EESA
THE ELECTRIC ENERGY SOCIETY OF AUSTRALIA
ENGINEERS AUSTRALIA

The Electric Energy Society of Australia

www.eesa.asn.au

A word from your president

The 240V to 230V Switch

In Australia we have officially been a 230V country since 2000. However, no significant changes have been made to the actual voltages delivered to most customers since the 240V days going back as long as I can remember. The change to 230V in Australia has been more about convenient labelling than one of actually changing the way we deliver power to electricity customers.

A recent article by Chris Halliday (Electrical Consulting & Training) and Dave Urquhart (Energex) has highlighted the misalignment of various Australian standards and government regulations in the 230V/240V area. There is a strong case for changing from the old 240V supply system to a true 230V system by actually lowering the steady state voltage we deliver to customers. The new drivers for change are four fold:

1. Many customers are under the misapprehension that they actually receive electricity supply at 230V. The reality is that much of the time the voltage is much higher near the top end of the old 240V ±6% range (253V).
2. The recent surge in connections of rooftop photovoltaics is causing new voltage rise pressures on the electricity networks and customer installations that they were never designed for. This results in severe overvoltage conditions in localised areas that are causing voltage stress on customer equipment and PV generation shutdowns caused by overvoltage inverter protection.
3. Many Australian equipment standards are written on the basis of supply voltage being near the nominal 230V level. e.g. motors have an "A" range of 230V ±5%. There is a clear mismatch between equipment standards and the supply voltages actually being received by most Australian electricity customers.
4. Specifications of mandatory Minimum Energy Performance Standards (MEPS) for customer equipment commonly call up performance tests to be conducted at or near 230V. This is a voltage much lower than the environment in which most of these appliances need to operate.

This mismatch between electrical equipment and actual supply voltage has gone on for too long. The community cost in terms of reduced equipment life, loss of equipment efficiency and maloperation of photovoltaic/inverter systems is simply too high to ignore. In my view, lowering of supply voltage to LV customers by about 3%-4% is needed now. This will bring us more into line with New Zealand, most of Europe and the many other 230V countries.

We need a concerted effort from Standards Australia (especially EL034), electricity distributors, Energy Networks Association, electricity regulators, equipment manufacturers/ suppliers and electricity customers to build a true coherent 230V environment. There are significant community benefits to be had. The challenge for us is to get Australian standards, government regulations and the National Electricity Rules aligned for the benefit of the community as a whole so that the voltage delivered by our electricity distributors matches the needs of customer equipment.

Colin Frost Awarded EESA Honorary Life Membership

It was my great privilege to present honorary life membership of the EESA to Colin Frost at our recent national conference held in Hobart. Colin graduated from the Swinburne Institute of Technology with a degree in Electrical Engineering in 1982. Since then he has had a most impressive career focusing mainly on project management in the power industry.

Colin's career has included positions with the CSIRO, SECV, United Energy, and National Power Services. Colin is now the principal of his own company, Power Project Engineering Pty Ltd.

During his career he has given a lot back to the Australian Power Industry through his volunteer work with the EESA and Engineers Australia. Colin has been the driving force behind the success of the Victorian/Tasmanian Chapter of the EESA. Colin was elected chair of the EESA VICTAS committee in 2003 and is now in his 9th year in this demanding position. In this time he has led the development of a very successful EESA chapter with growing membership and improved services to our members through the delivery of high quality professional development events in Victoria and Tasmania. Colin was the driving force behind the delivery of very successful EESA National conferences in Melbourne in 2006 & 2007 and the recent EECON 2011 in Hobart.

I congratulate Colin on his honorary life membership and I look forward to working with Colin for many years into the future. I thank Colin for his work in the EESA and I look forward to his future contributions to the EESA and the Australian electricity industry.

Dr Robert Barr
EESA National President

The **Hobart National EECON 2011** conference was undoubtedly a success and Richard Bevan, Phil Holmes and all the organizers are to be congratulated. Special thanks to our Gold Sponsor ABB and our silver sponsors Aurora Energy, Hydro Tasmania, Wilson Transformers and Alstom.

There were many excellent presenters from a wide area of expertise. The WestPoint Casino venue beside the Derwent river was magnificent.

