

A word from your President

Arc Flash Hazard – Better Protection for our People?



Over my career I have investigated a number of serious electrical accidents. All have involved either low voltage or high voltage arcs. The investigations always begin by getting a handle on what happened and why and then followed by the hospital visit to interview the victim. The victim is usually suffering severe burns and is in a state of shock. Fortunately I have never had to deal with a fatality. After you have completed one of these investigations, you never forget the details and the resulting pain and suffering caused.

Some people under estimate the arc hazard associated with low voltage systems. I've heard people say that it is "only low voltage". I call these systems "high current" systems. They are particularly dangerous because protection systems are sometimes slow to operate or can't clear arcing faults due to "relay confusion" caused by intermittent high and low current events, the result of arc restriking .

In Australia we lead the world in understanding arc flash. Research work completed recently by Dr David Sweeting (Sweeting Consulting) and Dr Tony Stokes from Sydney University is world class and is leading to better ways to protect our people who operate and work on and near live low voltage and high voltage equipment. Many of us in the EESA have seen Dr Sweeting's arc flash footage at the EESA Melbourne National conference in 2007 and the EESA Sydney NSW conference in 2006. The images are dramatic and highlight the hazards of arc flash to electrical workers.

The arc flash research work is leading to an understanding of what is required to reduce the hazard and the type of clothing that will provide the best protection for electrical workers. Is the old "cotton drill" clothing or the new what I call the "spacesuit" outfit the best? I suspect that neither are.

In Australia we are lucky to have a world class high power testing facility at the Lane Cove Test Station (owned by EnergyAustralia). We also have available modern digital high speed cameras that allow arcs to be analysed in ways that have never been possible in the past. Arc flash images can now be recorded in colour at 10,000 frames per second, providing new insights into arc behaviour and methods of protecting field staff from burns. With a little more research in the laboratory, I'm very optimistic that Dr Sweeting will be able to come up with better electrical worker arc flash protection based on an improved scientific understanding of arc flash. This work is very cutting edge and the small preview that I have seen is most exciting.

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**Energy NSW 2008.....The [R]Evolution in Networks
NSW Chapter Annual Conference & Trade Exhibition
29 to 31 October, Powerhouse Museum, Sydney**

Don't miss this opportunity It is not too late to register!

The conference program is now finalised with the acceptance by **Dr John Carras**, Deputy Chief of the CSIRO Energy Technology Division to give an opening keynote address to participants in the morning of the first day of the conference. Dr Carras is also the Australian Chairman of the Australian Consortium involved with the IEA Greenhouse Gas R&D Program. He is thus able to talk on The [R]Evolution in Networks and outline activities associated with the IEA GHG current program of work on sequestering CO₂ from power stations, the renewables take up and the hydrogen economy and its associated transmission system.

Due to industry demand there will be a special extra session to be held on Friday 31 October at 3.30-4.30 on Arcing Fault Hazards - where to next? The session will be presented by Dr David Sweeting.

To download the conference brochure please go to www.eesa.asn.au or contact Helen Mackenzie on eesa@tmm.com.au or tel: 02 9810 7322

Patrick McMullan

The Electric Energy Society of Australia

So where does all this lead us? Like most in the electricity industry, I'm very committed to electrical safety in all its forms. I'm confident that we can improve the safety of our electrical field workers by providing equipment, procedures and clothing that provides more protection from arc flash than is available at the present time. What is needed is more laboratory research for studying the arc impacts on different types of clothing and some firm recommendations that eventually will lead to improved standards in this area.

In his past research work, Dr Sweeting has been partially funded by one of his clients together with some funding from the old ESAA. He has also made large personal contributions to his work by way of his time and other direct costs. With the tests costing in excess of \$50,000 per test day you can see why it is difficult for him to bring his work to a conclusion. For the sake of our electrical field staff I'd like to see this work accelerated. Whilst there is some funding being provided by the ENA, lack of funding is the main barrier to finishing this work.

My view is that this work is so important that we need key industry players to help fund the research. This work will not only benefit our Australian electricity supply industry but will have wider international applications. This work needs to occur quickly and be brought to the stage where we are confident we are providing the best arc flash protection clothing for all our electrical field staff. I'd like to encourage distribution companies, generators, transmission companies, high voltage customers and electrical contracting firms to assist in this work. If your company can assist in this area, I'd encourage you to do so by either contacting myself or Dr Sweeting directly.

