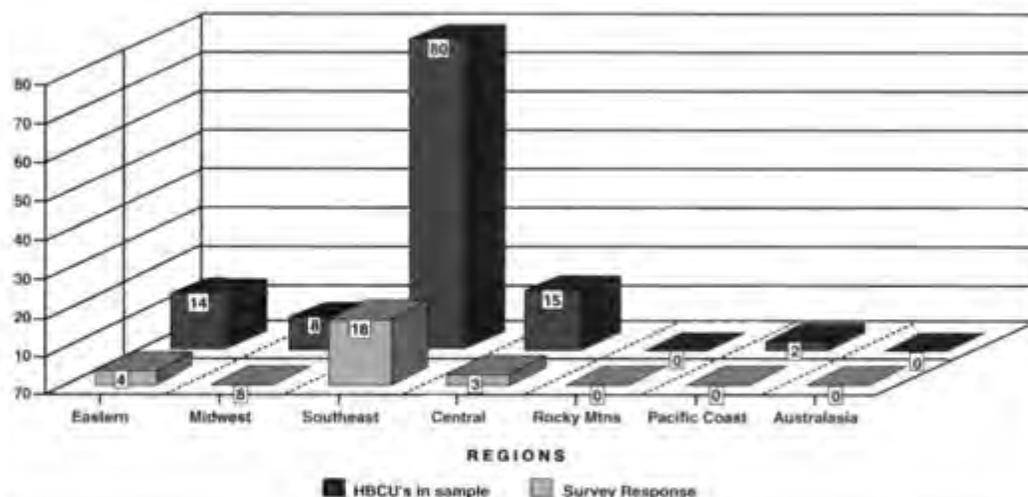


Figure 1. There were 14 HBCUs in the Eastern region, 8 in the Midwest, 80 in the Southeast, 15 in the Central, none in the Rocky Mountains, 2 in the Pacific Coast, and none in the Australasia region. Figure 1 also shows a breakdown of the number of HBCU responses to the survey.

**TABLE 1**

HBCU BACKGROUND INFORMATION					
MEMBERSHIP IN APPA	CURRENT	PAST	NEVER	NOT SURE	
	69	13	10	8	
MEMBERSHIP IN REGIONAL (APPA)	33	32	30		
KNOWLEDGE OF APPA	VERY	SOMEWHAT	NONE		
	58	26	16		
INSTITUTION DESIGNATION	PUBLIC—4 YR.	PRIVATE—6 YR.			
	87	13			
SIZE OF INSTITUTION	1,000 - 1,999	2,000 - 2,999	3,000 - 4,999	5,000 - 11,999	20,000+
	13	17	25	36	9
NO. OF YEARS IN APPA	2-5 YRS.	5-10 YRS.	10+ YRS.	NONE	
	28	17	38	17	
NO. OF YEARS ON REGIONAL (APPA)	1-2 YRS.	2-5 YRS.	5-10 YRS.	10+ YRS.	NONE
	16	19	4	28	33

information on former membership, perceived value of membership, and the reason for discontinuation of membership. The summary of this data is found on Tables 3 and 4. Formal members had a reasonably positive opinion of APPA and regional services as indicated by the excellent to good rating. The question was, "Why did they end their membership?" To answer this question, respondents were asked what effect did the number of blacks holding offices, serving on committees, attending conferences, and discussing relevant and unique HBCU issues influence their non-continuation of membership?

Referring to question numbers 1 through 4 in Table 3, it can be observed that 53 percent felt that blacks as officers and committee members had little effect on their membership. Question number 2 indicates that the attendance at conference had a 78 percent great/little effect. Question numbers 3 and 4 show a high concern for relevant discussion of unique HBCU issues.

We can summarize that facility issues have no institutional distinction, but there are some unique issues perhaps only

common to HBCUs. The response certainly suggests that a more direct and renewed emphasis is needed to address this concern. Additionally, the responses regarding the discontinuation of membership is shown in Table 4. Lack of funding and loss of key leadership does not appear to be of major concern as was assumed by the writer. However, 28 percent noted a lack of support from their administration and being dissatisfied with APPA services.

Research question number 3 requested information on future membership and incentives for membership consideration. The result of this data is shown on Table 5. From the data shown on Tables 1-4 and subsequent discussion, a more compelling need to give HBCUs membership more diligent attention is indicated in Table 5. It can be observed that the receipt of information has a high (75%) effect on membership. Such information could assist in determining the value of membership is indicated by the 56 percent. About 50 percent of HBCUs would be interested in trial membership.

**TABLE 2**

PARTICIPATION IN APPA & OPINION OF SERVICES				
APPA CONFERENCE	YEARLY	OCCASIONALLY	NEVER	NO KNOWLEDGE
	15	49	36	—
REGIONAL CONFERENCES	18	24	58	—
OPINION OF APPA SERVICES	EXCELLENT	GOOD	FAIR	NO KNOWLEDGE
	44	30	3	23
OPINION OF REGIONAL (APPA) SERVICES	17	40	—	43

**TABLE 3**

FORMAL MEMBERSHIP				
RESEARCH QUESTIONS	EXCELLENT	GOOD	FAIR	NO KNOWLEDGE
OPINION OF APPA SERVICES	39%	30%	4%	27%
OPINION OF RREGIONAL SERVICES	8%	37%	4%	51%

WHAT EFFECT DID THE FOLLOWING HAVE ON YOUR INSTITUTION'S MEMBERSHIP?				
RESEARCH QUESTIONS (1-4)	GREAT EFFECT	LITTLE EFFECT	NO EFFECT	NO KNOWLEDGE
1. DISPROPORTIONATE NUMBER OF BLACK OFFICERS & COMMITTEE MEMBERS	16%	37%	47%	—
2. DISPROPORTIONATE NUMBER OF BLACKS AT ANNUAL CONFERENCE	10%	68%	22%	—
3. LACK OF RELEVANT INFORMATION	28%	25%	47%	—
4. NO DISCUSSION OF UNIQUE HBCU ISSUES	23%	44%	33%	—

