



Supervisión Experta de la Calidad del Servicio Eléctrico – SECSE -



Universitat de Girona

Girona, Febrero 18 de 2002



Supervisión Experta de la Calidad del Servicio Eléctrico – SECSE

Juan José Mora Flórez

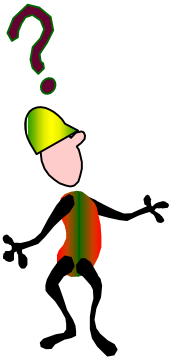
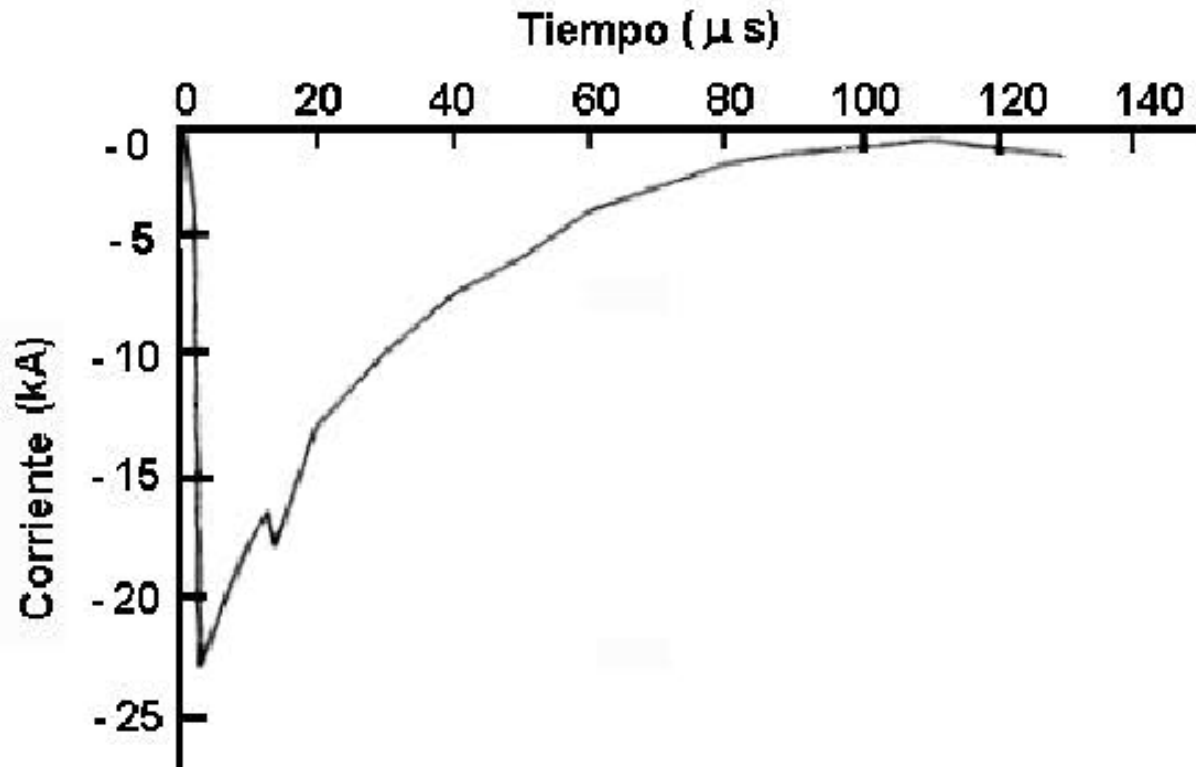


Universitat de Girona



Eventos

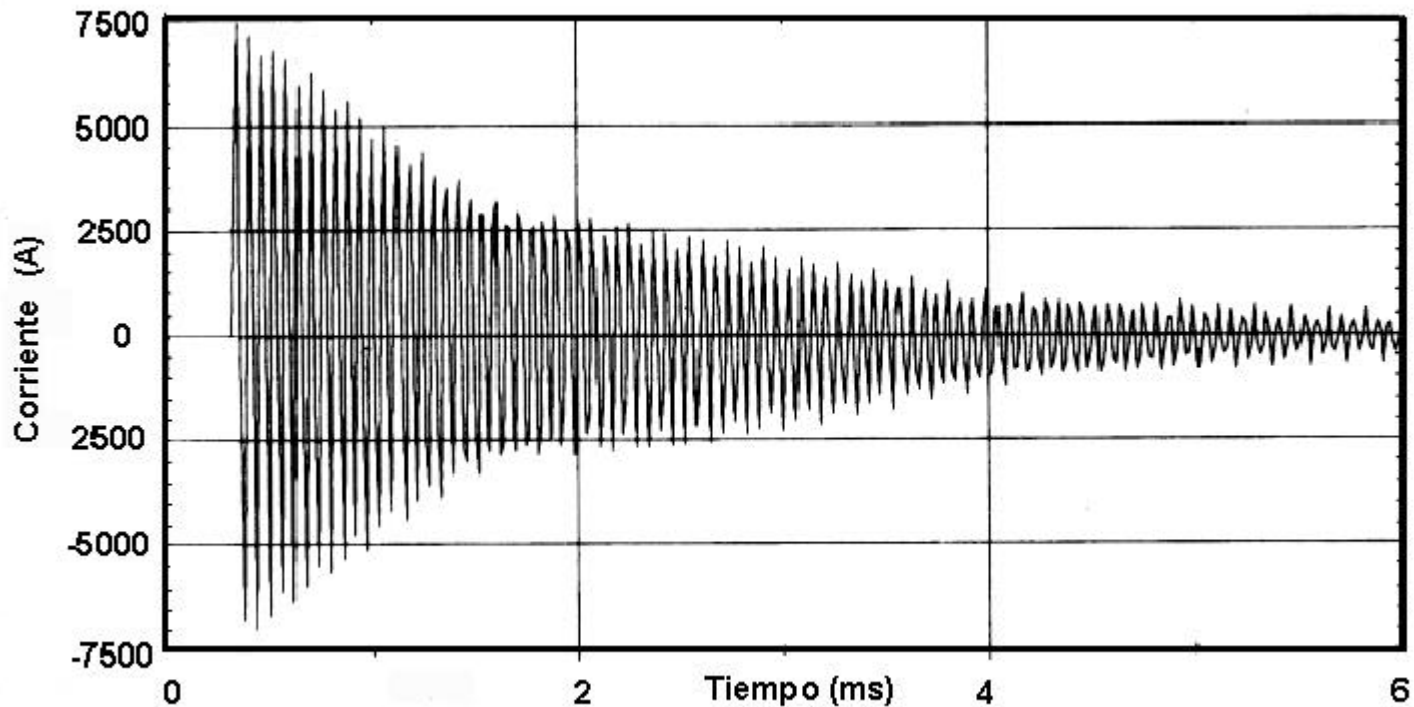
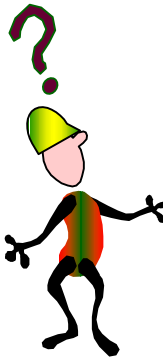
Impulso Transitorio