Dr Robert Barr
EESA National President

EESA South Australia Chapter News

Seminar on "Reverse Osmosis – Community and Industrial Applications"

This seminar was held on Wednesday 10 September at Engineering House, North Adelaide.

John Williams, Head of Strategic Projects for S.A. Water delivered an interesting talk describing the situation of Adelaide's water supply, the security of the River Murray, the impacts of the current drought and long term strategies. To help secure and sustain the future water needs for the community of Adelaide augmentation with a reverse osmosis plant is being planned. The seminar described the feasibility studies that determined why a reverse osmosis plant was chosen and why the Port Stanvac site was selected.

Terry Little, Chemical, Performance and Efficiency Leader of AGL Torrens Island delivered a talk on an industrial application of reverse osmosis technology in a sustainable engineering context. Reliable supplies of demineralised water are critical for the boilers and steam turbines at South Australia's largest power plant, Torrens Island Power Station (TIPS). The presentation showed how the TIPS water treatment plant was upgraded using reverse osmosis technology to provide a more reliable, cost effective and environmentally sound outcome.

The seminar was well received by the 40 attendees.

Upcoming Events

"Adelaide Sees the Light" – Wednesday 29 October 2008.

Richard Venus, member and former chairman of Engineers Australia's Heritage and History Branch, will deliver a presentation on the history of Adelaide's electric light. Richard has acquired his interest in engineering history in the mid-70s when, in his role as ETSA's Industrial Advisory Engineer. His talk will be a fascinating walk down memory lane to explore the challenges and stories in bringing electric lighting to Adelaide.

Visit to ETSA Utilities Network Operations Centre – 18 November 2008

Frank Crisci, ETSA Utilities Network Control Manager, will host a conducted tour of the Operations Centre at the ETSS Utilities Headquarters, Anzac Highway, Keswick.

Sustainable Engineering Initiative

A sub-committee of the EESA group recently helped with the selection process for the Australian Power Institute bursary awards and is supporting the bursary program in South Australia.

The Electric Energy Society of Australia

News and issues from around the Industry...

Nomination for the national professional electrical engineer of the year award

The Electrical College has established the "National Professional Electrical Engineer of the Year" award to promote excellence, promote the profession within the community at large and, at the same time, encourage young people to take up electrical engineering (especially power engineering) as a career.

The award is designed to recognise excellence in current performance by a highly respected senior member of the College, someone the members of the profession can relate to in terms of the work performed.

This person would also be someone who can be seen as a role model by young members and who can be promoted to the community as a respected senior member of the electrical engineering profession.

Nominations are sought from each Electrical Branch or Panel at each Division, together with the National Committees and Societies affiliated with the Electrical College.

SUBMISSION OF NOMINATION

The completed (template) form with signatures must be submitted in hard copy, printed form by no later than c.o.b. 24 October 2008.

For more information about the award, the judging criteria, and the timetable and to access the nomination form, please visit: <http://tinyurl.com/5z4v4w> or call 02-6270 6539.

Energy network infrastructure's vital role in climate change adaptation

The Energy Networks Association (ENA) has welcomed the release of the Garnaut Climate Change Review Final Report today as a vital contribution to the national consideration of the climate change challenge.

"ENA welcomes the Garnaut Report's recognition that there are risks that network infrastructure market failures, including those related to electricity transmission and the transport of natural gas could increase the costs of adjustment to climate change and mitigation," said ENA Chief Executive, Mr Andrew Blyth.

"ENA also welcomes the Report's recommendation that the national electricity transmission planner's role should be expanded to include a long-term economic approach to transmission planning and funding and that the Building Australia Fund should be extended to cover energy infrastructure.

"A key step in ensuring energy network infrastructure is adequate to meet the challenge of climate change is the recognition by the Australian Energy Regulator of all the costs and risks faced by networks in making the required structural changes.

"This will mean changes to the current regulatory framework so that network businesses are able to adopt the most efficient and effective options for delivering safe and reliable clean energy to customers", Mr Blyth said.

ENA expects that these regulatory changes will include:

- Recognition in the regulatory arrangements of the risks surrounding the uncertainties inherent in incorporating renewable energy supply into the network.
- Incentives in the regulations which will allow for consideration of non-network options, including demand side management and energy efficiency on the same basis as conventional alternatives.

