Separation distance between MV/LV substation and secondary neutral grounding configurations

Most probably, a generalized version for arbitrary grounding configurations will also be developed on the basis on the initial.

**Input data**

1. **(user input)** Geometric proportionality factor, kg (additional capability of calculating this factor based on simple expressions)
2. **(user input)** Surface potential proportionality factor, ksp(x), expressed as a function of separation distance, x
3. **Selection of system by the user:**

(i) TN

(ii) TT

(i) TN system

1. **Selection of standard by the user:**

(i) IEEE Std 80

(ii) CENELEC EN 50522

(i) IEEE Std 80

1. **(user input)** Resistance of the human body (typical value 1000 Ω)
2. **(user input)** k factor related to tolerable electric shock energy (typical values 0.116 and 0.157 As0.5)

(ii) CENELEC EN 50522

1. Curves from the IEC standard: (I) IB(tf), (II) ZT(UT)
2. **(user input)** Heart current factor, HF, and body factor BF (additional capability of selecting these factors based on the standard)
3. **(user input)** Constant F (additional capability of selecting values for this constant based on the standard)

(ii) TT system

1. **(user input)** Selection of Vlim based on fault duration (1200 V for tf ≤ 5 s, 250 V for tf > 5s) or input of value by the user.

**Up to this point here: The safety curve shown in the paper (Fig. 11) can be plotted (see output, point (1) at the Output Section of the specifications)**

**The above refers to a specific combination of two typical grounding configurations. There should be the capability of saving all those and changing them if necessary.**

1. **Selection by the user of the case to be evaluated: soil resistivity ρ (or ground resistance Rg, to be converted to soil resistivity through kg)**
2. **Selection by the user** Yes or No: Calculation of the maximum grid current IG according to IEEE Std 80?
3. **If no:** **(user input)** maximum grid current, IG
4. **If yes:** **(user input)** symmetrical ground fault current fault current, If, division factor, Sf, and decrement factor, Df
5. **Selection by the user** Yes or No: Calculation of the decrement factor Df according to IEEE Std 80?
6. **If no: (user input)** decrement factor, Df
7. **If yes:** **(user input)** X/R ratio, fault duration, tf
8. **Additionally for TN systems: (user input)** Time-current characteristic of the protective device (**A.** additional capability of selection between given characteristics, such as those of Fig. 5) (**B.** additional capability of calculation using common expressions from literature) (**C.** additional capability of adding a specific time value or a second curve in terms of time so as to consider the addition of fault times of different protective device to form the total shock duration)

**The above refer to specific installations of the typical grounding configurations (points (2) and (3) at the Output Section of the specifications). There could be several of those in a system. There should be the capability of saving the data for every installation and changing them if necessary.**

**Output**

TN system

(i) IEEE Std 80

1. Plotting of the safety curve as shown in the paper ((IG√tf)ρ-x curve)

2. Minimum separation distance value

3. Addition of point to the curve showing the corresponding case examined.

(ii) CENELEC EN 50522

1. Plotting of the basic safety curve as shown in the paper ((IG/UTp(tf))ρ-x curve)

2. Minimum separation distance value

3. Addition of point to the curve showing the corresponding case examined.

(ii) TT system

1. Plotting of the basic safety curve as shown in the paper (IGρ-x curve)

2. Minimum separation distance value

3. Addition of point to the curve showing the corresponding case examined.

**Διάφορα (σε 2η φάση)**

1. Καρτέλα Project για την εισαγωγή γενικών πληροφοριών, π.χ. φόρτωση φωτογραφιών, λίστα με τα υπάρχοντα συστήματα γείωσης και τη θέση τους, αποθήκευση τιμών ειδικής αντίστασης του εδάφους και αντίστασης γείωσης κτλ.
2. Δυνατότητα αποθήκευσης της κάθε γενικής περίπτωσης συνδυασμού τυπικών συστημάτων γείωσης σε ένα Project
3. Δυνατότητα να κρατήσει τα δεδομένα και να γίνουν επιθυμητές μόνο αλλαγές για να βελτιωθεί η συμπεριφορά του υπό μελέτη συστήματος γείωσης.
4. Δυνατότητα εκτύπωσης ή αποθήκευσης σε pdf
5. Καρτέλα με πληροφορίες
6. Βασικά στοιχεία βοήθειας (ίσως αν αφήνεις το ποντίκι κάπου να δίνει πληροφορίες)