**TABLE 4**

REASON FOR DISCONTINUATION OF MEMBERSHIP			
RESEARCH QUESTIONS	AGREE	DISAGREE	NOT SURE
LACK OF FUNDING	4%	11%	85%
LOSS OF KEY LEADERSHIP	4%	44%	52%
LACK OF ADMINISTRATIVE SUPPORT	28%	11%	61%
DISSATISFIED WITH APPA SERVICES	28%	44%	28%

**TABLE 5**

WHAT EFFECT WILL THE FOLLOWING HAVE ON YOUR INSTITUTION'S MEMBERSHIP IN APPA?			
RESEARCH QUESTIONS	GREAT EFFECT	LITTLE EFFECT	NO EFFECT
RECEIVE BETTER INFORMATION	75%	20%	5%
DETERMINE VALUE	56%	39%	5%
TRIAL MEMBERSHIP	50%	50%	—

WHAT EFFECT WILL THE FOLLOWING HAVE ON YOUR INSTITUTION'S CONTINUED MEMBERSHIP?			
CONTINUE PRESENT OPERATION	64%	22%	14%
INCREASE BLACK OFFICERS & COMMITTEE MEMBERS	44%	43%	13%
ADDRESS HBCU ISSUES	54%	41%	5%
INCREASE BLACK ATTENDANCE AT CONFERENCES	46%	49%	5%



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Once membership is made, concentrated efforts are needed to retain membership specially. The respondents indicated that the following will greatly effect the continuation of present operations at 64 percent; the increase of black officers and committee members at 44 percent, the addressing of unique HBCUs issues at 54 percent, and increase black attendance at conferences at 46 percent.

### Implications

The findings listed provide pertinent data regarding HBCUs' present, past, and future participation in APPA and regional associations. These findings will give the leaders of these associations a clearer understanding of the needs, aspirations, and expectations of HBCU institutions. The findings suggest that leaders must be keenly aware and actively approach this population with deliberate concern. The potential influence of HBCUs is vital to the growth of APPA and improved facilities management at these institutions. Moreover, serious and determined efforts will promote awareness of APPA among senior officers of the institutions served by facilities management personnel. Additionally, they will establish membership and bring within APPA this section of stakeholders.

### Recommendations

The following suggestions are offered for future action by APPA and regional associations as a result of this investigation:

- A similar study should be conducted for all non-HBCU institutions. Such a study could provide similar data for involvement of other nonmember institutions.
- The interest of HBCUs and their participation in professional associations was very clear. Membership committees, along with APPA leadership, should use this data to assist in recruitment efforts.
- Addressing the unique concerns of HBCUs regarding value of membership, participation of blacks as officers and committee members, attendance at annual conferences, discussion of unique and relevant issues, and flow of information should become an assumed responsibility and commitment of APPA and regional associations.

This study forms a nucleus for future studies and evaluations of membership and the recruitment of HBCU stakeholders in earnest. If these recommendations are followed, an improved APPA association should develop. This, in turn, should direct more HBCU institutions to become active members in APPA and regional associations. 🏛️

## APPENDIX 1 APPA REGIONS—HBCU INSTITUTIONS

REGIONS	STATE: UNIVERSITIES, COLLEGES & OTHERS
AUSTRALASIA	N/A
EASTERN	<p>DELAWARE: <i>Delaware State</i></p> <p>DISTRICT OF COLUMBIA: Howard, U District of Columbia</p> <p>MARYLAND: <i>Bowie</i>, Coppin, <i>Morgan</i>, U of Maryland-Eastern Shore</p> <p>MASSACHUSETTS: *Roxbury Community College, *Sojourner - Douglas College</p> <p>PENNSYLVANIA: <i>Cheyney</i> &amp; Lincoln</p> <p>NEW YORK: *Florence H. LaGuardia Community College, *N.Y. City Tech &amp; *Edgar Evers College</p>
MIDWEST	<p>ILLINOIS: *Chicago State, *Kennedy-King College</p> <p>MICHIGAN: Lewis College of Business, *Highland Park &amp; *Wayne County Community College</p> <p>OHIO: Central State, Wilberforce &amp; *Cuyahoga Community College</p>
SOUTHEASTERN	<p>ALABAMA: Alabama A&amp;M, <i>Alabama State</i>, <i>Bishop State</i>, Concordia, J.F. Drake, Lawson, Miles, Oakwood, Selma, Shelton State, <i>Stillman</i>, Talladega, Trenholm &amp; Tuskegee</p> <p>FLORIDA: Bethune-Cookman, Edward Waters, <i>Florida A&amp;M</i>, Florida Memorial</p> <p>GEORGIA: <i>Albany State</i>, Clark Atlanta, Fort Valley, Morehouse, Morehouse-Medicine, Morris Brown, Paine, <i>Savannah State</i>, Spelman, *Atlanta Metropolitan</p> <p>KENTUCKY: <i>Kentucky State</i>, Simmons</p> <p>LOUISIANA: Dillard, Grambling, So Univ A&amp;M, So Univ-New Orleans, So Univ-New Orleans, <i>So Univ - Shreveport</i> &amp; Xavier</p> <p>MISSISSIPPI: Alcorn, Coahoma, Hinds, Utica, <i>Jackson State</i>, Mary Holmes, <i>Mississippi Valley</i>, Natchez, Rust, Tougaloo &amp; Prentiss</p> <p>NORTH CAROLINA: Barber-Scotia, Bennett, Elizabeth City, <i>Fayetteville State</i>, Livingston, NC A&amp;T, <i>NC Central</i>, Saint Augustine, Shaw &amp; <i>Winston-Salem</i></p> <p>SOUTH CAROLINA: Allen, Benedict, Claflin, Denmark, Morris, <i>SC State</i>, Voorhees &amp; Johnson Smith</p> <p>TENNESSEE: Fisk, Knoxville, Lane, LeMoyné-Owen, Meharry &amp; <i>Tennessee State University</i></p> <p>VIRGIN ISLANDS: <i>University of the Virgin Islands</i></p> <p>VIRGINIA: <i>Hamilton</i>, Norfolk State, <i>Saint Paul</i>, Virginia Seminary, Virginia State &amp; Virginia Union</p> <p>WEST VIRGINIA: WV State &amp; Bluefield State</p>
CENTRAL	<p>ARKANSAS: Arkansas Baptist, Philander Smith, Shorter College &amp; UA-Pine Bluff</p> <p>MISSOURI: <i>Harris-Stowe</i> &amp; <i>Lincoln</i></p> <p>OKLAHOMA: Langston</p> <p>TEXAS: Houston-Tilluston, Jarvis Christian, Paul Quinn, <i>Prairie View</i>, Southwestern Christian Texas College, Texas Southern &amp; Wiley College</p>
ROCKY MOUNTAINS	N/A
PACIFIC COST	CALIFORNIA: *Charles Drew & *Compton College

