

User-group meetings are important for sustaining professional growth

It's no secret that the economic downturn has adversely impacted budgets at virtually all companies in, or doing business with, the electric power industry. Just about everyone you talk to these days is feeling the pinch and they don't expect much relief in 2010.

Kilowatt-hour production is down and generation executives are not confident that positive economic signs in recent months will translate into a full-blown recovery anytime soon. So the thumbscrews continue to be turned in a clockwise direction and power-plant personnel are being asked to do still more with less.

If you are a believer in conspiracy theories, rest assured there isn't one here. Consider these cold, hard facts compiled by the Energy Information Administration:

- Net generation in the US dropped by 1.9% from August 2008 to August 2009.
- August was the 13th consecutive month that net generation was down compared to the same calendar month in the prior year.
- Real gross domestic product (GDP) decreased by 0.7% from 1Q/2009 to 2Q/2009.
- Industrial production last August, as reported by the Federal Reserve, was 10.7% lower than it was in August 2008, the 14th consecutive month that indicator was down compared to the same calendar month in the prior year.

None of the foregoing should be surprising because electric production has closely tracked GDP for decades.

Now for some good news, even if it means being selfish: Coal-fired generation declined by 9.4% from August 2008 to August



CTOTF
35th
Anniversary
Meeting

April 25-29, 2010
 Amelia Island Plantation
 Amelia Island, Fla

2009, while generation from natural-gas-fired plants increased by 9.3%. Wind generation also was up significantly while electric production from hydroelectric, nuclear, and petroleum resources was down slightly.

Generation by coal-fired plants contributed 44.4% of the nation's electric power for the first eight months of 2009, gas-fired plants 23.2%. Nuclear was in third place at 20.4%. Non-hydro renewables—geothermal, biomass, solar, wind, and other miscellaneous resources—accounted for 3.6%.

The bottom line for all employees in the gas-turbine-based generation sector: You're right where you want to be. The pressure you are feeling is strictly economic "fallout." The permitting, construction, operation, and maintenance of your plants are all based on sound economic principles—no tax breaks, no "stimulus" money, no political favoritism. You are gaining market share on a challenging playing field. Take a bow for your accomplishments.

Value proposition

You're not going to cancel Christmas because you can't afford to give yourself a gigantic flat-screen TV with surround sound. Likewise, you can't stop participating in industry events—in particular, user-group meetings—just because of a budget crunch. This is the time to get creative with your spreadsheet, without exceeding the bottom line, so you and/or others on your staff can get out of the plant to network with industry colleagues.

How do you expect to produce more power, reliably and at the lowest possible cost without exceeding permit requirements, if you don't invest a little money

Executive Committee

- Robert G Kirn** (TVA), chairman
- Rich Evans** (NAES), executive vice chair, power systems
- Eddie Mims** (Colectric Partners), executive vice chair, turbines
- Ray deBerge** (AmerenUE), executive vice chair, program development

Roundtable Discussion Forum Leaders

- Alstom frames:** Ed Sundheim (NAEA), Clint Sexton (First Energy)
- GE frames:** Pierre Boehler (Mirant Mid-America), Larry Rose (Dominion Energy)
- Siemens frames:** Joe Schneider (RRI Energy)
- Mitsubishi frames:** Mike Dwyer (Portland General Electric), Zach Cowart (TVA)
- Pratt & Whitney aeros:** Bill Clark (Constellation Energy), Mike Featham (NCEMC), Kevin Harris (Exelon)
- GE aeros:** Frank Deriso (National Grid), Tom Sparkman (Western Farmers)
- Industry issues:** Rich Evans (NAES), Ray deBerge (AmerenUE)
- Generators:** Jack Borsch (RRI Energy), Moh Saleh (SRP)
- HV electrical:** Jack Borsch (RRI Energy), Mike Adams (APS)
- Environmental:** Scott Takinen (APS), Matt Cochran (NAES)
- Combined cycle:** Mike Rutledge (SRP), Ed Wong (NRG Energy)
- O&M/business practices:** Steve Hedge (NRG Energy), Bill O'Brien (Entegra Power)

and time to stay at the forefront of industry knowledge? Fall behind on best practices, lessons learned, the latest technologies, etc. and your plant could drop a notch or two in the dispatch order.

