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[IEEE DataPort] Error in IEEE 1584 calculation spreadsheet

1 message

liaung.yip@ieee.org <liaung.yip@ieee.org> 14 February 2022 at 00:22
To: liaung.yip@ieee.org

Hello SA Dataport,

Li-aung Yip (https://ieee-dataport.org/authors/li-aung-yip) has sent you a message via your contact form (https://ieee-dataport.org/user/6628/contact) at IEEE DataPort.

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Message:

To whom it may concern,

Greetings from sunny Perth, WA, Australia.
I hope this finds you well.

While testing a piece of software [1] I had written for correctness, I discovered that the current version of the arc flash calculator spreadsheet [2], located at URL [3], currently contains formula errors.

This spreadsheet is intended to do arc flash calculations for the "minimum arcing current variation" case,
However the minimum current variation factor is not applied to all calculations where it should be.
As a result, the spreadsheet outputs different results vs. the expected results from IEEE 1584-2018 Annex D.1.

The example calculation in Annex D.1 gives the expected values of:
E_min = 13.343 J/cm2 (result D.62) and
AFB_min = 1,704 mm (result D.72).

For the same inputs as Annex D.1, the spreadsheet currently gives values of:
E_min = 13.440 J/cm2
AFB_min = 1,713 mm

The error is relatively minor (1%) for the above case, but in other cases the divergence is up to 47%.

For example, for the following input parameters,

V_oc = 0.601 kV
EC = VCB
G = 19.05 mm
D = 305 mm
height = 200 mm
width = 200 mm
depth = 100 mm
I_bf = 65 kA
T = 10 ms

The correct result is E_min = 4.7638 J/cm², where the calculator spreadsheet [2] gives E_min = 7.0153 J/cm², a discrepancy of 47%.

If someone could contact me at liaung.yip@ieee.org I would be more than happy to discuss the precise formula corrections needed.

Regards,
Li-aung "Lewis" Yip, MIEEE.

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[1]: https://github.com/LiaungYip/arcflash
[2]: IEEE ExcelCalculator_V 2.6.6_M_mm_08_29_2019.xlsm
[3]: https://ieee-dataport.org/open-access/arc-flash-ie-and-iarc-calculators