\* Other equal opportunity educational colleges & universities

\_\_\_\_\_ Returned survey

## APPENDIX 2

### PARTICIPATION OF HISTORICALLY BLACK COLLEGES AND UNIVERSITIES (HBCUs) IN THE ASSOCIATION OF HIGHER EDUCATION FACILITIES OFFICERS (APPA) AND REGIONAL ASSOCIATIONS SURVEY

(Please fill in the box which best represents your institution's position or opinion)

#### A. BACKGROUND INFORMATION

1. Institution: \_\_\_\_\_  
NAME  
STATE / REGION
2. Institution's membership in APPA:  
 CURRENT     IN THE PAST     NEVER     NOT SURE
3. Institution designation:  
 PUBLIC/     PRIVATE     2-YR.     4-YR.     OTHER DESIGNATION \_\_\_\_\_
4. Knowledge of APPA:  
 VERY KNOWLEDGEABLE     SOMEWHAT KNOWLEDGEABLE     NOT KNOWLEDGEABLE
5. Membership in the regional association: (i.e., PCAPPA, RMA, AAPPA, CAPPA, SRAPPA, MAPPA, ERAPPA)  
 CURRENT     IN THE PAST     NEVER     NOT SURE
6. Size of institution (FTE):    0-999    1,000-1,999    2,000-2,999    3,000-4,999    5,000-11,999  
 12,000-19,999     20,000+

#### B. MEMBERSHIP INFORMATION

1. Number of years your institution has been a member in APPA:  
 1-2     2-5     5-10     10+ (WRITE EXACT NUMBER \_\_\_\_\_)     NONE
2. Attendance at annual APPA Conference:  
 EACH YEAR     OCCASIONALLY     NEVER
3. Number of years your institution has been a member of your regional association:  
 1-2     2-5     5-10     10+ (WRITE EXACT NUMBER \_\_\_\_\_)     NEVER
4. Attendance at your annual regional conference:  
 EACH YEAR     OCCASIONALLY     NEVER
5. What is your opinion of services rendered by APPA:  
 EXCELLENT     GOOD     FAIR     POOR     HAVE NO KNOWLEDGE OF SERVICES
6. What is your opinion of services rendered by your regional association:  
 EXCELLENT     GOOD     FAIR     POOR     HAVE NO KNOWLEDGE OF SERVICES
7. The primary reason for your institution not being a member:  
a. Lack of funding:     AGREE     DISAGREE     NOT SURE  
b. Loss of key leadership with interest in APPA:  
 AGREE     DISAGREE     NOT SURE  
c. Lack of administrative support for professional involvement:  
 AGREE     DISAGREE     NOT SURE  
d. Not satisfied with APPA member services:  
 AGREE     DISAGREE     NOT SURE
8. During the time of active membership, what was your opinion of services rendered by APPA?  
 EXCELLENT     GOOD     FAIR     POOR     HAVE NO KNOWLEDGE OF SERVICES
9. During the time of active membership, what was your opinion of services rendered by your regional association?  
 EXCELLENT     GOOD     FAIR     POOR     HAVE NO KNOWLEDGE OF SERVICES

10. What effect, if any, did the following have on your institution's former membership?

- a. Disproportionate number of blacks serving as officers and on committees:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- b. Disproportionate number of blacks in attendance at Annual Conferences:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- c. Lack of relevant information:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- d. Issues unique to HBCU's were not addressed:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT

11. What effect, if any, will the following have on your institution's future membership in APPA?

- a. Receive information to be better informed about APPA:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- b. Determine value of institutional membership: (What's in it for us?)  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- c. Receive trial membership:  
(Check ONLY if you are not a member at the present time)  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT

12. What effect, if any, will the following have on your institution's continued membership in APPA:

- a. Continue present operation:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- b. Increase the number of blacks serving as officers and on committees:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- c. Address unique issues of HBCU's:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT
- d. Increase attendance of blacks at Annual Conferences:  
 GREAT EFFECT     LITTLE EFFECT     NO EFFECT

13. Please list any other concerns you may have about APPA, membership and ways to increase HBCU participation:

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**"THANKS FOR YOUR PARTICIPATION"**

(OPTIONAL:)

