

POTENZA DI CORTOCIRCUITO



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Short Circuit ABC **Learn It in an Hour** **Use It Anywhere** **Memorize No Formula**

Moon H. Yuen, Senior Member, IEEE



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Short Circuit ABC—Learn It in an Hour, Use It Anywhere, Memorize No Formula

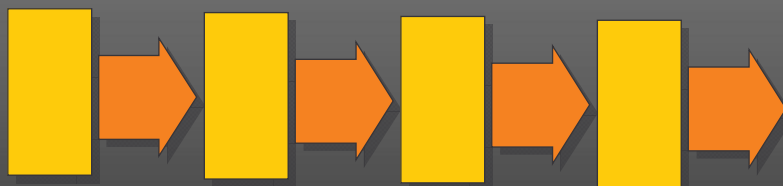
MOON H. YUEN, SENIOR MEMBER, IEEE

Abstract—Short circuit ABC—learn it in an hour, use it anywhere, memorize no formula. The MVA method for solving industrial power system short circuits appropriately fits this description. Indeed, solving short circuit problems with the MVA method is as easy as learning the ABC's.

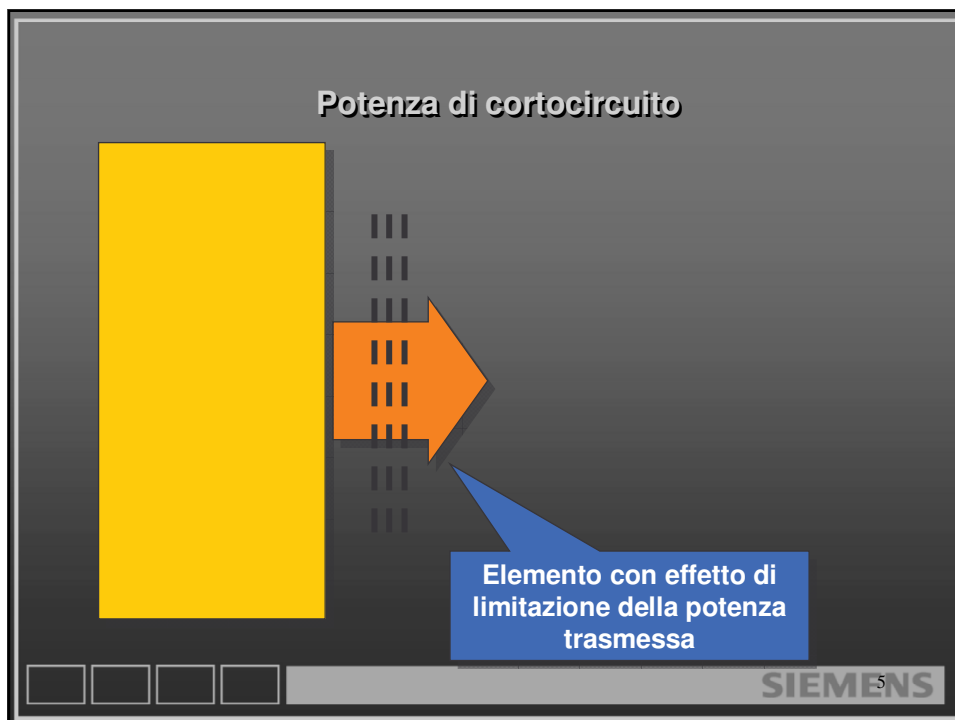
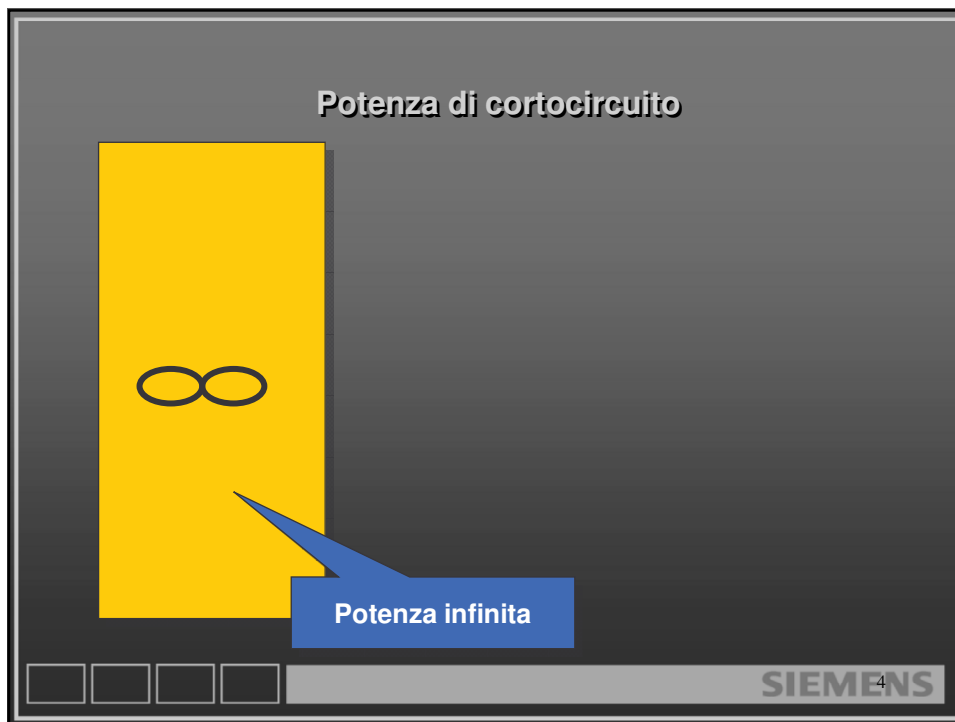


