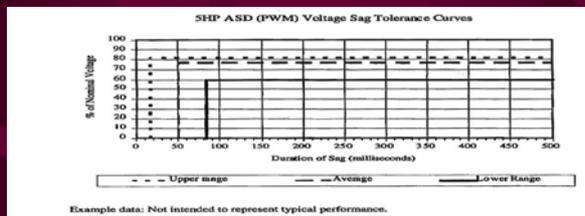
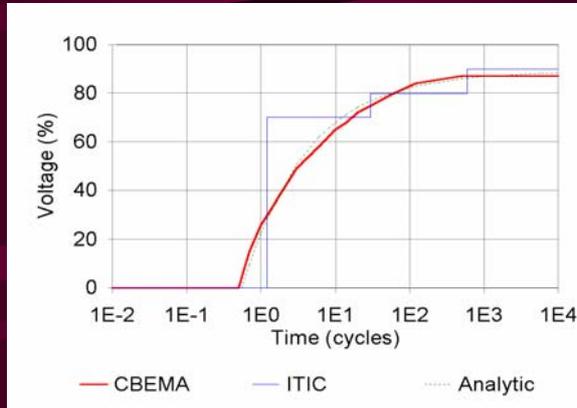


# Inmunidad a los huecos de tensión

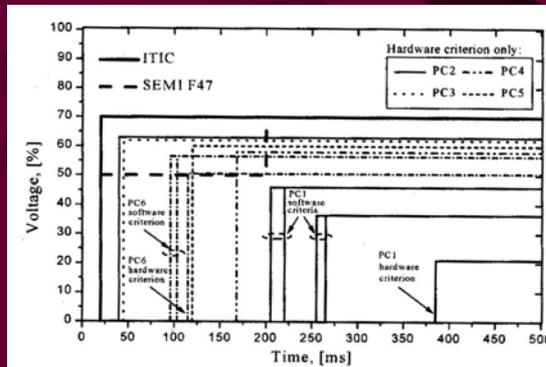
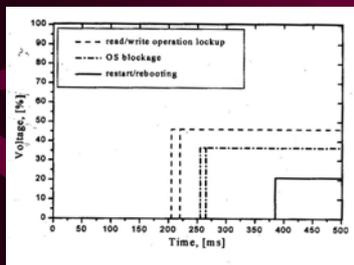


Example data: Not intended to represent typical performance.

# Inmunidad de computadoras personales

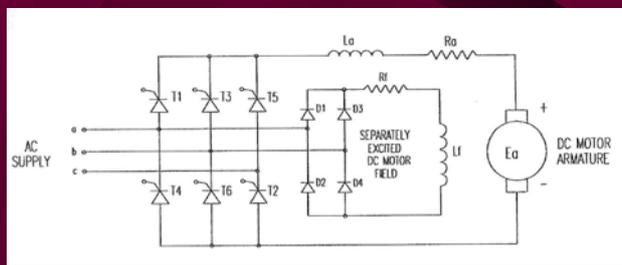
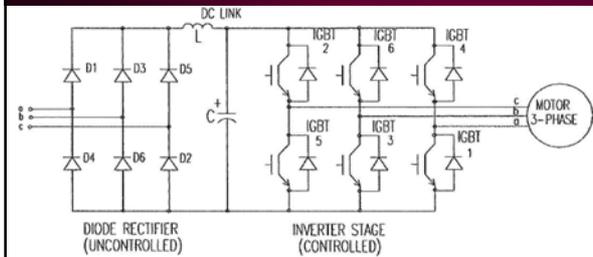
## Incremento de costo de fuentes de PC

Características adicionales	Incremento (%)
Fuente de alimentación básica	0
Protección contra sobretensiones transitorias (1 puerto)	3
Eliminación de armónicas y factor de potencia unitario	16
Soportar huecos de 1/2 segundo	25
Protección contra sobretensiones transitorias (todos los puertos)	20
Descarga electrostática	10
Todas las mejoras juntas	74



