

Experiment 2

17th October 2011

Title: Electrical Energy Delivery Systems.

Objectives: Understand basic operation of transmission and distribution systems.

Analyze energy loss and voltage drop in energy transmission and distribution with and without transformers.

Familiarize with application of transformers in an electrical energy delivery system.

Measurements/results:

Specifications of step up transformer used.

Primary voltage V_1 (V)	Secondary Voltage V_2	VA rating (VA)
15	230	45

Voltage across $V_{source} = 8V$

Resistance of model transmission line = 0.217Ω

Reactance of model transmission line = 0.476Ω

Measurements in Part 1

Trial	V_{source} (V)	I_{source} (A)	P_{source} (W)	I_{line} (A)	I_{load} (A)	V_{load} (V)
1	8.04	2.260	18.0	0.14	2.05	6.559
2	8.15	2.259	18.1	0.14	2.05	6.55
3	8.12	2.252	18.0	0.14	2.05	6.570
Average	8.10	2.257	18.0	0.14	2.05	6.560

Measurements in Part 2

Trial	V_{source} (V)	I_{source} (A)	P_{source} (W)	I_{load} (A)	V_{load} (V)
1	7.97	1.218	8.1	1.25	3.872
2	8.12	1.239	8.4	1.25	3.940
3	7.93	1.21	8.0	1.25	3.840
Average	8.01	1.222	8.2	1.25	3.884