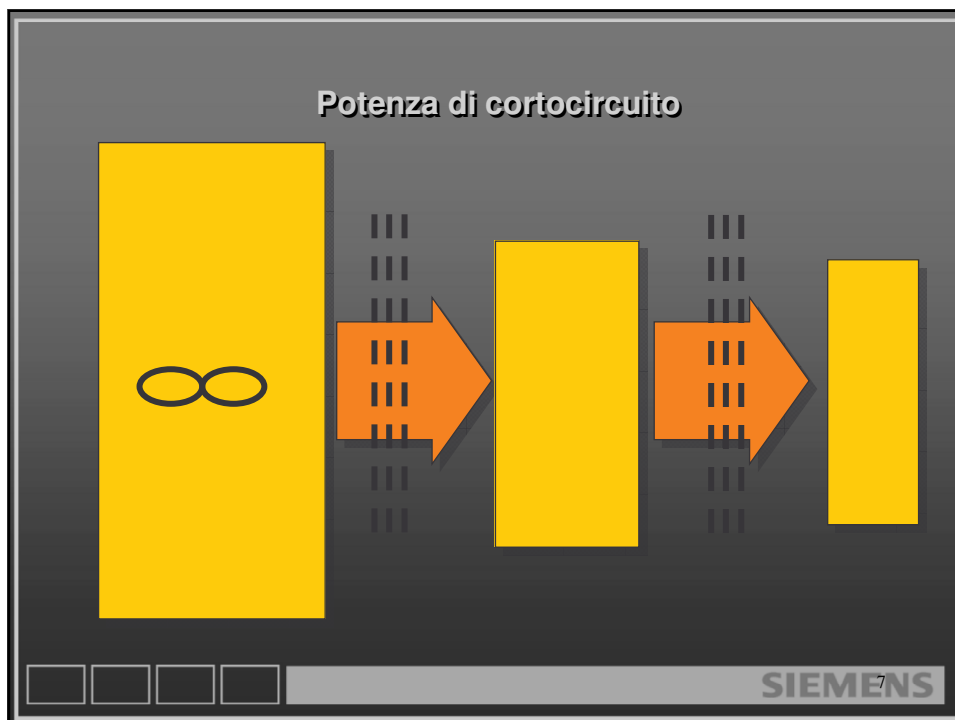
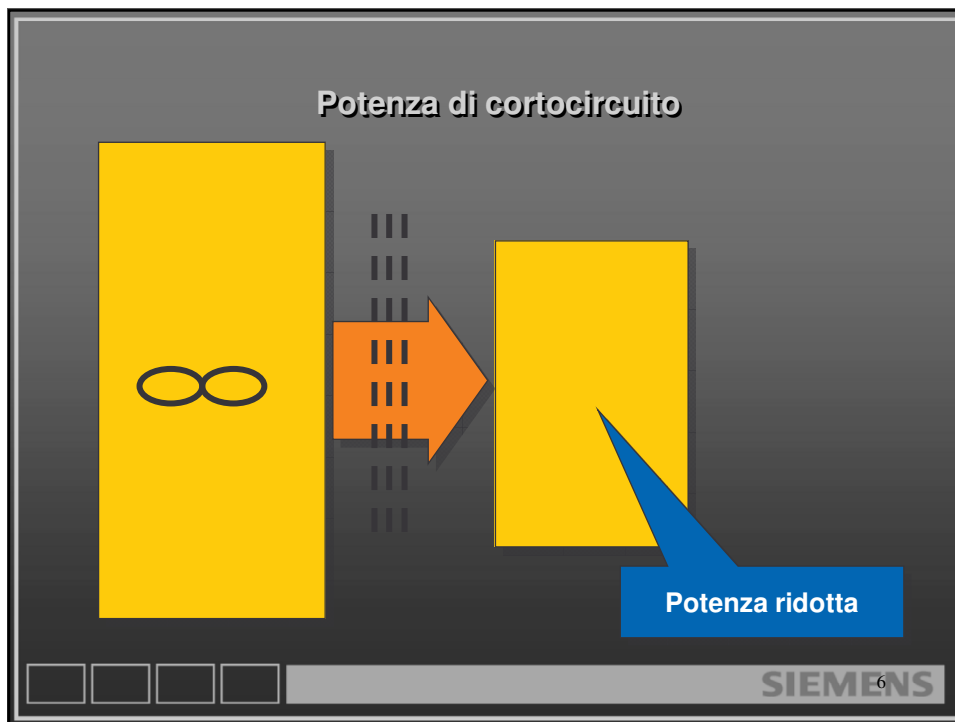
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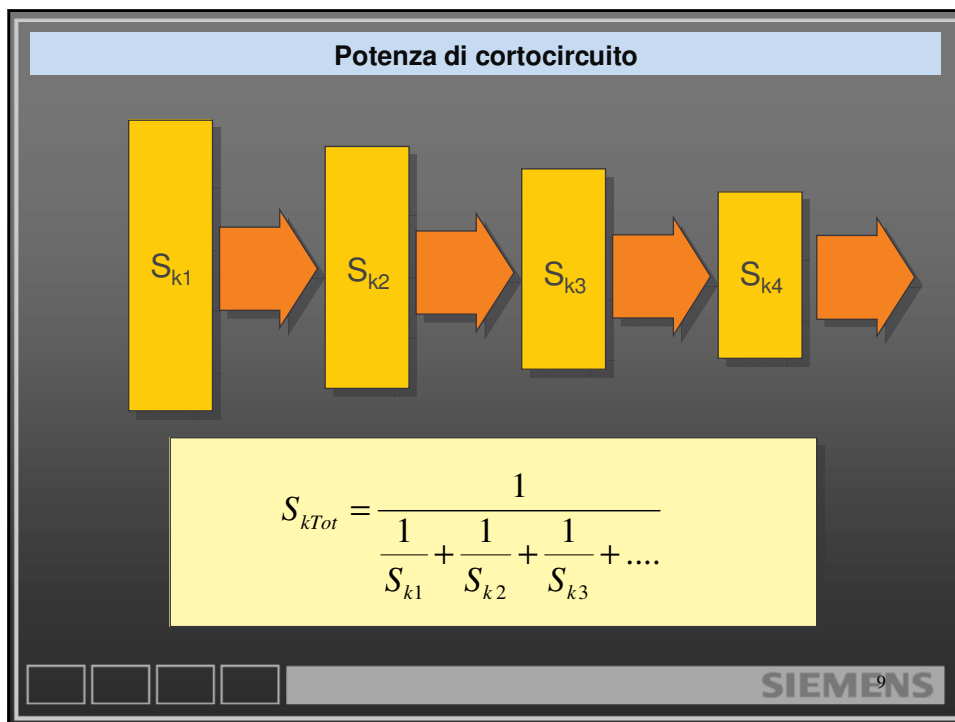
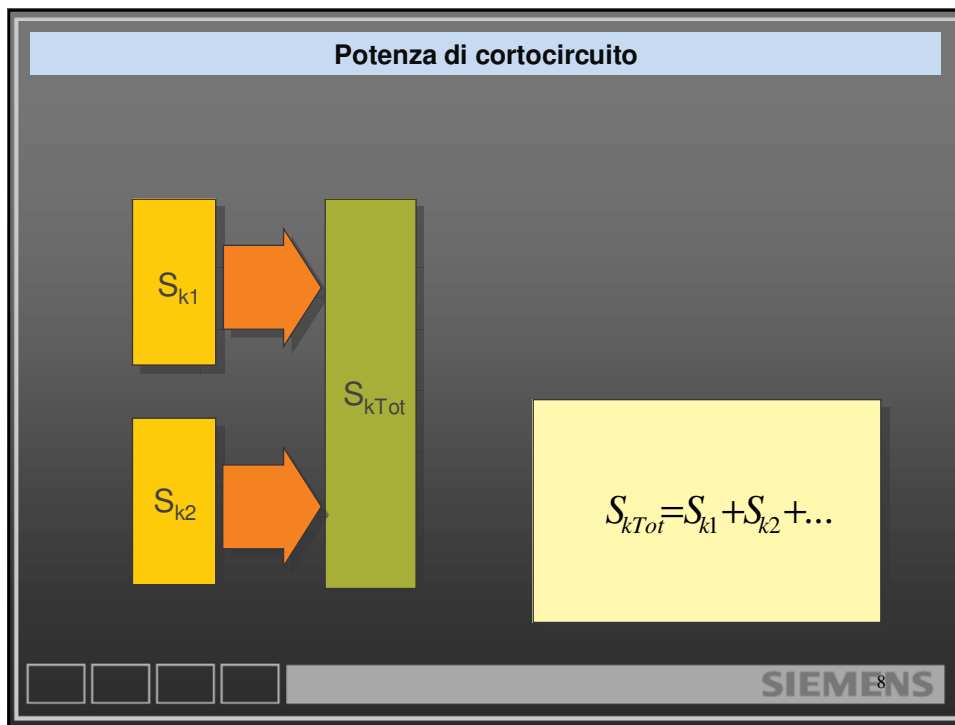
Potenza di cortocircuito

