

Attendance strong despite deteriorating economy

The 7EA Users Group annual conference and vendor fair normally is the last meeting of the year in the gas-turbine-based sector of the electric power industry. The conference typically attracts around a hundred users; it broke the century mark again last November 4-6, in Savannah, even though the economy was suffering through a whopping fourth-quarter GDP decline of 6.2%.

More than five dozen owner/operators of 7EAs were represented—for good reason. With economic and environmental issues forcing the postponement or cancellation of many coal-fired and nuclear projects, power producers will rely heavily on gas-fired combined cycles and peaking turbines to meet market needs. Read about the mini-boom in GT project development in “By the Numbers,” which begins on p 2.

And with benchmark natural-gas prices below \$5/million Btu, GTs will be running longer and harder despite the drop in electric demand caused by the economic downturn. Lower production costs are sure to move GTs up in the dispatch queue.

Any company considering adding capacity, or wanting to take full advantage of emerging market opportunities, should redouble participation in user groups supporting its assets. No better place to network and learn new ways to improve productivity and performance. Last thing you want to do is make the same mistakes others have because you thought saving \$1000 to \$1500 (the average total cost of attendance at a user-group meeting) really would “help the budget.”

By not participating, O&M costs almost surely will *increase*. Virtually every user polled offered two or three ideas he or she brought back to the plant and implemented within a year. The typical annual return the editors hear for performance-related improvements traceable to a user-group meeting rounds out to about \$10,000—a tenfold return on the cost of attendance. And who can put a price tag on the safety idea that reduces worker exposure to harm?

Highlight of the first day at the

Westin Savannah Harbor hotel—GE Energy’s effort aside—was a panel on Mark IV and V support and upgrades. You can’t criticize the OEM for trying to sell you a Mark VIe replacement. But unless you’re going to upgrade an engine and require a far more robust control system, why spend precious capital this way? The OEM may no longer be supporting legacy controls, replacement cards, and repair services for those cards, but third-party suppliers do.

This article focuses on the Mark IV and V support and upgrades panel, hopefully offering you some ideas on how to reduce expenses without compromising reliability and availability. Remainder of the program will be covered in detail next issue.

Session participants were Craig Corzine, president and CEO, CSE Engineering Inc, Concord, Calif (corzinec@cse-eng-inc.com); G Randall Riggs, manager, Powergenics, Midlothian, Va (rriggs@powergenics.com); and Peter Zinman, president, Gas Turbine Controls Corp (GTC), Ardsley, NY (peter@gasturbinecontrols.com). The 7EA group’s vice chairman, Lane Watson, moderated the discussion session that followed the formal presentations.

Corzine’s presentation, “Control System Integration Solution to Extend the Life-Cycle of the Mark IV and Mark V,” was a critical look at six control-system communication configurations—from relatively “rudimentary” systems by today’s standards to the most sophisticated a user probably would want. Common shortcomings of the early control systems included the following: (1) no (or limited) control-to-control communications for data exchange, (2) no automatic time synchronization between control systems to provide a common, system-wide data time stamp, and (3) multiple operator interface systems.

Upgrading to provide desirable features such as (1) enhanced security protection, (2) secured wireless operator interface, (3) unlimited HMI clients, (4) automatic time synchronization, and (5) enhanced control and protection between the DCS and individual control systems, would

require increasing your capital and O&M budgets.

Members of the 7EA Users Group can get a visual comparison of the various control system arrangements Corzine addressed, and a detailed list of pros and cons for each, at <http://ge7ea.users-groups.com>. Others employed by owners or operators of GE 7EAs can gain access to this and other presentations by joining the group, at no cost, through the Website.

Zinman’s presentation, “If It Ain’t Broke, Don’t Upgrade It,” struck a responsive chord with the group with the recession assuring tighter budgets for the next couple of years at least. He focused on extending the lives of Mark IV and V turbine controls by use of replacement parts.

Zinman said that GTC had the world’s largest stock of Speedtronic cards and a capable in-house technical staff to troubleshoot, test, refurbish, and repair them. He reviewed his company’s inventory and how it does business—including its exchange discount and repair-and-return practices. Zinman stressed the pedigree of its parts, explaining that GTC stocks only genuine original parts that it buys from the OEM and in the surplus market.

A particularly helpful portion of the presentation was a series of slides explaining board nomenclature. Looking around the room, one got the sense that many did not know or were not sure what all those numbers and letters meant, and their importance.

