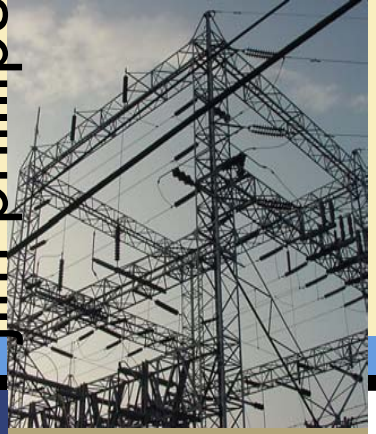
jim phillips



TECHNICAL TRAINING GROUP

Arc Flash

The worksheets are from the class “How to Perform and Arc Flash Study” taught by Jim Phillips, P.E. and are used to simplify the manual calculation process. Detailed instructions are not provided since it is expected that the user has either attended the class or has a good working knowledge of arc flash calculations.

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The worksheets are derived from formulas published in IEEE 1584-2002 and as listed in Annex D of NFPA 70E – 2004.

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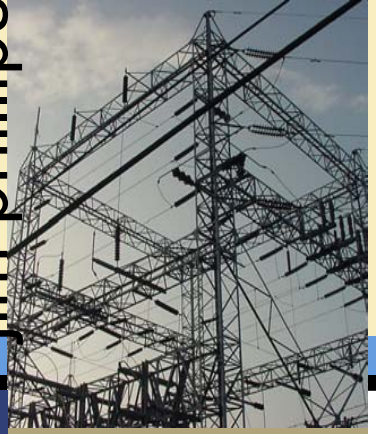

$$\log I_a = K + 0.662 \log I_{bf} + 0.0966V + 0.000526G + 0.5588V(\log I_{bf}) - 0.00304G(\log I_{bf})$$

$$Ia = 10^{\log Ia}$$

$\text{Log} = \text{Log}_{10}$

I_a = arcing current in kA

K = - 0.153 for open air and -0.097 for arcs in a box

I_{bf} = bolted three-phase available short-circuit current (symmetrical rms kA)

V = system voltage in kV

G = conductor gap in millimeters (mm)

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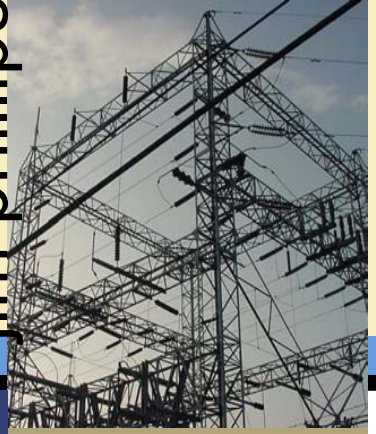
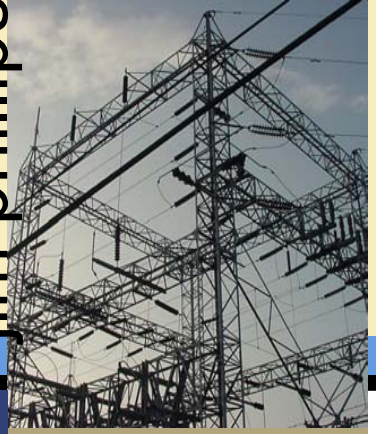


TECHNICAL TRAINING GROUP

Arc Flash

Predicted Three Phase Arcing Current Work Sheet NFPA 70E D.8.2 - Based on IEEE Std. 1584tm 2002			
I_{bf} = 3 Phase Short Circuit Current in kA		V = system voltage in kV G = Conductor gap (mm)	K = - 0.153 for open air arcs = - 0.097 for arcs in a box
Step 1	0.662 x Log (I_{bf})	0.662 x Log ( )	
Step 2	0.0966 x V	0.0966 x ( )	
Step 3	0.000526 x G	0.000526 x ( )	
Step 4	0.5588 x V x Log (I_{bf})	0.5588 x ( ) x Log ( ) 0.5588 x ( ) x ( )	
Step 5	- 0.00304 x G x Log (I_{bf})	-0.00304 x ( ) x Log ( ) -0.00304 x ( ) x ( )	-
Step 6	Add K	K = - 0.153 for open air arcs K = - 0.097 for arcs in a box	-
Step 7	Log (I_a) = Step 1 + Step 2 + Step 3 + Step 4 + Step 5 + Step 6		
Total I_{arcing}	10 log (Ia) for most calculators enter 10 Y^X (Step 7)		kA



T2G TECHNICAL TRAINING GROUP

System Voltage (kV)	Type of Equipment	Typical Conductor Gap (mm)	Distance X-Factor
0.208 to 1	Open-air	10 – 40	2.000
	Switchgear	32	1.473
	MCC's and panels	25	1.641
	Cables	13	2.000
>1 to 5	Open-air	102	2.000
	Switchgear	13 – 102	0.973
	Cables	13	2.000
>5 to 15	Open-air	13 – 153	2.000
	Switchgear	153	0.973
	Cables	13	2.000