THE S F PEN

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Editor-in-Chief: Kris Buchholz

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NOTE: Please pass this on to interested non-PES members

This is the 74th edition of *The SF PEN* and the last one in a printed format. The 75th edition will be posted on the PES website www.ewh.ieee.org/r6/san_francisco/sfpes. If you do not have an Internet account and would like a printed copy in the mail, use the Mailing List Additions form in this issue.

PACE ANNOUNCEMENTS

By Pauline Tapia

Your Professional Activities Committees for Engineers (PACE) has compiled information that you will find useful.

Make Plans Now to Attend ESMO 2003

The ESMO 2003 10th International Conference on T&D and substation construction, operation, and live-line maintenance, is April 6-10 in Orlando, FL, featuring 2 days of outdoor field demonstrations/exhibits and a 2 day technical program & indoor exhibits. Visit www.esmoconference.com.

Read the PACE interview in Workforce Diversity Magazine at **www.eop.com** for electrical engineering workforce issues.

2003 PACE Planned Activities

Spring - Control Center facility tours Oakland & San Francisco.
Summer - Engineering Management Forum & Network Social
Fall - 2nd annual PE Review Problem Solving Sessions

BAY Area PACE Activities Pending

Depending on membership interests, your PACE committee is planning for EIT Problem Solving sessions, Consultant Workshop, and a Certified Professional Software Developer course.

We like to hear from you. Forward your interests, suggestions and/or comments to your PACE representatives.

2003-2004 PACE Representatives

-- PACE Sections/Chapter Support: Eremita Miranda (Eremita.Miranda@sce.com)
-- Region 6 PACE Chair: Winford Myles (wjmyles@yahoo.com)
-- SF Section PACE Chair: Pauline Tapia (pbt@ieee.org)

SAN FRANCISCO GOLD GROUP

By Robert Turner

San Francisco Section has started a new GOLD affinity group. IEEE formed GOLD (Graduates of the Last Decade) in the mid 1990's to address specific concerns. GOLD is targeted at members that have recently entered the workforce. Typically, these members are younger, recent college graduates in their 20's. The primary goals of GOLD are to:

- Assist young IEEE members in their transition from an academic lifestyle to their professional careers.
- Increase membership retention of recent graduates.
- Increase participation in IEEE activities by recent graduates.

Since January 2003, San Francisco GOLD Affinity Group has been meeting monthly. We meet at the Las Guitarras restaurant in Cotati (great Mexican food and margaritas.) On March 26, the 3rd meeting, officers were elected and we enjoyed a general IEEE presentation from Dan Sparks. The group founder and newly elected chairman Robb Myer also gave a great presentation on IEEE GOLD history, initiatives and goals. We had several recent grads as well as 2 SFSU EE students present. I look forward to further association and involvement with the group as part of an ongoing effort to retain membership from student affiliation to professional member. It did seem that the enthusiasm was shared with all those present and that a growing young engineer involvement will develop from the group. Past meetings include career development and retirement investment presentations. Upcoming topics will include stress management, tax planning, and leadership skills development. In addition, SF GOLD is planning several social activities, such as a ski trip.

Although GOLD specifically tailors its programs on general topics to recent graduates, IEEE members that graduated more than 10 years ago are welcome to participate. For more information, contact Robb Myer at rmyer@ieee.org or visit the SF GOLD website at: ewh.ieee.org/r6/san_Francisco/gold/.

DG FUNDAMENTALS WORKSHOP – NEW DATE

By Chase Sun

The one-day Distributed Generation Fundamentals Workshop has been delayed to October due to schedule conflicts. Please check the September *IEEE Grid* and *The SF PEN* for the course agenda, presenters, and registration details. We will have presenters that are members of the California Rule 21 and the IEEE-1547 working groups along with other industry experts for a well-rounded coverage of the subject matter.

REAL TIME ENERGY MANAGEMENT

By Dan Sparks

John Sell, Director of Sales for EleQuant, described his view of the future of real-time energy management systems (EMS) at the January 15 technical meeting. Traditional EMS combines Automatic Generation Control with Supervisory Control and Data Acquisition to operate large grids consisting of transmission lines and generators.

Mr. Sell began his presentation with an overview of the history of EMS. Starting with manual procedures carried out by system dispatchers, EMS has developed into sophisticated computer systems. One of the key milestones in the history of EMS was the development of state estimation in the 1970's. A state estimation model takes data from a few busses and estimates crucial values for the rest of the system. To monitor voltage, current, power flow, etc. at any point in the system, a Remote Telemetry Unit (RTU) is required. It is too expensive to put RTUs at every bus, but with a state estimator, all the relevant information can be calculated from the RTUs that are installed. The state estimator is needed to perform real-time operating tasks such as contingency analysis, clearance evaluations, and determining available transmission capacity.