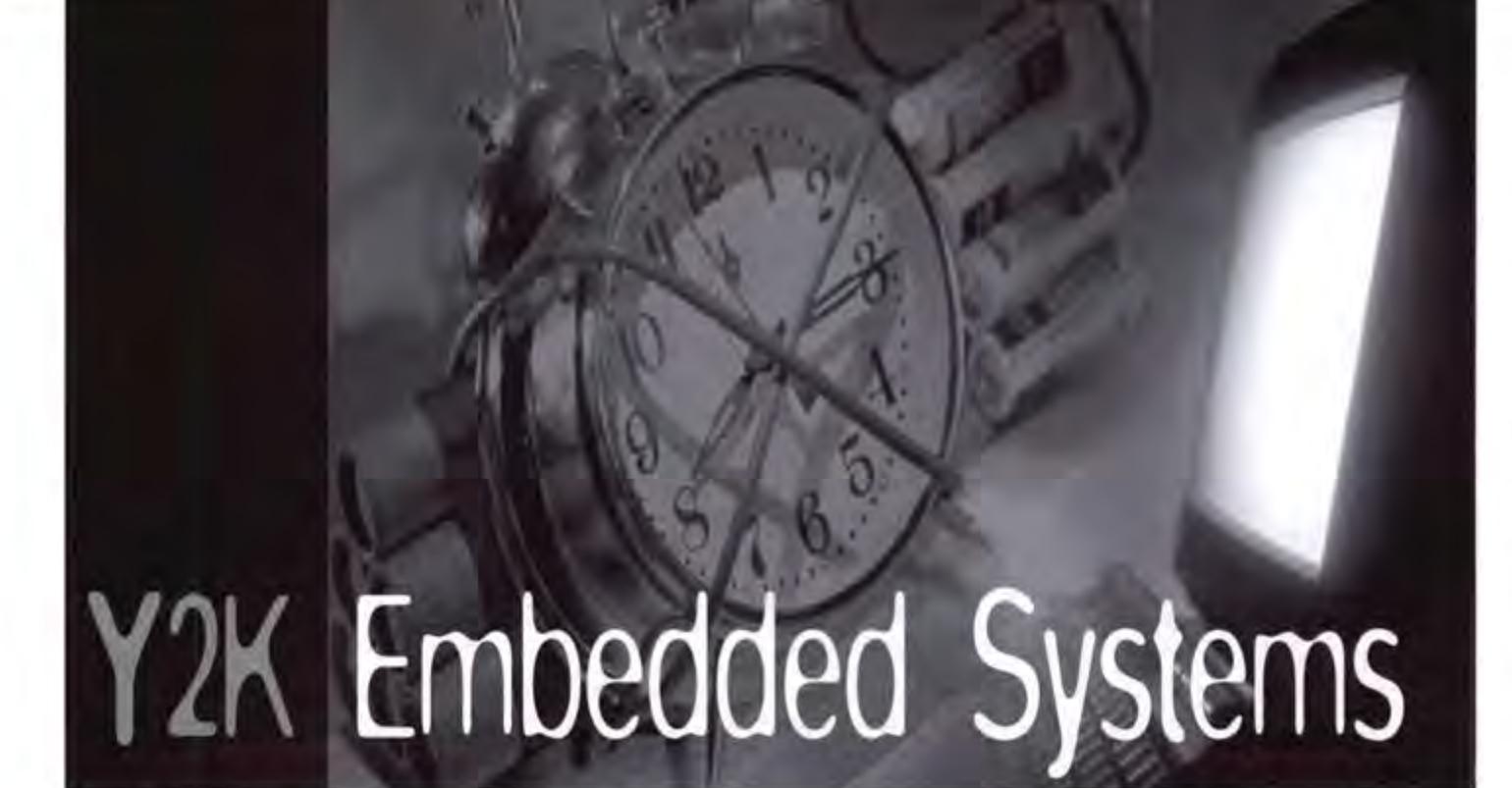
Respondent's Name: \_\_\_\_\_

Telephone/Fax No: \_\_\_\_\_

Date

**PLEASE RETURN SURVEY TO:**

Dr. Sam L. Polk Sr.  
Director of Facilities Management  
Tennessee State University  
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Nashville, TN 37209-1561  
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Fax: (615) 963-5642  
e-mail: spolk@picard.tnstate.edu



# Y2K Embedded Systems

by L. Joe Spoonemore

**A**t this point in time I am convinced that most facilities managers are familiar with the potential for computer system failure attributed to the inability of computer hardware or software to properly interpret a "00" in the year-date field. In reality, the problem lies in the potential inability of the CPU or BIOS to respond to the information delivered by the RTC (real-time-clock). I will also assume that a lengthy discussion of the relationships of the motherboard, RAM, ROM, CMOS, BIOS, RTC, and CPU will be unnecessary.

What we need to recognize and deal with is that in the United States alone there are some 25 billion embedded chips similar to the old Z-80 type that now cost in the order of \$1 and can wipe out an entire enterprise. Whether they are in PCs or PLCs (programmable logic controllers) or whether the associated software cannot cope with the double-zero issue the task is to identify them, test them, and develop a compliance strategy for mission critical services. The cost of world-wide compliance is estimated to be \$600 billion and climbing. Less than six months ago it was assumed that 50 percent of this sum would be required to test the existing systems. This figure has increased and experts on the subject expect an excess of 60 percent of the total cost will be required just for testing.

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*APPA President Joe Spoonemore is director of special projects, facilities management, at Washington State University. He can be reached at [joe\\_spoonemore@wsu.edu](mailto:joe_spoonemore@wsu.edu).*

The immensity of the problem, at first consideration, is almost overwhelming. So too are the consequences of not familiarizing yourself with the location and function of these little denizens of computer architecture. Unlike some pundits, I am convinced that with investment in preparation and readiness our industry can avoid the collapse of our modern computer driven society. Some skeptics are convinced that the domino effect will cause failure of electrical generation and distribution systems which will lead to the complete breakdown of our transportation, telecommunication, utilities, and financial systems. Recent predictions from the electrical industry, however, indicate that somewhere between 1 and 2 percent of the national grid may actually fail. The lesson here is that we must recognize the potential impact of the loss of purchased power and be ready to react.

The word "ready" is the key word. Some would argue that we must be 100 percent compliant to avoid any possibility of loss of essential services. Realistically, 100 percent compliance cannot be guaranteed. No matter how diligent, we cannot absolutely guarantee the functionality of any system that requires the support of elements that are not under our control. As individual consumers we cannot guarantee the delivery of electricity or other critical services and materials to our site. Nor can we give assurances that all elements of a computer network will function flawlessly. The failure of a single piece of hardware or software could result in the loss of the entire network.

Again, the challenge is to be ready! We simply must not fail to deliver essential services to the campus community.

Regardless of the depth of coverage you have in terms of written covenants from manufacturers or the potential for subsequent recovery via litigation the bottom line is that the campus community will find little comfort in these pieces of paper if they lose power and water. Speaking of litigation, it is my understanding that 40 states have passed legislation that holds computer and software vendors blameless should their product fail to be compliant as the world moves into the year 2000. Some protection may be afforded by complying with the "Good Samaritan Law" signed by President Clinton on October 19, 1998. The Year 2000 Information and Readiness Disclosure Act covers the time period from January 1, 1996 thru July 14, 2001. The retroactive period (prior to October 19, 1998) must be addressed prior to December 3, 1998 to be effective.