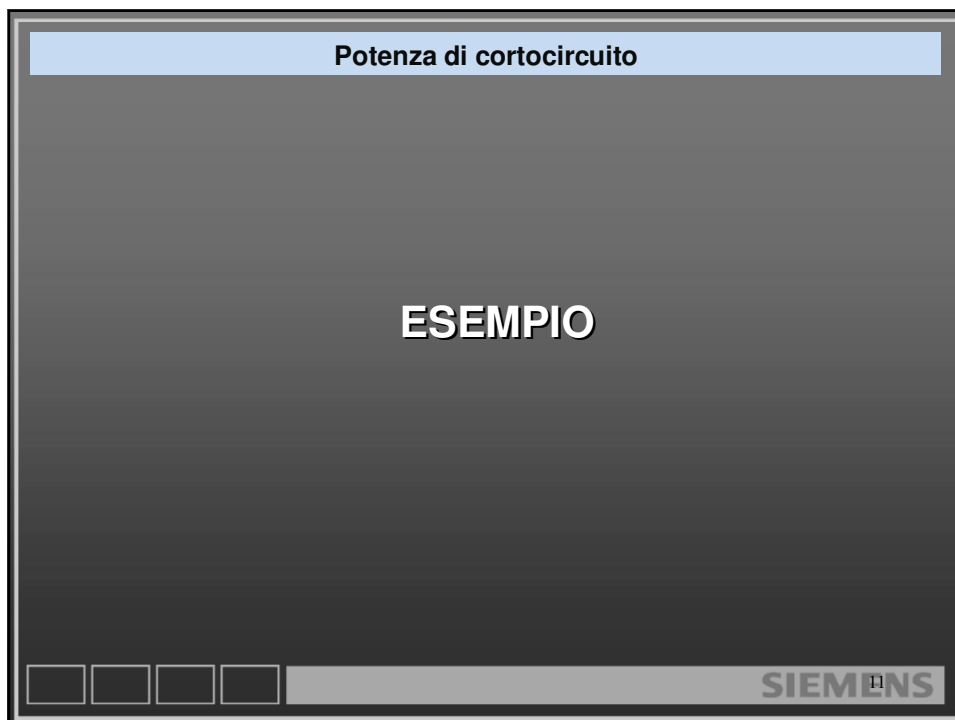
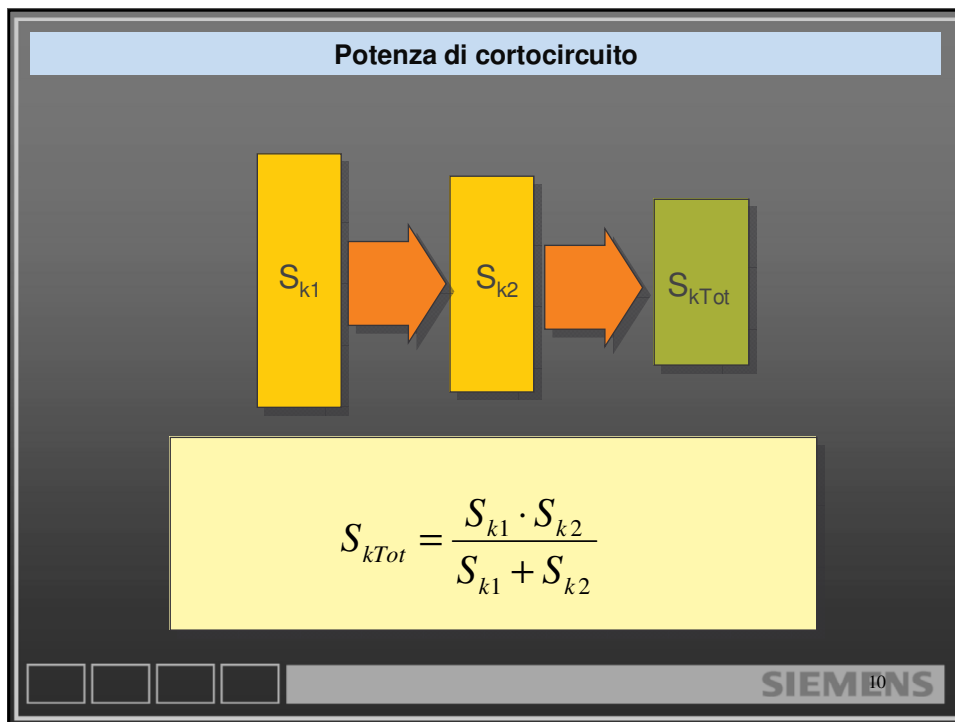