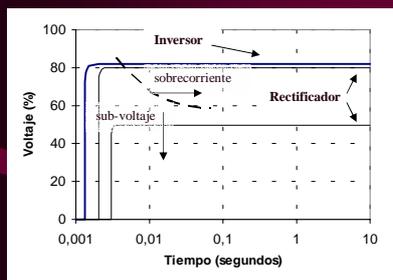
# Equipos sensibles particulares I

## Variador de velocidad CA y CC

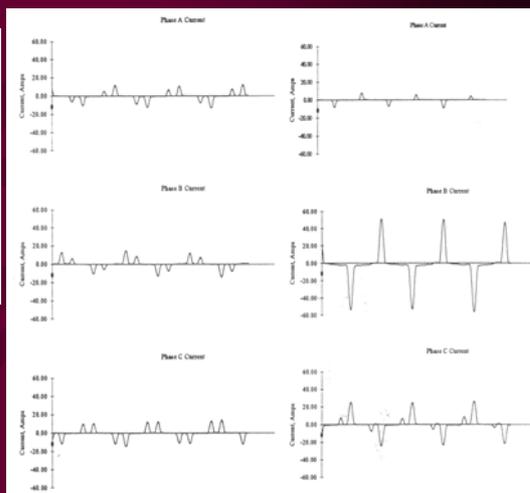


# Equipos sensibles particulares I

## Variador de velocidad CA



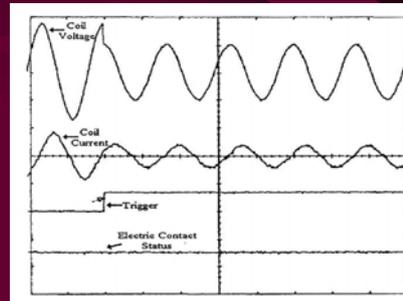
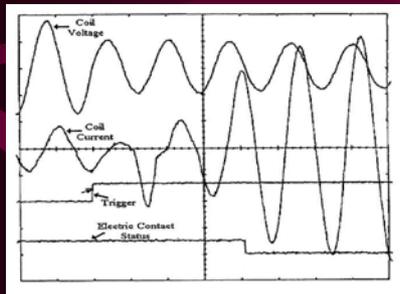
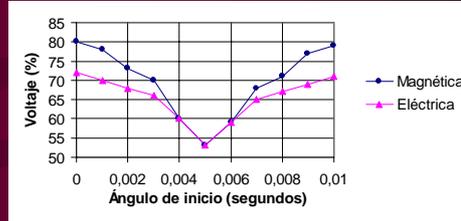
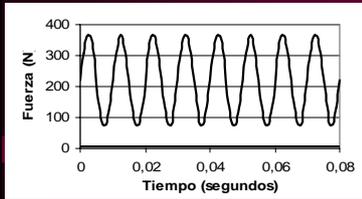
Immunity for magnitude of voltage



Effect of voltage imbalance

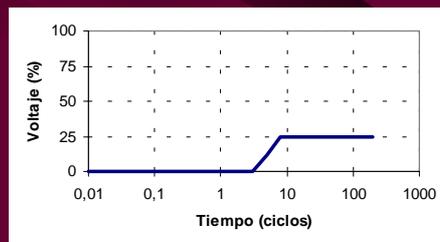
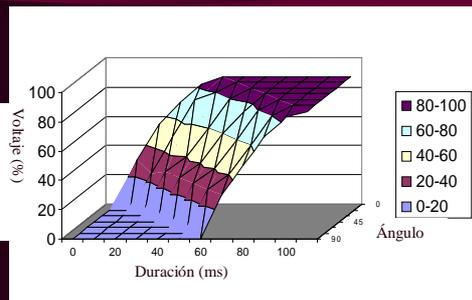
# Equipos sensibles particulares II

## Contadores



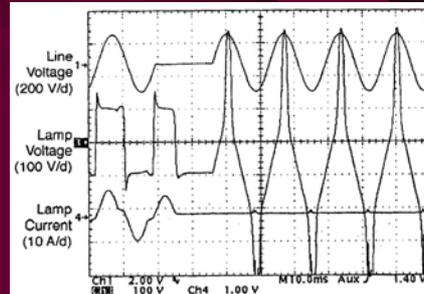
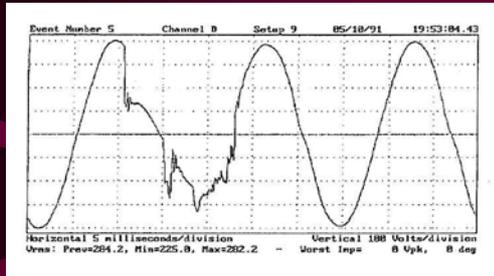
# Equipos sensibles particulares II