Eventos

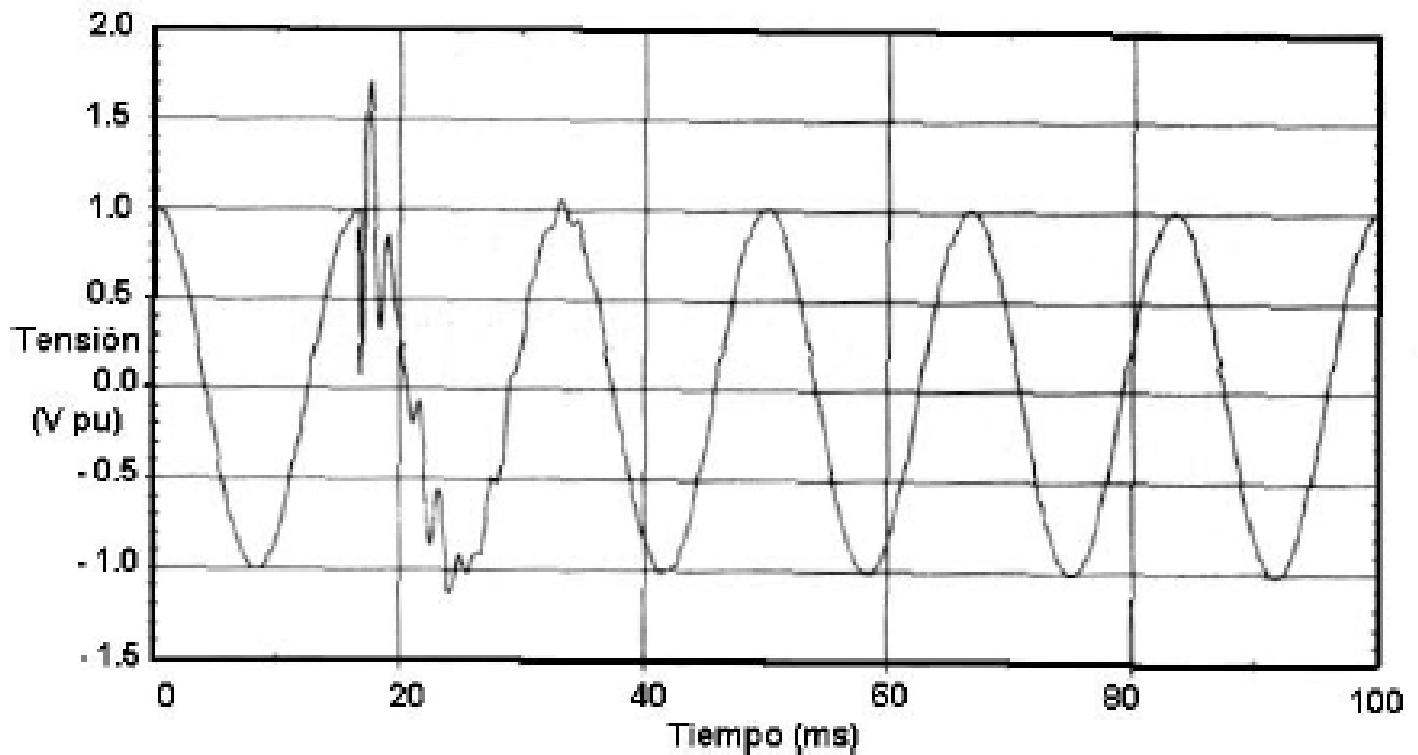
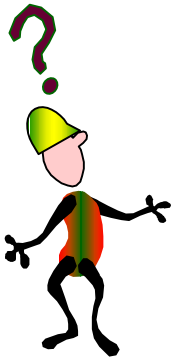
Transitorio Oscilatorio





Eventos

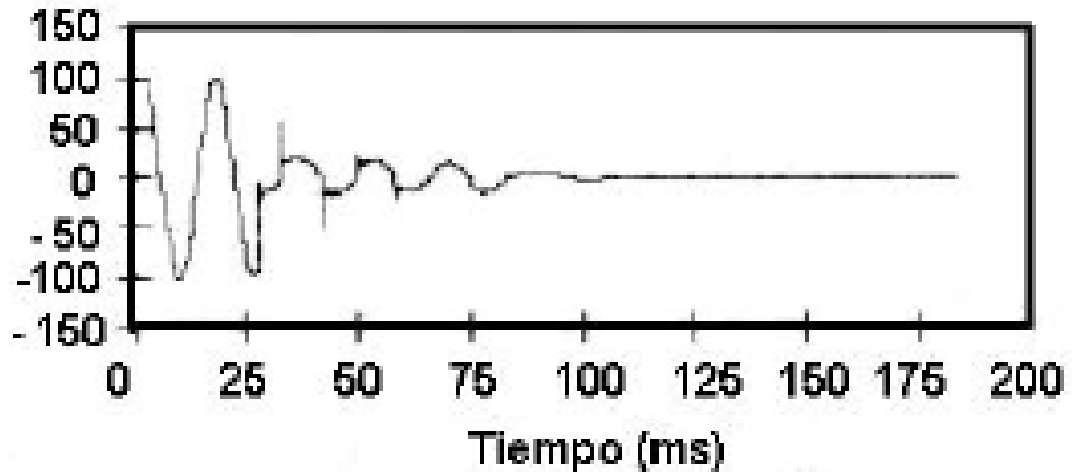
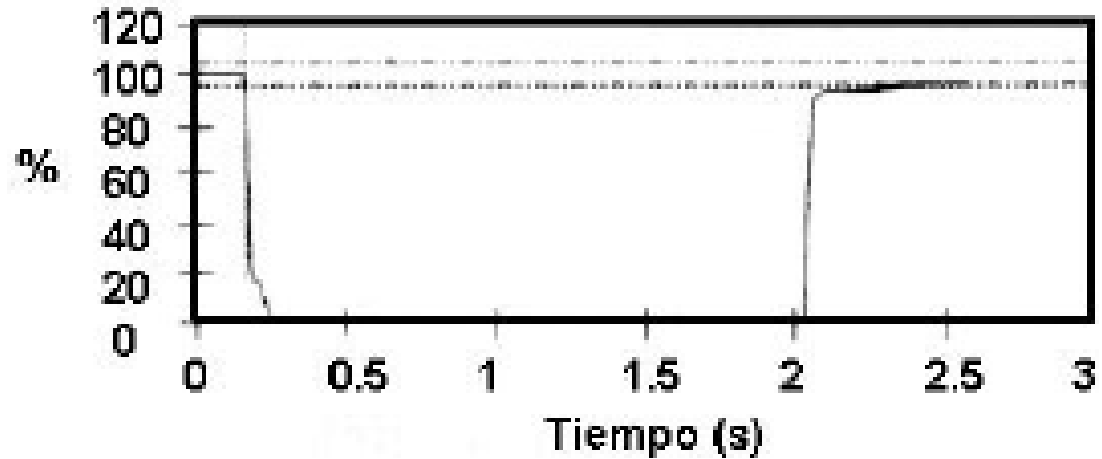
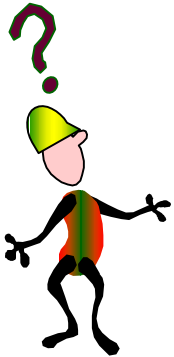
Transitorio Oscilatorio por energización de un banco de condensadores





