ECE 529
Utility Applications of Power Electronics

Session 13
\[ i_{po} = \left(\frac{1+m}{2}\right) i_{AC} \]

\[ \left(\frac{1-m}{2}\right) i_A \]

\[ \text{for HW - ideal sources} \]

\[ m(t) \cdot V_{dc} \]

\[ \int m_B(t) V_{dc} \]

\[ \int 0m(t) \]

\[ 30 \text{ source} \]
collector sub

PCC
point of common coupling

O-2-1

POI

PU

LPU
AC side

Point of interconnect

\( V_{TA} \)

\( P, Q \)

\( V_a(t), \phi_z \)
Part E: should be supply reactive power
not consuming
3 phase converters

2 level converter
normally $m_d(t) + m_b(t) + m_c(t) = 0$ at any instant in time

- Sine-triangle PWM
- Synchronous PWM if $f_s = h f_0$, $h$ = integer
Three Phase VSC Averaged Model

- **ATPDraw Three Phase Converter Model**

Power Circuit

- Averaged model

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TAC< controlled source
- Can combine the 3 sets of DC current sources into one equivalent source that takes the sum of the three phase contributions.

- Voltage command

- Current commands
- Generate modulating functions
Vt from switching and averaged models
- Average converter model: source equations

Q axis at opposite angle of definition from class
Create open loop modulating functions
Main: Compare Voltage Angle: Switched and Average

Main: Line currents: Switched and Average

due to lack of SS Initiator