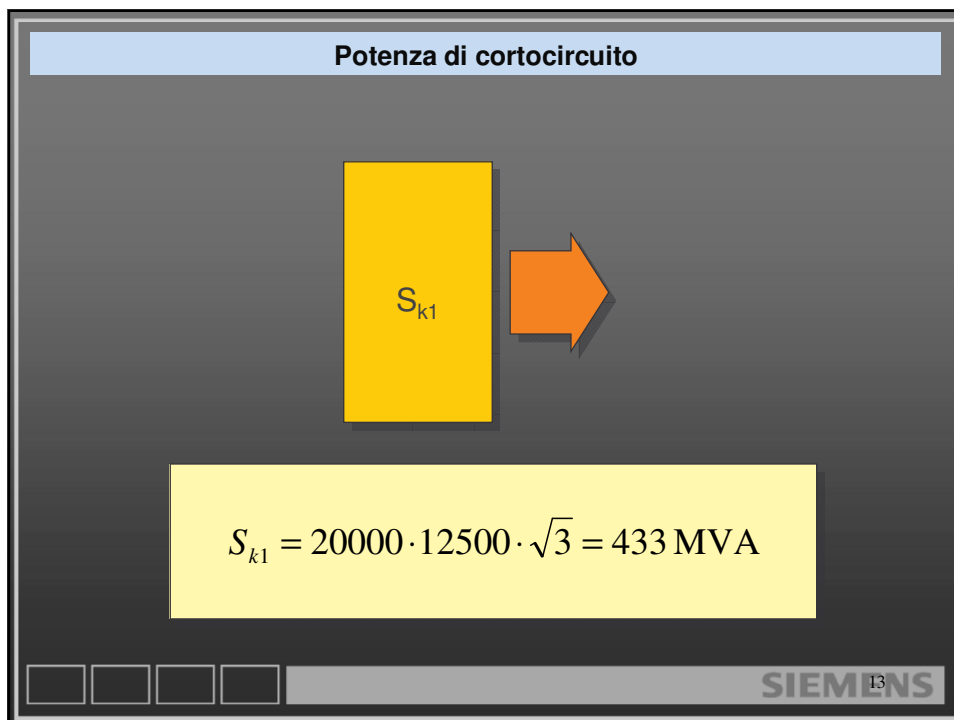
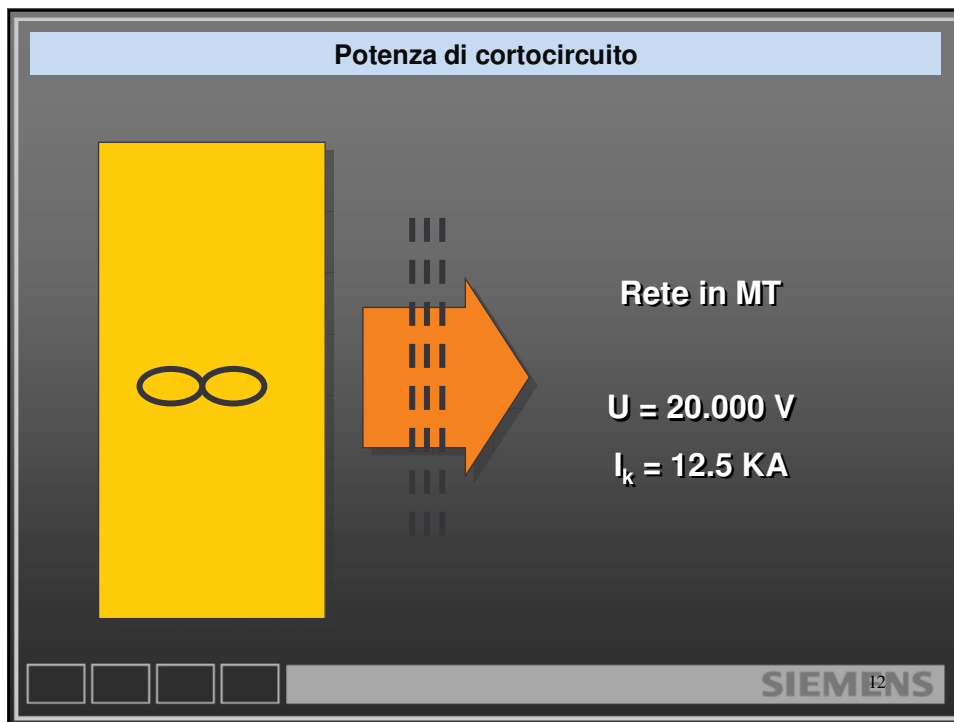
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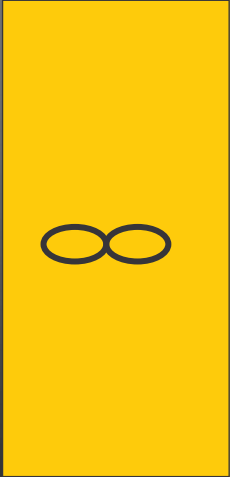


