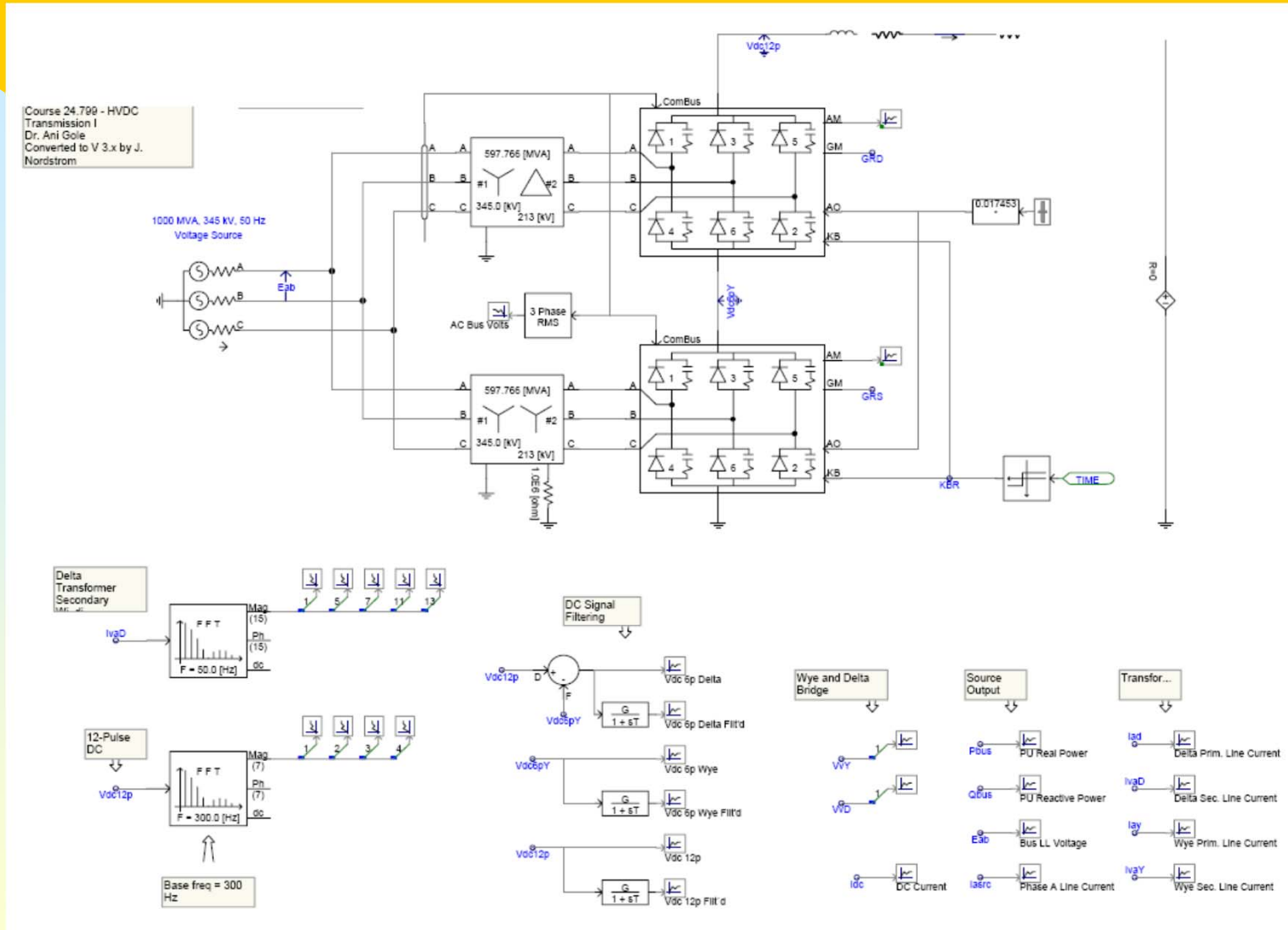
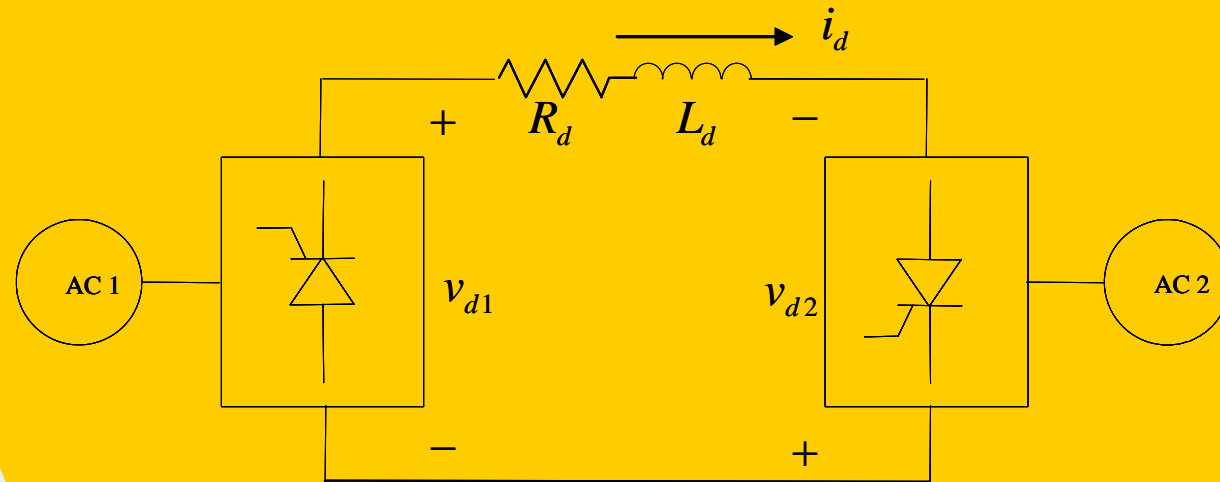


