

ELECTRICAL ARC FLASH FORUM

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14th & 15th April 2010

Crowne Plaza
Melbourne, Australia

Featuring:

Keynote Speaker
Dr. DAVID SWEETING
Director, Sweeting Consulting
Australian Arc Flash Hazards Expert

WHAT YOU WILL GAIN FROM THIS FORUM:

- Clearly understand what an arc flash is and the potential injuries that can result
- Detail what Personal Protective Equipment is required on your site
- Define the steps to perform an arc flash hazard analysis
- Define how to achieve an electrically safe work situation
- How to perform testing and maintenance on your personal protective equipment
- How to provide arc flash training for your staff
- Learn about Australian standards developments in arc flash

WHO SHOULD ATTEND:

- Instrumentation & Control Technicians and Engineers
 - Engineering Managers
 - Risk Assessors
 - Design Engineers
 - Manufacturers of PPE & Safety Equipment
 - Safety Facilitators
 - Electrical Technicians, Engineers and Managers
 - Process Safety and Loss Prevention Managers
 - Government Safety Regulators/inspectors
 - OHS/Training Managers
 - Tradespersons working in potentially explosive areas
- And all Engineering Professionals who have an interest in arc flash hazards

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INTRODUCTION TO ELECTRICAL ARC FLASH

Arc flash is arguably today one of the most topical issues being discussed in the electrical engineering community in Australia (especially in the mining, utilities and manufacturing areas). Technology and safety procedures have significantly reduced most other forms of electrical injuries; however incidents related to arc flash have surfaced as one of the leading causes of injury and death to workers. The technical aspects and physics associated with arc flash are still somewhat debatable. And there has been some concerns about the physics of electrical arcing faults being significantly different to those established by the USA with the NFPA 70E and the IEEE 1584 standards and the Canadian Standards Association (CSA) new arc flash safety standard CSA-Z462. Although arc flash is a contentious & critical issue in Australia there are still no official Australian standards that deal with arc flash safety. The objective of the forum is to provide you with the latest developments and best practice to deal with arc flash hazards in Australia. You will have an opportunity to discuss your arc flash issues with our speakers, giving you the opportunity to discuss practical aspects of applications of arc flash safety. The focus throughout is on the practical experiences of users. The forum will be attended by those who are interested in technical solutions to their arc flash problems, industry trends, standards developments and new techniques to tackle existing arc flash threats.