## Contadores



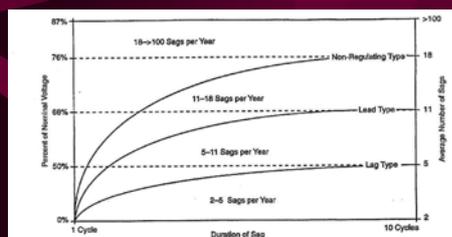
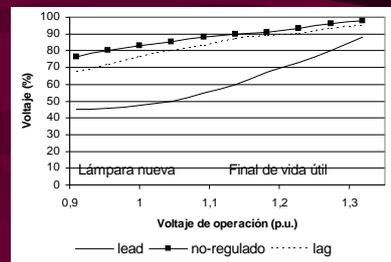
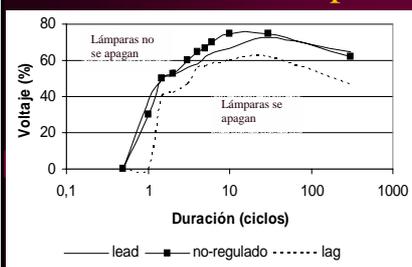
# Equipos sensibles particulares III

## Lámparas de vapor de sodio

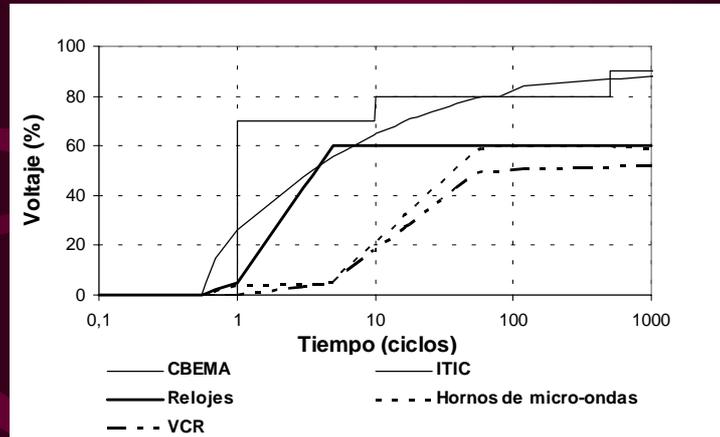


# Equipos sensibles particulares III

## Lámparas de vapor de sodio



# Electrodomésticos

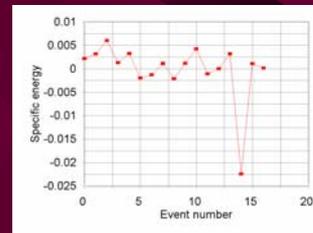
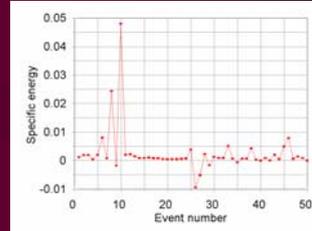
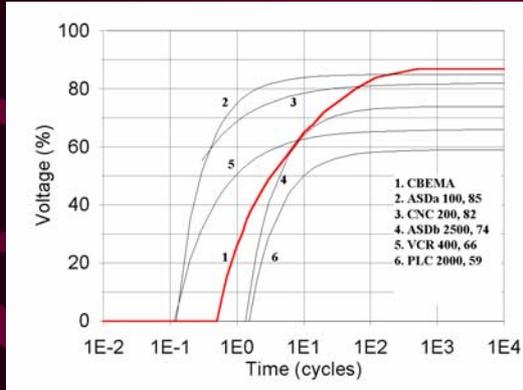


Inmunidad frente a huecos de tensión de equipos locales.

