3 Phase Imbalance Sheet

L1 – L2 _____

L2 – L3 _____

L1 – L3 _____

Total _____

Divided by 3 _____ = **Average voltage**

Deviation between average voltage and each phase

Average Voltage _____ L1 – L2 _____ = _____ **Voltage Deviation**
Average Voltage _____ L2 – L3 _____ = _____ **Voltage Deviation**
Average Voltage _____ L1 – L3 _____ = _____ **Voltage Deviation**

Take the Maximum Voltage Deviation (highest number) and plug into the following formulas
% Imbalance = Maximum Voltage Deviation ÷ Average Voltage x 100

_____ = _____ ÷ _____ **x 100**

2% Voltage imbalance can be damaging to three phase equipment

% voltage unbalance	Winding temp. (°C)	I^2R losses (% of total)	Efficiency reduction	Expected winding life (years)
0	120	30%	—	20 years
1	130	33%	Up to 1/2%	10
2	140	35%	1-2%	5
3	150	38%	2-3%	2.5
4	160	40%	3-4%	1.25
5	180	45%	5% or more	Less than 1