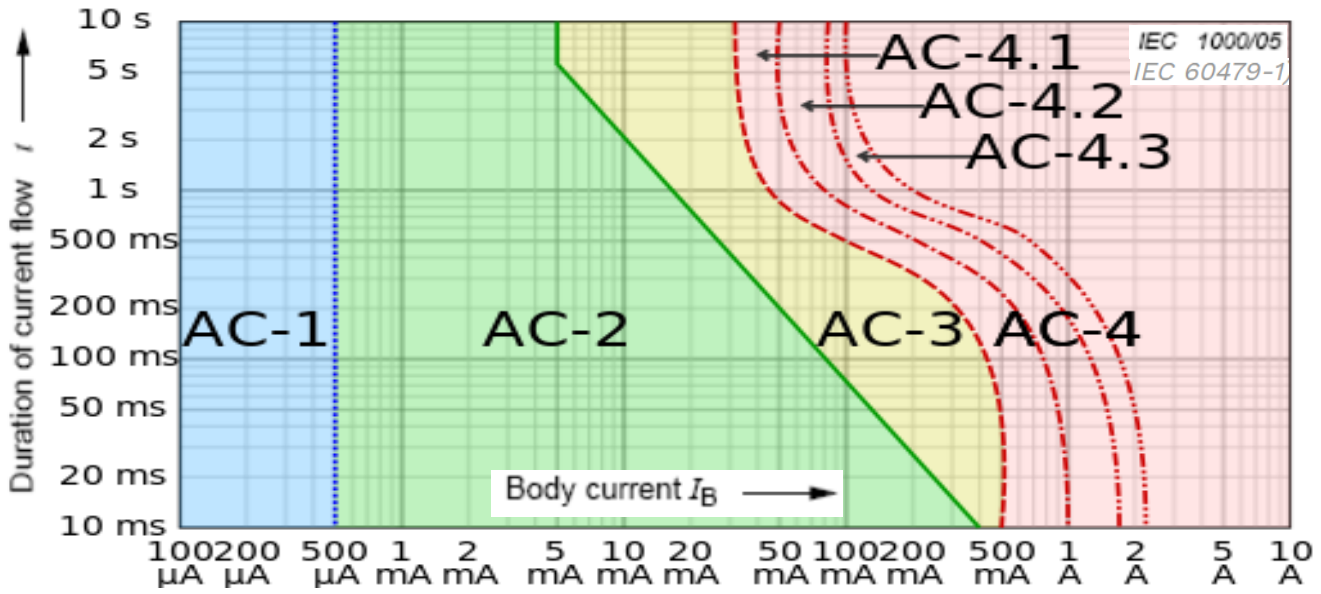
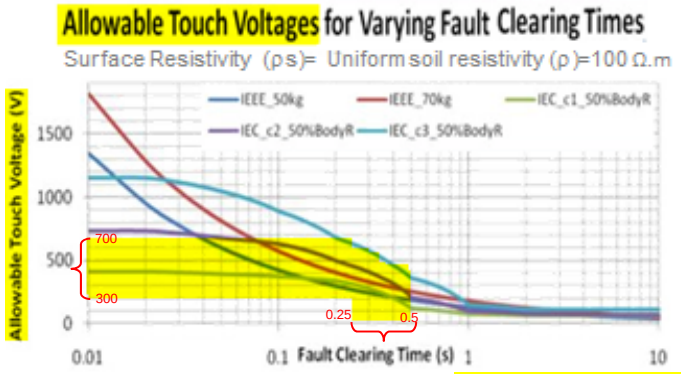
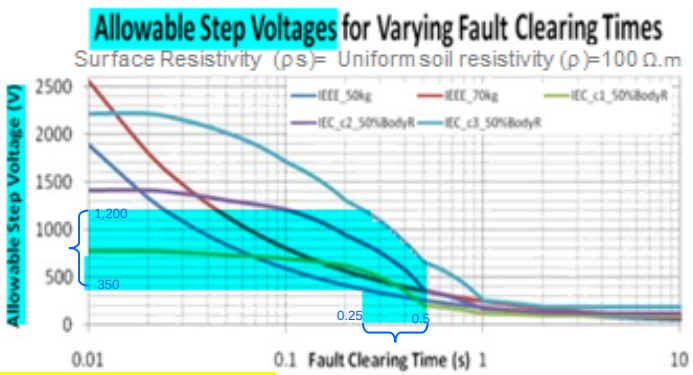
Permissible Touch and Step Voltage–IEC

$$V_T^a = i_{b,\,\mathrm{perm}}(t)\left[R_b^T(i_{b,\,\mathrm{perm}}(t)) + r_{\mathrm{eq},\,T}\right]$$

$$V_S^a = i_{b,\,\mathrm{perm}}(t)\left[R_b^S(i_{b,\,\mathrm{perm}}(t)) + r_{\mathrm{eq},\,S}\right]$$







Typical clearing time range: **0.25 s** ≦ t_c ≦ **0.5 s**

Where:

V_T^a The permissible (or allowable) touch voltages

V_S^a The permissible (or allowable) step voltages

$i_{b,\mathrm{perm}}(t)$ is the permissible body current per IEC 479-1 for an electric shock duration t.

$R_b^T(i_{b,\mathrm{perm}}(t))$ is the body resistance for the path specified by the touch voltage (typically, hand to two feet) and for a body current equal to $i_{b,\mathrm{perm}}(t)$.

$R_b^S(i_{b,\mathrm{perm}}(t))$ is the body resistance for the path specified by the step voltage (foot to foot) and for a body current equal to $i_{b,\mathrm{perm}}(t)$.

$r_{\mathrm{eq},T}$ is the feet to soil resistance for touch voltage; i.e., the two feet to soil resistances are in parallel.

$r_{\mathrm{eq},S}$ is the feet to soil resistance for step voltage; i.e., the two feet to soil resistances are in series.

REFERENCE : *1) A Comparison of IEC 479-1 & IEEE Std 80 on Grounding Safety Criteria C-H LEE & S. MELIOPOULOS*
2) Comparison-of-substation-safety-criteria-given-by-the-american-ieee-and-european-iec-standards- Electrotechnik.