How do you get the biggest bang for the “meeting buck” you wring from your budget? If you manage one or more plants—particularly assets having more than one engine model—pick a conference providing (1) valuable perspective on emerging industry issues that may not yet be apparent at the deck-plates level, and (2) exposure to the many technologies that compete for your time—such as gas turbines, steam turbines, generators, high-voltage electrical, environmental, etc.

If this sounds right for you, consider attending at least one of the two CTOTF (Combustion Turbine Operations Task Force) meetings conducted annually—the Spring Turbine Users Forum and Trade Show (eastern location) and Fall Turbine Users Forum and Trade Show (western location). You can learn more about these conferences at www.ctotf.org.

Even if a CTOTF meeting is not “right” for you at this time, consider tapping into the group’s information resources—such as its online library and bulletin board service. The price is appropriate for tough times—**FREE!** Sidebar provides details.

The information needs of your supervisory personnel may be met best by a user group serving your dominant engine type—the Frame 6, 7F, 7EA, 501F, D5-D5A organizations. To learn more, see the 2010 meeting calendar on p 1.

Plenary session

CTOTF meetings start on Sunday evening with a welcome reception and dinner. It’s an opportunity to meet many of the people you’ll be spending the next four days with from breakfast at 7 am through 5 pm, except for Monday when the trade show runs until 9. There may be special evening events on other days as well.

Monday there’s one session in the morning, the Industry Issues Roundtable, and one in the afternoon, the O&M and Business Practices Roundtable. Material presented and discussed in these sessions is of value to all attendees. At the recent Fall Turbine Users Forum at the DoubleTree Paradise Valley Resort in Scottsdale, Ariz, Mark Shiavoni, senior VP of fossil operations for Arizona Public Service Co opened the meeting. “Welcome speakers” typically give

you a few stats on their companies, mention a thing or two about their gas turbines, and tell you something about the area—worthwhile attractions, for example. Not Shiavoni, who had a hard-hitting presentation on the realities of the current business climate.

We’re in a period of profound change, he said, and that can be difficult for some people to accept. Those who embrace change will drive it. O&M is at the heart of our business, Shiavoni continued, not forgetting safety and the environment, which cannot be compromised. The challenge is to do what’s necessary with less while still assuring long-term reliable production from the asset. We cannot look back five years from now, he added, and blame poor performance on maintenance left undone. That’s not acceptable.

He called for plant personnel to benchmark their facilities against others in the industry—both regulated and merchant—and to use the results as a catalyst for change. But Shiavoni

cautioned against changes that do not make good business sense.

Industry Issues Chair Rich Evans of NAES and Vice Chair Ray deBerge of AmerenUE worked hard to develop an all-star lineup of speakers and their presentations were well-received by the group. VP Keith Emery, PE, of Tenaska Power Services Co, followed Shiavoni’s opening address with an overview of the NERC (North American Electric Reliability Council, Princeton, NJ) compliance process. Many in the group were familiar with bits and pieces of the NERC program but lacked the overall perspective Emery provided.

A backgrounder on NERC and its efforts to maintain grid reliability at a high level was a good place to start. It was established as an industry-led voluntary organization in 1968 in response to the Northeast blackout of late 1965. Nearly 30 years later, in 1993, “NERC 2000” recommended mandatory compliance and enforcement.

How to access CTOTF’s Presentations Library

Information that can (1) help solve a nagging O&M problem, (2) improve availability, efficiency, safety, (3) reduce emissions, (4) assist in outage planning, etc. is readily accessible via the CTOTF’s Presentations Library, which is part of the organization’s Internet Bulletin Board Communications Service (IBBCS).

