

LAMPIRAN 3

Pada Lampiran 3 ditunjukkan perhitungan energi insiden pada GRUP 6 dan MCC 8 yang memiliki kategori bahaya 3. Guna meminimalisasi resiko bahaya, maka parameter waktu pemutusan gangguan (t) diubah dari 0,4 detik menjadi 0,1 detik untuk kategori bahaya 1 dan 0,2 detik untuk kategori bahaya 2.

1. GRUP 6

t = 0,1 detik

$$\begin{aligned} E_{\text{ins}} &= C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x \\ &= 1,5 \times 10,38 \times \left(\frac{0,1}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641} \\ &= 12,5 \text{ J/cm}^2 \\ E_{\text{ins}} &= 12,5 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2} \\ &= 3 \text{ cal/cm}^2 \end{aligned}$$

Energi insiden sebesar 2,99 cal/cm² termasuk dalam kategori bahaya 1.

t = 0,2 detik

$$\begin{aligned} E_{\text{ins}} &= C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x \\ &= 1,5 \times 10,38 \times \left(\frac{0,2}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641} \\ &= 25 \text{ J/cm}^2 \\ E_{\text{ins}} &= 25 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2} \\ &= 6 \text{ cal/cm}^2 \end{aligned}$$

Energi insiden sebesar 6 cal/cm² termasuk dalam kategori bahaya 2.

2. MCC 8

t = 0,1 detik

$$\begin{aligned} E_{\text{ins}} &= C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x \\ &= 1,5 \times 10,34 \times \left(\frac{0,1}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641} \\ &= 12,45 \text{ J/cm}^2 \\ E_{\text{ins}} &= 12,45 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2} \\ &= 2,99 \text{ cal/cm}^2 \end{aligned}$$

Energi insiden sebesar 2,99 cal/cm² termasuk dalam kategori bahaya 1.

t = 0,2 detik

$$\begin{aligned} E_{\text{ins}} &= C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x \\ &= 1,5 \times 10,34 \times \left(\frac{0,2}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641} \\ &= 24,89 \text{ J/cm}^2 \end{aligned}$$

$$E_{\text{ins}} = 24,89 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2}$$

$$= 5,97 \text{ cal/cm}^2$$

Energi insiden sebesar 3 cal/cm² termasuk dalam kategori bahaya 2.

3. Panel Sentral

$$t = 0,1 \text{ detik}$$

$$E_{\text{ins}} = C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x$$

$$= 1,5 \times 9,89 \times \left(\frac{0,1+0,08}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641}$$

$$= 13,36 \text{ J/cm}^2$$

$$E_{\text{ins}} = 13,36 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2}$$

$$= 3,21 \text{ cal/cm}^2$$

Energi insiden sebesar 3,21 cal/cm² termasuk dalam kategori bahaya 1.

$$t = 0,2 \text{ detik}$$

$$E_{\text{ins}} = C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x$$

$$= 1,5 \times 9,98 \times \left(\frac{0,2+0,08}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641}$$

$$= 20,78 \text{ J/cm}^2$$

$$E_{\text{ins}} = 20,78 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2}$$

$$= 4,99 \text{ cal/cm}^2$$

Energi insiden sebesar 4,99 cal/cm² termasuk dalam kategori bahaya 2.

4. PLN Trafo 1 dan PLN Trafo 2

$$t = 0,1 \text{ detik}$$

$$E_{\text{ins}} = C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x$$

$$= 1,5 \times 9,89 \times \left(\frac{0,1+0,08+0,05}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641}$$

$$= 17,37 \text{ J/cm}^2$$

$$E_{\text{ins}} = 17,37 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2}$$

$$= 4,71 \text{ cal/cm}^2$$

Energi insiden sebesar 4,71 cal/cm² termasuk dalam kategori bahaya 2.

$$t = 0,2 \text{ detik}$$

$$E_{\text{ins}} = C_f \times E_n \times \left(\frac{t}{0,2}\right) \times \left(\frac{610}{D}\right)^x$$

$$= 1,5 \times 9,89 \times \left(\frac{0,2+0,08+0,05}{0,2}\right) \times \left(\frac{610}{457,2}\right)^{1,641}$$

$$= 24,92 \text{ J/cm}^2$$

$$E_{\text{ins}} = 24,92 \text{ J/cm}^2 \times 0,24 \frac{\text{cal/cm}^2}{\text{J/cm}^2}$$

$$= 5,98 \text{ cal/cm}^2$$

Energi insiden sebesar 5,98 cal/cm² termasuk dalam kategori bahaya 2.