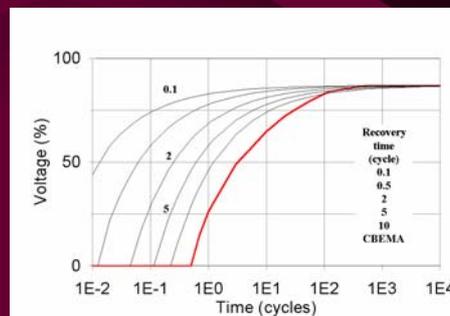
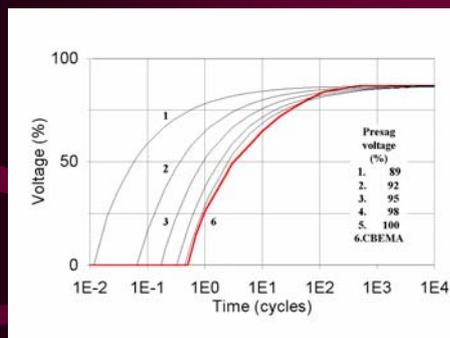
Hueco de tensión		Equipo ensayado				
Magnitud (%)	Duración (ms)	PLC	PC	Contactor	Lámpara de Mercurio	Lámpara de Sodio
87	42	+	+	+	+	+
	181	+	+	+	+	+
	339	+	+	+	+	+
	618	+	+	+	+	+
68	42	+	+	+	+	+
	181	+	+	+	+	*
	339	+	+	*	*	*
	618	+	+	*	*	*
54	42	+	+	*	*	*
	181	+	+	*	*	*
	339	+	+	*	*	*
	618	+	*	*	*	*
40	42	+	+	*	*	*
	181	+	+	*	*	*
	339	+	*	*	*	*
	618	+	*	*	*	*
20	42	+	+	*	*	*
	181	+	+	*	*	*
	339	+	*	*	*	*
	618	+	*	*	*	*
6	42	+	+	*	*	*
	181	+	+	*	*	*
	339	+	*	*	*	*
	618	+	*	*	*	*

Nota: \* en fondo sombreado, indica salida de servicio.

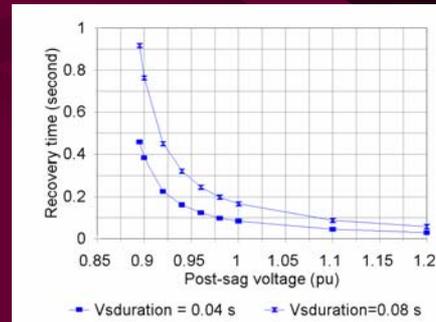
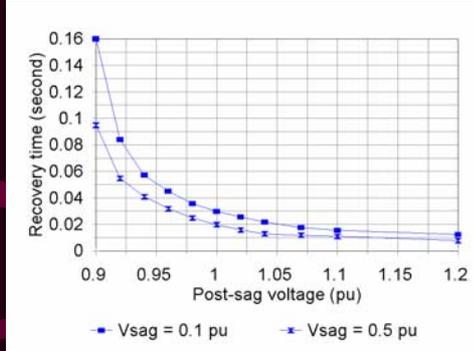
# Concepto de Energía Específica