State estimation also serves to provide input data for load flow analysis. Although he didn't provide a mathematical proof of EleQuant's solution technique, Mr. Sell noted that their new EMS uses a non-iterative and deterministic methodology to solve for load flows. This allows for very fast load flow solutions.

One of the most promising areas to benefit from fast load flow solutions is restoration planning. Restoration plans are procedures specifically developed to return the system to normal operating conditions after an unplanned outage. For example, if a transformer failed and its failure resulted in transmission lines relaying and customers losing power, a restoration plan would need to be developed. The plan would detail actions to be taken by the system operators to return power to the customers and operate the system within acceptable limits. Many system operators develop restoration plans for potential failures. These plans are developed "a priori" or in advance of the outage. The limitation of such predeveloped plans is that actual operating conditions may vary significantly from the assumptions used in developing the restoration plan. Using state estimation and a fast load flow engine, EleQuant's recovery model can effectively perform near real-time, optimal restoration plans. This results in quicker restoration time and lower outage costs benefiting the system operator and its customers.

As a case study, Mr. Sell recounted the experience of Pacific Gas and Electric Company (PG&E). In December 1998, PG&E experienced a double contingency that caused the loss of most of the transmission lines into San Francisco as well as the two major power plants in the City. It took more than eight hours to restore power to all customers in San Francisco. The resultant costs due to the outage were estimated at $200 million. To prevent a recurrence, PG&E acquired EleQuant's EMS and recovery model. Using data from the 1998 event, the recovery model recommended steps that would have restored service in 2½ hours.

MAILING LIST ADDITIONS

If you are not regularly receiving *The SF PEN,* and would like to, fill out the form below and return to the Editor-in-Chief of *The SF PEN.* Or better yet, become a member of one of the San Francisco Bay Area's IEEE Power Engineering Societies and automatically receive *The SF PEN.* For PES membership information, call Trang Luu, (510) 874-2512 and FAX (510) 874-2507.

= DETACH HERE =

RETURN TO: Kris Buchholz
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P.O. Box 770000, Mail Code H12A
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Yes, I'd like to receive *The SF PEN.* Place me on your mailing list to receive future issues.

NAME: _____

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_____

By Siri Varadan

As you may have already noticed, the SF PES is making significant progress in "saving the trees" with our next all-electronic issue of the PEN. This is extremely significant for several reasons. First we are being more conscious of our environment and heeding the words of the "wise". Second, we are cutting costs – costs associated with printing, production and postage. Thirdly, we are keeping in tune with state-of-the-art technology – a trend that is most essential for our survival. We all know this as professional engineers.

As we continue to completely phase out paper communications, it is of utmost importance to ensure that your e-mail addresses are current. Since we periodically receive member profiles and e-mail addresses for members in the Bay Area from IEEE Headquarters, it is important that each of you update your user profile. This will ensure that communications are efficient, direct and cost effective.

We have begun this year with extremely worthy ambitions. With your help, I hope to lead the SF Chapter to being eligible for the High Performance Chapter Award (HPCA). This goal is definitely within our reach…with just a little extra effort. To this end, we are exploring several options. Membership and Senior Membership drives are being planned, in addition to the usual activities that qualify us for the award. We are planning to support the IEEE-GOLD initiative in the Bay Area and initiate new awards for eligible members to enable participation in the IEEE General Meetings held annually.

As I mentioned earlier, we will be sending out e-mails apprising you of our planned activities and urging your participation in winning the HPCA. Meanwhile watch for your e-mail and rejoice with us – We will save a tree!

GREEN BUILDINGS

By Dan Sparks

Geof Syphers, Director of Green Building Services, KEMA, presented "Engineering Green Buildings" at the February 12 meeting. The primary vehicle by which Green Building design is being incorporated into construction is the Leadership in Energy and Environmental Design Program (LEED™) Green Building Rating System. Developed by the U.S. Green Building Council (USGBC), the LEED™ system "is a national consensus-based, market-driven building rating system designed to accelerate the development and implementation of green building practices."

The LEED™ system defines a "green building". Builders can achieve four levels of LEED™ certification: Certified, Silver, Gold, and Platinum. To earn credits toward certification, building design must meet specific criteria in six categories: sustainable sites, water efficiency, energy & atmosphere, materials & resources, indoor environmental quality, and innovation & design process. Mr. Syphers focused on the energy & atmosphere category since it was of most interest to our members.

