WEST SIDE SIGNAL

Official Bulletin of Toronto's Oldest Amateur Radio Club

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Meetings

Meetings held at 7:30pm on the third Tuesday of each month , Etobicoke. Municipal Offices (Burnhamthorpe & The West Mall) No meetings in July or August. Visitors always welcome.

Club Nets

FM Net
Wednesday 8:00pm
VE3SKY repeater 146.985 Mhz

CW Net
Sunday 10:00am 7.029.5 Mhz

SSB Net
Sunday 11:00am 7.075 Mhz

Next Meeting

Tuesday Oct 20th 2009
7:30pm
Etobicoke Municipal Building
Burnhamthorpe Rd & West Mall
Etobicoke

CLUB NEWS

Oureptember meeting was attended by the usual 'Old Faithfuls' VE3EQF Chris, VE3OBU Bert, VE3PA Bill, VE3PNX Michael, VE3RER Dave, and VE3UT Al. I could probably save space and just say "The usual gang" each month. The secretary informed me that the only club business discussed was the proposed luncheon meeting for December to be held at the Chinese Buffet Restaurant at Dundas St W and Mississauga Rd. Can't remember the name of the place, it's either King's or Imperial but it's the only one in that strip mall anyway.

Bill VE3AR spent some time in hospital recently, after suffering a fainting spell he was carted off and kept for observation and various tests. He was released after several days and presently is at home where he has his caregiver Lilly taking good care of him. Unfortunately he is not able to get up and down stairs too well and spends most of his time in a wheelchair consequently he is restricted to the main floor of the house. This curtails his HF radio activity because his HF station is set up in the basement. However he is able to operate on 2 meters and has shown up on our Wednesday evening and Sunday morning net. I'm sure you all join me in wishing Bill a speedy return to his old self .

One thing about it Bill you're not missing much on the HF bands, they are still in very poor shape and the sun is certainly not doing what it's supposed to. Very little activity and the solar figures reflect that. For a couple of days it looked as if we were creeping up solar flux wise but it only reached 73 and then started slowly dropping, today (Oct 7) it is 69. The experts also seem to be stymied by it all some are saying this and others that....don't know what to believe but I can certainly believe my ears when I turn on the rig Hi.

Clyde Shepherd of Alpine is floored by the prospect. He recently installed the second of two windmills on his property that are each rated at 2.4 kilowatts continuous output. He's searching for a battery system that can capture and store some of that for later use when it's calm outside, but he hasn't found a good solution. "This changes the whole scope of things and would have a major impact on what we're trying to do," Shepherd said. "Something that would provide 20 kilowatts would put us near 100 percent of what we would need to be completely independent. It would save literally thousands of dollars a year."

Shepherd is connected to the grid through Rocky Mountain Power, which charges a variable rate for power depending on demand during a given 24-hour period. With his windmill setup, Shepherd has what's called "net metering" -- an electric meter that spins both ways. He pays for electricity coming in, but gets a credit from Rocky Mountain for any excess power generated by his windmills that flows back onto the grid. Already, he's cut his power bills in half, and with good storage batteries he thinks he could reduce the bill to zero.

While Shepherd opted for windmills over solar at the time he was planning his alternative energy installation, he said he would reconsider that decision today as the bottom continues to fall out of the cost of solar cells.

"Batteries and PV are about to merge," said MIT's Nocera, using the shorthand for "photovoltaics" or solar power. "First Solar is now saying that it takes $1 a peak watt to manufacture, and another 80 cents for installation. So they're saying that you can get PV for under $2 a watt. That's a reduction of cost by a factor of four. Only a few years ago, it was $8. If CoorsTek and Ceramatec come up with a good battery, the market will develop quickly."

The long-term impact of home electric generation for a power company's business model could be huge. After all, you can't stay in business if nobody's paying for power. Exactly how that will play out remains to be seen.

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Fifty miles south of Ceramatec's laboratories, Chris Cannon, the former congressman from Utah County, is on a crusade to transform the world through technology. He currently sits on Ceramatec's advisory board with Nocera. No longer burdened by the pressures of Washington, he's using his experience in energy, manufacturing and government to carry the message of innovation and help move research to reality.