Modeling HVDC Converter in EMTDC



Control of an HVDC System



$$V_{d1} = 2 \times \left[\frac{3\sqrt{2}}{\pi} V_{LL1} \cos \alpha_1 - \frac{3}{\pi} \omega L_{s1} I_d \right]$$

$$\gamma = 180^\circ - (\alpha + u)$$

$$V_{d2} = 2 \times \left[\frac{3\sqrt{2}}{\pi} V_{LL2} \cos \alpha_2 - \frac{3}{\pi} \omega L_{s2} I_d \right]$$

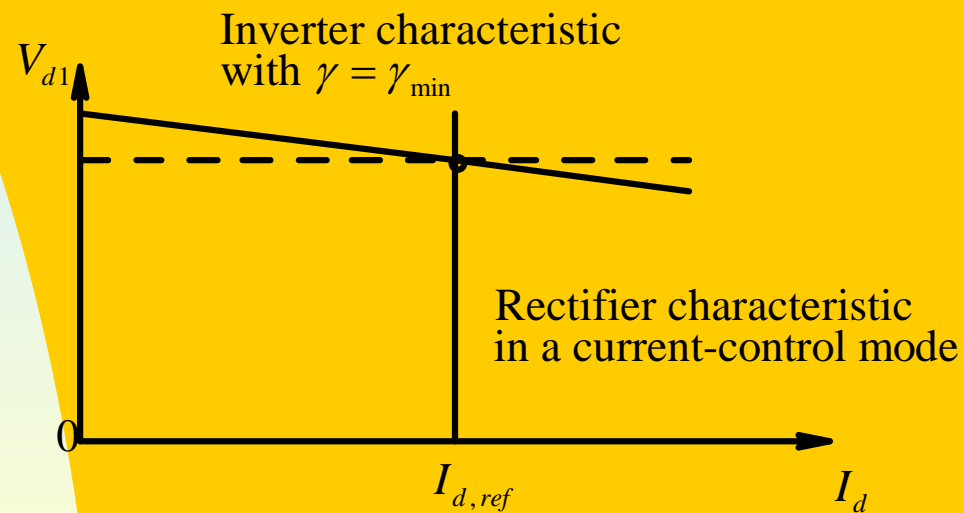
$$V_{d2} = 2 \times \left[-\frac{3\sqrt{2}}{\pi} V_{LL2} \cos \gamma_{\min} + \frac{3}{\pi} \omega L_{s2} I_d \right]$$