The library currently contains more than 200 presentations from meetings conducted from 2006 through fall 2009. While it’s true that CTOTF IBBCS might be the acronym to end all acronyms in this over-acronymed industry, it’s one you should commit to memory because it can “save your bacon.”

Further, given budget cuts, staff-size challenges, and generally unsympathetic management it’s difficult to get to all (any) of the meetings you want to attend. But *user* access to prepared remarks from CTOTF conferences is only a few mouse clicks away—after you register (it’s *free*). *User* is defined as a person employed by a company that owns and/or operates gas turbines, or has its first units under construction.

Here’s how to get your “library card” and access to CTOTF’s valuable bulletin-board service:

- Access www.ctotf.org.
- Click on the “New Member” button on the horizontal toolbar at the top of the page.
- Complete and submit the online membership registration form.

- Confirmation of your acceptance as a CTOTF member with full IBBCS privileges generally will be e-mailed to you within 72 hours.

As a member, go to www.ctotf.org, and click the flashing link “Free Online Bulletin Board Service.” Next, scroll down the page to “Presentation Library” and click on that link. Presentations are arranged in chronological order, by meeting, most recent first. So it’s easy to find any presentation referenced in the COMBINED CYCLE Journal.

When you click on a presentation, the first information that pops up is the complete title of that presentation, the name of the presenter, and an abstract. The PowerPoint slides are accessed by clicking the word “here” under the abstract—as directed. After you have reviewed a presentation, you may want additional information. Return to the abstract page and access the presenter’s website by clicking the link after his or her name.

Finally, if there’s a particular subject you want to know more about—say, borescope inspections—click on the search button at the top of the page and complete the pop-up form. A Google-like search engine will line up for your review all the material CTOTF has to offer. With these resources at your fingertips, there’s no reason not to keep up with what’s going on in the gas-turbine-based sector of the electric power industry.

2010 BEST PRACTICES Awards

Enter today while the accomplishments of plant personnel are fresh in your mind

One way to get management's attention long enough to appreciate the contributions you and your co-workers are making on a daily basis is to win an industry award. The BEST PRACTICES Awards program conducted by the COMBINED CYCLE Journal, and endorsed by the Combustion Turbine Operations Task Force (CTOTF), recognizes ideas implemented by plant personnel to increase reliability/availability, improve efficiency, reduce emissions, minimize accidents, etc. Such performance improvements are important to every owner and its management team.

To enter the 2010 BEST PRACTICES Awards competition, access the requirements/rules page at www.combinedcycle.com

www.combinedcycle.com/bestpractices.html.

The program supports work done in gas-turbine-powered combined-cycle, cogeneration, and peaking plants larger than 5 MW. There are five awards categories: management, environmental stewardship, safety, design, and O&M.

Your entry should take no more than two hours to prepare and e-mail to scott@psimedia.info. Photos and diagrams explaining the work done, plus a picture of your plant, are welcomed. The deadline is Dec 31, 2009, but don't wait: Prepare the entry today, while the accomplishments are fresh in your mind.

Judging will be by a panel of experts from the CTOTF Leadership Committee.

relating to renewable resource penetration/concentration and smart grid development, Emery said. Latter will impact distributed generation, smart grid devices, and cyber security.

Wrapping up, he stressed that good compliance programs should be robust and sustainable. It's important, Emery said, to develop a culture of compliance; you don't want to manage by "audit fire drill." Top management must set this tone and provide the needed resources to sustain a compliance culture.

The benefits of a corporate "culture of compliance," coupled with robust and sustainable compliance programs, were conveyed by the next speaker as well. Industry veteran Starla Lacy, NV Energy's environmental, health, and safety executive, is her company's primary interface with federal, state, and local permitting agencies regarding air and water emissions and other regulatory aspects of power generation and delivery.