Eventos

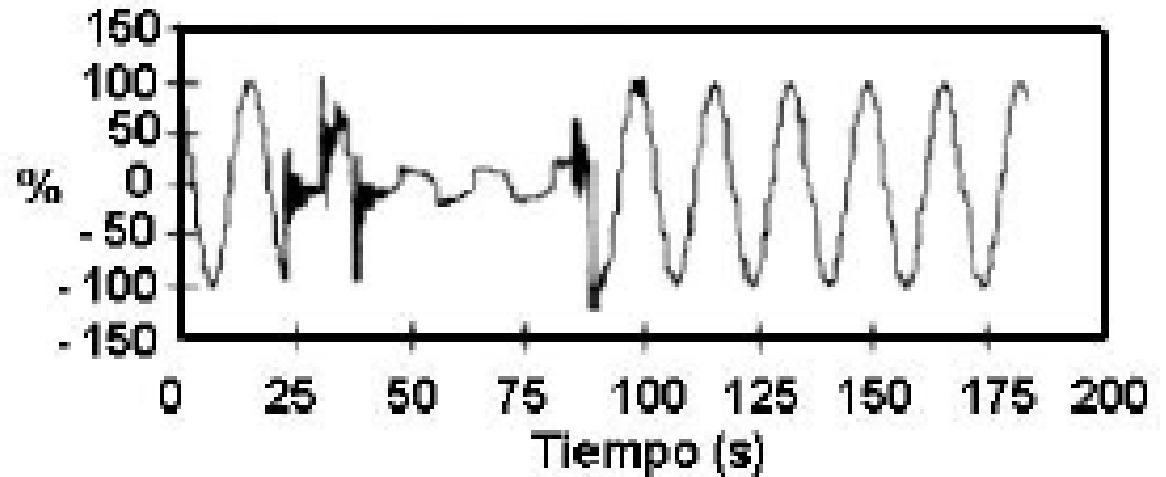
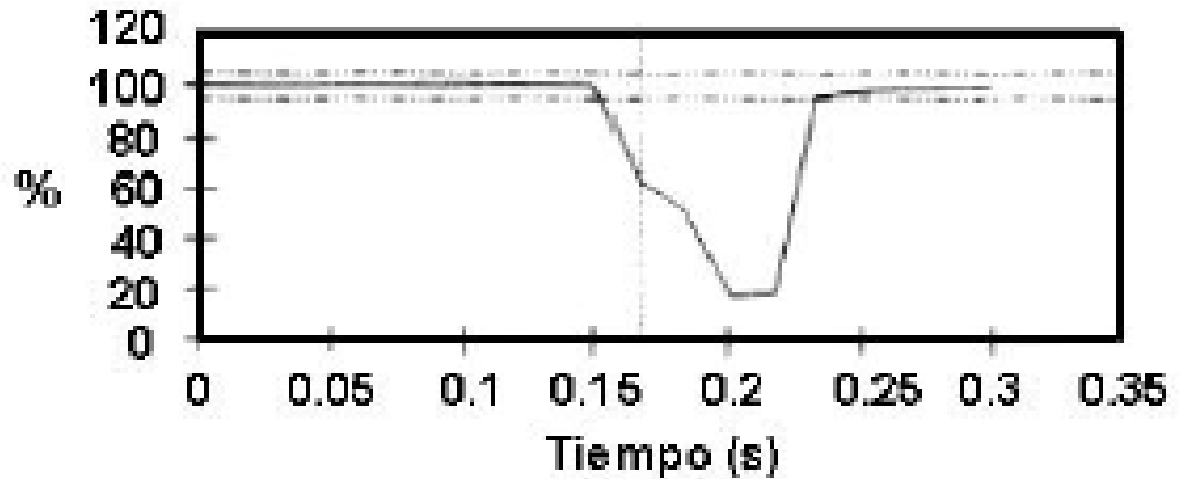
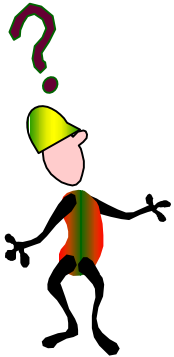
Interrupción