"What I choose to concentrate on now are things that will make the world a better place," Cannon said, "and Utah is an incredibly good place to do that."

Approached by Ceramatec after he left Congress, Cannon fills a complementary role in a group of smart engineers and academic types. With extensive Washington contacts and an understanding of the inner workings of power generation, he hopes to be able to make connections that will push the new battery technology forward for the benefit of the country.

"I have an energy and manufacturing background, so I understand the process," he said. "Ceramatec had a gap in their experience which I think I filled pretty well." On top of that, there was "good chemistry" from the start.

While Cannon's six terms in Congress representing what is arguably the most conservative district in America means keeping a somewhat jaundiced eye on the Obama administration, he's far from negative. He thinks of himself as a "post-partisan Republican" willing to run with good ideas regardless of their source. And when it comes to energy policy, he's anything but discouraged.

"If you look at the president, he inherited some really difficult things," Cannon said. "But he hired a guy to be the secretary of energy who is a scientist. And we are on the verge of so many scientific breakthroughs that no matter what the president's ideology is, if we do the right thing scientifically, America is going to do well. Many of the innovations that are coming out of Utah that I'm involved with are likely to be really important, regardless of the leadership."

Last month, Obama introduced a raft of broad energy proposals that were sharply criticized by conservatives as economic back-breakers. Proponents hailed the plans as progressive. Either way the administration appears to be on a path that could soon drive the cost of conventional energy higher -- some say as much as double. Electrical generation at home using solar panels, coupled with storage in effective batteries, could soften the financial impact on many homeowners' utility costs.

The new Ceramatec battery could also change the way private enterprises invest in energy, Cannon said. Instead of building another power plant, for example, maybe they buy 100,000 or a million batteries and distribute those around the service area of a utility to reduce loads and eliminate expensive "spinning reserve," the supplementary power generation that's fired up in response to daily spikes in electric demand.

"The technology could mean a lot of things," Cannon said, "but it certainly means that we change the way we invest. It also means that we shift our expenditures on terrorism, because our infrastructure for power transmission is probably the weakest link in America today. If you have local batteries with local control, that gives terrorists a more difficult target. And local control systems are much simpler than a vast national transmission grid."

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CoorsTek's manufacturing roots go back to the early 20th century, when Adolph Coors diversified his beer brewing empire based in Golden, Colo. He set up a ceramic manufacturing business called the Herold China and Pottery Company, whose early product line included dinnerware and utensils but later moved to high-tech industrial products made of ceramics. With World Wars I and II, the company stepped up to provide needed ceramics for industry and the military, including materials used in the production of the atom bomb.

"To most Americans, the word 'Coors' means beer," wrote Business Wire on the ceramic maker's 75th birthday. "But to scientists and industrialists throughout the world, the word 'Coors' means technical ceramics of extraordinary quality."

That hasn't changed. Cellular telephones, car engines, computer chips, soda dispensers, semiconductor casings, blood processing pumps, bulletproof vests and armor for military vehicles, to name just a few items in a dizzying high-tech product array, all use ceramic components produced by Coors enterprises. And so it was natural in 2008 for CoorsTek to purchase the hottest ceramics R&D firm going -- Ceramatec, with its 165 employees in Salt Lake City.

Ceramatec was founded in 1976 by a group of University of Utah professors who made important contributions to the sodium-sulphur battery technology being pursued by Ford Motor Company for vehicles at the time. Those early liquid-core batteries didn't pan out well for transportation, though, because of their size and weight, and because of the extremely harsh internal chemical conditions required for them to work.

In the years since, electric cars have remained on the sexy-tech list, with substantial industry efforts aimed at developing various flavors of zippy batteries to power them. Ceramatec had other ideas, recognizing a vast potential market for a different sort of power -- for homes.

"With a house, you don't need to get energy in and out instantaneously. You need huge amounts of storage capacity," says MIT's Nocera. "That suggests a different commercial market and different technical re-

straints and opportunities."

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In 2000 Ashok Joshi, a native of India, took the helm at Ceramatec. His international reputation in ion technology and fuel cells kept the company among the first rank of innovators.

