

A word from your President



230 or 240 Volts?

This simple question is one of the most difficult and confusing questions I've had to deal with. As a committee member of Standards Australia EL34, I'm part of a team writing a new steady state power quality standard for Australia. How can something as simple as the steady state voltage being provided to customers be so difficult to define and specify?

The 220V voltage countries and the 240V voltage countries have notionally agreed on a 230 volt compromise but with a wide $\pm 10\%$ range. Unfortunately that wide range makes it difficult for some electrical equipment to function. Distributors are not keen on major change because of a perceived lack of benefits, most customers simply don't understand and suppliers/manufacturers of electrical equipment have to adapt with local knowledge in the various world markets. Put simply, the existing arrangements are complicated and confusing or should I say "non-optimised". This is why Australia and the world need a new power quality based steady state voltage standard. There are clear community benefits to be had.

Our new draft standard which we hope will eventuate over the next year will address some of the power quality issues. How to measure? Percentage of time within limits? Different ranges in different countries? The outcome will provide more specific requirements for distributors and more certainty for customers and equipment manufacturers.

The work will be a world first. What makes it difficult is that unlike the high tech measures of harmonics, flicker and unbalance, every electrical engineer has a view on the 230 volt issue and a host of experiences to back it up. Customers have significant problems but don't know it and I suspect we are getting some degree of premature equipment failures that we can't quantify. To compound the problem we call our low voltage system a 230 volt system but our supplies spend most of the time well above 240 volts and many supply engineers continue to refer to a "240 volt" supply system. We have the classic situation of 230 volts in our national standards with some states having 240 volt references in their regulations. Our friends in New Zealand have already made the change to a true 230V $\pm 6\%$ system - this is quite a major international achievement.

Watch this space for the announcement of the birth of the new 230V Australian standard. More standards meetings and more compromises will be needed. I'm looking forward to popping a champagne cork to celebrate when we get to the end of this process.

EESA National Conference 5 -7 August 2009

I've registered and I'm looking forward to being part of the 85th Annual Conference of the EESA. Smart grids, smart energy and smart people is the theme of this year's conference. Judging by the high quality of last year's Brisbane conference, this conference will be a huge success. The Australian industry is forging ahead with changes toward a "smart" grid. Every electricity distribution company has its own idea of what a smart grid means and what it can do for customers. This conference will examine the many smart things that are happening throughout the electricity industry. If you need to keep up to date with what is happening in our industry then register now and come to the Gold Coast 5-7 August 2009.

Dr Robert Barr

EESA National President

Nominations to EESA National Council now sought

Nomination forms for positions on the National Council have been included with this Bulletin. It is probable that all the retiring Council members will re-nominate, however others may also nominate.

Forms to be returned by fax to Pearl Ansley at Engineers Australia, 02 6273 2358, by Thursday 30 July. If required, elections will be conducted at the AGM at the National Conference on Friday 7th August.

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The Electric Energy Society of Australia

National Conference 2009

85th National Electric Energy Society of Australia (EESA) Conference & Exhibition

Electricity 2009 – Smart Grids, Smart Energy and Smart People - That's what the **85th National Electric Energy Society of Australia Conference and Exhibition** to be held at Conrad Jupiter's Broadbeach, Gold Coast, Queensland from Wednesday 5 August to Friday 7 August, 2009 will provide as well as many other topical discussions.

The conference program has something for everyone whether it is demand site management, smart grids, or future proofing the industry. The information gained from the conference will be of great value to all those who attend.

The premium sponsor for the second year running, ABB Australia, has recognised the importance of the partnership that this conference provides to the industry as a whole. With ENERGEX and Ergon Energy as our major sponsors, the continuing development of the industry into new fields remains a strong focus.

Coupled with the many great exhibitors from International and Australian companies at the conference, this surely adds up to being the premier electric energy industry event for 2009.

The pre conference site on Wednesday will take place at the Yatala Brewery. This is one of Australia's largest breweries which host's state of the art brewing and packaging technologies. This site visit will take in an overview of the whole brewery as well as the technical side to our particular field of interest.

So why not consider a short break with your family and stay at one the many self contained apartment that are close to the beach and the conference venue whilst attending the conference.

