



## CALL FOR PAPERS

# Arc Flash and Low Voltage Standards Conference

**Day 1:** Electrical Arc Flash

**Day 2:** Low Voltage Design & Maintenance (Including Application of SANS 10142-1)

Johannesburg, SOUTH AFRICA – 25th & 26th November 2015

**Are you an engineering professional in the electrical industry?** We are looking for a number of presenters to submit a topic and present their papers at the upcoming **Arc Flash & Low Voltage Standards Conference**. This event has been developed to promote best practice in these two important areas of engineering as most arc flash incidents occur with low voltage.

### **Day 1: Arc Flash – What is it?**

An arc flash is the explosive release of energy occurring when there is a phase-to-phase or phase-to-earth fault. It can be caused by various reasons including accidental contact, unsafe work procedures, corrosion, insulation failure or conductive dust or moisture/liquids. Heat generated by an electric arc is capable of reaching temperatures of around 1000°C, which can cause a significant amount of damage. The rapid heating of the air and vaporization of the conductive metals creates an intense pressure blast which exposes the electrical worker to shrapnel, air, vaporized metal, intense UV exposure and heat. Typical injuries resulting from arc flash include: burns, blindness, deafness, broken bones, lacerated and burnt skin, and damaged internal organs which can result in death or serious permanent disablement and disfigurement, exacerbated by the heat and intense UV light.

Arc flash is arguably today one of the most topical issues being discussed in the electrical engineering community in South Africa and worldwide (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 have been some concerns about the real 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. At the conclusion of this conference we want our delegates to have a thorough understanding of arc flash hazards, analysis concepts and selection of appropriate personal protective equipment.



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## **Day 2: Low Voltage Design & Maintenance (Including Application of SANS 10142-1)**

This part of the conference will be of special interest to the electrical engineering community, as regulators are demanding continual improvement in low voltage design, maintenance and safety outcomes such as the elimination of arc flash incidents. The event aims to review the application and best practice in the requirements laid down by the standard **SANS 10142-1 - Wiring of Premises**. It will focus on **Part 1 – Low Voltage Installation** which covers fixed electrical installations of up to 1000 V AC and 1500 V DC. This standard is called up by the Occupational Health and Safety Act as well as for prescribed electrical installations by the Mines Health and Safety Act.

An electrical installation has to provide protection against shock current, overcurrent, fault current, overvoltage, under voltage, excessive temperatures and electric arcs. Any engineer involved in the planning and design of electrical systems, installation or maintenance must have a clear idea about the various requirements contained in the SANS 10142-1 standard.

In addition to low voltage design and installation, low voltage maintenance is a challenging undertaking and the local industry needs to have the sustainability and reliability of ageing equipment at the forefront of their minds when planning and designing their upcoming projects. The conference will discuss problems that arise from equipment maintenance and how industry can overcome these issues through well planned maintenance programs, adherence to standards/regulations and forward thinking.

### **SUGGESTED TOPICS:**

#### **Electrical Arc Flash:**

- Arc flash research and case studies
- Arc flash calculations
- Working distances and flash boundaries
- Arc flash assessments
- Practical solutions for reducing arc flash hazards
- Electrical hazards and effects on humans
- Data collecting and system modeling
- Personal Protective Equipment (PPE)
- Guidance on safe isolation procedures
- Isolator/disconnect switch techniques
- Isolator switch technology
- Flash protection approach boundaries
- Hazard risk category
- Codes and standards – overview, review and critique – NFPA 70E/IEEE 1584 /ESAA NENS 09-2004/CSA-Z462
- Practical electrical isolation for the avoidance of arc flash risk and injuries
- Arc flash awareness training to NFPA70E requirements.

#### **Low Voltage Design & Installation (Based on SANS 10142-1 – Wiring of Premises):**

- Design of an electrical installation
- Low voltage safety
- Standards and regulations



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- Power system protection
- Electrical systems, earthing and bonding
- Application areas
- Alterations, additions and repairs alternative arrangements
- Protection for safety
- Selection and installation of electrical equipment, switchgear and control gear
- Inspection and testing
- Arrangement and control of electrical installation
- Devices for isolation and switching
- Fault protection
- Devices for protection against overcurrent and short circuit
- Coordination and discrimination
- Protection against earth leakage current, overvoltage and undervoltage
- Switchboards
- Circuit arrangements, protection coordination, limits of LV feeder lengths for proper earth fault detection (as per SANS 10142-1)
- Calculating the demand of electrical systems for proper conductor sizing (as per SANS 10142-1)
- Earthing in electrical installations
- Special Electrical Installations (Baths, showers and fixed water containers)
- Hazardous Areas
- Emergency Systems

### **Low Voltage Maintenance:**

- Replacement versus reconditioning of electrical equipment
- Managing ageing equipment
- Maintenance programs and asset management strategies
- Electrical safety related to LV equipment
- Reliability centered maintenance (RCM) of LV equipment
- RCM risk analysis - Assessment of switchboards, circuit breakers, rotating machines, transformers
- Condition based maintenance (CRM) of LV equipment
- Testing and maintenance of cables, circuit breakers, switchgear
- LV maintenance – Rotating equipment
- Medium-voltage contactors
- Isolation tagging and locking systems
- Low voltage circuit breaker testing
- Switchgear life extensions
- Battery testing
- Cable maintenance and testing
- Maintenance issues causing arc flash and blast
- Auditing of all types electrical installations for compliance to the OHSACT and SANS 10142-1

### **We are seeking presentations that:**

- Provide practical examples and case studies.
- Offer less material on theory, more on problem and resolution or new technology improvement.
- Contain in-depth information about SANS 10142-1
- Include more technical & practical design implementation techniques
- Cover the whole design process, limitations, latest development and regulations.
- Provide specific and detailed technical topics/issues.



**We are seeking speakers who** have a desire to discuss the issues involved and want to help in reducing the number of arc flash, electric shock and burn incidents in South Africa and feel strongly about achieving compliance with the SANS 10142-1 - Wiring of Premises standard. We need electrical professionals who are passionate about improving the procedures of electrical safety in the industry.

This overall objective is to provide participants with relevant electrical engineering know-how which they can apply directly in their workplaces. Join your peers in a vigorous and positive exchange of views, building your career and public profile and making a contribution to South African electrical engineering practice in this vital area!

IDC Technologies conferences are non-commercial. The focus is on providing practical applications and solutions – probably the best way to showcase your technologies and engineering skills. In particular we are seeking practical case studies, applications and the newest developments in this critical subject.

#### **What is required?**

- A **100 word topic abstract** and title, which outlines the topic/proposed presentation. This needs to be submitted **no later than Friday 3<sup>rd</sup> July 2015**, to secure a spot on the program.
- For approved topics, a **technical paper and PowerPoint slides** will be due six weeks prior to the event.
- Speaking slots are allocated on topic suitability and on a first come first served basis, so please register your interest today.

For more information on this event, or to submit your topic abstract, please contact Conference Coordinator **Joseph Madeley** [joseph.madeley@idc-online.com](mailto:joseph.madeley@idc-online.com)



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