Non-networked, non-IT, or smaller non-administrative computing systems require different strategies to address their specific needs. One approach has been taken by BOMA (the Building Owners and Managers Association) in its "Meeting the Year 2000 Challenge," General Motors in its "Year 2000 Test Procedures," or the University of Oklahoma as managed by Reginald Tempelmeyer. The difference between our approach at WSU and those previously mentioned is that 1) we are concentrating on only those systems that we perceive to be critical to life/safety, service delivery or research, and 2) we have been given the task of searching beyond the Physical Plant purview and into the academic/research community.

At the outset, we considered the more-or-less classic approach of identifying and cataloging all potential locations of embedded systems. Realizing that, with a very limited staff, we were considering a stupendous task we quickly refocused on only those systems that had a potential impact on critical services. The procedure is much the same as the other approaches in that once the potential impact on service delivery is determined a triage/prioritization is performed, testing is pursued, estimates for correction are prepared, funding requests are organized and finally, compliance projects are scheduled. What has been discovered to date is that the single most pervasive non-compliant networks are our Central Control and Monitoring System (CCMS/EMS) and the Safety Division Communication network. Initial estimates to bring the Landis & Staefa CCMS/EMS system into compliance by updating the MBCs and SCUs is \$250,000. The Safety Division has discovered that their Motorola Centralink, Silent Knight, Intesis paging system and 911-Dictaphone recorder are all non-compliant and will require a total of some \$35,000 to upgrade.

Other plant infrastructure systems that have been examined and determined to be either compliant or inconsequential in terms of potential failure are as follows:

- Security alarm systems
- Card key system
- Elevators

- Vehicles (cars, firetrucks, and ambulances)
- Traffic lights
- Fire detection and suppression
- Power plant boiler controls
- Building clock systems
- Parking gates
- Bar code fire extinguisher certification system
- APU/UPS equipment
- Plant radio communication network
- Computerized auditorium light dimmer systems
- Dedicated computerized lighting systems
- Computerized sign fabricator
- Fresh water pumping equipment, chlorinator, fluoridator
- Electrical feeder equipment
- CAD plotters and printers
- Variable speed chilled-water pump controllers
- Underground storage tank monitor
- Street lighting
- Intecom E telephone switch
- FAXs, copiers, video cameras
- Sewage lift stations
- Fuel dispensing systems
- Area lighting

Unlike most facilities organizations that I am aware of, we at WSU have been asked to go beyond the infrastructure systems and examine the entire campus. For a very small staff, this could be an overwhelming task if the rigorous approach were to be assumed. We, therefore, have deviated somewhat and simply ask the question, "will the failure of a given piece of hardware, research equipment, or software result in life/safety trauma or significantly impact our ability to deliver service?"

To systematically assess the impact of embedded, time/date sensitive systems, a Y2K Embedded System Checklist and an attendant Y2K Embedded Chip Risk Assessment Matrix have been included at the end of this article and can be used to initiate thinking about how to begin a program. Between these two instruments the intent is to isolate those situations that would have the maximum impact on our ability to deliver service. A combination of Information Technology analysts, departmental computer technologists, and the Y2K project administration has enabled WSU staff to begin a site visitation and assessment process. Once findings are recorded, compliance-cost estimates completed, and non-compliance consequences reviewed, contingency plans will be prepared as justification for further funding. The request for plant compliance funding, which appears to be the most overarching issue, has been submitted.

What have we discovered that is worthy of passing on to our fellow techno-victims?

- If you have not commenced a search and cataloging of potential embedded system locations, you have some catching up to do.

- Make sure that your institution is not currently purchasing non-compliant equipment or software by attaching the appended form letter to the purchase order.
- Although there are many dates that are considered to be sensitive, in terms of "end-of-file indicators" or failure to correctly coordinate the date and day of the week the most likely problems will occur with those dates listed on the purchase order form letter as appended.
- It is widely believed that hardware and software produced before 1992 is probably not compliant.
- Not all computerized systems contain embedded time/date chips.
- Computers that appear to be identical can have different BIOS.
- An otherwise non-compliant RTC may be inconsequential with compensating BIOS.
- It is believed that a CPU, in some configurations may be able to bypass the BIOS and directly access a non-compliant RTC. To preclude this eventuality Microsoft suggests that a network source such as the US Navy observatory time service be incorporated.
- Not all manufacturers/vendors are anxious to submit letters of compliance or offer gratis compliance upgrades.
- You cannot assume that even if you are able to isolate the BIOS or RTC that a simple replacement is cost justifiable.
- Do not assume that you have a legal avenue of recovery for non-compliant systems.

You may seek compliance confirmation from vendors of previously purchased equipment or software with the use of a form letter similar (or identical) to the one that is appended. The University of Oklahoma and the University of Virginia both have excellent examples of form letters.

There is no substitute for testing! Be very careful to backup all tested programs. Be aware that licensing could be truncated and that you might not be able to return to "1900" dates. Also, be cautious when calling up a file while testing in the next century. It may be lost.

Even though the time/date function is non-compliant this may be inconsequential for some applications. Research testing/analysis apparatus such as a Gas Chromatograph Mass Spectrometer, High Pressure Liquid Chromatograph, Spectrophotometer, Luminescence Spectrometer, Environmental Chambers or Radio Chromatograph may be indifferent as to the century.

Testing a PC and/or software for compliance is relatively uncomplicated. The dates, at a minimum, and rollover sequences to be confirmed are the same as those listed in the appended purchasing form letter. A good explanation of "Mission Critical Dates" can be found at <http://www.buzzbyte.com/criticaldates.html>. There are several fee-based as well as free "date detective" programs such as the one that we are using on campus which is NSTL YMARK

2000. A sample of fee-based testing vendors are: WRQ Inc., Viasoft, Centennial Systems Consultants Ltd., and Silicon Valley Networks Inc.

Departmental owners and users of computer driven systems and equipment are your most direct and reliable source of information. Expect to encounter a certain amount of indifference to the whole Y2K issue.

The WSU Simplex fire alarm system will make the initial transition without fail. Some systems, however, will fail the next leap year in 2004. Fortunately a \$3,500 firmware modification is available.