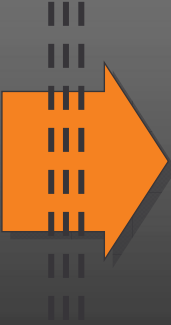






Potenza di cortocircuito



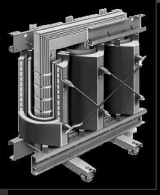


Trasformatore

20.000 / 400 V

630 kVA

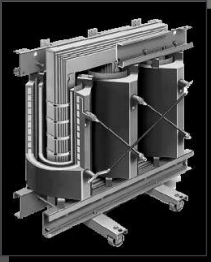
V_{cc}% = 6%



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Potenza di cortocircuito

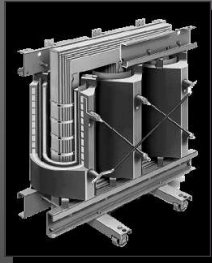


$$I_r = \frac{630.000}{400 \cdot \sqrt{3}} = 909,32 \text{ A}$$

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Potenza di cortocircuito

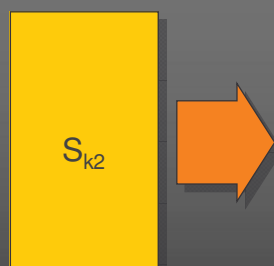


$$I_k = 909,32 \cdot \frac{100}{6} = 15.155 \text{ A}$$



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Potenza di cortocircuito



$$S_{k2} = 15.155 \cdot 400 \cdot \sqrt{3} = 10,5 \text{ MVA}$$