Eventos

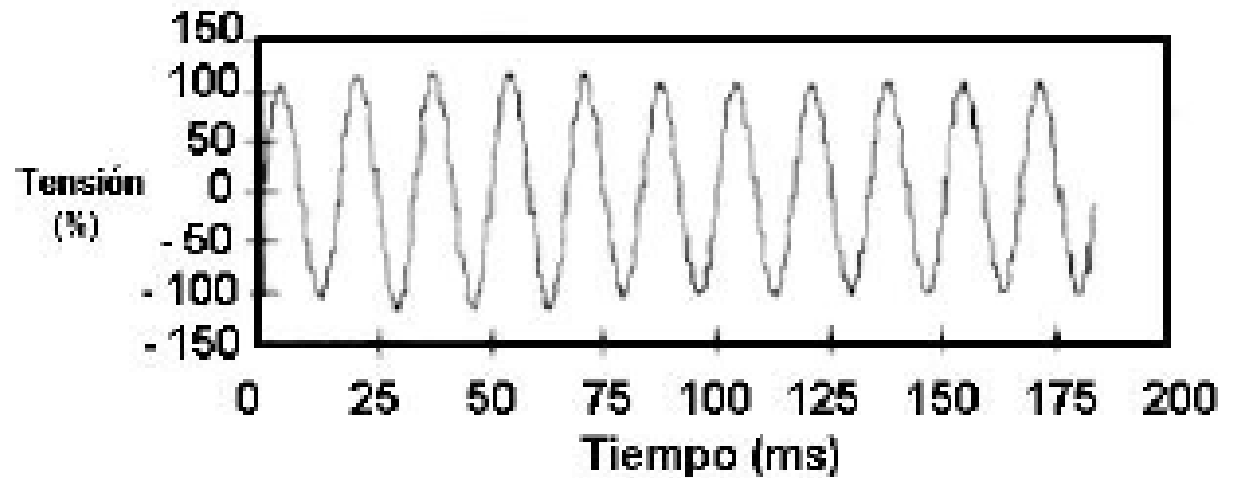
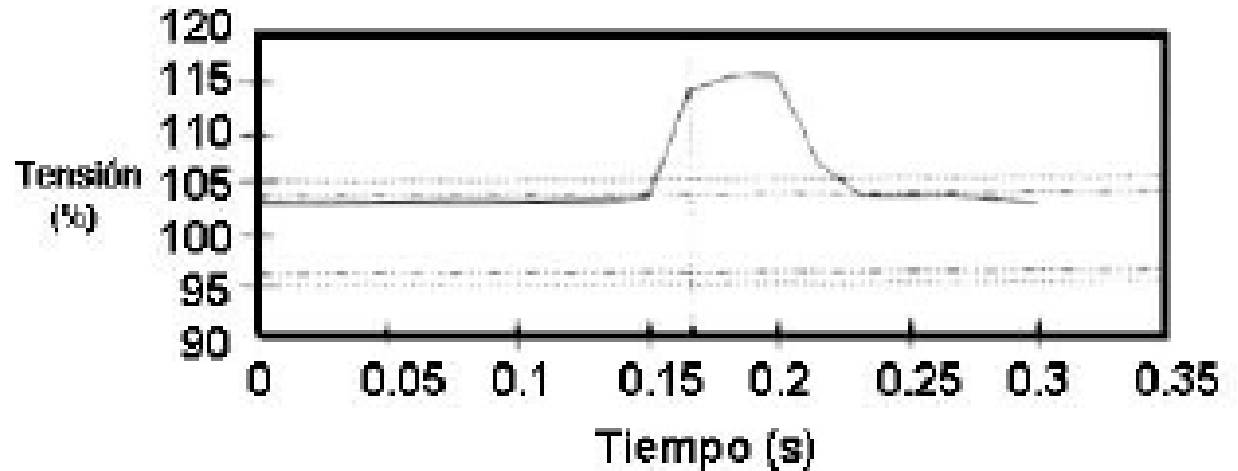
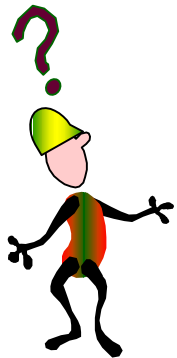
Sag o Dip





Eventos

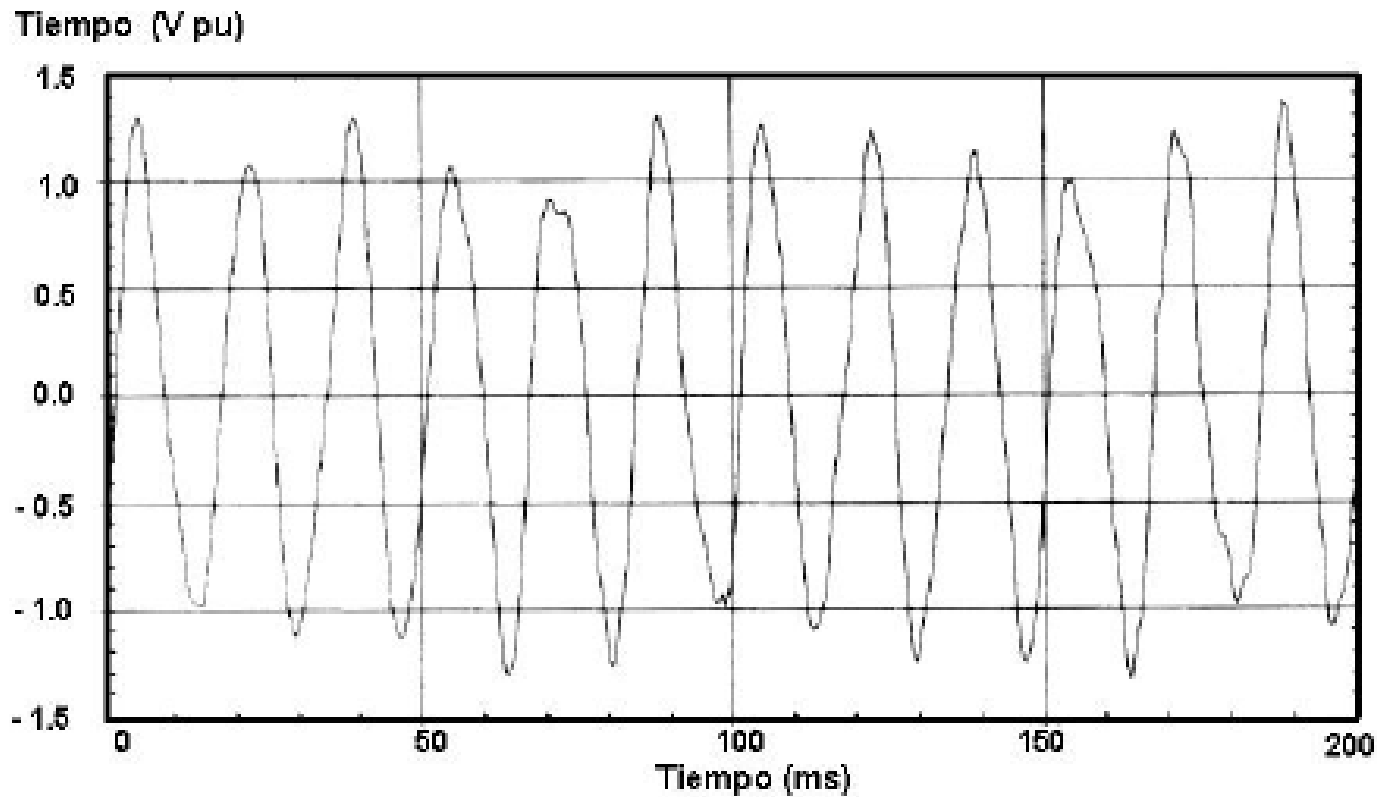
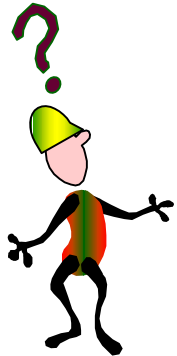
Swell