The conference website has all the relevant information regarding the program, registration and accommodation options and this can be found at: www.eesa.iamevents.com.au

Greg Bartlett

Conference Convenor 85th National EESA Conference and Exhibition

For conference information, please contact the conference organiser:

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Victorian Chapter News



Dr Liam Waldron, Felicity Galluzzo and Colin Frost, Chairman EESA VICTAS Chapter

Recent EESA VICTAS Chapter Awards

At the recent EESA VICTAS Chapter Awards evening Dr Liam Waldron presented Felicity Galluzzo with 'The Engineers Australia Graduate Electrical Power Engineer of the Year Award 2008'. The Engineers Australia Graduate Electrical Power Engineer of the Year Award 2009 is sponsored by NHP, and is an initiative of the Electrical College Board of Engineers Australia (ECB), the Electric Energy Society of Australia (EESA) and NHP.

As part of her prize, NHP, has awarded Felicity an overseas trip in recognition of Felicity's achievements and high quality application submission. The trip included visiting the Nuremburg Electrical & Automation Fair in Germany in November of 2008, and several electrical technology companies in Europe and Kuala Lumpur over a 2 week duration.

The evening also featured presentations by the EESA National Conference Award Winners, E2008 Conway Award Winner Professor Gerard Ledwich, for his paper titled 'Transmission Load Modelling'; and Creswell Award Winner Mr Tony Gillespie, for his paper titled 'Risk Based Power System Earthing' and the presentation of EESA VICTAS Power Engineering Students Awards 2008 to Fatima Osman, Victoria University, for her project 'Composite Load Model Parameter Development'

Bulletin 4, August - September 2009:

Please email submissions by 7 August 2009 to the Bulletin Editor,
Patrick McMullan on pmcmullan@energy.com.au

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News and issues from around the Industry...

EnergyAustralia named Best Performing Company, Friday, 29 May 2009

EnergyAustralia was announced as the Best Performing Company 2008 last night after topping Australia's Sixth Corporate Responsibility Index (CRI) for the second year in a row.

The CRI is an annual, independent assessment that ranks a company's impact on society and the environment by looking at its practices in the areas of community, environment, workplace and market place.

EnergyAustralia Managing Director George Maltabarow said the company's top ranking recognised its efforts to support the community and work in a sustainable way every day.

"The CRI recognises that success is not only about what you achieve, but how you achieve it," he said. "We're proud of this award because it highlights that doing the right thing is part of EnergyAustralia's culture. It pays tribute to our staff and their commitment to working in ways that benefit the community and environment."

This year EnergyAustralia was ranked alongside 35 companies and achieved Australia's top score of 98.16% to be named Australia's Best Performing Australian and New Zealand Company. The company bettered its winning score of 96% last year.

EEnergy Informer June 2009

Perry Sioshansi writes that Google has introduced a way to make electricity usage information easily accessible from anywhere

As time goes on, Google is emerging as the place to look for anything and everything one might possibly want or need. And that fact has not escaped the smart people of Google whose goal is to gather all available information and present it in ways that is useful and easy to use. The result is that more people come to Google for more things every day, which creates even more traffic to Google – exactly as intended.

That much everyone knows about Google, and most people give them credit for providing the answers to the word searches quickly and correctly. But what surprises many is that Google has been progressively and aggressively moving into the energy space.

First came the announcement that the company likes renewable energy resources, and wants it fast and cheap (Google Wants Renewables, Fast And Cheap, *EEnergy Informer Jan 08*).

Next came energy policy positions that – frankly – made more sense than the stuff coming out of the US Department of Energy (What is Google Doing In Energy Space, Nov 08, *EEnergy Informer Jan 08*).

This was followed by a joint statement with General Electric Company to collaborate on the smart grid (GE and Google To Promote Smart Grid, Oct 08, *EEnergy Informer Jan 08*).

The latest development, however, is even more interesting and potentially significant. Google is not just talking about the smart meter, smart pricing and beyond the meter applications but has just unveiled PowerMeter, a product that – while still rough and primitive – may leave the utility industry in the dust.

In late May, Google announced a partnership with 8 utilities in 6 states in the US plus Canada and India to enable roughly 10 million customers to "access detailed information on their home energy use." What is different about the new product is that consumers can view simple graphical displays of their power usage more or less in real time from anywhere there is access to the Internet, which is becoming virtually universal. Google has selected Itron as its metering partner, a huge feat for Itron.

The usage data, while not utility billing grade, is passable. Likewise, the pricing information is currently primitive – or has to be supplied by the customers, but it is good enough for the typical customer to get the gist of it. The project was originally launched with 200 Google employees each equipped with a simple device that records and reports the household's electricity consumption every 15 minutes via the Internet to Google. That data can then be viewed by each volunteer with a security code.

Google is clear on its policy that the usage information belongs to the customers, and it is the customers' choice to share it with other intermediaries if they choose to do so. But the clear intention is to make the data easily available to others, allowing them to develop specific applications to serve customers' needs – what ever they happen to be.

