

Electrical Engineering

INSTALLATION | DESIGN | MAINTENANCE



Electrical Safety UK

The UK's foremost exponent of **ARC FLASH** Technology

Electrical Safety UK Limited has a Holistic Approach to the Management of ARC Flash Risk



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Arc flash risk management

Electrical Safety UK is a specialist company concerned with the safe management of risk associated with all electrical work activities. With years of experience, ESUK has pioneered the European holistic approach to arc flash hazard assessment and management. Paul Hopton explains

As an electrical safety consultant, I meet many clients whilst helping them with their electrical problems. As part of this special feature on arc flash, I thought I would share with you some of my recent observations from around the world. The first thing to note is that the client's perception of arc flash can often be somewhat different to reality. For example, many people will be concerned about the arc flash risk on their high voltage network (HV>1000 volts).

When we first meet, customers often want to discuss carrying out a study on their high voltage network. If you consider that the only way you can be injured by an arc flash event is if you are exposed to sufficient incident energy that it harms you, you need to consider two key things: the amount of energy that can be released during an arc flash incident and how you can come in to contact with that energy. If you think about it, as an electrical person working in a typical industrial environment you are more likely to encounter arc flash at low voltage than at high voltage for two main reasons:

1. There is likely to be more LV equipment on site than HV equipment
2. You are more likely to be working on or near LV equipment whilst it is energised

When carrying out arc flash incident energy calculations we find that high incident energy can often be found at LV and it is in fact just as prevalent at LV as it is at HV.

The issue of corporate standards comes up regularly during my visits to clients, quite often American-owned businesses operating in the UK will quote IEEE 1584 and NFPA 70E as the two standards that must be complied with. This generally does not

cause an issue, as NFPA 70E includes risk assessment and the principle of hierarchy of controls, with personal protective equipment (PPE) being the control measure of last resort. This does, however, bring up the issue of PPE and the supply of PPE to businesses and sites that have not carried out an arc flash study. It is a requirement of the Personal Protective Equipment at Work Regulations 1992 that employers shall risk assess before instructing personnel to wear PPE and that the PPE provided should be appropriate for the risks involved.

The incident energy calculations that we carry out as part of an arc flash study give you the severity of the hazard, the risk assessment process then considers how this hazard can be realised. If you have implemented a blanket PPE policy without first carrying out an arc flash study, you could be leaving yourself open to criticism under current legislation.

It is important to note that there are many ways to reduce arc flash risk

without the use of PPE. We could consider any of the following when trying to reduce the incident energy levels:

- Protection setting changes
- Protection scheme design changes
- Arc flash relays
- Use of current limiting fuses/breakers – for example, fast acting breakers or fuses
- System configuration can be used to reduce available fault current – for example smaller kVA transformers
- Current limiting reactors
- Detect potential failures – for example, partial discharge monitoring, thermography, VESDA, maintenance inspection, and test
- Decommission and remove redundant electrical equipment

As part of our arc flash studies for each piece of equipment that has an incident energy value above a certain value, we consider what options are available to reduce the incident energy. We recommend the most appropriate option, as well as providing an order of magnitude cost. We also give guidance on what might be an appropriate level of expenditure to comply with the 'as low as reasonably practicable' (ALARP) requirements of legislation.

Finally, the regulator's expectations have been changing for many years when it comes to the management of arc flash risk. We were made aware recently of a business that was given an improvement notice by the HSE to carry out an arc flash risk assessment following a routine inspection. When I worked as a technical authority and in corporate engineering I had experience of HSE specialist inspectors asking about arc flash, and how we were managing the risk.

In conclusion, it is not difficult or expensive to manage arc flash risk. Arc flash events may be relatively infrequent, but they do happen, and the consequences can be fatal. Put your house in order, do an arc flash study and prevent an arc flash incident from happening on your watch. Claim your free copy of *Arc Flash – Managing your Risk* at arcflash@elecsafety.co.uk.



Electrical Safety UK elecsafety.co.uk

Why Use Electrical Safety UK for your Arc Flash Risk Assessments?



Consultancy | Training | Assessment

ESUK Advantages	How?
 <p>ESUK provides an unrivalled HOLISTIC APPROACH for the management of Electrical Safety</p>	<ul style="list-style-type: none"> • One Stop Shop Solutions. • ESUK facilitates a Risk Reduction Workshop with Client's Engineering department in line with HSE regulations. • Our Consultants identify and prioritise Risk Control Measures by attention to a sound targeted strategy to optimise cost/benefit considerations.
 <p>INFLUENCING the Global Electrical Safety Community</p>	<ul style="list-style-type: none"> • ESUK are at the forefront of electrical safety within the global community. Responsible for over 100 published papers and articles on Arc Flash. • Lead consultant for the DuPont European Arc Guide. • Presentations throughout Europe, Middle East and US IEEE Electrical Safety Workshop on the European Approach. • Jim Phillips (Associate Director, ESUK) is International Chairman of IEC TC 78 Live Working Group, Vice Chair of IEEE 1584 Working Group, Co-Chair & Author of First Draft IEEE 1584.1, Author of the book "Complete Guide to Performing Arc Flash Calculation Studies".
 <p>EXPERIENCE BY CLIENTS</p>	<p>ESUK are the UK's foremost exponent of Arc Flash Technology and carry out a wide range of power system studies across Europe, including short circuit, protection coordination and complex Arc Flash Studies. ESUK have provided consultancy to a wide range of large blue-chip Clients.</p>
 <p>EXPERIENCE BY MARKET SECTOR from 30 volts DC up to 400,000 volts AC.</p>	<ul style="list-style-type: none"> • Power Stations • Power Transmission • Chemicals • Pharmaceuticals • Manufacturing • Aerospace • Food • Steel • Printing • Cement • Healthcare • Electronics • Quarries • Water & Sewage • Public Electrical Power Distribution
 <p>EXPERIENCE BY GEOGRAPHY</p>	<ul style="list-style-type: none"> • Great Britain • Spain • Saudi Arabia • Belgium • Northern Ireland • Turkey • Malta • Luxembourg • Republic of Ireland • Czech Republic • Netherlands • Hungary • Germany • Romania • Italy • Poland • France • Malta • Portugal
 <p>Electrical Safety is our CORE BUSINESS</p>	<p>ESUK's CORE BUSINESS is Electrical Safety and we are trusted by many large blue-chip clients to provide the best possible advice, training, assessments, processes, and procedures. We believe that our dedicated approach to Electrical Safety Management is important.</p> <p>It's what we specialise in and excel at!</p>

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