



BICEENGINEERING + CONSULTING

Power System Analysis • Electrical Engineering • Arc Flash Hazard Mitigation

Typical Information Required For Arc Flash Studies:

1. **Utility or Local Energy Provider:** Thevenin Impedance in Ohms or In Per Unit on 100 MVA base; **or** 3-Phase and SLG MVA_{sc} available and X/R; **or** 3-Phase and SLG I_{sc} available and X/R ratio.
2. **Electrical conductors:** Type (i.e., CU/AL Cable, Segregated Bus Duct, Cable Bus, Isolated Phase Bus Duct, etc...), Size, Ampere Rating, length (ft), Insulation Type, Number of Conductors Per Phase, and Voltage Rating.
3. **Molded Case Circuit Breakers:** Manufacturer, Type/Model, Continuous Ampere Rating, Voltage Rating, Short Circuit Current Interrupting Rating, and Instantaneous Trip Setting (If available).
4. **Circuit Breakers w/ Electronic Static Trip Units:** Manufacturer, Type, Continuous Ampere Frame Rating, LTPU, LTD, STP, STD, INST, and GF Settings. Also, provide breaker short circuit current interrupting ratings.
5. **Time Overcurrent-Instantaneous Relays (50/51):** Manufacturer, Model/Type, CT ratio, Tap Setting, Time Dial Setting, Instantaneous Trip Setting, Curve Type.
6. **Fuses:** Manufacturer, Type, Continuous Ampere Rating, Short Circuit Current Interrupting Rating, Voltage Rating.
7. **Transformers (≥75 kVA):** MVA or KVA nameplate rating, Primary-Secondary Winding Configuration and Voltages, Neutral Grounding Resistor Rating (If Used), X/R ratio, and Percent Impedance (%Z) on Nominal MVA or KVA base.
8. **AC Induction Motors (≥50 Hp):** Rated Hp, Voltage, Full Load Amperes, Power Factor, Efficiency, Number of Poles, Rated Synchronous Speed (RPM).

Note: All smaller ac induction motors < 50 Hp will be modeled as a “grouped motor” with an equivalent Hp rating equal to the sum of the individual motors and a subtransient reactance of 0.28 p.u., in accordance with IEEE Std. 141 (Red Book). Add the total of these smaller motors connected the bus and record this as a “Motor Group” in the data sheets.

9. **Switchboards, Motor Control Centers, Panelboards, Bus Duct, Switchgear:** Manufacturer, Model/Type, Voltage Rating, Continuous Ampere Rating, Number of Phases, Number of Wires, Rated Frequency, and Short Circuit Current Bus Bracing Rating.
10. **Synchronous Generators:** Base MVA or KVA Rating, Output Voltage, Synchronous Speed or Output Frequency (Hz), Number of Poles, Saturated Synchronous Reactance (X_{d_v}), Saturated Transient Reactance (X'_{d_v}), Saturated Subtransient Reactance (X''_{d_v}), Transient Time Constant (T_d'), Subtransient Time Constant (T_d''), and Armature Short Circuit Time Constant (T_a).