The Tasmanian's laid on cloudless skies on all days which was great for the partners (and truants).

The conference focused on Green topics and the emerging Smartgrid and the keynote speakers at the opening plenum set the scene with great skill. Some 130 delegates were in attendance for the well run and entertaining conference. Delegates included local utility staff, interstate and international visitors.

The Tasmanian ESI supported the conference financially and their MDs participated in a very informative Panel Session.

Past Australian Test Cricket Batsman, David Boon entertained us all at the Bellerive oval complex with a most entertaining after dinner talk. During the dinner, Colin Frost, the long standing Chairman of the Victorian/Tasmanian Chapter of the EESA was awarded a well deserved honorary life membership of the Association.

Dr Robert Barr
EESA National President

Conference Prize Winners

CONWAY PRIZE:
Retaining Generation Y

Neil Smith, General Manager, System Operations, TransGrid

CRESSWELL PRIZE – joint winners/joint paper
Tasmanian Power System Load Modelling: Static & Dynamic Techniques and Comparisons

Shaun McIntyre, Powerlink and Luke Roberts, Transend

EESA THE ELECTRIC ENERGY SOCIETY OF AUSTRALIA
ENGINEERS AUSTRALIA
EECON

EESA NSW Chapter is proud to present
EECON NSW 2011 Conference & Trade Exhibition

The NSW EECON conference will again be held at the Australian Technology Park , Eveleigh on the 7 - 9th September and is the much awaited event for EESA member organisations and their engineers in NSW. Some 220+ participants are expected to attend.

The theme of the conference is **"New Technologies in Energy Networks - Topping up or tripping over?"** After the opening address by Phil Southwell, Western Power on "Networks of the future" setting the scene, the conference theme will be discussed by an outstanding panel of energy industry leaders in the opening plenary session. Two days of intensive sessions on aspects of the electric energy industry then follow.

The conference finale will be another plenary session which will look at international and national disasters and the potential implications for energy networks. This will be of great interest to the younger engineers attending [a group whose numbers are steadily increasing at the conference] as this is the future they will be inheriting.

The conference remains a major vehicle for the professional development of EESA NSW members. The Conference this year as with all previous EESA Conferences, focuses on the Electricity Supply Industry matters that are currently topical in the industry. This is almost the only conference that is exclusively focussed on electricity supply, touching mainly on areas of distribution and transmission engineering and associated engineering philosophies.

Go to www.eesa.ans.com.au for more information or email The Meetings Manager (meetings@tmm.com.au) to register your interest.

Upcoming Event...

Schneider Electric Roadshow announced around Australia... **emerge** Schneider Electric Energy Day

Join us in the Schneider Electric Day to:

- Expand their knowledge with hands-on demonstrations, displays and informative application presentations.
- Discover innovative Medium Voltage technology and industry leading smart-grid solutions
- Learn about the Schneider Electric improved customer solutions offering following the acquisition of Areva Distribution

Venues & dates:

Adelaide Convention Centre
Thursday 23rd June

Brisbane Convention Centre
Wednesday 29th June

Australian Technology Park (Sydney)
Wednesday 6th July

Melbourne - Melbourne Showgrounds
Wednesday 13th July

Perth Convention & Exhibition Centre
Thursday 21st July

EESA supports this event and by attending members will accumulate Continuing Professional Development (CPD) hours as required by Engineers Australia for professional accreditation.

For more information or to register visit
http://events.schneider-electric.com.au/emerge2011
or by email: sheryl.magtibay@schneider-electric.com

News and Issues from around the Industry

http://www.iea.org/impagr/cip/archived_bulletins/issue_no75.htm#two

Marketing energy-saving home renovation

IEA Energy Bulletin 75

Reducing energy consumption in buildings is a crucial and affordable way to tackle climate change and reduce energy bills. In theory, many countries have vast potential for reducing energy use in existing building stock. Technical solutions are available to carry out the necessary advanced housing renovation. How can market uptake of advanced renovation projects be accelerated? How can private and public actors join forces to make it happen? Which strategies work best? Answers can be found in the report From Demonstration Projects to Volume Market - Market development for advanced housing renovation, published by the IEA Solar Heating and Cooling Programme (IEA SHC), Task 37 on Advanced Housing Renovation with Solar and Conservation. This 87-page report provides insight for policy makers and other decision takers on what drives the market, what are the barriers and what are the critical success factors in each phase of market expansion. IEA SHC is an IEA energy technology collaboration.

http://www.iea-shc.org/publications/downloads/Advanced_Housing_Renovation.pdf

Halving carbon emissions from cars: realistic?