There are numerous Y2K websites. In addition to the vendor/manufacturer sites many universities, such as Stanford, Virginia, and Notre Dame have excellent sites. The following sites are recommended references:

- Washington State
- Building Owners and Managers Association
- Legal Issues
- GM Year Test Procedures
- GSA (product compliance)
- Electric Utilities
- Y2K Bug

In summary, it is not likely that the year 2000 will cause society to collapse. It is clear, however, that serious consequences await those that do not make the effort to root-out embedded systems that can impact the delivery of essential services. The following advice is offered to reduce the failure of computerized systems as they make the transition into the next century:

- Rely on your staff to brainstorm and complete a survey of all systems that are computer dependent.
- Establish a priority relative to the delivery of vital public services.
- Rely on vendors for letters of certification and assistance in preparing compliance strategies.
- Use the Internet and your APPA listserv.
- Test your systems.
- Develop contingency scenarios.
- Seek a sign-off from the Department head or Dean that they are compliant.

Never assume that you are 100 percent compliant—you probably won't be.

With the knowledge that you are probably not 100 percent compliant, then you must have your contingency and emergency response plans in order and be READY for critical failures.

May the force be with you! 🙏

## Y2k Embedded System Checklist

1. Has the VP/Dean/Director or primary administrator officer been apprised of the potential complications associated with Y2K and embedded 19clock chips? 1
2. Has a College/Departmental contact been appointed?
3. Has a list of equipment that potentially utilizes embedded clock chips been established? If not, what is the projected date of completion?
4. Has a list of application programs utilizing departmental computing equipment been catalogued? If not, when will this work be complete?
5. Have the programs and hardware been tested to confirm compliance or non-compliance? If not, when will this work be complete? Are you requiring certification records? Do you require assistance?
6. Have you determined the consequences of non-compliance on life safety, the ability to provide service, and the ability to maintain research? Would non-compliance have only an annoyance or cosmetic impact? Are there plans to phase out the equipment or system prior to Y2K?
7. Have you estimated the replacement value of non-compliant hardware or software?
8. Have you considered alternatives to outright replacement in-kind such as hardware updates or reprogramming?
9. Have you established a lead-time for software/hardware replacement? Ordering? Delivery? Installation?
10. Is sufficient internal staff available to complete the required compliance process?
11. Are you comfortable with the level of preparation to date?
12. Have you prepared contingency plans should compliance not be achieved?
13. If any of your computers are networked, are the other elements of the network compliant?
14. Have you reviewed your suppliers and considered the consequences of their inability to comply?
15. Have you secured written confirmation of compliance from hardware and software vendors?

## Y2k Embeded Chip Risk Assessment Matrix

College/Department:		Departmental Contact:			Date:
Hardware/Software I.D./Location	Life/Safety Critical	Service Delivery Critical	Research Critical	Superficial Impact	
1.	A. B. C. D.				
2.	A. B. C. D.				
A. Application B. Cost of Compliance C. Non-Compliance Consequences D. Non-Compliance Contingency					



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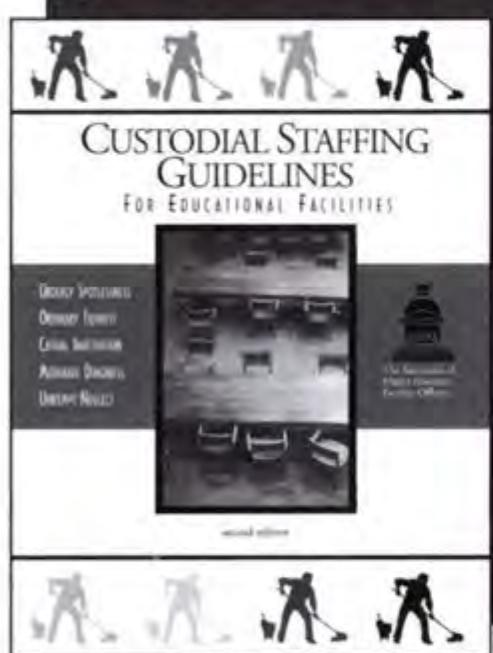
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## The Energy/Environmental Merry-Go-Round

by Stratton C. Schaeffer, P.E.

Gone are the days when operating campus power plants and utility systems was based solely on engineering economics and operating experience. The 1960s' amendments to the Clean Air Act were a powerful wakeup call. Suddenly we were forced to shift the management of Btus on campus from straight conservation and availability to a more balanced approach integrating environmental concerns. Our traditional methods of selecting energy resources and technologies became outmoded with the environmental movement. For instance, operating practices were modified at great expense to minimize three culprits—nitrogen oxides, particulate, and sulfur oxides, more commonly referred to by the boiler operators as NOX, ROCKS, and SOCKS.

A decade passed and we were just getting our sea legs when life was further complicated by a handful of oil-producing countries who proceeded to control the price and supply of international oil. Our campus operations were then whiplashed between the environmental movement and the exploding cost of energy. Thus was born a new breed of facilities manager.

Today's manager, in addition to being a good operating engineer, is expected to have knowledge of international marketplace trends, environmental science, energy

*Stratton "Lefty" Schaeffer is a consulting engineer based in West Fairview, Pennsylvania. He can be reached at 717-732-0776. He is writing here as a representative of the Council of Industrial Boiler Owners.*

management, and emerging technologies. He or she must also keep a finger in the air to sense the shifting winds of political correctness on campus and in the halls of government. In short, the modern physical plant director must have the wisdom of Solomon, the patience of Job, and the luck of the Irish. But shucks folks, if it was easy, anybody could do it and we might all be out chasing ambulances or running for public office.

Thanks to the talent of the APPA membership, a good job has been done to keep campus systems reliable, operating economically, and in environmental compliance. However, there is a growing school of thought among the membership that defensive management in reaction to outside forces is not the most effective method of minimizing costs while maximizing reliability. The new sentiment is to more actively monitor pending legislation and policies that negatively impact physical plant operations. The old adage that an ounce of prevention is worth a pound of cure is applicable. Educating politicians and bureaucrats to the adverse impact of their proposed activities is more effective than changing laws and policies chiseled in stone.