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Potenza di cortocircuito

$$S_{kTot} = \frac{433 \cdot 10.5}{433 + 10.5} = 10,251 \text{ MVA}$$

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Potenza di cortocircuito

$$I_k = \frac{10.250}{400 \cdot \sqrt{3}} = 14.796 \text{ A}$$

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Potenza di cortocircuito

**Confronto tra metodo MVA
e calcolo impedenze
secondo CEI 11-25**

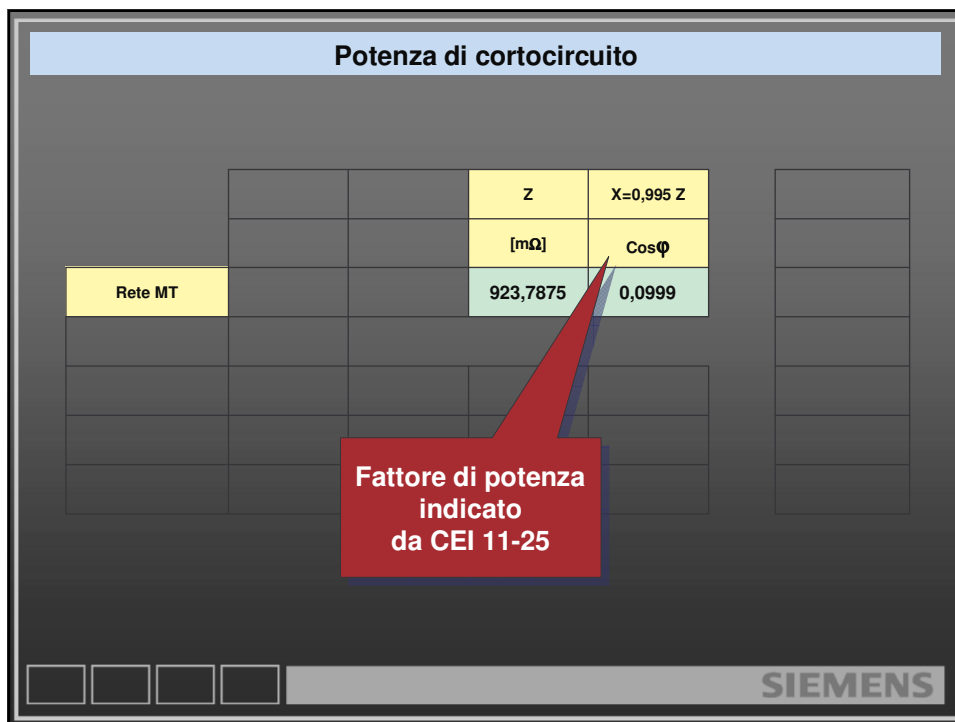
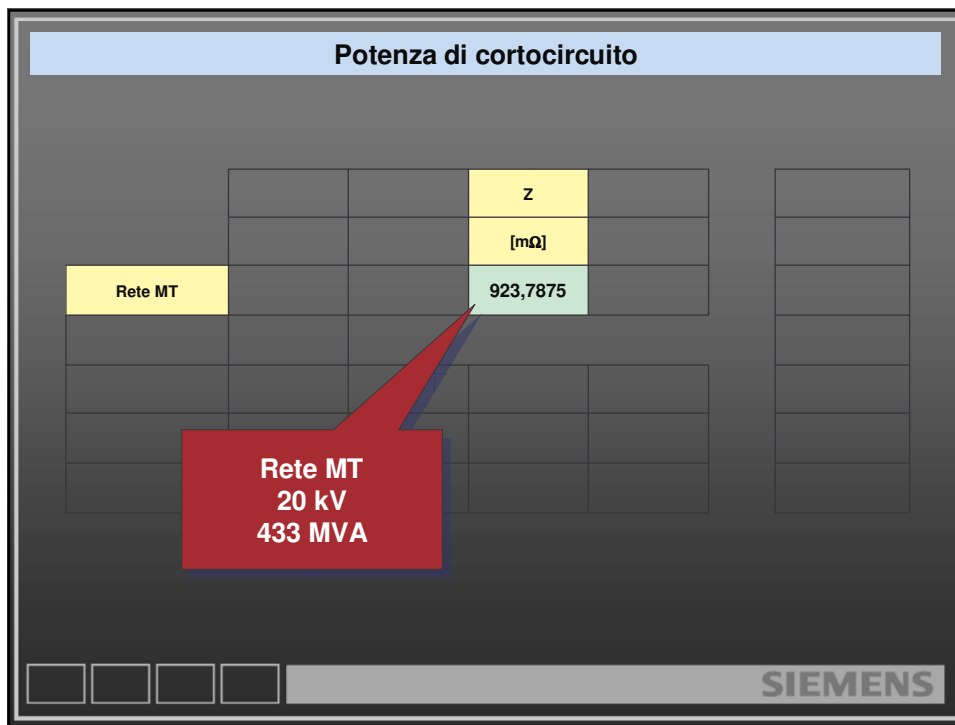
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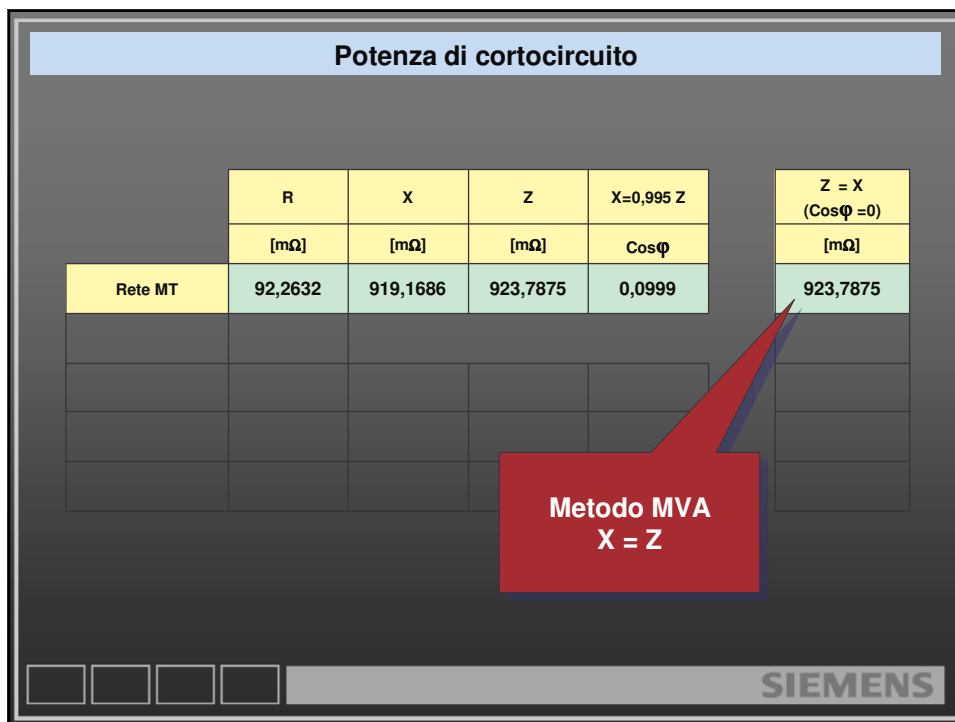
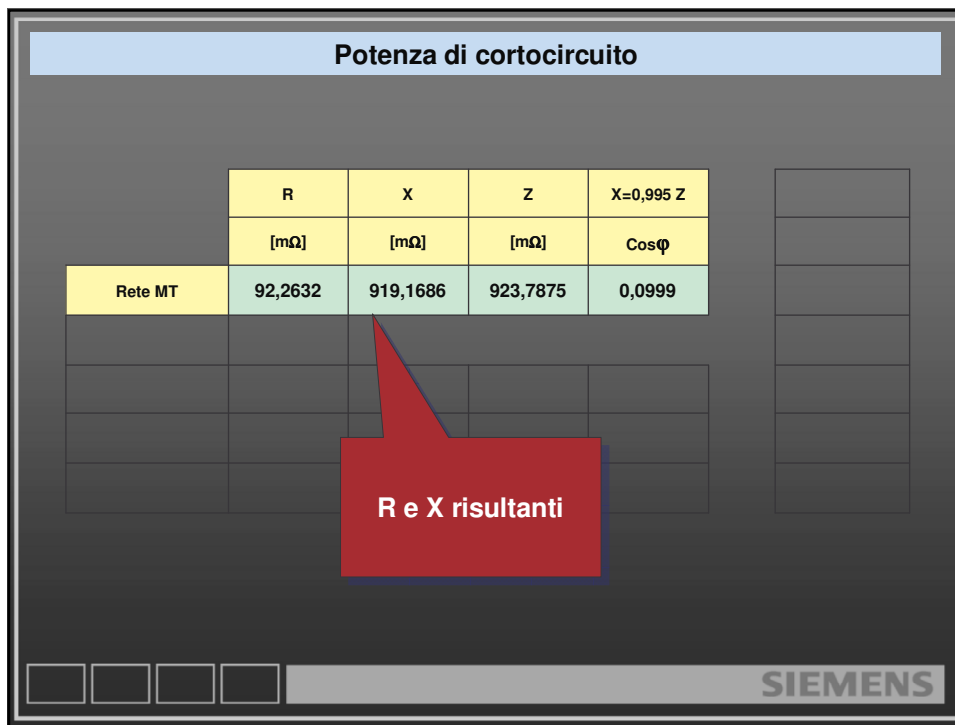
Potenza di cortocircuito

