Battery safety south africa

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The aim of the article is to consider some of the legal requirements and how the regulations have changed or could be applied/interpreted for battery storage systems as used in conjunction with solar PV systems and backup systems.

In this article, a combination of references from different documents are considered. We explore how these regulations could potentially render a large percentage of solar PV installations that contain storage and Backup systems, to be "illegal" or "unsafe".

Batteries store energy that is used on demand (as and when required). The most prominent battery technologies used in SA are lead acid batteries with Li-ion and Flow technologies gaining popularity.

An increasing number of solar installations in grid areas contain batteries or some sort of storage mechanism and a very large percentage of these installations have exposed battery terminals. The general perception is that DC is harmless and exposed terminals on commissioned battery systems are an "acceptable norm". It is therefore not uncommon to find a Certificate of Compliance being issued in an installation where battery terminals are left exposed.

But what does the wiring code and regulations have to say about exposed terminals? With older versions of some of the standards/regulations, a 50V threshold was provided before insulation became a requirement and for some reason a 48V battery bank is considered to be under 50V. Regulations however do not mention the 50V threshold in updated versions. Despite this threshold, a 48V battery bank can very easily reach 57Volts. During accidental contact, a Direct Current shock can result in injuries that are far more sever than that those caused by Alternating Current.

An electrical installation is defined in the electrical machinery regulations as . . . ."electrical installation" means any machinery, in or on any premises, used for the transmission of electricity from a point of control to a point of consumption anywhere on the premises, including any article forming part of such an installation irrespective of whether or not it is part of the electrical circuit, ...

For this article we only want to look at the definition of "electrical installation" as defined in the electrical installation regulations because the definition of an electrical installation makes reference to the word "machinery"

The scope of the Electrical machinery regulations 2011"2) These Regulations shall apply to users who generate, transmit or distribute electricity whether overhead or underground to the point of supply"

The regulation further states in Section 6 (1)An employer or user shall cause enclosed premises housing

switch gear and transformers -(g) to be of such construction that persons cannot reach in and touch bare conductors or exposed live parts of the electrical machinery.

and then Section 18(1)An employer or user shall cause -(b) all accessible metallic parts of electrical machinery that, though normally not forming part of an electrical circuit, may become live accidentally, to be protected by an insulated covering or to be otherwise enclosed or to be earthed and the resistance of the earth continuity path shall not exceed 0,2 Ohm.

Section 22The employer or user shall cause bare conductors, other than conductors of a power line which cannot be completely insulated and which is installed on premises, to be so placed as to prevent accidental contact therewith, and warning notices to be prominently displayed at such conductors.

3. (1) Every employer or user of machinery shall- (a) ensure that all machinery used by him, is suitable for the purpose for which it is used, and that it is installed, operated and maintained in such a manner as to prevent the exposure of persons to hazardous or potentially hazardous conditions or circumstances;

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Web: https://sumthingtasty.co.za/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346