Distorsiones de onda

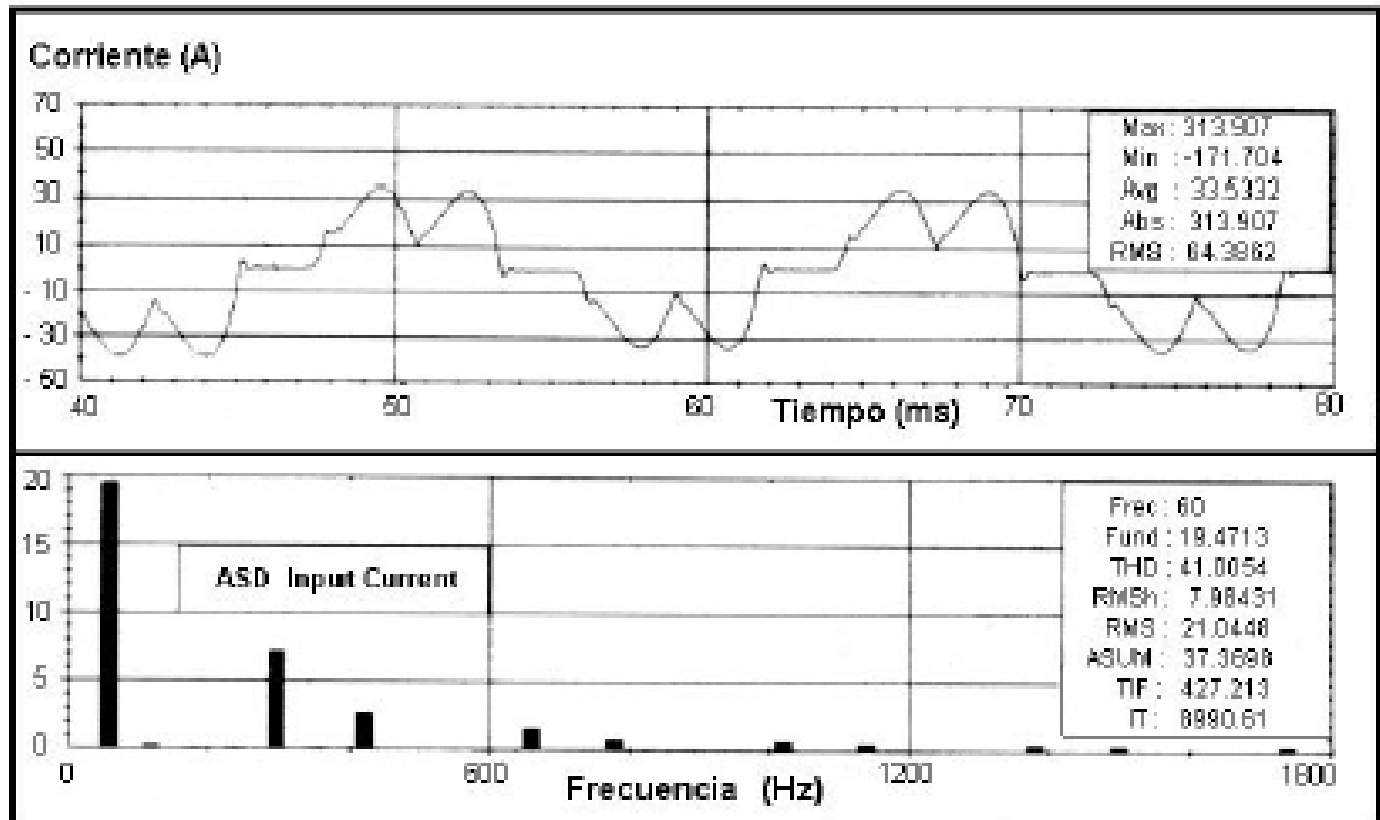
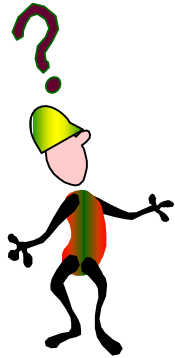
Flicker