To qualify for credits under the energy & atmosphere category, building design must satisfy three prerequisites. First, it must be verified that building elements and systems are designed, installed, and operated as intended. Second, the building must adhere to a minimum level of energy efficiency specified by the American Society of Heating, Refrigerating and Air-Conditioning Engineers and Illuminating Engineering Society of North America (ASHRAE/IESNA) codes or local codes, whichever is more stringent. Third, use of chlorofluorocarbons (CFCs) is prohibited.

Once those prerequisites have been met, buildings can earn LEED™ credits by:

- Exceeding energy performance per ASHRAE/IESNA or local codes
- Supplying at least 5% of the building's energy through on-site renewable sources
- Independently verifying that building elements and systems are designed, installed, and operated as intended
- No halons and hydrochlorofluorocarbons in HVAC and fire suppression systems
- Installing metering for ongoing optimization of energy and water consumption
- Supplying at least 50% of the building's energy through energy contracts supplied by Green-e certified generation (>2years).

Benefits of Green Buildings include reduced energy and water costs, reduced maintenance costs, and increased productivity that can offset additional construction costs associated with LEED™ certification.

For more information, visit the USGBC website at www.usgbc.org.

LANDFILL GAS PROJECT

By Julian Ajello

On March 20, Tom Vence (VP, Brown, Vence & Associates) presented a Santa Cruz Landfill Gas (LFG) Utilization Project. Most garbage is disposed of in landfills. The decay of organic waste produces a gas byproduct, mainly methane and carbon dioxide. If allowed to escape, the gas can be hazardous so a landfill is kept under a slight vacuum by drilling wells and collecting the gas with blowers. The gas can be flared, which is wasteful and causes public complaint, so making electricity is better.

Santa Cruz County started this project at Buena Vista Landfill near Watsonville in 1995. Landfill projects usually take a long time to develop, but this one was exceptionally long. It utilizes three 1 MW Jenbacher reciprocating engines designed to use landfill gas. Combustion turbines and microturbines are sometimes used for landfill gas, but they are more expensive and more sensitive to the impurities in the gas.

Gas production builds up rapidly to a peak value after a cell in a landfill is sealed, then tapers off over a long period. Economic production of gas takes about 20 years, but production never stops entirely. The generators are not installed until the landfill is closed and enough gas is generated. Landfills can be divided into cells so that they can still accept garbage even though closed cells are generating gas.

LFG technology is barely competitive with natural gas and relies on state and federal subsidies to survive. This project has a 5-year contract with the California Department of Water Resources (CDWR) that will provide a premium price of 6.5¢/kWh while amortizing the initial investment. LFG generation has an installed cost of about $1,200/kWh and a lifetime average cost 1.5 - 2¢/kWh. Other LFG uses under development are compressed LFG to power vehicles and liquefied LFG.

The LFG at Buena Vista Landfill is not yet operational. Challenges with financing have delayed construction. The contract with CDWR begins in 2004 so the upcoming months will be crucial for the project.