FORUM DAY 1 - 14th April 2010

8.00am	Registration	
8.15am	Opening Address	
8.30am	HALF DAY WORKSHOP Includes Morning Tea - 10.30am	
Session 1	Arcing Hazards Physics Dr. David Sweeting Director, Sweeting Consulting - Electrical Power, High Voltage and Control Engineers	concerned with electric shock. Hence, electrical safety research, awareness and procedures were primarily directed towards electric shock. However, Lee's paper high lighted the fact that working near energised electrical conductors could result in arc flash burns - which can result in serious burn injury and death in the case of severe burns. This paper will present a detailed overview of current global arc flash standards along with case studies. These will include the US standards NFPA 70E & IEEE 1584, Australian guidelines NENS 09 - 2004 developed by the Energy Supply Association of Australia (ESAA) and the Australian general standard for electrical design & installation AS3000. The authors will include a brief overview of Canadian arc flash protection standard CSA Z462.
	This workshop explains the nature of unconstrained free-burning arcing faults in order to allow participants to understand what is actually happening inside arcing faults and how they cause injuries to personnel in the immediate vicinity. This requires an understanding of the energy dissipation and the energy transfers in the close proximity to these uncontrolled arcs. An explanation of the physics of arcing faults is used to describe the energy transfers within an arcing fault. This provides a basis for describing the potential energy transfers to personnel in the vicinity of an arcing fault. This includes arc root movements on humans and the transfer of the arc out of the body which has a significant impact on ventricular fibrillation and personal protection equipment (PPE) for high voltage workers. It goes on to describe what needs to be considered in minimising the impact of arcing faults.	
	Lunch - 12.30pm	
1.30pm	Arc Flash Hazard (AFH) - Case Study: Bell Bay Site	Afternoon Tea - 3.00pm
Session 2	Trung Nguyen Power Engineer, Rio Tinto - Bell Bay Site	3.30pm Internal Arc Classified (IAC) Prefabricated Substations
CASE STUDY	At the Rio Tinto Bell Bay site in Tasmania, AFH is currently being seriously measured and all necessary information is being collected to evaluate arc flash energy levels. Based on calculated data, labels are fixed at isolation points across the site to advise isolation personnel of the PPE required to safely isolate power supplies. In addition engineering modifications have been made to frequent isolated switches and isolators to reduce the arc flash energy so operators and maintainers do not have to wear any additional PPE for isolation purposes. One example that will be explored is the replacement of new fast acting circuit breakers and fuses in reduction lines to reduce AFH from Category 4 to Category 0.	Session 4 Indrek Ulmas Product Manager - Medium Voltage, Schneider Electric
2.15pm	Arc Flash Hazard Standards: The Burning Question	MV/LV outdoor prefabricated (kiosk) substations have been largely used for more than thirty years. Since then safety and continuity of service has been a driving force to develop the standards and designs of prefabricated substations. In January 2008 a new standard was published as AS 62271.202 prescribing the operating conditions, assigned characteristics, general requirements and testing methods applicable to MV/LV prefabricated substations. The main evolution of this standard is related to internal arc fault protection. In the rare occasions of medium voltage equipment failure, an internal arc rated kiosk design minimises the risk of injury to nearby public or an operator working with the kiosk door open. These safety measures will be presented and discussed during the presentation.
Session 3	Sesha Prasad Specialist Power Systems Engineer, Welcon Technologies	4.15pm Arc Flash Assessment - Case Study: Maryvale Mill
	The Arc Flash Hazard was introduced to the world by Ralph Lee, when he presented the paper "The Other Electrical Hazard: Electrical Arc Blast Burns" in the United States in 1982. Traditionally, electrical safety was	Session 5 Andrew Sun E & I Engineer, Australian Paper
		CASE STUDY The exposure to hazards associated with electrical arcing phenomena, while working on energized equipment is very real and a topic of significant interest to industrial plant personnel. There has been plenty of discussion and debate around electrical arcing hazards, assessment and controls. The regulations, standards, research and application guidelines focus on reducing the exposure of personnel to burn injuries associated with arc flash events in low, medium and high voltage applications. A current project the author is working on is to perform an in-depth accurate study on arc flash hazards around the Maryvale Mill using available references and standards. The aim to improve awareness, review current PPE policies, and progressively reduce the dangers associated with arc flash.
		Closing - 5.00pm

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Photograph of a successful internal arc type test

All forum papers are reviewed and selected for their high quality and technical value by our panel of specialists experienced in the theory and practice of electrical arc flash hazards.

FORUM DAY 2 - 15th April 2010

8.30am Arcing Hazard Standards
Session 6
Dr. David Sweeting
 Director, Sweeting Consulting - Electrical Power, High Voltage and Control Engineers

KEY NOTE
 This keynote presentation goes through the history of arcing fault standards and explains the basis behind the existing standards. It goes on to describe real arcing hazards and how they behave and why in many cases high voltage electrocutions do not end up with ventricular fibrillation. The paper then reviews the IEEE PICIC 2009 conference, the current situation within America and the issues facing revision of the American standards.

9.30am Practical Steps and Implications of completing an Arc Flash Review
Session 7
Lee McDonald
 Primary Project Engineer, AllMac Electrical Engineers

There is more focus on getting "Arc Flash Studies" done. This has been prompted by the release of the last editions of NFPA70E and IEEE 1584 and various software programs with the capability of providing arc flash levels. Typical images conjured up when arc flash is mentioned are of bomb suits being worn all the time. With careful analysis, engineering and administration, this can be a thing of the past. Lee will highlight some of the pitfalls, leading towards how to define the scope of work, manage the risks, implement outcomes, ensure competency of staff and ensure long term compliance.