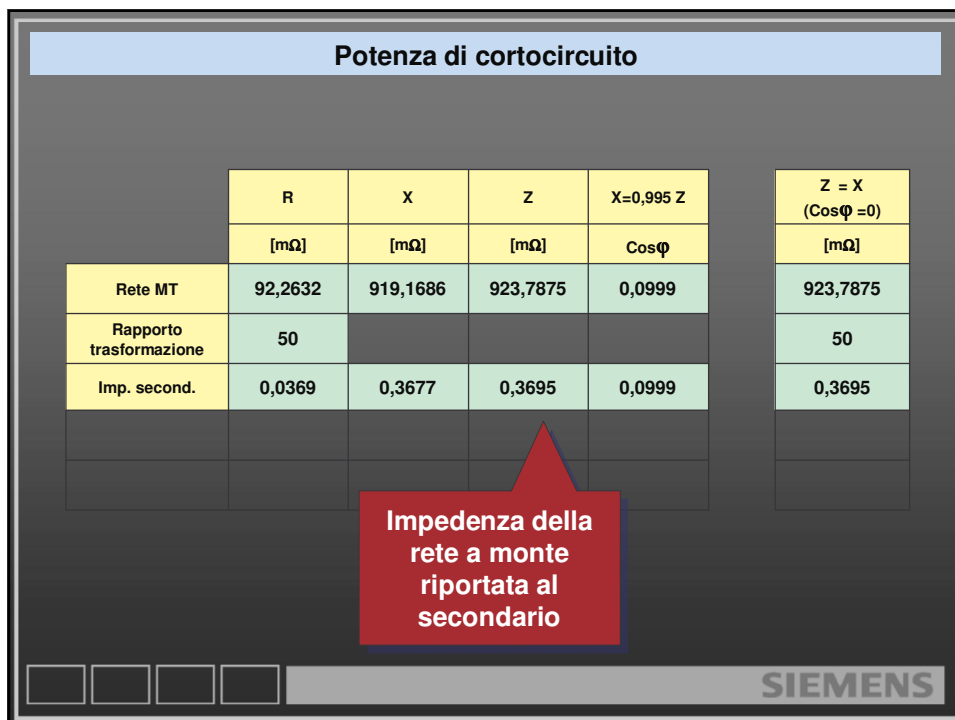
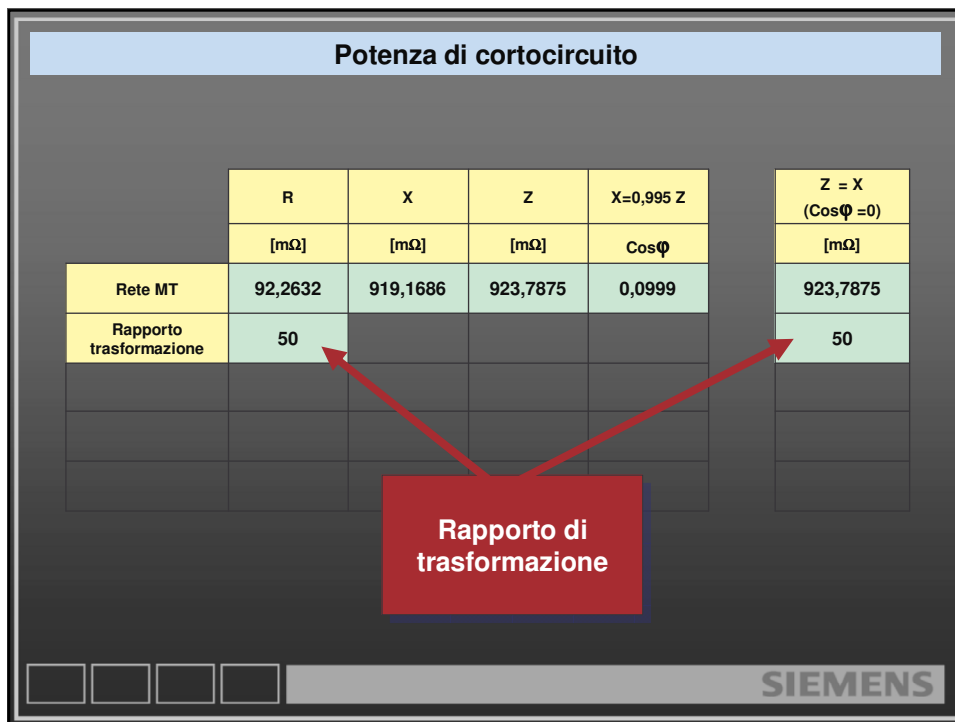
			z	
			[mΩ]	
Rete MT				

