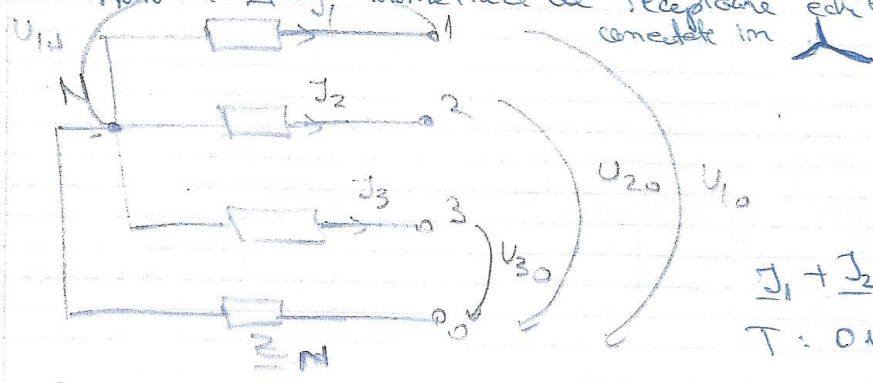


### 8.3. Calculul sistemelor trifazate simetrice

Calculul sistem trifazat simetric cu receptoare conectate in echilibru



$$\underline{I}_1 + \underline{I}_2 + \underline{I}_3 = \underline{I}_0$$

$$T: 01N0.$$



$$\underline{Z}_1 = \underline{Z}_2 = \underline{Z}_3 = \underline{Z} \text{ receptor echilibrat}$$

$$\underline{I}_1 = \frac{\underline{U}_{1N}}{\underline{Z}} = \frac{\underline{U}_{10} - \underline{U}_{N0}}{\underline{Z}}$$

$$\underline{I}_2 = \frac{\underline{U}_{2N}}{\underline{Z}} = \frac{\underline{U}_{20} - \underline{U}_{N0}}{\underline{Z}}$$

$$\underline{I}_3 = \frac{\underline{U}_{3N}}{\underline{Z}} = \frac{\underline{U}_{30} - \underline{U}_{N0}}{\underline{Z}}$$

$$\left. \begin{aligned} \frac{\underline{U}_{10} + \underline{U}_{20} + \underline{U}_{30}}{\underline{Z}} &= \frac{3\underline{U}_{N0}}{\underline{Z}} \\ &= \frac{\underline{U}_{N0}}{\underline{Z}_N} \\ &= \underline{U}_{N0} \left( \frac{3}{\underline{Z}} + \frac{1}{\underline{Z}_N} \right) \end{aligned} \right\}$$

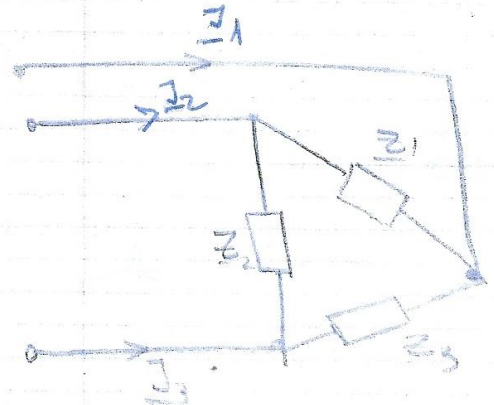
$$\underline{I}_0 = \frac{\underline{U}_{N0}}{\underline{Z}_N}$$

$$\Rightarrow \underline{U}_{N0} = 0$$

Potențialul punctului neutru al unui receptor echilibrat este 0.

$$U_{10}, U_{20}, U_{30} = U_{\phi}$$

$$\left. \begin{aligned} \underline{U}_{1N} &= \underline{U}_{10} \\ \underline{U}_{2N} &= \underline{U}_{20} \\ \underline{U}_{3N} &= \underline{U}_{30} \end{aligned} \right\} \Rightarrow \begin{aligned} \underline{J}_1 &= \frac{\underline{U}_{10}}{\underline{Z}} \\ \underline{J}_2 &= \frac{\underline{U}_{20}}{\underline{Z}} = a^2 \underline{J}_1 \\ \underline{J}_3 &= \frac{\underline{U}_{30}}{\underline{Z}} = a \underline{J}_1 \end{aligned}$$



receptor echilibrat  $\underline{Z}_1 = \underline{Z}_2 = \underline{Z}_3 = \underline{Z}$ .

sist. simetric:

$$\begin{aligned} U_{10} &= U \\ U_{20} &= a^2 U \\ U_{30} &= a U \end{aligned} \left| \begin{aligned} U_{12} &= U_{12} \\ U_{23} &= a^2 U_{12} \\ U_{31} &= a U_{12} \end{aligned} \right.$$

$\underbrace{\hspace{10em}}_{U_{\phi}}$

Convenția de fază

$$\begin{aligned} \underline{J}_{12} &= \frac{\underline{U}_{12}}{\underline{Z}} = \frac{\underline{U}_{12}}{\underline{Z}} = \underline{Y} U_{12} \\ \underline{J}_{23} &= \frac{\underline{U}_{23}}{\underline{Z}} = \frac{a^2 U_{12}}{\underline{Z}} = \underline{Y} a^2 U_{12} \\ \underline{J}_{31} &= \frac{\underline{U}_{31}}{\underline{Z}} = \frac{a U_{12}}{\underline{Z}} = \underline{Y} a U_{12} \end{aligned}$$

$$\begin{aligned} \underline{J}_1 &= \underline{J}_{23} - \underline{J}_{31} = \underline{Y} U_{12} (1 - a) = \underline{Y} U_{12} \sqrt{3} e^{j\frac{\pi}{6}} \\ \underline{J}_2 &= \underline{J}_{31} - \underline{J}_{12} \\ \underline{J}_3 &= \underline{J}_{12} - \underline{J}_{23} \end{aligned}$$

Dacă sist. de alimentare este simetric

$$U_{linie} = \sqrt{3} U_{faza}$$

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$$\underline{U}_{1N} = \underline{U}_{10} - \underline{U}_{No}$$

$$\underline{U}_{2N} = \underline{U}_{20} - \underline{U}_{No}$$

$$\underline{U}_{3N} = \underline{U}_{30} - \underline{U}_{No}$$

$$\underline{Z}_N \Rightarrow \underline{U}_{No} = 0$$

$$U_f = 100V$$

$$j_1 = \frac{U_{1N}}{Z_1}$$

$$j_2 = \frac{U_{2N}}{Z_2}$$

$$j_3 = \frac{U_{3N}}{Z_3}$$

$$\underline{U}_{No} = \underline{U}_N - \frac{U_{No}}{0} = \underline{U}_N$$

$$\underline{U}_{No} = \frac{\underline{U}_{10} Y_1 + \underline{U}_{20} Y_2 + \underline{U}_{30} Y_3}{\underline{Y}_1 + \underline{Y}_2 + \underline{Y}_3}$$

n. d. ...