APPA plans to better inform the membership of pending activities that impact the operation of campus systems. To accomplish this, several national associations where APPA members are active in energy/environmental issues will be monitored. One organization is the Council of Industrial Boiler Owners (CIBO). The membership of CIBO includes 75 industrial organizations representing owners, designers, con-

sultants, and suppliers of power plants equipment. In addition, CIBO has an affiliate membership of 25 universities, all APPA members. CIBO's mission is to promote the maximum exchange of information with its membership and between members and government. This information concerns policies, laws, and regulations relating to energy and the environment. CIBO also promotes information exchange that improves reliability and cost-effectiveness of members' power plants, through technical interchange and advocacy.

By monitoring the activities of CIBO and other common cause associations through our APPA members, we can alert our entire APPA membership of pending energy/environmental activities in Washington and the local level. These activities do not always impact our campuses in a negative fashion. To the contrary, the deregulation of the natural gas and more recently the electric utility industry, will have a positive impact on our method of purchasing or generating energy on campus. The technical exchange among CIBO members has already benefitted university affiliates. Our goal is to expand this benefit to the entire APPA membership.

In future issues of this magazine, we will alert the APPA membership to pending legislation and policies at the national and local level. We will also alert our membership to ongoing activities by other professional organizations where information sharing on common cause issues can become an important tool in our daily operations and long range campus strategy. ▲

## Recycling Space

by Matthew C. Adams, P.E.

Several times each year one or more administrators or the provost survey the facility stock. Each time they look for more useable space. It's almost a cliché to suggest that there is never enough. Today, this old slogan is becoming more and more real. The last of "Generation X" and the new "Generation Y" students are quite particular about their education. Some programs like education or engineering remain popular while others are redesigned to be more specialized. Art studies as a major is too general and now is broken down into Computer Graphic Design or Art Therapy or other niches. Some middle-sized to smaller institutions are even forced to abandon dated programs and replace them with more "market sensitive" courses.

This year, for the first time in history, over 15 million students are enrolled in our colleges. The number will continue to increase for at least the next five years by as much as 200,000 per year. The physical demand created by this enormous population of students is profound. Even 15 years ago, when class enrollments of 100, 200, or more were common, this demand would be a problem. However, the physical standards of learning have changed,

*Matt Adams is president of The Adams Consulting Group, a management/engineering consulting firm located in Atlanta, Georgia, specializing in the facility maintenance and management within higher education, school districts, and other institutions. He can be reached at mc.adams@facinet.com.*

and educational programs have changed as well.

All of the new standards improve the quality of education for students while drastically exacerbating existing shortages of space. The cost to construct new space to fill the need is prohibitive. The resulting reduction in measured classroom utilization created by new space also seems blatantly wasteful. The sensible way to meet this new demand is to closely examine the existing inventories. Proper analysis reveals new possibilities for the reuse or recycling of current space.

Prior to the current scramble by many institutions to reinvent themselves in order to remain competitive, one segment had previously figured out this changing market's demands. The community colleges have always operated with a nimbleness that allowed the flexibility to alter or invent new programs

to meet market demand. This demand is created by both industry (the ones hiring the graduates) as well as the new students themselves (education is now a "right" and they are particular buyers). This higher standard now extends to the other 2,400 institutions of higher learning and it has had a profound effect. This new dynamic affects space inventories in two significant ways: Space used for years in a traditional course of study must be altered to serve a radically new "market sensitive" program, and the ratios of almost every resource (faculty, teaching assistants, computer hardware, desk space, etc.) to the number of students must be decreased considerably.

As the Business Communication Program expands and the Home Economics Program contracts, the space is altered and reused. Unfortunately, old space is not always easy

**Table 1. Space Recycle Analysis**

	Recycled into	Possible New Business
Old Home Economics Lab		Communications Lab
30 stations per classroom faculty		15 stations per classroom faculty
Fixed tables		Modular computer stations
Moderate noise control		High level of sound attenuation
Minimum HVAC capacity		Air changes suitable for p.c. lab
Adjacent to English Department		Adjacent to English and Information Systems
One faculty office per class		One faculty and one small T.A. office per class
One network connection per class		17 network connections per classroom
Two electrical outlets per class and office		Modular connections for each p.c.

to recycle. At least 30 percent of the nation's building stock was constructed prior to 1960. The flexible classroom design was not widely embraced at the time. Entire buildings were built to meet the physical needs of programs that today are no longer popular. New construction is the obvious solution but not practical. The only way to make use of old space is to specifically test its ability to be recycled. Each space demand is clearly defined and compared with the physical analysis of available "reusable" space. For example:

This type of analysis is appropriate in maximizing the utilization of existing space inventories. In this way, the wish-list is paired with the current physical description. The next step is to identify the basic actions required to reuse space and qualify their availability. In the most basic sense there are only a few actions that can affect the space. They are as follows.

•*Upgrade the technological capacity of the space:* Almost without exception, space constructed 10 or more years ago is in need of technology upgrades for any use. In particular is the need for multiple campus network connections—ideally one per student or occupant if not classroom space. Other improvements might be fume hoods, modular service connections, Audio/video projection equipment, and program specific equipment (Berkeley desks for Graphics design programs). Upgrading the technology of space is costly. However, the new technology costs are present in new construction as well. The constraint for this upgrade is often physical. Some space is very hard to rewire. The cooling capacity of the associated system may not allow new electrical equipment. The electrical distribution to the space may also be inadequate. Identification of insurmountable constraints is coupled with summarized cost

estimated for "turn-key" technology upgrades for adequate input into the decision process.

•*Repartition the space:* A shortage of office space and an abundance of inappropriately sized classrooms are common campus space issues. Movable office partitions and folding class partitions offer easy options for larger spaces that require increased density. The physical structure may prevent this in relation to natural lighting, sound control, or egress. Space with insurmountable physical constraints preventing repartitioning is inventoried as a "low reuse" stock. Space that readily allows partitioning remains an active consideration to avoid new construction. Cost is rarely a constraint for this consideration.

•*Replace furniture and fixtures:* Lab benches, fume hoods, sinks, safety showers, and other fixtures are expensive to install and sometimes difficult to remove. However, in comparison to new construction, the cost may be more practical. By qualifying the existing furniture and the potential and costs associated with refitting, the reuse potential of the space is revealed. Sunk costs are lost. The cost to remove a dry-lab bench in order to create a computer classroom is better than constructing that classroom for one to two hundred dollars per square foot.