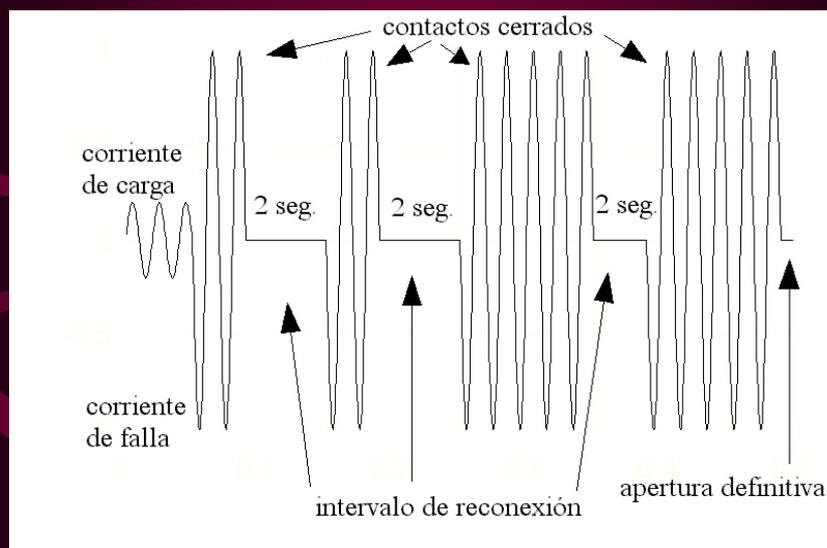
# Aplicación del concepto



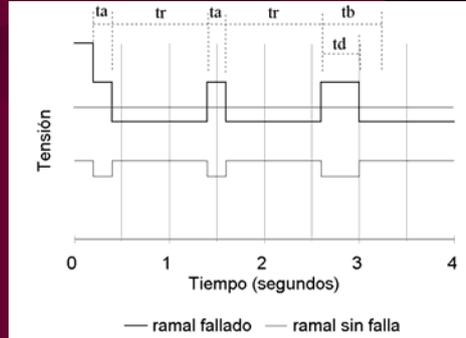
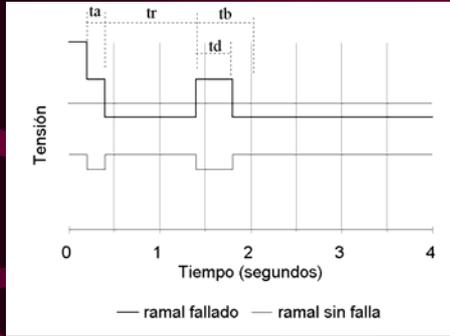
## Aplicación del concepto



## Operación de un reconectador

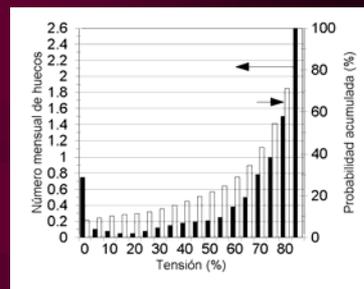
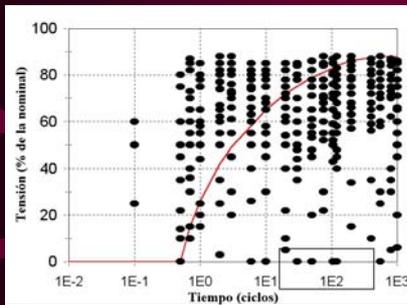


# Coordinación con la protección I

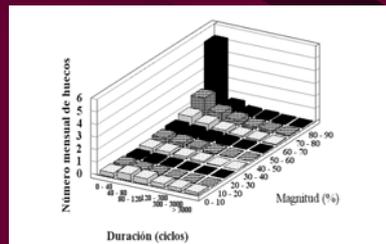


# Cambio de ajuste de la protección

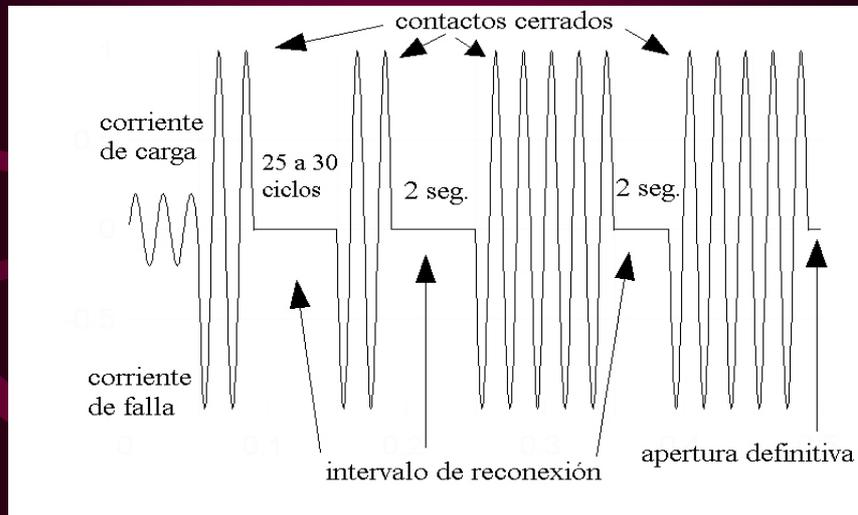
$V < 60\%$  - prob. 25 %,  $V < 10\%$  - probabilidad 10 %,  
relación daño/multa 2,5