She is proactive in dealings with regulatory bodies and has helped significantly to position the company as an environmental leader among the nation's electric utilities. One example: NV Energy's airborne pollutant emissions are among the lowest in the industry.

Lacy brought the group up to date on the regulatory front and offered valuable perspective on the integration of renewables and conventional generation resources.

She began with the primary regulatory drivers impacting the industry today—including the on-going challenges of permit compliance presented by technologies that have driven emissions to very low levels; air-quality attainment standards; new multi-pollutant proposals; renewable portfolio standards; efficiency standards; climate change.

Lacy then presented a snapshot of current regulations—BACT, LAER, PSD, NSR, BART, etc—and summarized a couple of the proposed climate-change initiatives. This was helpful to many plant-level executives who need a working knowledge of regulations and their possible impacts on plant operations but don't have the time to follow legislative/regulatory news regularly.

If you've forgotten what one or more of the acronyms noted above means, follow the directions in the sidebar to the CTOTF library and access the presentation—it's simple to do, only a few mouse-clicks away.

Lacy's perspective was especially valuable. She said there is little doubt that current greenhouse-gas (GHG) proposals to cap CO₂ emissions would

More than a decade after that, the Energy Policy Act (2005) created the concept of an "electric reliability organization." A year later, NERC was certified as the nation's first ERO. In mid 2007, compliance became mandatory and legally enforceable. The "good utility practice" voluntary standard was a casualty of the paradigm shift.

NERC structure provides for national standards development (there were 57 at the end of 2008), regional standards and enforcement activities through so-called "regional entities," enforcement authority, and penalty authority. Enforcement authority includes self-certifications and spot checks, data submissions, periodic audits, and targeted investigations. Penalties of up to \$1 million per day per occurrence are possible.

Results for the first complete audit cycle (2008) were the following: 350 scheduled NERC audits, 1646 violations reported to NERC (slightly more than half were self-reported). The top 10 most violated reliability standards included the following:

- Sabotage reporting.
- Critical Infrastructure Protection Standards (CIP).
- Vegetation management.
- Transmission and generator protection (maintenance and testing).
- Voltage and reactive power control.

Most violations were documentation-related and did not involve a financial penalty. For example, facilities failing to meet the intent of the sabotage reporting standards typically were cited for "unawareness," procedures not being sufficiently

specific, and failure to report to the FBI (only to local law enforcement). There were about three dozen violations of the vegetation management standards, a big focus for NERC, and some heavy fines.

Emery said to be cognizant of the fact that the standards provide general guidelines, they do not prescribe specific procedures. And for CIP, the plants must determine which assets are subject to NERC standards. This is an evolving issue, he added.

Emery offered some tips on the audit process, saying that the focus of an audit includes:

- Validation that a legitimate program is in place.
- Examples that demonstrate the program is being followed.
- Evidence of adherence to the standard (Reliability Standards Audit Worksheet).
- Interviews to establish consistency between management views and reality.

What is known for sure about compliance audits, he said, is the need both for document management/retention and continuous performance improvement. The standards are evolving and will continue to do so. Current focus is on CIP standards. There are 41 requirements under CIP standards and plants must be "auditably compliant" by July 1, 2010. NERC will continue to question plant management to gain insight into how the industry determines whether or not assets are critical to bulk power system reliability.

Looking ahead, expect standards

increase wholesale electricity prices and that future investments would be influenced by carbon-policy details. However, Lacy continued, uncertainty about fuel availability and pricing, emissions-reduction technologies under development, and costs also would impact decision-making.

Absent new emissions control technologies, the available options are demand side management (DSM), which includes conservation; addition of generation resources powered by renewables; retirement of the most polluting units in the fleet; use of cleaner fossil fuels; fuel switching where possible; and efficiency upgrades on existing units. But beware, she cautioned, the last option could trigger a new source review (NSR) and some unintended consequences.