Distorsiones de onda

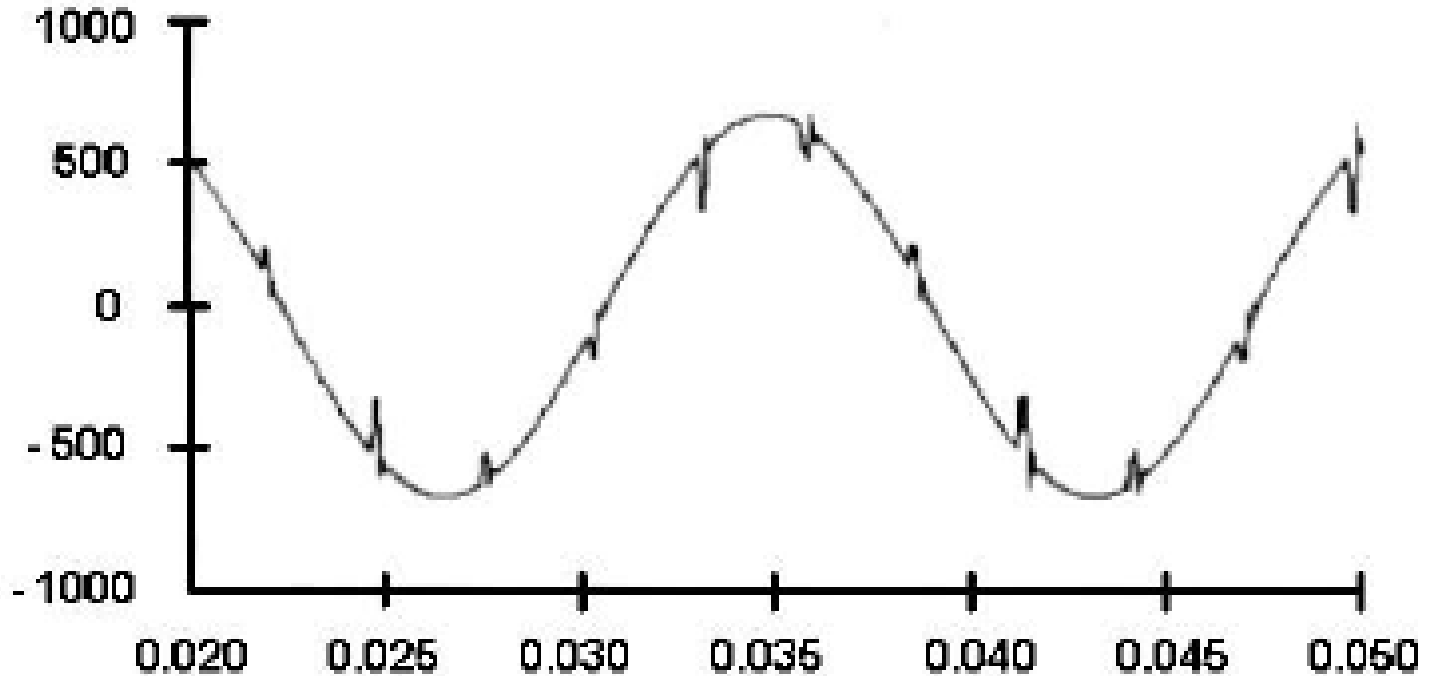
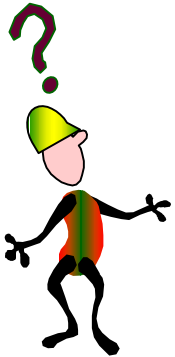
Armónicos





Distorsiones de onda

Notch





Huecos



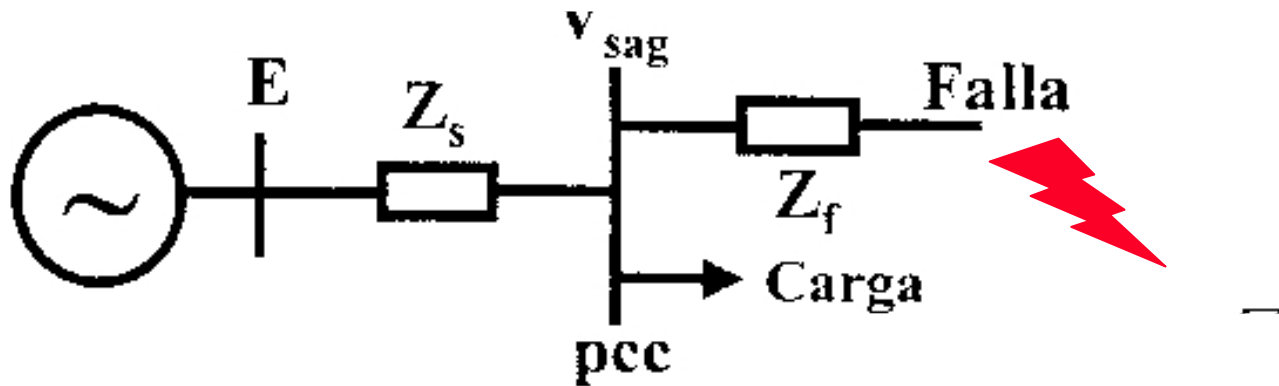
Tipos de Huecos



Tipos de : Fallas vs Huecos



Sistema básico

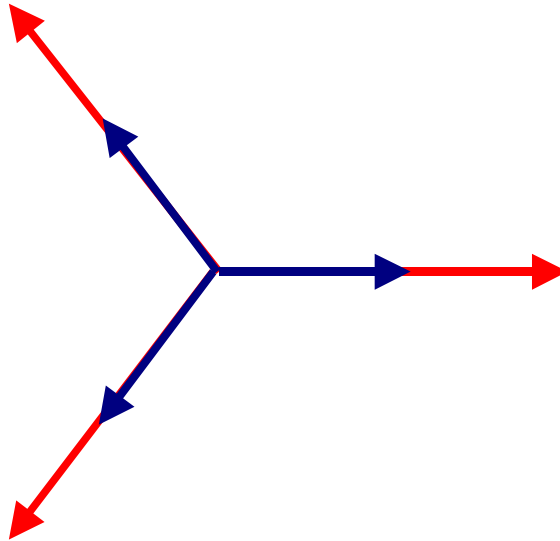




Tipos de Huecos



Tipo A



$$V_a = V$$

$$V_b = -\frac{1}{2}V - \frac{1}{2}jV\sqrt{3}$$

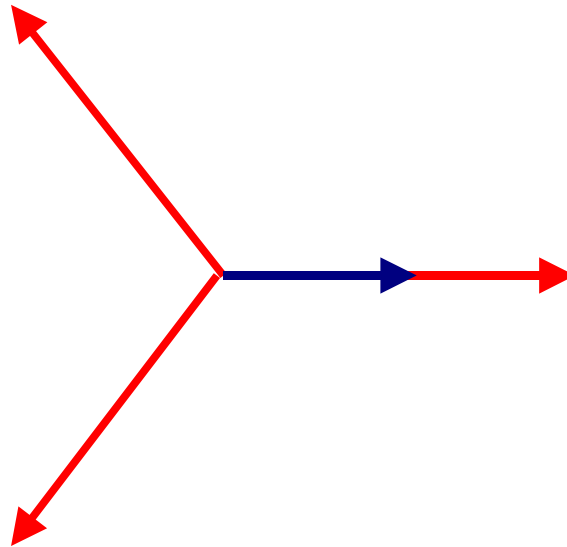
$$V_c = -\frac{1}{2}V + \frac{1}{2}jV\sqrt{3}$$