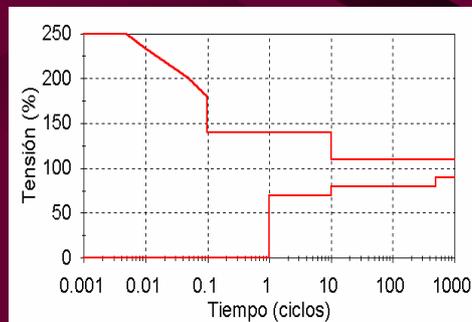
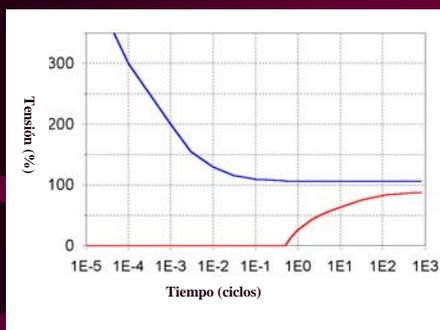
$V < 10\%$  (Int.) es el 40 %  $V < 60\%$  (Ss)  
80 % Int. evitadas con 1A3B  
80 % de 40 % es 32 % menos de Ss



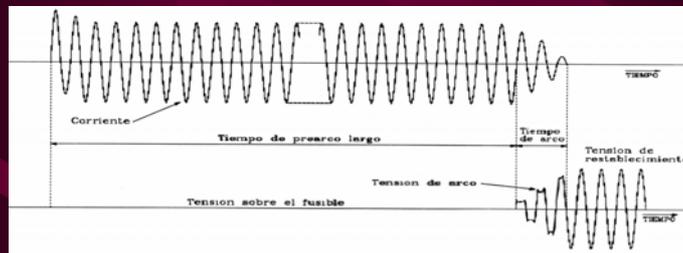
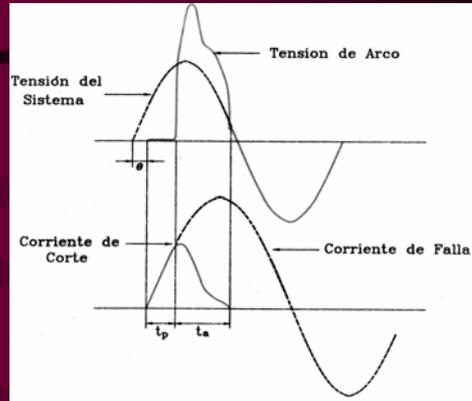
## Ciclo recomendado para Reconectador con una reconexión instantánea



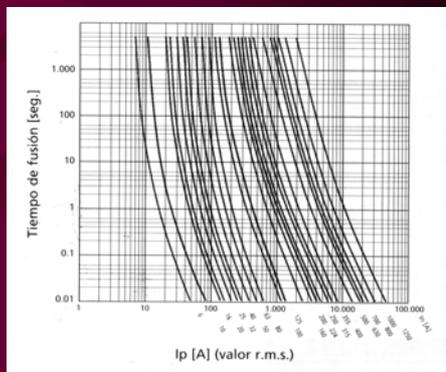
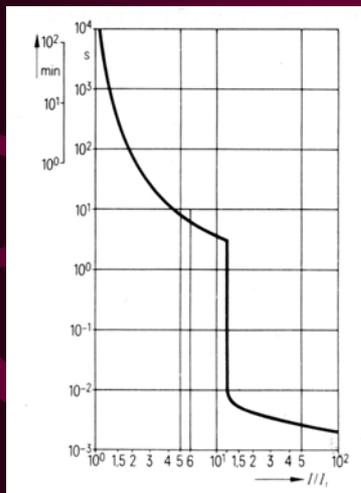
## Sobre y Subtensiones permitidas



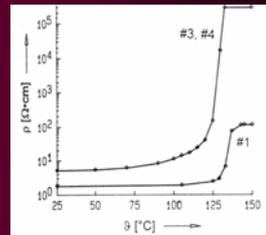
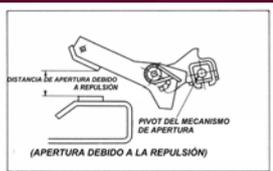
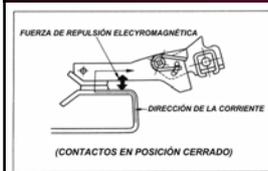
## Operación de la protección limitadora (ACR)



