Northeast Utilities installs transformers sized to serve the peak demand of the customer. In most cases the transformer rating will be considerably smaller than the customer's service entrance switch.

The customer's peak demand could increase due to load growth. Northeast Utilities will provide the customer with the magnitude of the symmetrical fault current that would be available at the ***secondary*** terminals of a transformer sized to accommodate at least 80 percent of the service entrance switch size. The customers should be advised of their responsibility to consider asymmetric and motor contribution factors which could increase the short circuit magnitudes, or service conductor(s) lengths which could reduce the fault current.

The customer should select equipment having an interrupting capacity compatible with the estimated maximum short circuit amperes available from the transformer(s) to which such equipment is or will be connected.

Use these tables to provide the customer with the ***maximum*** fault current that ***could*** be available at his service entrance switch. The recommendations take into account that the customer is limited to a peak demand of 80 percent of the service entrance size, and that an infinite high side bus exists. In most cases, the actual fault current will be significantly lower.

These tables ***are not*** to be used for determining the size of the transformer required to serve the customer. ***In most cases, the actual size of the transformer is significantly smaller*** and should be determined by the New Service Process. Also, existing loads of a similar nature should be referred to as an aid in assisting in the sizing of the transformer.

Note: When changing out an existing transformer, care should be taken to compare the available fault current of the new transformer against the interrupting capability of the existing customer service entrance. In such cases, an infinite bus should not be assumed, the actual circuit calculations should be provided by Asset Management. Also, System Engineering should be consulted for special conditions that may necessitate special transformers.

"One on One"

The "Service Entrance" column indicates the service size that matches the maximum transformer bank kVA. For services supplied by a dedicated transformer, use this column to find the maximum available short circuit current from the maximum sized transformer recommended for the service.

Group Services

Where a transformer or bank of transformers supplies several services, as in a shopping mall or downtown area, determine the maximum available short circuit current based on the transformer size for the group. The "Service Entrance" column is irrelevant.

A. THREE–PHASE TRANSFORMERS

"One On One"	Secondary Three–Phase Symmetrical Amperes					
	208 Volts		240 Volts		480 Volts	
Service Entrance (Amperes)	MAXIMUM XF Bank kVA	Fault Current Amperes RMS, SYM	MAXIMUM XF Bank kVA	Fault Current Amperes RMS, SYM	MAXIMUM XF Bank kVA	Fault Current Amperes RMS, SYM
200	75	14,000	75	12,000	150	12,000
300	75	14,000	150	24,000	300	24,000
400	150	28,000	150	24,000	300	24,000
500	150	28,000	150	24,000	300	24,000
600	150	28,000	300	48,000	500	40,000
800	300	56,000	300	48,000	500	40,000
1000	300	56,000	300	48,000	750	16,000
1200	300	56,000	500	80,000	750	16,000
1400	500	93,000	500	80,000	1000	21,000
1600	500	93,000	500	80,000	1000	21,000
1800	500	93,000	500	80,000	1000	21,000
2000	500	93,000	750	31,000	1500	31,000
2200	750	36,000	750	31,000	1500	31,000
2400	750	36,000	750	31,000	1500	31,000
2600	750	36,000	750	31,000	1500	31,000
2800	750	36,000	1000	42,000	2000	42,000
3000	750	36,000	1000	42,000	2000	42,000
3200	1000	48,000	1000	42,000	2000	42,000
3400	1000	48,000	1000	42,000	2000	42,000
3600	1000	48,000	1000	42,000	2500	52,000

A. **Transformers of 500 kVA or less** – low loss transformers can have impedances as low as 1.5 percent. The available fault current, at the secondary terminals of the transformer, can be as great as 66 times the full load ***secondary*** current of the transformer.

B. **Transformers 750 kVA and larger** – have impedances of 5.75 percent per ANSI standards. The available fault current, at the secondary terminals of the transformer, will be 17 times the full load secondary current of the transformer.

Three–Phase Transformer Fault Current Calculations:

Note: The following examples are to show how to calculate available fault current magnitudes. Because the actual impedances of transformers can vary, thus causing significant differences in available fault currents, the charts should be always used to provide the customer with the ***worst case*** levels of fault current.

The actual fault current available at the secondary terminals of the installed transformer(s) is calculated as follows:

Equation – $$\frac{\text{(transformer kVA) x100}}{\text{(line–to–line secondary voltage in kV) x 1.73 x(\% impedance from the transformer nameplate)}}$$

Example:

Question – What is the available fault current for a 120/208Y volt, 300 kVA transformer that has an impedance of 4 percent?

Answer – $$\frac{\text{300 kVA x100}}{.208 \times 1.73 \times 4} = \text{20,843 symmetrical amperes}$$

Single–Phase Installations – These loads can be served from a pad–mounted transformer up to 167 kVA in size or a pole–mounted unit through 100 kVA. Such transformers can have impedances as low as 1.2 percent. Therefore, the available fault current can be as high as 83 times the full load secondary current of the transformer. Customer or company provided secondary/service cables, or circuit conditions may significantly reduce the available levels of fault current.

B. SINGLE–PHASE TRANSFORMERS

	Single–Phase Symmetrical Amperes 240 Volts	
Service Entrance (Amperes)	MAXIMUM Transformer Size kVA	Fault Current Amperes RMS, SYM
100	25	8,680
200	50	17,000
400	75	26,000
600	100	35,000
800	167	58,000
1000	167	58,000

Single–Phase Transformer Fault Current Calculations:

Equation – $$\frac{\text{(transformer kVA) x 100}}{\text{(single–phase secondary voltage in kV) x (\% impedance from the transformer nameplate)}}$$

Example: Question –What is the available fault current for a 240/120 volt, 100 kVA transformer that has an impedance of 1.2 percent?

Answer – $$\frac{\text{100 kVA x 100}}{.240 \times 1.2} = \text{34,722 symmetrical amperes}$$