Tipos de Huecos



Tipo B



$$V_a = V$$

$$V_b = -\frac{1}{2} - \frac{1}{2} j\sqrt{3}$$

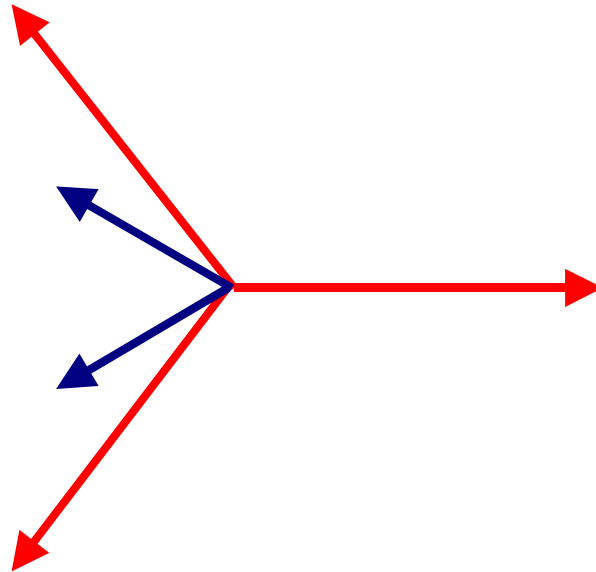
$$V_c = -\frac{1}{2} + \frac{1}{2} j\sqrt{3}$$



Tipos de Huecos



Tipo C



$$V_a = 1$$

$$V_b = -\frac{1}{2} - \frac{1}{2}jV\sqrt{3}$$

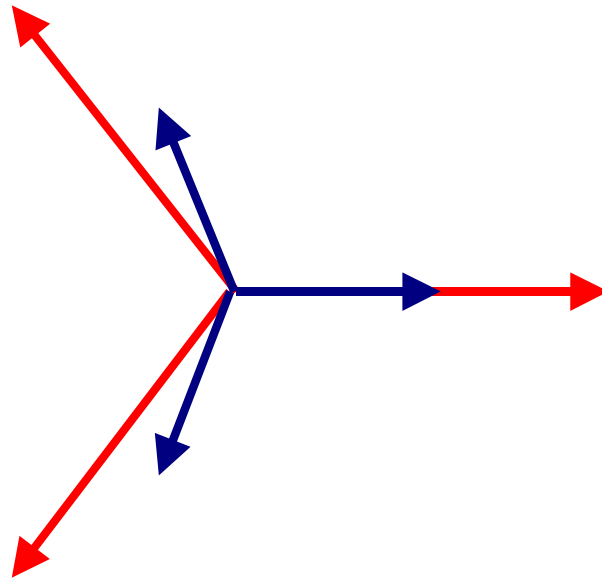
$$V_c = -\frac{1}{2} + \frac{1}{2}jV\sqrt{3}$$