Each possible recycle comparison illustrates, on paper, the relative feasibility of altering the space for new use. In earlier years, space was considered for reuse in only less intensive forms, e.g. large classrooms were divided into several offices. The great demand for more intensive and technologically modern space requires the option of recycling space into more intensive uses. The costs of new construction is much less often justified when objective analysis of existing space inventories is utilized. ▲

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# Coming Events

For more information on APPA seminars and programs, contact the APPA Education Department at 703-684-1446, ext. 230 or ext. 231.

**February 7-13—Leadership Skills Academy: Professional Skills.** College Park, MD.

**March 14-19—Leadership Skills Academy: Individual Effectiveness Skills.** Stanford, CA.

**April 11-16—Leadership Skills Academy: Organizational Skills.** Notre Dame, IN.

**June 20-22—1999 Educational Conference & 86th Annual Meeting.** Cincinnati, OH.

**September 12-17—Institute for Facilities Management.** Montreal, Canada.

**July 16-18, 2000—2000 Educational Conference & 87th Annual Meeting.** Fort Worth, TX.

## APPA Regional Meetings

**Sept. 26-29—AAPPA Regional Meeting.** Wellington New Zealand.

**Sept. 26-29—MAPPA Regional Meeting.** Notre Dame, IN.

**October 3-5—ERAPPA Regional Meeting.** Ocean City, MD.

**October 3-5—PCAPPA Regional Meeting.** Las Vegas, NV.

**October 6-10—RMA Regional Meeting.** Albuquerque, NM.

**October 10-14—CAPPA Regional Meeting.** San Antonio, TX.

**October 23-26—SRAPPA Regional Meeting.** Biloxi, MS.

## Other Events

**Feb. 16-19—2nd Conference for Canadian APPA.** Calgary, Alberta, Canada.

**Mar. 15-17—NOx Control XII.**

Durham, NC. Contact the Council of

Industrial Boiler Owners, 703-250-9042.

**Apr. 7-8—GlobalCon '99.** Denver, CO. Contact the Association of Energy Engineers, 770-447-5083.

**Apr. 11-16—1999 IEEE/PES: Transmission and Distribution Conference and Exposition.** New Orleans, LA. Contact the Entergy Corporation, 504-576-2400

**Apr. 21-22—Winning at Deregulation: Measurement & Verification for Load Profiling.** Atlantic City, NJ. Contact the Association of Energy Engineers, 770-447-5083.

**Apr. 25-27—FM'99: Productivity—How is it Defined, Measured and Impacted?** ISFE's 16th Annual Conference. Cambridge, MA. Contact the International Society of Facilities Executives, 978-536-0108.

**May 4-5—FEDFacilities '99.** Washington, DC. Contact FEMP, 800-731-6106.

**May 17-18—Operations & Maintenance Management.** Chicago, IL. Contact Amy Tilton or Nicole Ray at FEMP, 509-372-4368

**May 19-21—1999 International ARCHIBUS/FM Users' Conference.** San Diego, CA. Contact ARCHIBUS, 617-338-1011.

**June 1-3—The 1999 Electrical Code (#8191).** Orlando, FL. Contact Katie Peterson, University of Wisconsin-Madison, 800-462-0876.

**June 2-5—Ontario APPA Annual Meeting.** Lakehead University, Ontario, Canada.

**June 12-15—90th Annual IDEA Conference & Trade Show.** Boston, MA. Contact IDEA, 202-429-5111.

**June 17-88—West Coast Energy Management Congress '99.** Anaheim, CA. Contact the Association of Energy Engineers, 770-447-5083.

**July 17-18—Life Cycle Costing.** Rockville, MD. Contact Amy Tilton or Nicole Ray at FEMP, 509-372-4520.

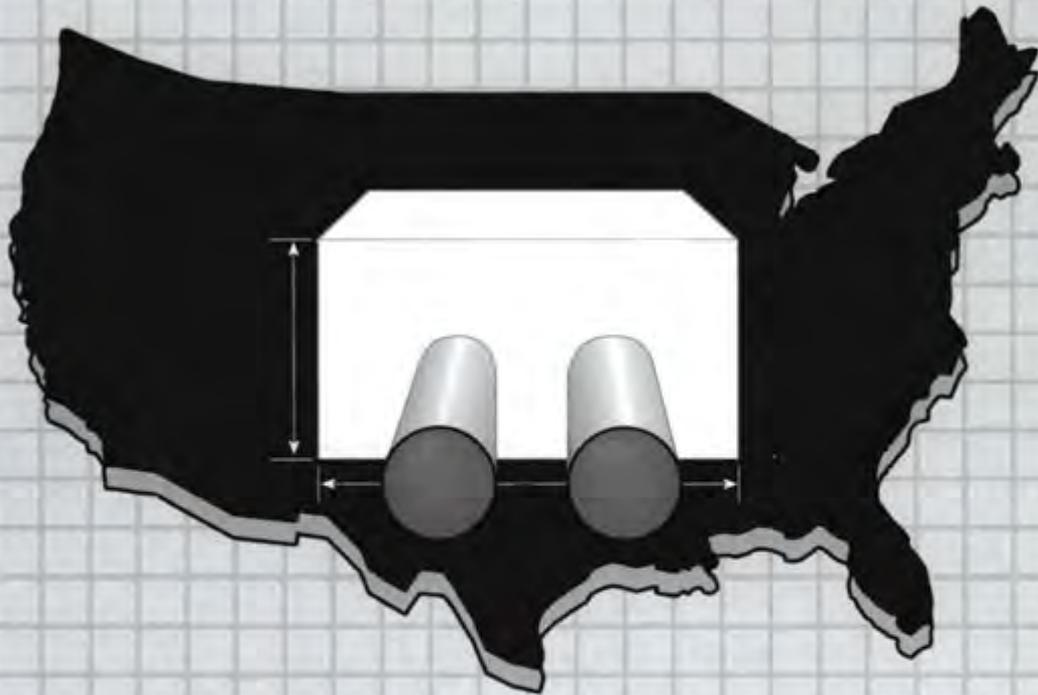
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