IEA Energy Bulletin 75

Is halving new cars' greenhouse gas emissions by 2030 a realistic goal? And could all cars' emissions be halved by 2050? Yes, according to the study '50 by 50', Prospects and Progress, just released by the Global Fuel Economy Initiative (GFEI), in which the IEA is a partner. Drawing on research and development conducted over the past year, the report finds that the technology is certainly available to design and produce new cars emitting much less CO2. But the author recommends that countries lagging behind in developing national fuel economy initiatives should be pro-active. They should ensure the necessary fiscal and regulatory environments are in place to encourage manufacturers to use new technology to improve fuel economy and not produce heavier or higher-performance vehicles. The GFEI report, which also presents assessments of progress to date in reaching the '50 by 50' goal, can be downloaded from the website of the Global Fuel Economy Initiative, which was launched in 2009. Visit the Global Fuel Economy Initiative website to learn more about the '50 by 50' campaign.
http://www.globalfueleconomy.org/Pages/Homepage.aspx

http://www.energybiz.com/article/11/02/wind-shortfalls-make-grid-guys-nervous

Wind Shortfalls Make Grid Guys Nervous

Ken Silverstein in EnergyBiz 17 March 2011

When it comes to integrating wind into the transmission lines, system operators say that they are challenged. While they understand and appreciate the reasoning, they are saying that the networks lack the flexibility to handle wind variation.

Green energy has a lot of public appeal. But the intermittent nature of wind and solar power coupled with the relatively higher costs put the grid's traffic cops in an untenable position. Those are the fellows whose job it is to schedule the resources to where they need to be so that the electricity keeps flowing. Their task is to maintain that reliability with the lowest-priced fuels.

In the case of California, it now has 3,000 megawatts of wind. In a few years, that will be 7,000 megawatts. A few years later, it will be 10,000 megawatts. By 2020, the goal is to have 33 percent of electricity generated from renewable energy. "That's making grid operators nervous," says Detmers, who spoke at Wartsila's Flexible Power Symposium in Vail, Colo.

Simply, the wind does not blow on demand. Ditto for the sun. So these resources must be backed up with other, "dispatchable" forms of generation. But such "firming" or "cycling" creates two distinct issues: The first is that the power is not free and the second is that if coal plants are "cycled" up and down, they release more pollutants per unit of output than if they ran full steam ahead.

As wind energy increases its market share, thermal plants can be expected to rev up and down more often. If coal is the main fuel source that is dispatched, it will decrease the emissions savings from wind.

"The actual emissions reduction rates from wind are far less than what the lobbyists are touting," if system operators do not have the flexibility to use cleaner backup fuels, says Brannin McBee, energy analyst for Bentek Energy, a speaker at the conference. "Thermal plant cycling is also very expensive," particularly if the older coal plants are used to firm up the wind generation.

Coal facilities without carbon capture and sequestration cannot get the permits to operate, says Doug Egan, chief executive of Competitive Power Ventures. And if the plants are built with such capacity they are too costly. Even those with coal gasification that nearly eliminate the sulfur, nitrogen oxide and mercury but which don't capture and bury the carbon are prohibitively expensive, he adds.

Natural gas is the most plausible option to firm up wind and solar. More than enough of it exists with the recent discoveries of shale gas, the unconventional source that is extracted from rocks more than a mile beneath the ground using hydraulic fracturing. That withdrawal technique, though, is under fire from some community organizations that say it is polluting their drinking water.

The U.S. Environmental Protection Agency wants developers to voluntarily disclose the chemicals they are using as a way to ease tensions. Producers are baulking for now, saying its exploratory methods are proprietary.