Joshi (he prefers A.J.) looked to the potent combination of sodium and sulphur for the basic components of a new battery. That was known chemistry. But while he wanted to achieve a high energy density offered by those elements, he also wanted to get rid of the extreme heat, corrosion and toxicity of liquid sodium batteries.

The key would be found in a paper-thin, yet strong and highly conductive, electrolyte material -- an advanced ceramic -- to serve as the barrier between the battery's sodium and sulphur. The thinner the barrier, the cooler the battery can operate. If you can get below the melting point of 98 C, sodium stays in its solid state, and you've got enough energy to run a house with safety.

Charged particles of sodium and sulphur -- ions -- now scoot so effortlessly through the new ceramic wafer that the sodium doesn't even approach 98 C, let alone 350.

The ceramic that made this possible was dubbed NaSICON by chemists. That stands for "sodium super ion conductor" -- "Na" being the code name for sodium in chemistry's periodic table.

Ceramatec's formulation is a trade secret. With trademark modesty, A.J. observes, "We feel confident it's a good material."

"It's a miracle material," corrects Grover Coors. He's the great-grandson of Adolph Coors, the brewmaster-industrialist who started all this. Grover has a Ph.D and specializes in solid-state ionics and advanced materials. He's working with Ceramatec as a sort of research fellow to evaluate technologies and advise senior management. A.J. stayed on as president after the sale to CoorsTek.

"There are two classes of ceramic materials that are good conductors," Coors explained. "One is what developed here in the early days -- beta-alumina solid electrolyte, or BASE. It's temperamental, brittle. A.J. thought of a better material. It's a better conductor, easier to manipulate and process, and lower cost."

This is where the earth moves for renewable energy. The new electrolyte enables the development of an energy-dense, inexpensive and safe storage battery for use at home. Combined with the rapidly emerging thin-film solar cells, it presents an unparalleled business opportunity.

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Grover's brother, John K. Coors, is CEO of CoorsTek, the manufacturing company that applies what the scientists at Ceramatec dream up. Their nephew, Doug Coors, oversees R&D.

With some 21 plants producing advanced ceramic products worldwide, the expectation is that full-scale production of ceramic sheets for the new batteries could be tooled up in short order. In fact, only a handful of CoorsTek facilities would likely be employed.

The order of magnitude pencils out along these lines: a target of 20 gigawatt hours of storage in 20 kilowatt-hour battery increments equals 1 million batteries. Or using a different metric, 1 million square meters of thin ceramic electrolyte would yield 20 gigawatt hours of batteries, equal to California's entire spinning reserve.

Nobody at CoorsTek even blinks at such figures. The company already produces 3 million pounds of ceramic material per month. "Once we have a working prototype battery with all the standards and cost requirements met, it will come up quickly," said Grover Coors. "It would scare people to know how quickly

we can bring this up."

They're about about six months away from initial scale-up toward a commercial product, he said.

Lots of sodium will be needed to make the new batteries, and Ceramatec proposes a symbiotic relationship with the federal government to get it. Enormous quantities of sodium metals, the byproducts of nuclear weapons manufacturing, just happen be available for cleanup at Hanford nuclear reservation near Richland, Wash. It's a ready-made source of material that CoorsTek can recycle.

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In a laboratory at Ceramatec, a small battery -- a NaSICON sandwich in silver foil -- has been cycling up and down since October to prove out the electrochemistry. Engineers are confident the tests will support a projected useful life of 3,650 cycles, which meet the standard of one discharge/recharge cycle per day for 10 years. It's a tall challenge, according to Coors, but doable. "It's very efficient in terms of watt-hours per kilogram," he said. "We're now in excess of 200, which puts us in the sweet spot for all the applications we've been talking about."

There are a handful of small hurdles yet to cross in the science, but nobody seems terribly concerned. One is the fact that when two solids are joined along flat surfaces, there will always be at least a 1-micron gap between them. That needs to be closed somehow. Nocera is making some suggestions for suitable fillers, but neither he nor Ceramatec developmental scientist John Watkins feel that the problem will be a difficult one.