What sorts of applications may evolve? For anyone who has witnessed a live demonstration of PowerMeter, it does not take a lot of imagination to see the sheer simplicity of the idea and the fact that easy access through the Internet will make electricity usage and price data ubiquitous.

The power industry has been talking – and talking – about smart metering and variable pricing for quite a long time. Lately, it has started to invest billions in advanced metering infrastructure or AMI. An increasing number of trials and experiments have been offered of late – far too many, some would argue. But here is a newcomer who has been in business less than a decade, knows relatively little about the power sector, and yet is poised to offer a solution that has eluded the industry for decades. Would it not be ironic if Google were to be the first to offer a simple gateway to the home, the meter and the devices beyond the meter?

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Google figures that many of us visit its website frequently. With iGoogle, it offers a personalized way to read the news, check the weather, the traffic, the stocks – and now – electricity consumption data and the means to remotely adjust device settings – from where ever we may be.

Talking to PowerMeter people, it is clear that not everybody in the industry is enamoured with the idea of working with Google, or going through Google gateway to reach the customers. Having invested billions of dollars on fancy two-way communication technology to be told of an easier and cheaper way to communicate with the customers must be a setback for some utilities.

“Companies who are in this camp are obviously not the ones who have been talking to us,” one Google insider said. But the reality is that utility customers are not going to spend a lot of time and effort to read their meter information on utility websites even if they could easily do this. But these same customers are far more likely to be visiting Google for something else they need – and that may ultimately turn PowerMeter into a powerful tool to manage electricity consumption on truly large scale and at very low cost.

New UK Policy: No CCS, No Coal, Perry Sioshansi in the June edition of EEnergy Informer

Perry Sioshansi writes that the new UK direction provides needed clarity on future of coal – to a point

The status of coal remains in a virtual limbo in a number of developed countries. Few utilities want to proceed with conventional coal-fired plants since no one is entirely clear what the potential costs of carbon emission restrictions may be 2, 5 or 10 years from now. By the same token, few investors would want to fund construction of such plants without knowing their own risk exposure (US Poised To Fire On All Cylinders In Copenhagen, May 09). In the US and Europe, everyone is waiting for the carbon price fog to lift before making significant commitments.

In late April Britain’s climate change secretary Ed Miliband announced that henceforth there would be no new coal plants unless a proportion of their carbon dioxide emissions are buried underground. The new policy addresses three competing priorities of the UK government, namely the need to ensure the security of the UK’s energy supply; build a low-carbon economy; and slash greenhouse gas emissions.

Mr. Miliband said, “There is no alternative to carbon capture and sequestration (CCS) if we are serious about fighting climate change and retaining a diverse mix of energy sources for our economy,” pointing out that UK was the only major economy committed to highly significant near-term cuts in greenhouse gas emissions – 34% by 2020 relative to 1990.

Like other coal-dependent economies, UK must find a way to use coal while reducing its significant carbon footprint. After a 30-year period when no coal plants were built, there are proposals for 8 new coal-fired stations. In the mean time, one-third of all existing coal stations in the country must be shut down over the next decade due to European Union pollution restrictions. Moreover, UK’s North Sea natural gas reserves are declining and the country is reluctant to become more reliant on imported gas. Few would want Mr. Miliband’s job under the circumstances.

EPRI Research Confirms Impact of Corona Discharge on Polymer Insulators

Research conducted by the Electric Power Research Institute (EPRI) has confirmed that corona discharges can degrade certain 115-kV and 138 kV polymer transmission line insulators and that it has developed a 3-dimensional electric field modelling process to help utilities avoid the failure of these components, which can also affect transmission reliability.

“Our research has been conclusive in finding that there is an issue with polymer insulator degradation on 115 and 138 kV transmission lines due to the lack of corona rings in certain applications,” said Andrew Phillips, director of transmission research for EPRI.

PNM and Public Service Electric and Gas Company (PSE&G) collaborated with EPRI in conducting the research, which proved instrumental in helping the two utilities avoid insulator failures in their systems due to corona discharges.

“Using this modelling process, existing insulators are able to be retrofit,” stated Emilie Dohleman of PNM in New Mexico. “This model really showed where the problem was when a 2-D model probably would not have.”

The 3-D modelling process is part of an EPRI report that helps utilities address the premature aging of polymer insulators. It provides reference information and resources, including recommendations for assessing existing insulators and for specifying replacement polymer insulators.

