



Section I - Location & Equipment Information

Equipment Identification & Description:

SWTS Site Leader:

Site Name & Address:

Describe Project:

Describe work on this equipment:

Section II - Basic Information

1. Supply Source, usually a transformer or generator (Typically MVA, V & Z% are available on the name plate)

Power, MVA = _____ Voltage, V = _____ Impedance, Z% = _____ Bolted Fault, $MVA_{bf} = MVA \times \frac{100\%}{Z\%} =$ _____

Don't forget... $MVA = KVA / 1000$

$bf =$ bolted fault

2. Characteristics of the feeder breaker or current limiting device.

_____ t = Clearance time (in cycles) Describe the device _____
you are working on _____

Typical instantaneous clearance times are:

current limiting fuse	0.25 cycles	low voltage insulated case breaker (<600V)	2 cycles
current limited, molded case breaker (<600V)	0.25 cycles	low voltage power breaker (<600V)	3 cycles
molded case breaker (<600V)	1 cycle	metal clad breaker (>1kV)	6 cycles

Note: For main breakers, motors and other equipment fed from a breaker with a trip delay, use the trip delay and not the instantaneous clearance time.

3a. Minimum Approach Distance

Never work on energized equipment with any part of your body closer than the Minimum Approach Distance

$D_{Min} =$ _____ ft

Use: 50 V to 1 KV.....0.0 ft (no contact)
1 KV to 15 KV2.16 ft (26 inches)
>15 KV see table R-6 in 29 CFR 1910.269

3b. Flash Boundary Distance

The NFPA70e rule allows you to calculate the flash boundary or use a default value—check the option used.

Calculated

$$D_f = \frac{\sqrt{MVA_{bf} \times t}}{4.76} = \text{_____ ft}$$

Default

$$\frac{D_f = 4 \text{ ft}}{\text{Limited to } <600V \text{ systems}}$$

Section III - Basic Risk Determination & Extenuating Circumstances (check as applicable)

Low Risk (<3 cal/cm²)

➤ Outside flash boundary

-or-

➤ $MVA_{bf} < 20$ MVA

Medium Risk (3-8 cal/cm²)

➤ Inside the flash boundary &

➤ MVA_{bf} is 20-50 MVA

High Risk (8-25 cal/cm²)

➤ Inside the flash boundary &

➤ MVA_{bf} is 50-125 MVA

Very High Risk (25-40 cal/cm²)

➤ Inside the flash boundary &

➤ $MVA_{bf} > 125$ MVA

You **MUST** increase PPE by one (or two) level(s) if:

(e.g. Medium becomes High or Very High)

Clearance time of the feeder breaker is 12 cycles or more.

Work involves your hands or tools/leads/cables in your hands coming in contact with energized bus or other components.

Note: Under some circumstances work on energized equipment with an $MVA_{bf} > 200$ MVA may require a special type of flash suit.

You **MAY** decrease PPE by one (up to three) level(s) if:

All work may be done outside of arms-length (2 ft) distance from energized bus or other components (using a hot stick for example).

Work involves **observation activities only**, there will be no contact (or realistic potential for contact) by you or your tools. If equipment is de-energized, the equipment will not be re-energized.

Clearance time of the feeder breaker is 2 cycles or less.

Section IV - Personal Protective Equipment (PPE) Selection (check as applicable)

Low Risk PPE

NFPA Risk Category 0 -or- 1

➤ 100% cotton work clothes

➤ Electrical gloves (w/ leather gauntlet depending on voltage)

➤ Hard hat

➤ Safety glasses

Medium Risk PPE

NFPA Risk Category 2 -or- 2*

➤ Indura or Nomex coverall
➤ 100% cotton work clothes
It is acceptable to substitute a flash coat for the coverall

➤ Electrical gloves w/ leather gauntlet

➤ Hard Hat

➤ Safety glasses

➤ Face shield

High Risk PPE

NFPA Risk Category 3

➤ Flash Coat
➤ 100% cotton work clothes

➤ Electrical gloves w/ leather gauntlet

➤ Hard Hat

➤ Safety glasses

➤ Flash hood

Very High Risk PPE

NFPA Risk Category 4

➤ Flash suit
➤ Indura or Nomex coverall
➤ 100% cotton work clothes

➤ Electrical gloves w/ leather gauntlet

➤ Hard Hat

➤ Safety glasses

➤ Flash hood