## Curvas características de interruptores y fusibles



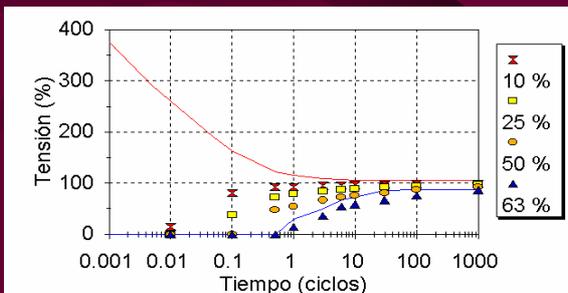
# Principios de funcionamiento de interruptores limitadores repulsión polimérico



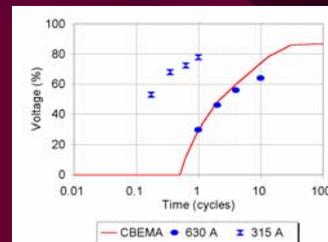
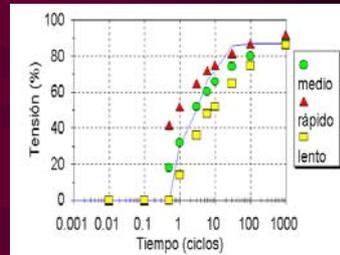
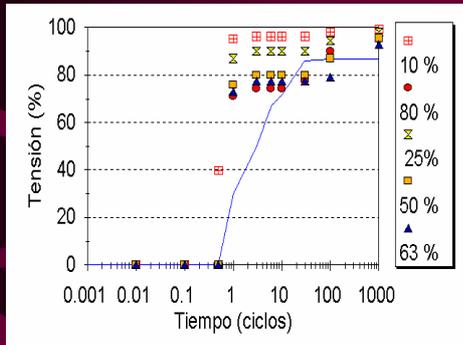
# Coordinación con la protección

Corrientes y huecos en el tiempo, para fusibles de distinto valor nominal

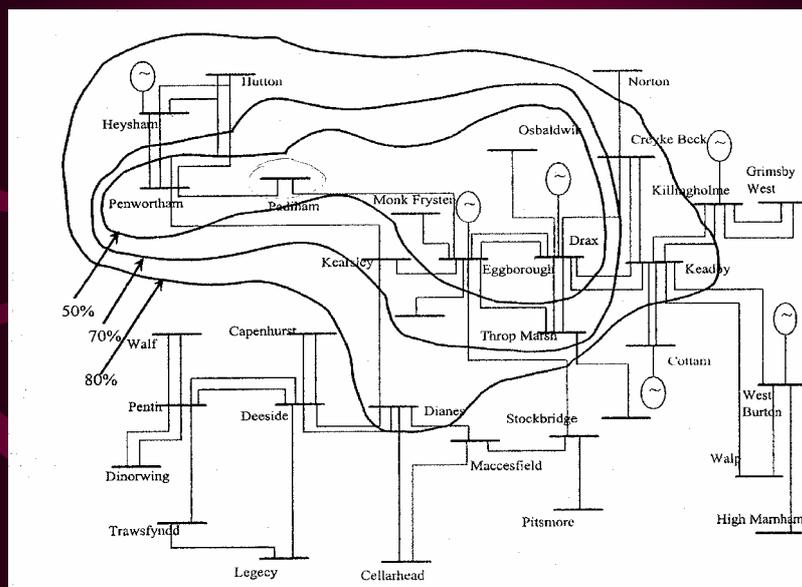
Tiempo ciclos	fusible 100 A		fusible 250 A		Fusible 500 A		fusible 630 A	
	$I_{falla}$ kA	Hueco %	$I_r$ kA	H. %	$I_r$ kA	H. %	$I_r$ kA	H. %
0,01	21,5	14	25,0	0	25,0	0	25,0	0
0,1	4,8	80,8	15,6	37,4	25,0	0	25,0	0
0,5	2,15	91,4	7,0	72	13,0	48	20,5	18
1	1,8	92,8	5,4	78,4	11,5	54	17,0	32
3	1,3	94,8	4,0	84	8,4	66,4	12,0	52
6	1,05	95,8	3,1	87,6	7,0	72	9,9	60,4
10	0,93	96,3	2,9	88,4	6,05	75,8	8,5	66
30	0,73	97,1	2,15	91,4	4,7	81,2	6,4	74,4
100	0,54	97,8	1,50	94	3,1	87,6	5,0	80
1000	0,32	98,7	0,9	96,4	2,0	92	2,7	89,2