"I want to say, this is no big deal," Nocera said. "But sometimes little things can bite you in the butt. So we'll just work it out."

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Meanwhile, heavyweight liquid sodium-sulphur batteries from Japan are making an inroad into the United States at Luverne, Minn. They're part of a demonstration project by Xcel Energy, an eight-state power utility. In February, Xcel began testing a 1-megawatt battery installation intended to capture power from a giant 11-megawatt wind farm owned by Minwind Energy, LLC. It's said to be the first attempt to store wind-generated power at a large-scale.

Contrasting with Ceramatec's vision of many small home-based power centers with refrigerator-size batteries, this project is another mainframe -- albeit fueled by wind. Hot liquid sodium-sulphur batteries from NGK are intended to move a lot of energy to the grid. The 50-kilowatt battery modules -- 20 cylindrical cells -- are roughly the size of two semi-trailers and weigh 80 tons. They'll store about 7.2 megawatt hours of electricity, enough to power 500 homes for seven hours, according to company data. The test is intended to validate greater penetration of wind energy on the Xcel Energy system.

It's one of many efforts by industry to cut down carbon dioxide emissions and move to a more sustainable energy model, but it's not without hurdles.

"One of the big problems with the NGK system is that it's megawatt-scale storage," said Ceramatec's Coors. "It has to be on top of the 10 kilowatt side of the utility transformer, meaning that there's a lot of step-down transformers and whatnot involved in hooking those things up -- a lot more system complication.

"If you go with a smaller system like the 5 kilowatts for four hours system that we're contemplating, that's all done on the 110-volt side of the transformer, and so all the switching can be done with solid-state relays very inexpensively."

Such comparisons are batted around frequently by Ceramatec insiders as they seek to optimize the science and develop business models. A recent Sunday dinner with several board members was a popcorn machine

of problem-solving and technical musings.

Over dessert, Cannon suggested a new angle: Was it possible to use the thin ceramic membrane developed at Ceramatec to reduce the production costs and improve efficiency of NGK's existing hot liquid batteries -- replacing the old beta-alumina electrolyte currently used in those devices? After all, the new ceramic membrane is cheaper and a better conductor. That got Nocera's attention, and the idea then bounced to A.J., whose mental wheels were rolling.

The exchange was typical of the collegial atmosphere and dynamic thinking processes that characterize Ceramatec.

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Joe Hunter envisions applications for a new generation of batteries in his specialty of hydroelectric power -- not massive banks of batteries at dam sites, but maybe something along the lines of the 1 megawatt battery array at Minwind's Minnesota wind farm. Alternatively, many small batteries could be distributed throughout a community.

Hunter is a former deputy assistant secretary in the Department of the Interior and was Cannon's chief of staff.

In Hunter's world, large dams typically don't employ batteries on-site because the torrent of juice a hydroelectric plant generates is overwhelming. Glen Canyon Dam, for example, produces close to 1,000 megawatts, which is comparable to a big coal-fired power plant. In eastern Utah, Flaming Gorge churns out 150 megawatts.

The advantage of a dam over a wind farm, however, is predictability. Water must be released continuously to support fisheries and other environmental systems downstream. That's essentially wasted power. If small energy generation and battery storage could piggyback on such flows, the community could benefit at low cost. Inexpensive batteries could be used economically in areas serviced by many dams, Hunter suggested.

Take Deer Creek at the head of Provo Canyon, for instance. Generators at the dam can produce up to 5 megawatts, but they run mainly in the irrigation season. But water to sustain the Provo River has to be released all the time, and local residences, with batteries trickle-charging continuously, could benefit.

It's another value proposition added to others, like the net metering enjoyed by the Shepherds in Alpine. The idea in all this is to ease pressure on the grid while moving people toward greater energy independence.

"What we're talking about is the ability to take the edges off," Hunter said. "We're at a tipping point for alternative energy."

In Salt Lake City, Grover Coors agrees: "This will be the largest industry of all time," he said. "But it's all about cost and reliability."