Zinman closed with an announcement of GTC’s Mark IV Guaranteed Parts Pool and a promise that a pool for Mark V parts would be coming soon. Pool members pay a “moderate” annual subscription fee to guarantee availability of circuit boards, power supplies, relays, panel interface, and CRT—even the rarest cards.

Discussion following the presentations was lively. One of the first questions concerned the susceptibility of Mark V cards to shelf-sitting. “Not much” was the consensus view of the three speakers, adding that proper handling is a much bigger issue. Static electricity, they said, can destroy cards (Sidebar). Proper storage of cards and the importance

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Dos and don'ts to remember when handling circuit boards

The Q&A segment of the Mark IV and V support and upgrades session that followed the prepared presentations generated considerable discussion on the proper care of circuit boards. The editors approached Peter Zinman, one of the speakers, and Sam Leyton, Gas Turbine Controls Corp (GTC), Ardsley, NY, to develop a short primer on dos and don'ts to remember when handling cards. The following is what Zinman and Leyton developed. If you have any follow-up questions, e-mail Leyton at sleyton@gasturbinecontrols.com, or call him on 914-693-0830 x-20.

A large number of repairs received by GTC are believed the result of a user's mishandling that causes static discharge to the board. This is particularly important because many circuit-board components are sensitive to static electricity. Best practices to assure long life of your boards can be grouped into these three categories:

1. Reduce environmental static

- If possible, and to the extent practical, maintain a heightened level of humidity around the control panel and other areas where boards may be handled.
- Ground your panel. A properly grounded panel helps prevent the buildup of static charges and can dissipate built-up charge from the operator.
- Avoid wearing clothing that easily generates or stores static electricity. Cotton or cotton blends are recommended, synthetic or woolen materials are not.
- Plastic items have the potential for generating a static

charge. Keep all plastic and Styrofoam™ items away from any area where circuit boards are handled.

2. Ground yourself

When handling a circuit board, the operator should be properly grounded by (1) wearing a wrist strap connected to a grounding device, or (2) wearing heel grounders while standing on a static dissipative floor surface or mat.

In the absence of either, always discharge any static charge your body might have built up before handling a circuit board. This can be done by touching a grounded metal object—such as a grounded electrical outlet—and holding it for at least two seconds. If your panel is grounded, that will work too. Wearing an antistatic laboratory coat also can reduce the risk of static discharge to the board from clothing.

3. Handle equipment correctly

- Do not touch components, circuit traces, or connectors on a circuit board. Handle circuit boards by their edges. Never hold a card in the horizontal position by one edge; the resulting stress can damage the circuitry.
- After a circuit board or module is removed from a control panel, promptly store it in an antistatic protective bag or box.
- Do not store circuit boards in a stack or adjacent to each other because this also can damage the components.

Do



Wear antistatic wrist strap



Hold at the corners

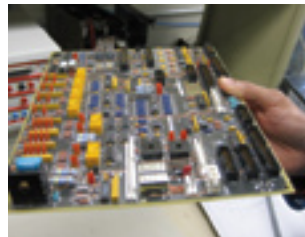


Hold at the sides

Don't



Hold inner circuit board



Hold one side



Touch circuit traces



Touch connectors

of storage environment also were included in the discussion.

One speaker mentioned that the Mark V was problematic regarding grounding, whereas he considered the Mark IV "bulletproof." Suggestion: Check control panels for proper grounding because these panels are prone to floating grounds. Reference was made to a grounding standard in Mark VI documentation that can be used for the Mark IV and V.

How long would Mark V parts be available? Almost indefinitely

(20-30 years), said the experts—that is, except for ARCnet cards. One of the panelists pointed to the fact that 1970's vintage Mark II cards are still available.

Then came a probing question regarding test protocols used by repair vendors. The user said he found repaired cards that didn't work right out of the box. First warning from the panelists was to avoid buying cards from companies that do not have a solid reputation in the electric power industry for quality product.

The group was told that third-party suppliers sometimes cannot test all components to the OEM's standards, because those test standards are not available. However, one panelist said his company uses a test rig similar to that of the OEM's and conducts functionality tests in a Mark V panel that runs actual operating scenarios. Best practice: Install your repaired cards as soon as they are received and put the cards removed in the warehouse—you know they'll work when needed. CCJ