## Comparación curvas características tiempo - corriente con tiempo - tensión

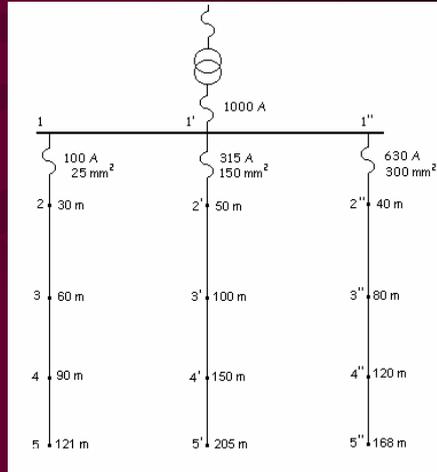


## Zona vulnerable

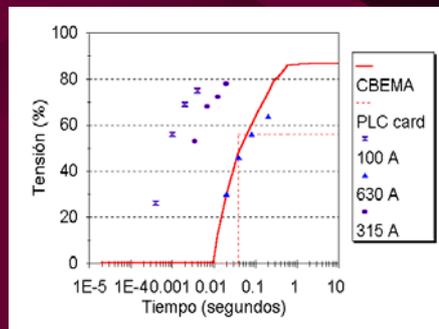
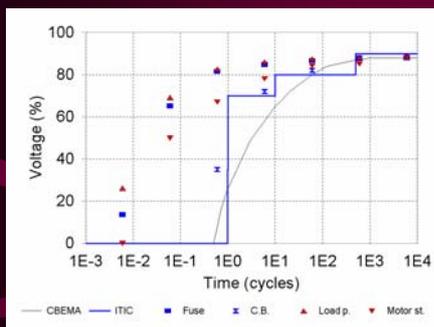


## Vulnerabilidad en función de la distancia a la falla

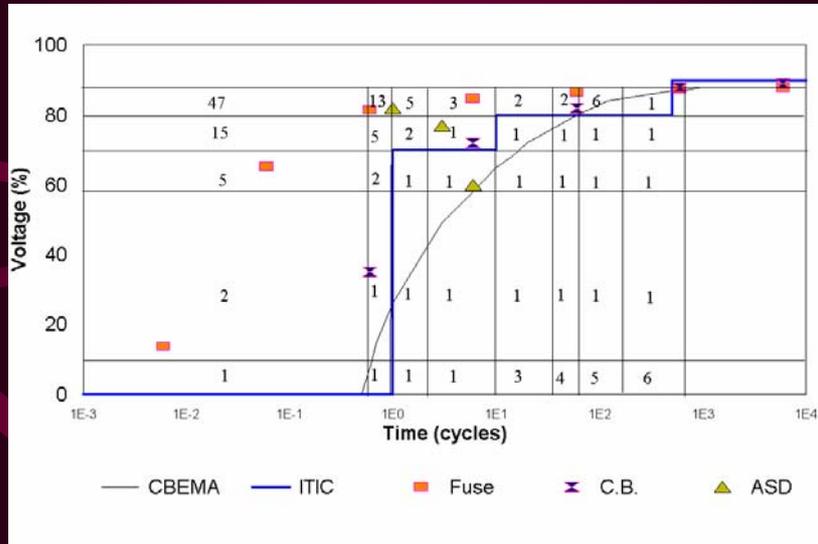
Punto en falla	Intensidad (A)	Tensión residual (%)	Duración (s)
1"	22.680	0	0,03
2"	15.891	30	0,02
3"	12.230	46	0,04
4"	9.940	56	0,08
5"	8.117	64,2	0,2
2	5.966	26,3	0,0004
3	3.435	58	0,00122
4	2.412	70,2	0,0025
5	1.844	77,2	0,00423
2'	12.088	53	0,00335
3'	8.240	68	0,00721
4'	6.250	72,4	0,0125
5'	4.938	78,2	0,020



## Coordinación en gráficos t - v



# Esquema completo de coordinación



# Coordinación en gráficos t - i

