IEEE Test Feeder System Impedances for Short Circuit Studies

IEEE 34 Node: $kVLL := 69$ $kVLN := \frac{kVLL}{\sqrt{3}}$

Three-phase fault:

$$I_{3P} := 1734.25 \cdot e^{-j \cdot 68.62 \cdot deg}$$

Short Circuit MVA:

$$MVA_{3P} := \frac{\sqrt{3} \cdot kVLL \cdot \overline{I_{3P}}}{1000} \qquad MVA_{3P} = 75.558 + 192.9996j$$

$$\left|MVA_{3P}\right| = 207.2628 \qquad \frac{\arg\left(MVA_{3P}\right)}{deg} = 68.62$$

$$Z_{pos} := \frac{kVLL^2}{\overline{MVA_{3P}}} \qquad Z_{pos} = 8.3741 + 21.3901j \quad \text{Ohm}$$

$$Z_{pos} := \frac{kVLN \cdot 1000}{I_{3P}} \qquad Z_{pos} = 8.3741 + 21.3901j$$

LG Fault:

$$I_{LG} := 1262.4 \cdot e^{-j \cdot 67.81 \cdot deg}$$

Short Circuit MVA:

$$MVA_{LG} := \frac{\sqrt{3} \cdot kVLL \cdot \overline{I_{LG}}}{1000} \qquad MVA_{LG} = 56.981 + 139.6973j$$

$$\left|MVA_{LG}\right| = 150.8713 \qquad \frac{\arg\left(MVA_{LG}\right)}{deg} = 67.81$$

$$Z_{zero} := 3 \cdot \frac{kVLL^2}{\overline{MVA_{LG}}} - 2 \cdot Z_{po} \qquad Z_{zero} = 19.0068 + 44.8784j \quad \text{Ohm}$$

$$I_{pos} := \frac{I_{LG}}{3} \qquad \left|I_{pos}\right| = 420.8 \qquad \frac{\arg\left(I_{pos}\right)}{deg} = -67.81$$

$$Z_{eq} := \frac{kVLN \cdot 1000}{I_{pos}} \qquad Z_{eq} = 35.7549 + 87.6585j$$

$$Z_{zero} := Z_{eq} - 2 \cdot Z_{pos} \qquad Z_{zero} = 19.0068 + 44.8784j$$

IEEE 13 and 123 Node: $kVLL := 115$ $kVLN := \frac{kVLL}{\sqrt{3}}$

Three-phase fault:

$$I_{3P} := 13700 \cdot e^{-j \cdot 80.89 \cdot deg}$$

Short Circuit MVA:

$$MVA_{3P} := \frac{\sqrt{3} \cdot kVLL \cdot \overline{I_{3P}}}{1000} \qquad MVA_{3P} = 432.0593 + 2694.4249j$$

$$\left|MVA_{3P}\right| = 2728.846 \qquad \frac{\arg\left(MVA_{3P}\right)}{deg} = 80.89$$

$$Z_{pos} := \frac{kVLL^2}{\overline{MVA_{3P}}} \qquad Z_{pos} = 0.7673 + 4.7852j$$ Ohm

$$Z_{pos} := \frac{kVLN \cdot 1000}{I_{3P}} \qquad Z_{pos} = 0.7673 + 4.7852j$$

LG Fault:

$$I_{LG} := 10952.6 \cdot e^{-j \cdot 84.06 \cdot deg}$$

Short Circuit MVA:

$$MVA_{LG} := \frac{\sqrt{3} \cdot kVLL \cdot \overline{I_{LG}}}{1000} \qquad MVA_{LG} = 225.7674 + 2169.8894j$$

$$\left|MVA_{LG}\right| = 2181.6029 \qquad \frac{\arg\left(MVA_{LG}\right)}{deg} = 84.06$$

$$Z_{zero} := 3 \cdot \frac{kVLL^2}{\overline{MVA_{LG}}} - 2 \cdot Z_{pos} \qquad Z_{zero} = 0.3474 + 8.518j$$ Ohm

$$I_{pos} := \frac{I_{LG}}{3} \qquad \left|I_{pos}\right| = 3650.8667 \qquad \frac{\arg\left(I_{pos}\right)}{deg} = -84.06$$

$$Z_{eq} := \frac{kVLN \cdot 1000}{I_{pos}} \qquad Z_{eq} = 1.882 + 18.0885j$$

$$Z_{zero} := Z_{eq} - 2 \cdot Z_{pos} \qquad Z_{zero} = 0.3474 + 8.518j$$

IEEE 37 Node: $kVLL := 230$ $kVLN := \frac{kVLL}{\sqrt{3}}$

Three-phase fault:

$I_{3P} := 7736.51 \cdot e^{-j \cdot 75.55 \cdot deg}$

Short Circuit MVA:

$MVA_{3P} := \frac{\sqrt{3} \cdot kVLL \cdot \overline{I_{3P}}}{1000}$ $MVA_{3P} = 769.0686 + 2984.5096j$

$\left|MVA_{3P}\right| = 3082.0065$ $\frac{\arg(MVA_{3P})}{deg} = 75.55$

$Z_{pos} := \frac{kVLL^2}{\overline{MVA_{3P}}}$ $Z_{pos} = 4.2831 + 16.6212j$ Ohm

$Z_{pos} := \frac{kVLN \cdot 1000}{I_{3P}}$ $Z_{pos} = 4.2831 + 16.6212j$

LG Fault:

$I_{LG} := 6204.08 \cdot e^{-j \cdot 78.75 \cdot deg}$

Short Circuit MVA:

$MVA_{LG} := \frac{\sqrt{3} \cdot kVLL \cdot \overline{I_{LG}}}{1000}$ $MVA_{LG} = 482.1715 + 2424.0401j$

$\left|MVA_{LG}\right| = 2471.5298$ $\frac{\arg(MVA_{LG})}{deg} = 78.75$

$Z_{zero} := 3 \cdot \frac{kVLL^2}{\overline{MVA_{LG}}} - 2 \cdot Z_{pos}$ $Z_{zero} = 3.9609 + 29.7351j$ Ohm

$I_{pos} := \frac{I_{LG}}{3}$ $\left|I_{pos}\right| = 2068.0267$ $\frac{\arg(I_{pos})}{deg} = -78.75$

$Z_{eq} := \frac{kVLN \cdot 1000}{I_{pos}}$ $Z_{eq} = 12.527 + 62.9774j$

$Z_{zero} := Z_{eq} - 2 \cdot Z_{pos}$ $Z_{zero} = 3.9609 + 29.7351j$