Advisory Note

A Service to A.G. Coombs Group Clients.

Safe Working Around Electrical Equipment

In response to the identification of potential risks to workers from electric shock and arc flash, an Australian Standard has been updated to provide new guidelines for the principles for safe working.

The updated edition to Australian Standard AS/NZS 4836 Safe Working on or Near Low Voltage Electrical Installations supersedes the 2011 edition. The major changes highlight principles of risk management, working on or near electrical equipment and the selection of the appropriate personal protective equipment.

Background of Electrical and Arc Flash Risks

There are a number of electrical work tasks which are unavoidable when working on or near live electrical parts. These generally include:

+ Isolation or switching
+ Inspections to rectify faults
+ Thermal imaging
+ Testing or verification of operation

The risk from unintentional contact with a live electric part can range from minor to serious burns, cardiac arrest or other injuries which may result in fatality. Any of these activities exposes workers to the risk of electrocution or arc flash.

An arc flash is the rapid discharge of a large amount of energy and in some examples may cause the explosion of electrical cubicles or equipment. In these instances the circuit breaker protection may not operate.

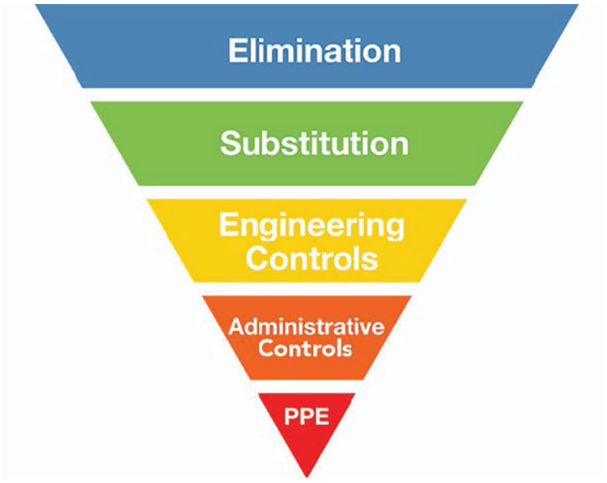
In addition to endangering safety, any electric shock or arc flash incident may disrupt business operations due to equipment damage and or loss of electrical supply.

Regulatory Obligations

Work Health and Safety Regulations identify that if electrical work is to be carried out on energised equipment, a competent person is to complete a risk assessment.

AS/NZS 4836 also provides guidance to the risk assessment process, detailing a hierarchy of control to determine the risk mitigation hazards. The controls identified within the standard include:

+ **Elimination** – switching off the device or equipment
+ **Substitution** – use of alternative power such as batteries or replacing switchboard with improved arc-resistance construction
+ **Isolation or Separation** – provide warning or lock-out tags and switch-off or install barriers around the hazard
+ **Engineering** – design of disconnection devices to operate faster protection settings
+ **Administration** – have the correct permits / procedures and safe work practices in place i.e. Safe Work Method Statements SWMS
+ **Personal Protective Equipment PPE and Clothing** – least desirable approach which is to be introduced as an additional precautionary measure in conjunction with other controls



A thorough risk assessment should establish the incident energy which identifies the correct circuit breaker sizing and associated fault current rating, commonly provided with a kA rating. The incident energy is measured in calories per square centimeters (cal/cm2). Energy as low as 1.2 cal/cm2 can produce second degree burns and ignite materials such as cotton, therefore the correct PPE and clothing is imperative when working under these scenarios.

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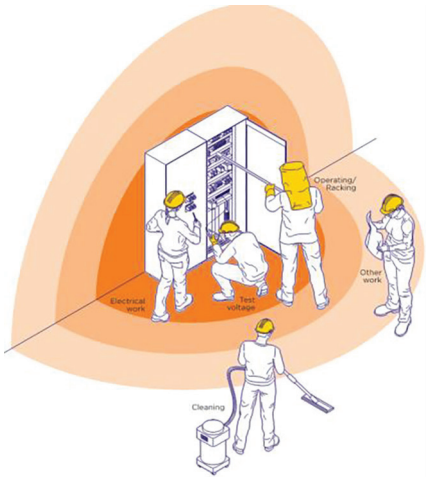
Following the assessment of the incident energy rating, the selection of the appropriate PPE is determined based on the resultant cal/cm2 value. Increased ratings will require different degrees of PPE and the appropriate clothing.

The assessment should also consider the arc flash boundary which identifies the affected distance from the flash source which helps establish the restricted area or zone around the electrical equipment with and without PPE applied.



Following the assessment of the arc flash including the arc flash boundary and incent energy level, an appropriate label should to be applied indicating these values and the minimum level of PPE required.

An arc flash register should be completed for each component of the electrical infrastructure. This provides the competent person with the information required to adequately mitigate and manage risks associated with working on electrical components. The information on the warning label includes;

+ Fault Level calculated at the switchboard
+ Voltage phase to earth value at the switchboard
+ Working Distance around the switchboard which has been assessed
+ Open Panel Arc Flash Energy (cal/m2 value) at the stated working distance
+ PPE Category level of minimum PPE required
+ Arc Flash Boundary minimum distance from the board a person must be when no PPE is applied

For further guidance on the application of the updated Australian Standard AS/NZS 4836 Safe Working on or Near Low Voltage Electrical Installations contact:

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Images sourced from Australian Energy Council Arc Flash Guidelines (March 2019).