"ENA concurs with the Garnaut Review's conclusion that a full account of the implementation costs of embedded generation be undertaken and that if the outcomes support a lower tariff than that currently applied this would represent a cross subsidy, an outcome contrary to the energy reforms of the past decade. Further, ENA agrees with the Report's statement on a nationally consistent feed-in tariff methodology", Mr Blyth said.

Decentralised Energy Technology, Policy and Opportunities for Australia and the Asia-Pacific Region

20th-21st November 2008, Rydges World Square, Sydney, Australia

Presented by the CSIRO Centre for Distributed Energy and Power (CenDEP) and the World Alliance for Decentralised Energy (WADE)

The conference brings together leading experts from around the world to discuss the economic and environmental opportunities for decentralised energy, highlighting leading edge technological advances and policy issues related to electricity generation and delivery.

For more information go to www.csiro.au

The Electric Energy Society of Australia

News and issues from around the Industry...

AGL uses smart gas meters to cut costs (Source: Mahesh Sharma, The Australian)

Utilities hope to cut costs by trimming bloated legacy systems and simplifying products. The exercise will enable them to use smart meters, which provide faster reports of energy use and allow better management of electricity distribution across the network. AGL Energy is spearheading a once-in-a-generation move by utilities to slash operating costs by ripping out obsolete systems. The 170-year-old energy company is close to finishing its \$150 million Project Phoenix business retail systems transformation.

EnergyAustralia has earmarked \$240 million to upgrade its IT infrastructure between 2009 and 2014. The gas and electricity supplier streamlined its technology division to support this. Other players including Origin, Energex and Integral Energy are expected to start similar projects soon.

AGL is 90 per cent of the way through its transformation project, having already moved about 1.6 million customers to its SAP billing and customer relationship management system. The remaining customers are to be migrated by the end of the year.

Project Phoenix involves moving more than 100 disparate customer management and billing systems to a single platform, rationalising AGL's products from 1100 to about 78.

Chief information officer Owen Coppage said the project would deliver cumulative cost benefits of \$60 million in earnings before interest and tax by the end of 2009. "This will be a revolution in the way AGL does business, delivering a robust IT platform that will add value and a competitive edge in the long term," Mr Coppage said.

AGL has started using analytics to sort customer information to assist in assembling and targeting products.

The invisible hand and the invisible regulator (Source: Energy Business Review)

Ofgem is coming under increasing pressure to cash in on utilities current high profits. That pressure should be resisted, but the British energy regulator needs to adapt its model for the 21st century.

The current howls over energy and utility firms' profit margins from those claiming to represent consumer interests continue to make headlines, and in some cases seem to be gaining currency. In September, Ofgem, the British regulator for electricity and downstream natural gas markets, published a consultation document which suggested that the utility workers' pension schemes should be curbed, just as the major players announced record profits. At the same time, calls for a one-off windfall tax on the 'Big Six' have grown in volume, from voices across the political spectrum. Both proposals are counter-productive, on a variety of counts.

To begin with, profits should not be penalized. Both upstream and downstream suppliers need to invest in infrastructure and new technologies. Additionally, profits attract new market entrants, encouraging competition and breeding innovation. Furthermore, the profits themselves are not, in fact, that large. Margins for the 'Big Six' suppliers hover around the 4% region, as most of the revenue is generated upstream. Any attempt to impose taxes on upstream producers will simply be passed on down the line, ending with the consumer.

Moreover, the free-market strategy which the UK has adopted is not designed to provide invariably low prices. Rather, it is intended to more accurately reflect costs than a state-subsidized program, such as the French model. Hence as upstream reserves have become scarcer (e.g. the depletion of North Sea fields) and as the cost of carbon emissions are accounted for, energy prices have reflected these changes and risen.

Laissez-faire or fairly lazy?

Having noted these points, it is fair to say that the market could be regulated better. Ofgem has employed the 'RPI-X' price control mechanism for the past 20 years, but the model now needs adaptation. Essentially, the regulator dictates how much revenue each utility should be allowed to make every five years, and from this derives the level at which prices should be set. In effect, distributors' profits are the difference between the rates that they receive and their actual costs, giving them an incentive to reduce those costs through innovative new techniques and increased efficiencies. The problem is that the returns on this model are starting to diminish: UK firms are running out of traditional avenues to explore when cutting margins (in stark contrast to their European counterparts, which are still playing catch-up). The model works, but it is becoming stale.

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Please email submissions by
8 December 2008 to the Bulletin Editor, Patrick McMullan on
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