$$I_d = \frac{V_{d1} + V_{d2}}{R_d}$$

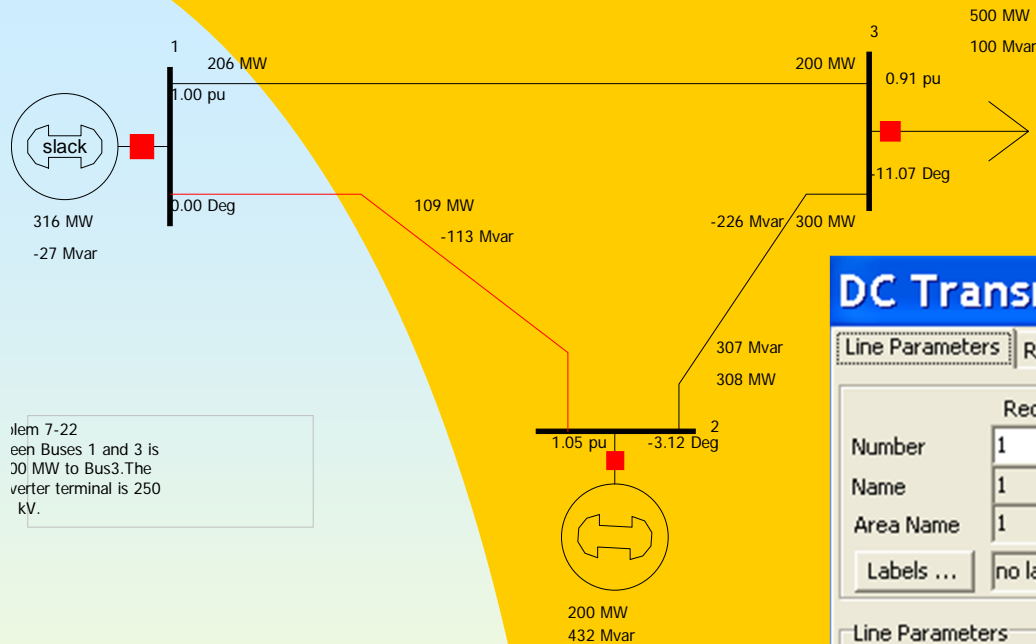
$$V_{d1} = 2 \times \frac{3\sqrt{2}}{\pi} V_{LL2} \cos \gamma_{\min} - \underbrace{\left(\frac{6}{\pi} \omega L_{s2} - R_d \right)}_{\text{positive}} I_d$$

Control of an HVDC System (Continued)

$$V_{d1} = 2 \times \frac{3\sqrt{2}}{\pi} V_{LL2} \cos \gamma_{\min} - \underbrace{\left(\frac{6}{\pi} \omega L_{s2} - R_d \right)}_{\text{positive}} I_d$$



Modeling HVDC Transmission System in Power World



Item 7-22
 between Buses 1 and 3 is
 200 MW to Bus3. The
 converter terminal is 250
 kV.

DC Transmission Line Options

Line Parameters | Rectifier Parameters | Inverter Parameters | Actual Flow | OFF

	Rectifier Bus	Inverter Bus	Circuit ID
Number	1	3	1
Name	1	3	
Area Name	1	1	

Find By Numbers
 Link to New DC Line
 Labels ... no labels

Line Parameters

Status	Setpoint	200.0	Setpoint Specified at
<input type="radio"/> Open	Resistance	10.000	<input type="radio"/> Rectifier
<input checked="" type="radio"/> Closed	Sched Voltage	250.0	<input checked="" type="radio"/> Inverter
Control Mode	Switch Voltage	0.0	Metered End of Line
<input type="radio"/> Blocked	RComp	0.000	<input type="radio"/> Rectifier
<input checked="" type="radio"/> Power			<input checked="" type="radio"/> Inverter
<input type="radio"/> Current			

OK Save Cancel Help

DC Transmission Line Options



Line Parameters

Rectifier Parameters

Inverter Parameters

Actual Flow

OPF

Rectifier

of Bridges

1

Base Voltage

345.0

XF Ratio

0.6000

XF Tap

1.0000

XF Min Tap

1.0000

XF Max Tap

1.0000

XF Tap Step

0.00625

Commutating XF Resistance

0.000

Commutating XF Reactance

10.000

Minimum Firing Angle

0.0

Maximum Firing Angle

30.0

Firing Angle

18.1

DC Transmission Line Options



Line Parameters

Rectifier Parameters

Inverter Parameters

Actual Flow

OPF

Inverter

of Bridges

1

Base Voltage

345.0

XF Ratio

0.7000

XF Tap

1.0000

XF Min Tap

1.0000

XF Max Tap

1.0000

XF Tap Step

0.00625

Commutating XF Resistance

0.000

Commutating XF Reactance

10.000

Minimum Firing Angle

5.0

Maximum Firing Angle

45.0

Firing Angle

29.3