2003
SAN FRANCISCO CHAPTER
POWER ENGINEERING SOCIETY
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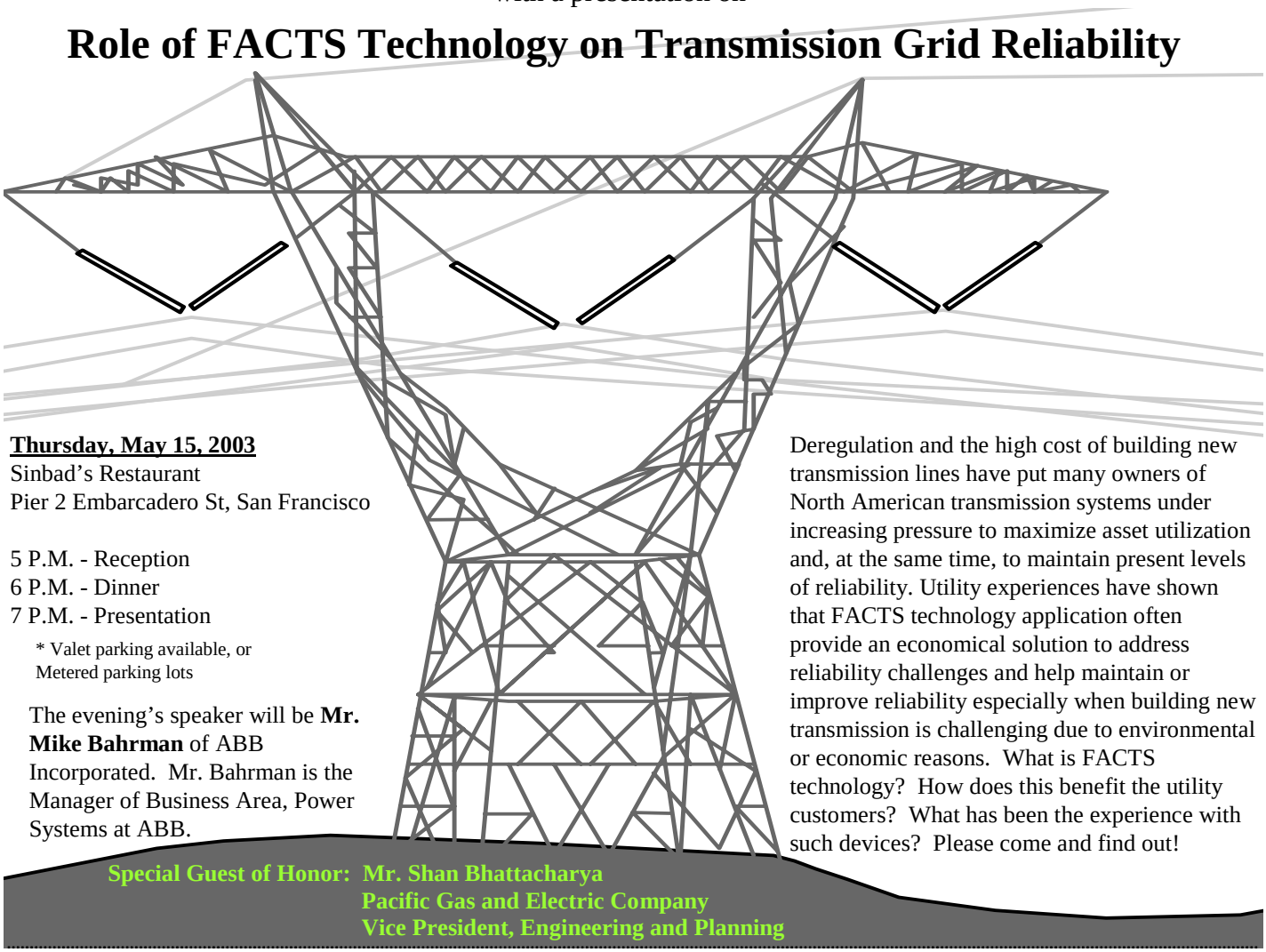
The San Francisco Power Engineering Society

Annual Spring Banquet

with a presentation on

Role of FACTS Technology on Transmission Grid Reliability



Thursday, May 15, 2003
Sinbad's Restaurant
Pier 2 Embarcadero St, San Francisco

5 P.M. - Reception
6 P.M. - Dinner
7 P.M. - Presentation

* Valet parking available, or
Metered parking lots

The evening's speaker will be **Mr. Mike Bahrman** of ABB Incorporated. Mr. Bahrman is the Manager of Business Area, Power Systems at ABB.

Deregulation and the high cost of building new transmission lines have put many owners of North American transmission systems under increasing pressure to maximize asset utilization and, at the same time, to maintain present levels of reliability. Utility experiences have shown that FACTS technology application often provide an economical solution to address reliability challenges and help maintain or improve reliability especially when building new transmission is challenging due to environmental or economic reasons. What is FACTS technology? How does this benefit the utility customers? What has been the experience with such devices? Please come and find out!

Special Guest of Honor: Mr. Shan Bhattacharya
Pacific Gas and Electric Company
Vice President, Engineering and Planning

Dinner Menu:

- ☐ Salmon Florentine — Filet on top of spinach bed w/ sun dried tomatoes & caper sauce
- ☐ London Broil — Sliced with mushrooms, Teriyaki Sauce on side w/ Chef's special potato
- ☐ Oven Baked Free Range Lemon Herb Chicken
- ☐ Pacific Red Snapper — Blackened Cajun Style

all entrees served with Salad, Chef's choice of Potato or Rice, Bread & Butter, Coffee, Tea or Milk

Name: _____

E-mail: _____

Phone: _____ Fax: _____

Please reserve _____ tickets

Reserve by May 1st w/ choice of entrees

Cost: $25 IEEE members, $35 Non-members, $10 Students w/ ID, $50 Couples, $250 Group of Ten.
Please do not send cash. Make checks payable to "Power Engineering Society, SF Chapter". Mail check and reservation form to: Bhaskar Ray, PG&E, Mail Code N3B, P.O. Box 770000, San Francisco, CA 94177. Phone: 415.973.0582.