International Snippets from around the Industry

http://www.nextgenpe.com/news/food-into-fuel/

Grain used to feed more cars than people

Dan Jones in Power and Energy magazine

In the US last year enough grain to feed 330 million people for one year, at average world consumption levels, was instead turned into ethanol to fuel cars, according to new data from the US Department of Agriculture.

This figure accounts for 25 percent of the total US grain crop and with 200 ethanol distilleries in the country set up to transform food into fuel, the amount of grain processed has tripled since 2004.

The new data has led to accusations that the biofuel revolution that began under the Bush administration in 2007 is starting to damage world food supplies. Under President Bush, ethanol production was increased through farm subsidies and laws as he challenged farmers to increase production by 500 percent by 2017 to cut oil imports and reduce carbon emissions.

But in a globalized food economy, increased demand for food to fuel American vehicles puts additional pressure on world food supplies.

Whereas the development of biofuels is important as we try and move away from traditional energy sources, America looms so large in the world food economy that the fact it comes at the expense of food production makes it relatively dangerous. The US is far and away the world's leading grain exporter, exporting more than Argentina, Australia, Canada, and Russia combined.

One of the most worrying findings is that because the wheels of this revolution are so ferociously in motion, it is almost impossible to wind down biofuel production. Since 2007, 80 new ethanol plants have been built with more expected by 2015, by which time the US will need to produce a further 5 billion gallons of ethanol if it is to meet its renewable fuel standard.

Also, even if the entire US grain crop were converted to ethanol (leaving no domestic crop to make bread, rice, pasta, or feed the animals from which we get meat, milk, and eggs), it would satisfy at the very most 18 percent of US automotive fuel needs, as reported by Environmental-Expert.com.

World grain prices at record highs

According to Lester Brown, the director of the Earth Policy Institute, a Washington think tank that conducted the analysis, the growing demand for corn for ethanol helped to push world grain prices to record highs between late 2006 and 2008, people in low-income grain-importing countries were hit the hardest.

http://www.earth-policy.org/press_room/C68/2010_datarelease6

This unprecedented spike in food prices drove up the number of hungry people in the world to over 1 billion for the first time in 2009.

Ethanol producers deny that their record production means less food, arguing that innovations and development in technology mean they no longer have to a "false choice between food and fuel", so says Tom Buis, the chief executive of industry group Growth Energy.

The US taxpayer is still funding the subsidization of ethanol production to the tune of $6 billion every year, so the transformation of food to fuel under the federal government's Renewable Fuel Standard will continue to increase. But at a time when pressures on the earth's land, water and food resources is at record levels we may have to realign our priorities in order to avoid putting large numbers of people at risk and to also avoid potential sources of conflict.

http://www.swvatoday.com/news/article/google_evatran_team_for_electric_car_charging_technology/9672/

Google, Evatran team for electric car charging technology

Amanda Evans in McClatchy-Tribune Regional News 30 March 2011

Wytheville is wowing the West Coast and the world with its own spin on wireless technology.

Earlier this March, Evatran, a subsidiary of MTC Transformers, partnered with the premier Internet search titan Google to launch "Plugless Power," the world's first hands-free charging system for electric vehicles.

"From our side of things," said co-founder Rebecca Hough, "Google is the ultimate...What better than the Google brand name to pair with a new start-up venture?"

So on March 7, an Evatran team flew out to sunny Mountain View, California, and installed the plugless power stations at the Google headquarters.

Google has multiple low-speed, plug-in EVs as part of its on-campus employee car-sharing program.

Cars have been retrofitted for the plugless power technology and over the next few months, drivers on the Google campus will provide feedback to Evatran on how the technology is working and how it can be improved.

Instead of plugging in the car to an external apparatus like with traditional electric power stations, drivers of EVs will simply park their vehicle over the power pad.

Using the principle of electrical induction, which is the basis for things like electric transformers and electric toothbrushes, the pad in the garage floor or parking space will align with the pad on the undercarriage of the car to transfer electricity.

International Snippets from around the Industry

"The system is completely safe," assured Hough.

There are no exposed wires or danger zones or anything of the sort with this technology. In actually, it is safer than a traditional conductive connector.

Currently, there are only a few electric cars actually on the market, Hough said, but almost every car manufacturer worldwide has announced plans to introduce their own versions of EVs within the next five years.