Tipos de Huecos



Tipo D



$$V_a = V$$

$$V_b = -\frac{1}{2}V - \frac{1}{2}j\sqrt{3}$$

$$V_c = -\frac{1}{2}V + \frac{1}{2}j\sqrt{3}$$

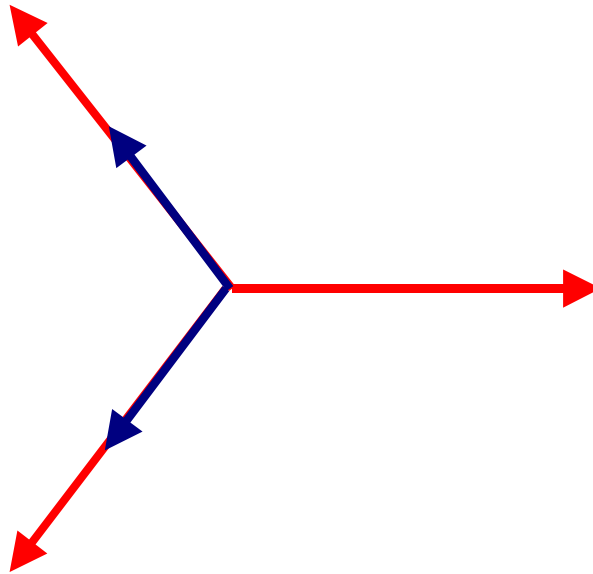


Tipos de Huecos



Fallas bifásicas a tierra

Tipo E



$$V_a = 1$$

$$V_b = -\frac{1}{2}V - \frac{1}{2}Vj\sqrt{3}$$

$$V_c = -\frac{1}{2}V + \frac{1}{2}Vj\sqrt{3}$$

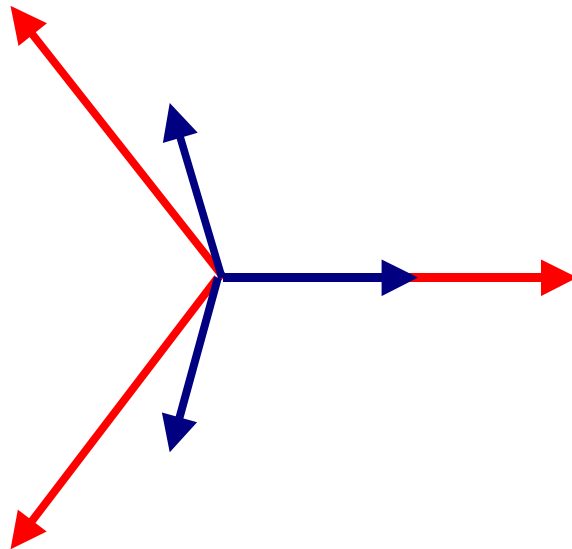


Tipos de Huecos



Fallas bifásicas a tierra

Tipo F



$$V_a = V$$

$$V_b = -\frac{1}{3}j\sqrt{3} - \frac{1}{2}V - \frac{1}{6}Vj\sqrt{3}$$

$$V_c = +\frac{1}{3}j\sqrt{3} - \frac{1}{2}V + \frac{1}{6}Vj\sqrt{3}$$

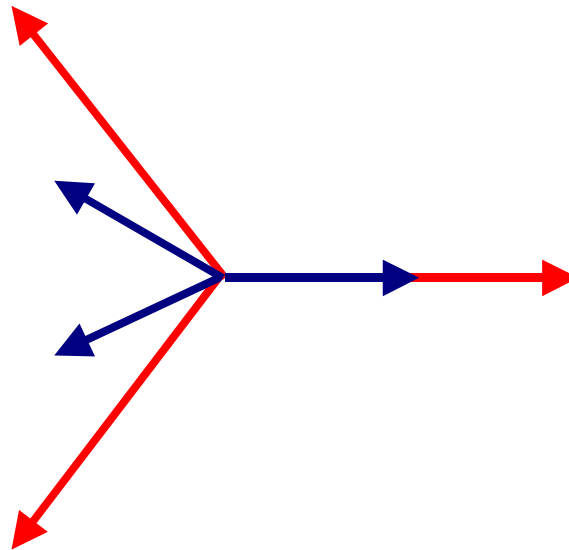


Tipos de Huecos



Fallas bifásicas a tierra

Tipo G



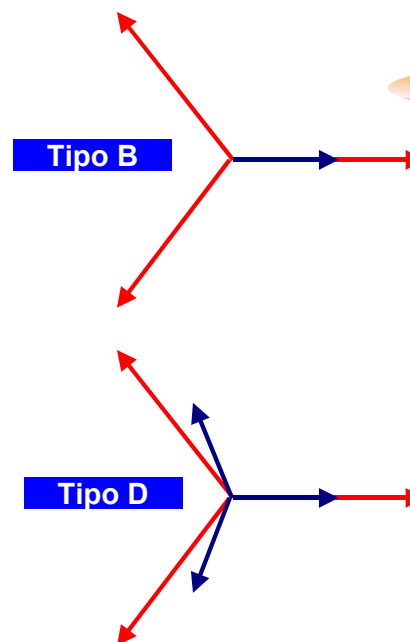
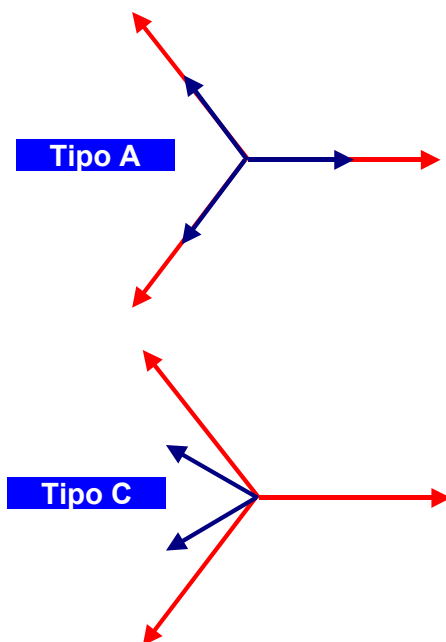
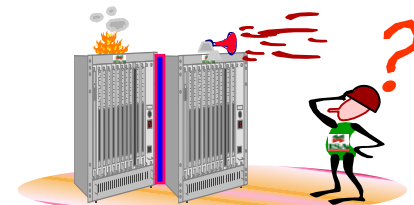
$$V_a = \frac{2}{3} + \frac{1}{3}V$$

$$V_b = -\frac{1}{3} - \frac{1}{6}V - \frac{1}{2}Vj\sqrt{3}$$

$$V_c = -\frac{1}{3} - \frac{1}{6}V + \frac{1}{2}Vj\sqrt{3}$$



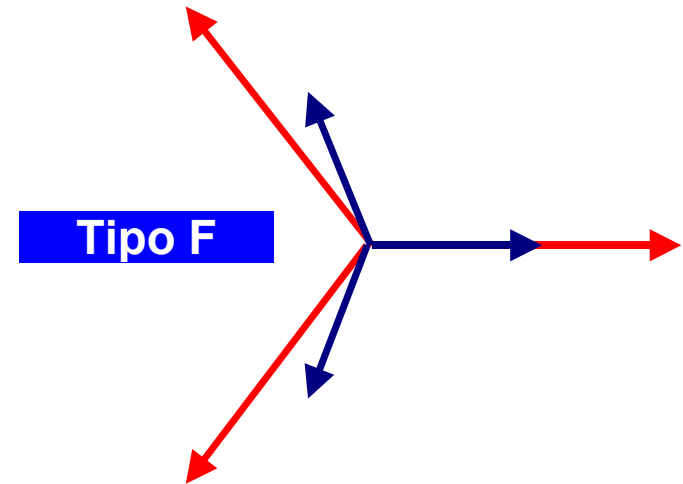
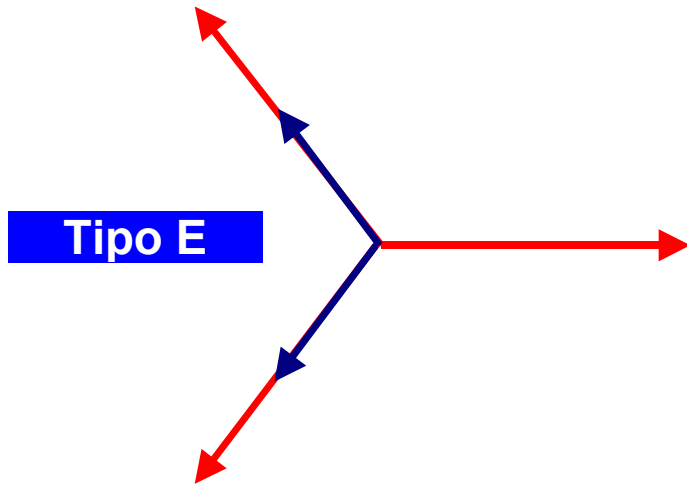
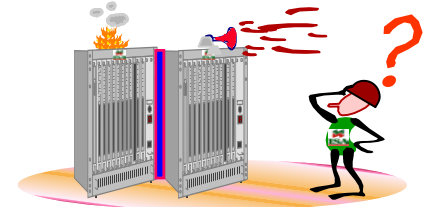
Huecos - Fallas



Tipo de falla	Carga en estrella	Carga en Delta
Trifásica	Sag A	Sag A
Fase – fase	Sag C	Sag D
Monofásica	Sag B	Sag C



Huecos - Fallas



Tipo de falla	Carga en estrella	Carga en Delta
Dos fases a tierra	Sag E	Sag F