1. ECE Department
   - AVISTA Schobrs
     - 5-6
   - POWER Engineers
     - 1
   - Retherford
     - 1
   - MW Engineering
     - 1
   - Satre (Wendell Satre)
University of Idaho

- March 7
- Resume
- Coverletter

IEEE Power and Energy Society
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PES Scholarship Plus

www.ee-scholarships.org
3. Problem 2.1 and 2.2 in the book: demonstrate using phase diagram or equations

4. A three-phase transformer rated 5 MVA, 115/13.2 KV has per-phase series impedance of 0.078 + j0.72. Draw an equivalent circuit of the system indicating all impedances in per unit. Choose the power factor 0.85.

13.2 KV. The line supplies a balanced three-phase load represented by a source impedance of 0.078 + j0.72 per unit on a base of 10 MVA. Represented by a source impedance per phase of 0.078 + j0.72 per unit. The transformer is connected in a three-wire connection which can be represented by a source impedance of 0.078 + j0.72 per phase.


Voltage regulation at the load.

With the voltage at the primary side of the transformer held constant at 115 KV, find the voltage at the primary side of the transformer held constant at 115 KV. Find the system AVVA base as 10MVA, and set the voltage base starting from 13.2 KV as the base.

(a) Draw an equivalent circuit of the system indicating all impedances in per unit. Choose the

Due Date: Session 17 (February 26)

ECE 420: Homework #2
Measuring voltage or current in high voltage settings

- voltage in 10³ or 10⁵ of kV
- current in hundreds, thousands of A

Single phase transformers

Ideal Transfer
\[
\frac{dF}{dt} = \frac{V_1}{N_1} = \frac{V_2}{N_2} = \frac{V_3}{N_3}
\]
\[ N_1 I_1 = N_2 I_2 \rightarrow \frac{H_1}{H_2} = \frac{N_2}{N_1} \]

---

3 winding \( \rightarrow \) assume current in to all 3 poles, 1 mesh

\[ N_1 I_1 + N_2 I_2 + N_3 I_3 = 0 \]
Measurement Transformers

Voltage Transformer

\[ I_1 \rightarrow I_2 \rightarrow Z_B \]

- Impedance of meter - high impedance
- \[ I_2 \approx 0 \]

Used up to
about 132 kV or so

Common in North America
Higher voltages
Capacitive voltage transformer

420 kV 1% 9/6

A

\( jx_1 \)

\( jx_2 \)

\( jx_{cap} \)

Transformer

Meter

33 kV