The presentation moved to renewables—the promise and looming issues. The first thing Lacy did was to differentiate between renewable energy and green power. Most in the room, including the editors, believed they were one in the same. Not so: EPA defines green power as electricity produced from solar, wind, geothermal, biogas, biomass, and low-impact small hydroelectric sources. No reason for the differentiation was offered.

Renewable technologies represent potentially unlimited sources of energy, Lacy said, echoing public officials and others with vested interests for promoting the idea. The key word, of course, is “potentially.” “So why aren’t we there yet?” she asked the group. The answers include:

- Resources are location-specific.
- Cost and availability require improvement.
- Storage options are not yet mature.
- The site development process is not fully defined and questions regarding impacts remain.
- Transmission is a significant issue.

Finishing up, Lacy told attendees what they wanted to hear: Gas-fired units still make sense. They can be paired with variable-output renewable sources to provide the reliable base-load resource necessary to maintain grid stability. Furthermore, GTs offer operational flexibility and can be brought online quickly to back up wind generation when the wind subsides and solar when cloud cover becomes an issue.

Don Schubert, senior VP of Marsh Inc’s Power Utility Practice, closed out the morning session with an insurance update aimed at GT owner/operators. In one graphic, where he charted losses over a timeline of mile-

stones in a GT project—civil work, erection, mechanical completion, testing, performance run, and commercial operation—Schubert showed that losses from project initiation through completion for the period 2003-2008 averaged about 16% higher than for the 15-yr period ending in 2008. More than 70% of the losses occurred from the time systems and components were first started after mechanical completion through the end of cold and hot testing.

Schubert gave some examples of losses typically associated with failures in F-Class GTs requiring replacement of major components: combustion section, \$3-5 million; turbine R1 (rotating blades and stationary vanes), \$7 million average; compressor, approximately \$9.2 million on average.

There were 16 major losses from January 2008 through August 2009 attributed to the combustion section. Outages to deal with these losses averaged 34 days. Compressor sections in 17 machines required rebuilds; there were 48 “near misses.” Eleven engines required turbine overhauls which averaged 58 days each.

Policy limitations were fewer in 2009 than in the previous two or three years. One reason was the increased use by owner/operators of monitoring and diagnostic centers—the OEM’s or a third party’s—to proactively avoid loss events. Schubert said that nearly half of the GTs his company insures use advanced asset management tools. More frequent expert inspections and data trending and analysis are part of this. CCJ

BUSINESS PARTNERS

GTE’s great leap forward

The product-development incubator has been quietly operating overtime at Gas Turbine Efficiency plc (GTE) for the last two years or so. There have been a few announcements along the way, but the incubator doors were thrown wide open at Power-Gen International in early December to reveal a robust products and services portfolio for gas-turbine (GT) owners and operators.

Said CEO Steven Zwolinski, “GTE is committed to lead in power generation and continue the development of cleantech solutions for the energy industry.” The beaming executive, along with Chief Technology Officer Thomas Wagner, discussed the company’s latest innovations—including

combustion-system upgrades, DLN and DLE automated tuning, compressor cleaning, power augmentation, fuel conditioning, emissions reduction, mods and upgrades, and outage management options.

One of the advanced solutions featured at the GTE booth was ECO-MAX™, an automated tuning system that allows users to customize operational objectives—such as increased power, emissions optimization, and life extension of expensive turbine hardware. Positive results from beta tests of Ecomax conducted by a leading merchant generator on its F-class assets were first “leaked” at the 7F Users Group meeting last May (p 14). Derek Grayson is the GTE sales executive responsible for the Ecomax product line (www.gtefficiency.com).

Monitoring and diagnostic

(M&D) services for the company’s full product portfolio also were rolled out in Las Vegas. “Ecomax, combined with our new state-of-the-art M&D center (photo) allows us to bring critical information to the customer’s operating decision point—offering faster, more optimized solutions,” Zwolinski added.

Wagner continued, “The technology behind the M&D center allows GTE to remotely monitor from



M&D center allows GTE to bring critical information to the customer’s operating decision point faster