4U1UN CELEBRATES UN GENERAL ASSEMBLY WITH SPECIAL EVENT

To celebrate the 64th General Assembly of the United Nations, 4U1UN -- the Amateur Radio station at the UN -- began operating as 4U64UN on September 22. According to , 4U64UN will be on the air for 64 days on all bands and modes. QSL via Logbook of The World (LoTW) or direct to Herbert Aeby, HB9BOU. Logs will be uploaded to LoTW once the event is over. QSL cards will be mailed out starting in December 2009.

IARU NATIONAL RADIO SOCIETY TO CELEBRATE ITS CENTENARY

The Wireless Institute of Australia turns 100 next year making it the world's oldest National Radio Society.

WIA President **Michael Owen VK3KI** says he wants the world-wide amateur radio community to join in the celebration.

In the October edition of the WIA's Amateur Radio magazine he announces a program that includes a special callsign **VK100WIA** that will be operated next May by the WIA, and then by many affiliated clubs around Australia for the next five months.

A commemorative QSL card will be issued for contacts with VK100WIA between May and October next year.

A limited edition operating award, called the **WIA Centenary Award** is also to be available and two contacts with VK100WIA are required under its rules.

A program of events will occur around the WIA's annual meeting in the nation's capital Canberra in May 2010, while radio clubs are planning events to promote the centenary of organised amateur radio in Australia.

It all began in 1910 with a meeting of wireless pioneers in Sydney to protect their interests and rights against what they considered to be harsh treatment by authorities and a high licence fee.

The Wireless Institute of Australia has continued since to protect and enhance the privileges of radio amateurs and to promote amateur radio.

Details of the centenary program can be found on the WIA website www.wia.org.au (from 3 October).

Ontario's New Rules For Hand-Held Wireless And Entertainment Devices

September 30, 2009 10:39 AM

As of October 26, 2009, Ontario's new distracted driving law will make it illegal for motorists to use hand-held wireless communication devices or any hand-held electronic entertainment devices while driving.

This includes hand-held cell phones, texting and e-mailing.

Hands-free devices will still be permitted.

This new law also prohibits viewing a display screen unrelated to the driving task such as laptops or DVD players while driving.

HANDS-FREE DEVICES

The new law applies only to hand-held wireless communications and hand-held electronic entertainment devices. This means drivers must only use wireless devices that can be used in a "hands-free" manner:

- a cell phone with an earpiece or headset using voice dialling, or plugged into the vehicle's sound system
- a global positioning system (GPS) device that is properly secured to the dashboard or another accessible place in the vehicle
- a portable audio player that has been plugged into the vehicle's sound system.

Some wireless devices require that users push a button to activate and/or deactivate the device's "hands-free" function. This activity is permitted under the law.

HAND-HELD DEVICES

All drivers

Drivers will not be permitted to use hand-held communication and entertainment devices when driving, with the following exceptions:

- Calling 9-1-1 in an emergency situation
- When the driver has safely pulled off the roadway and is stationary or is lawfully parked.

Other devices not included in the ban:

- Viewing a display screen used for collision avoidance systems
- Viewing a display screen of an instrument, gauge or system that provides information to the driver about the status of systems in the motor vehicle.

Emergency Response Personnel

Police, fire department and emergency medical services personnel will be permitted to use hand-held wireless communications devices and view display screens in the normal performance of their duties.

The use of hand-held radios by amateur radio operators (who provide assistance, especially in emergency situations such as severe storms and blackouts) will be phased out within three years, to allow hands-free technologies to be developed.

Commercial Drivers

A small percentage of drivers in transport-related industries (e.g., school buses, taxis, couriers) and public service workers (e.g., transit and highway maintenance workers) rely on the use of certain types of wireless devices and display screen technologies in the performance of day-to-day operations.

To help these businesses stay competitive, Ontario is granting a three-year phase-out period for the commercial use of two-way radios, including mobile and CB radios, to allow for hands-free technologies to be developed.

The new law will not affect mobile data terminals, logistical tracking devices and dispatching devices. They will be exempt for commercial and public service vehicle drivers who are engaged in the performance of their duties.

Hand-mikes (push-to-talk systems) and portable radios (walkie-talkies) may be used in a hands-free mode. This would mean the driver can use a lapel button or other hands-free application as long as the hand-mike or walkie-talkies is not held while driving.