Rete MT
20 kV
433 MVA

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Potenza di cortocircuito

	R	X	Z	$X=0,995 Z$	$Z = X$ ($\cos\phi = 0$)
	[mΩ]	[mΩ]	[mΩ]	$\cos\phi$	[mΩ]
Impedenza Trasformatore			15,2381		

**Impedenza interna del trasformatore
639 kVA / 6%**

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Potenza di cortocircuito

	R	X	Z	$X=0,995 Z$	$Z = X$ ($\cos\phi = 0$)
	[mΩ]	[mΩ]	[mΩ]	$\cos\phi$	[mΩ]
Impedenza Trasformatore			15,2381		15,2381

**Metodo MVA
 $X = Z$**

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Potenza di cortocircuito

	R	X	Z	$X=0,995 Z$	$Z = X$ ($\cos\phi = 0$)
	[mΩ]	[mΩ]	[mΩ]	$\cos\phi$	[mΩ]
Impedenza Trasformatore	3,8095	14,7542	15,2381	0,25	15,2381

Componenti
dell'impedenza del
trasformatore

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Potenza di cortocircuito

	R	X	Z	$X=0,995 Z$	$Z = X$ ($\cos\phi = 0$)
	[mΩ]	[mΩ]	[mΩ]	$\cos\phi$	[mΩ]
Imp. second.	0,0369	0,3677	0,3695	0,0999	0,3695
Impedenza Trasformatore	3,8095	14,7542	15,2381	0,25	15,2381

Impedenza rete a
monte e
trasformatore

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Potenza di cortocircuito					
	R	X	Z	$X=0,995 Z$	$Z = X$ ($\cos\phi = 0$)
	[mΩ]	[mΩ]	[mΩ]	$\cos\phi$	[mΩ]
Imp. second.	0,0369	0,3677	0,3695	0,0999	0,3695
Impedenza Trasformatore	3,8095	14,7542	15,2381	0,25	15,2381
TOTALE	3,8464	15,1219	15,6034	0,25	15,60952

Impedenza totale al secondario

Potenza di cortocircuito					
	R	X	Z	$X=0,995 Z$	$Z = X$ ($\cos\phi = 0$)
	[mΩ]	[mΩ]	[mΩ]	$\cos\phi$	[mΩ]
TOTALE	3,8464	15,1219	15,6034	0,25	15,60952
I_k [A]	14800,61				14794,82

Corrente di cortocircuito risultante al secondario