Morning Tea - 10.15am

10.45am The Do's and Don'ts of Servicing Equipment with High Fault Levels
Session 8
Paul Spresser
 Principal Consultant, EPEE Consulting

CASE STUDY
 A number of fatalities and incidents of severe arc flash injury have occurred in Australian industries in the past decade, irrespective of other normally effective safety measures. This paper will highlight arc flash incidents that have occurred, what caused them and the steps that have since been taken to prevent recurrences. A summary of procedure and equipment requirements (PPE and test instrument) will be provided as a summary.

11.30am Rio Tinto C2 Electrical Safety Standard
Session 9
Bradley Edwards
 Electrical Engineer, Rio Tinto

The Rio Tinto C2 Electrical Safety Standard states *"there shall be an arc flash protection program in place to determine the incident energies and define the appropriate PPE and associated procedures to mitigate the hazard."*

This presentation will discuss how Rio Tinto is approaching arc flash hazards and will cover the following methods of prevention: Up to date dynamic network modeling; determining system faults in accordance with the applicable standards; site survey assessments on electrical equipment more than 100A @ 415Vac; determine arc incident energies; produce arc flash labels for equipment such as electrical panels, switch boards, motor control centre's which are likely to be operated while energized; training & competency package based on Rio Tinto "Arc Flash Hazard User Guide" and PPE requirements & Matrix.

Lunch - 12.15pm

1.15pm Managing Arc Flash Risk in Industrial Installations from Design to Operation
Session 10
Jeff Strath
 Principal, Compliance Solutions & Services

The basic requirements for achieving an installation that is electrically safe are mandated by the regulatory authorities in each state.

Understanding how to achieve an installation free from electrical risk requires us to understand electrical arc flash risk and how to manage it. The role of the various states' electrical legislation and associated codes of practice will be explained, the relevance of Australian and overseas standards along with enterprise procedures for performing work will be put in the context of an operating plant. Jeff will then clearly explain the importance of site specific training to achieve the safest possible outcome in an environment.

2.00pm Arc Flash Protection LV Switchgear
Session 11
David Stonebridge
 Head of Technical Support - LVS systems, ABB Australia

In switchgear, internal arc faults are more of a potential hazard to life and limb than a bolted short circuit. Arcing faults can produce enormous gas pressures and extreme temperatures. Personnel in the path of super-hot gases created by the arc can be killed or suffer serious burn injuries confining arc faults are a major safety concern. David will discuss arc flash issues and offer numerous strategies to help reduce arc flash risks in your workplace.

Afternoon Tea - 2.45pm

3.15pm Arc Flash Standards - Australian Developments
Session 12
Peter Willis
 Principal Electrical Engineer, DlgSILENT Pacific

Across the world, Arc Flash Hazard studies have emerged as a engineering service centred around two standards, IEEE 1584 and NFPA 70E. The first is the only available standard on arc hazard quantification but soon after publication was shown to be fundamentally incorrect through the research of Sweeting & Stokes. The second standard forms part of North America's equivalent to the Australian Wiring Rules. Neither standard is appropriate for the Australian workplace but in the absence of technical direction from the IEC, these documents have now become de-facto arc flash standards for Australian industry, particularly across the local operations of multinational companies.

An array of arc flash software tools based around these standards has produced a new opportunity for consulting engineers however it would seem even without considering the IEEE 1584 problems, basic power engineering principals have been overlooked. This presentation will track the development of new flash hazard guidelines covering calculation methodologies and the operational measures adopted for responsible lifecycle management of arc flash hazards in industrial facilities.

4.00pm Discussion Panel
Session 13

This session will provide delegates with the opportunity to ask our speakers questions and discuss electrical arc flash issues in their workplace, covering typical problems and possible solutions.

Closing - 4.45pm

NETWORKING SESSION
Cocktail Hour - 5.00pm to 6.00pm
 An hour dedicated for all attendees to meet and socialise with experts and industry peers at the Arc Flash Forum Cocktail Hour.

Sponsorship Opportunities

Representing your business at the 2010 Arc Flash Forum will provide you the opportunity to reach key decision makers from a multitude of industries.

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