"We're at the dawn of EVs coming on the scene," she said.

Bulletin 3, June - July 2011:
Please email submissions by 30th June to the Bulletin Editor, Patrick McMullan on pmcmullan@energy.com.au

http://www.menloenergy.com/?p=305

Exxon Acknowledges Decline In Oil's Supremacy

Menlo Energy Economics and EEnergy Informer March 2011 Issue

The world's biggest global oil company happens to be bullish on, surprise, natural gas. Despite investing enormous sums of money and going to great lengths in far corners of the Earth, Exxon Mobil Corp., the world's largest publicly traded oil company, cannot find enough oil to maintain, let alone increase, its oil reserves. The company recently reported that for every 100 barrels of oil pumped out of the ground in the past 10 years, it could only find 95 new ones.

And Exxon is not the only oil company facing this conundrum. Nearly all oil majors are facing similar challenges in maintaining – let alone increasing – their reserves. In an internal document, Peter Voser, the CEO of Royal Dutch Shell PLC, for example, recently acknowledged that as early as 2012, Shell would produce more gas than oil – a significant milestone for an oil company.

Call it what you may, it is happening and very few experts see a way around it. The simple explanation may be that the days of easy oil found in large fields in accessible locations may be over. There is still plenty of oil left to be found, but it will most likely be in smaller fields, in less accessible locations, and at higher extraction costs.

The good news is that there is plenty of natural gas, and at least in Exxon's view, it will grow to replace coal as the second biggest source of global energy by 2020. That is a lot faster than many others, including the International Energy Agency (IEA) and the Energy Information Administration (EIA) are projecting.

IEA does not see the crossover to occur until after 2035 – a rather different perspective. Perhaps Exxon is ahead of the game or knows something the others have not figured out yet.

One explanation is the emergence of unconventional gas. Bill Colton, Exxon's VP for Corporate Strategic Planning, said the company recognized the growing significance of shale and other unconventional types of gas as early as 3 years ago and this has been reflected in the company's longer-term forecasts.

The conventional wisdom is that the new technologies that have resulted in discoveries of vast new resources of gas at reasonable cost is a game changer with long-lasting impact on global energy resources. The successful application of the so-called fracturing technologies, so far limited to North America, is expected to be transferable to other parts of the world. Companies with the expertise are intent to try it in Asia, Europe, Australia and elsewhere where the geology is favorable.

In its latest annual energy outlook, Exxon reckons that the demand for natural gas will grow 60% between 2005 and 2030 while coal demand will grow at a more modest level. By 2030, Exxon projects oil supplying 32% of global energy demand with natural gas supplying roughly 26%.

For an oil company, Exxon must be praised for its analysis of alternative transportation fuels. It sees a decent size market developing for hybrid and all electric vehicles with a noticeable penetration in North America, Europe and China. This is another acknowledgement of the growing competition for oil – especially with oil prices rising as they have been.

The most stunning feature of Exxon's latest annual outlook, however, is a rather coherent discussion of greenhouse gas (GHG) emissions – a distinctly new twist for the oil giant. It points out that at current growth rates, by 2030, per capita emissions in China will be nearly equal to those in OECD Europe. China is clearly catching up with the West in more than one way.

http://www.beehive.govt.nz/release/next-steps-govt-plan-build-faster-growth

NZ Government announces next steps to build faster growth

The Official Website of the New Zealand Government 26 January 2011

New Zealand Prime Minister John Key has outlined the government's plan to pursue a mixed ownership model of public assets as a measure to reduce national debt. In a statement outlining the details and rationale for the mixed ownership model Key says the government is considering selling 49 per cent of state owned energy companies Meridian, Mighty River Power, Genesis and Solid Energy based on advice received from Treasury. "These companies represent quality investment opportunities for New Zealanders who want to put their money into something other than housing. They are also sizeable, well-established companies," he says. In regard to concerns raised about how the partial sale of the energy companies will affect power prices Key says "Power prices will always in part reflect the cost of generation, moderated by the level of competition in any given market. Prices will reflect the ability of supply to meet demand. Having competing sets of investors will only enhance that scenario."