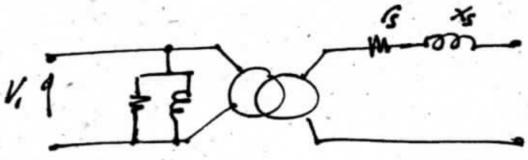
22/04/96

$$\eta = \frac{P_2}{P_1} = \frac{P_2}{P_2 + \Sigma p} \left(\stackrel{?}{=} \frac{P_1 - \Sigma p}{P_1} \right)$$

~~no, sólo aprox.~~
Sí, por balance de potencia activa

~~$P_2 = P_1 +$~~

$$P_1 = P_2 + \Sigma p$$



$$P_2 = S_2 \cos\varphi_2$$

$$\eta = \frac{S_2 \cos\varphi_2}{S_2 \cos\varphi_2 + P_{Fe} + P_J}$$

hip. $\begin{cases} V_1 = cte \\ f = cte. \end{cases}$

pero $P_J \simeq k S_2^2$ ← es una aprox, equivale a suponer que $V_2 = cte$

$$S_2 = V_2 I_2$$

$$\eta = \frac{S_2 \cos\varphi_2}{S_2 \cos\varphi_2 + P_{Fe} + k S_2^2}$$

$$\frac{d\eta}{dS_2} = \frac{\cos\varphi_2 (S_2 \cos\varphi_2 + P_{Fe} + k S_2^2) - S_2 \cos\varphi_2 (\cos\varphi_2 + 2 k S_2)}{(S_2 \cos\varphi_2 + P_{Fe} + k S_2^2)} = 0$$

$$\cancel{S_2^2 \cos\varphi_2 + P_{Fe} \cos\varphi_2}$$

Al anular el numerador, $\cos\varphi_2 \neq 0$, se simplifica.

$$\cancel{S_2 \cos\varphi_2} + P_{Fe} + k S_2^2 - \cancel{S_2 \cos\varphi_2} - 2 k S_2^2 = 0$$

$$P_{Fe} - k S_2^2 = 0 \Rightarrow P_{Fe} = k S_2^2$$

$$\boxed{P_{Fe} = P_J}$$

A su vez $\eta = \eta(\cos\varphi)$

η_{max} para $\cos\varphi = 1$