“Since we have been doing related research for many years, we had the tools in place to deal with this issue,” said Phillips. “We also have had ongoing dialogue with manufacturers and standards committee representatives to make them aware of what we have learned.” The polymer insulator failures also raised concerns about the health of the remaining insulators in service.

“Because of our involvement in the EPRI insulators project, we began to see increased evidence and some failures within the industry attributed to electrical discharge on 138 kV polymer insulators,” said Raymond Ferraro, emergent technology and transfer specialist for PSE&G. “With this information, we felt it prudent to investigate electrical discharge activity on our recently re-conducted and re-insulated 138 kV lines. We were able avoid a possible polymer insulator failures and at a point where remediation options were still possible.”

“EPRI’s long-term research in this area has proved invaluable in helping us develop a cost-effective solution,” said Dohleman. “EPRI developed a utility-specific guide for evaluating existing insulators, which has not only saved the cost of new insulators, but also expenses related to staff time, equipment, and line outages.”

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NSW Chapter News

A recent EESA NSW Chapter Event hosted by Country Energy at Queanbeyan, was heralded as a great success. The audience of 25 people representing a wide cross-section from the NSW distribution industry as well as representatives from the University of Wollongong, the CSIRO, and the Victorian Distributor Powercor, gathered at this half-day event to participate in an exclusive demonstration tour showcasing Country Energy's Intelligent Network Centre, and to listen to two seminar presentations highlighting the impact of small-scale renewable generation on the network, and the possible use of grid interactive inverters to condition the effects.



The demonstration tour showcased Country Energy's long term vision for what the electricity network is going to become - effectively bringing the electrical network into the digital age. This technology will make information available on the minute-by-minute behaviour of the network and the energy flows on it. Apart from being able to better monitor power usage and distribution all along the system, from power lines to substations, the Intelligent Network will bring energy usage information to the family home. As customers seek to do their bit combating climate change, it is important that they can observe and control their energy consumption. It's all about meeting customers' present and future energy needs.

Of course, the Intelligent Network will also help to manage the network better and deliver ever increasing reliability. By using intelligent sensors and equipment, operators will be better informed about network outages, deciding on the best course of action and acting quickly to fix the fault. In some cases, the network will be able to self-repair, minimising the number of customers affected by a fault.



The introduction of intelligent automation like this is yet another way Country Energy plans to meet its commitment to improve reliability, by transforming the performance of its network and the level of service it offers its customers.

The seminar session was chaired by Ben Bates with a brief welcoming address from Michael Lysaght, on behalf of Country Energy. Dr Robert Barr (National President) and Bob Smith (NSW Chapter Chairman) also welcomed attendees on behalf of EESA.

Professor Leith Elder demonstrated a computer simulation program that models multiple and varied small-scale embedded generation effects on MV distribution networks, and described their characteristics and behaviour under various topology scenarios, highlighting power quality and conditioning issues that Distribution Network Service Providers may have to account for in augmenting their existing networks, and in planning, designing, and constructing their future networks.

Ian Thompson and Cory Urquhart, gave a very interesting presentation regarding grid interactive (4 quadrant) inverter technology currently under development that could be used in the near future for MV and LV grid conditioning. They demonstrated a number of case studies showing how this technology needs to be controlled for optimal network benefits, and cases where it may be more economically feasible to use as opposed to traditional augmentation means.

Forensic Investigation Seminar

As part of a series of seminars around New South Wales a Forensic Investigation Seminar presented by Russell Lee was held in Sydney at Energy Australia's Auditorium in 570 George Street, Sydney on the 27th May 2009. Energy Australia is Corporate member of EESA and many of its staff are long standing individual members.

Some 45 participants, drawn from all over Sydney enjoyed a wide-ranging powerpoint tour of industry failures and investigations and some helpful hints on appearing as an expert witness. All enjoyed the dynamic and enthusiastic presentation and the responses to questions that followed. Russell then took the presentation to Newcastle where he appeared on the following day.

EESA Student Prize

Benjamin Grabau from Newcastle University won the EESA prize by coming top in the third year Bachelor of Engineering (Electrical) subjects ELEC3130 -- Electric Machines and Power Systems and ELEC3250 -- Power Electronics with marks of 87 and 91 respectively. This was an outstanding effort in two of the most challenging courses in the Electrical Engineering program.

His prize consists of a Certificate, one years student membership of EESA, a cash prize of \$500 and registration at the 2009 EESA NSW Chapter Annual two day Conference at the Powerhouse Museum including tickets for two at the Conference Dinner and accommodation for one night.



Benjamin Grabau receiving the EESA Prize from NSW Chapter Committee Member Paul Russell