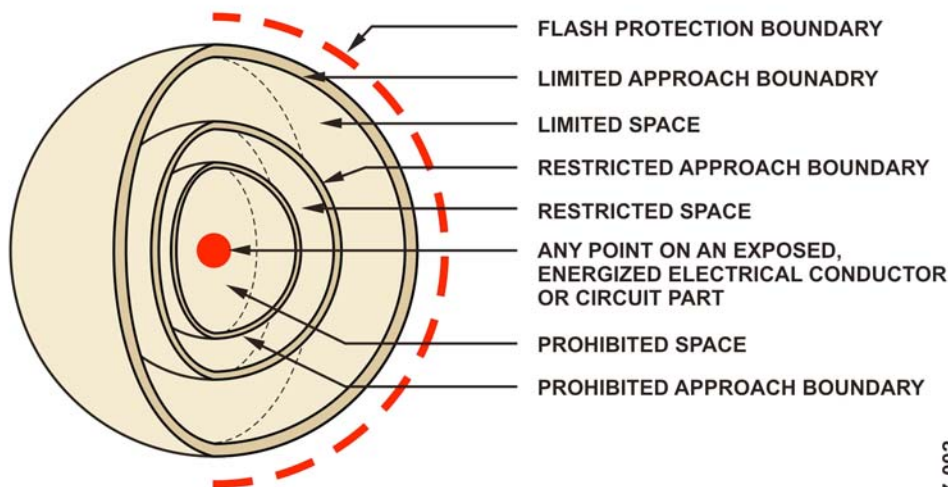


GLOSSARY

Arc Flash: A Hazardous “short circuit” or “fault” potentially occurring anywhere in an electrical system phase to phase or phase to ground. The fault instantly causes rapid heating of air molecules, vaporizes conductive metal materials and generates a densely concentrated blast of pressure formed by light and heat energy. The arc flash blast can propel molten metal, shrapnel, tools and workers through the air.

Arc Flash Boundaries: There are three classifications of arc flash boundaries: 1)Limited Approach, 2)Restricted Approach, and 3)Prohibited Approach. These boundaries are distances determined from the potential origination source of the arcing fault which produces 1.2 calories/cm². *Figure 3* illustrates the distance for each boundary from the potential origination point of the arc flash. Note: this is equal to holding your finger over the tip of a flame from a common household lighter for one second. The following are descriptions of each boundary.

- ♣ *Limited Approach Boundary:* The boundary around exposed, live parts that may not be crossed by “unqualified” person(s) unless accompanied by a “qualified” person(s).
- ♣ *Restricted Approach Boundary:* The boundary that marks the area from exposed energized “live” parts that may be crossed only by “qualified” persons using appropriate shock prevention techniques and equipment.
- ♣ *Prohibited Approach Boundary:* The boundary that marks the area from exposed energized “live” parts that may be crossed only by “qualified” persons using the same type of protection as if direct contact with live parts is planned.



FLASH PROTECTION BOUNDARY
AN APPROACH LIMIT AT A DISTANCE FROM EXPOSED LIVE PARTS WITHIN WHICH A PERSON COULD RECEIVE A SECOND DEGREE BURN IF AN ELECTRIC ARC FLASH WERE TO OCCUR (NFPA 70E)

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Figure 3: *The illustration above shows safe working distances based on the available fault currents and the size of the Arc Blast calculated from an Arc Flash Study.*

Arcing Time

Arcing time is the amount of time that the arc flash incident has the potential to last depending on the electrical system's upstream overcurrent protective devices.

Calorie

A calorie is a unit of measure for the amount of energy required to raise one gram of water one degree Celsius at one atmosphere. Second degree burns occur at 1.2 calories/cm².

Distance

The distance an individual is from an arc flash originating source. In more sophisticated electrical systems, equipment manufacturers have begun using remote operating equipment, circuit breaker racking, and other means to place distance between personnel and potential arc flash sources.

Fault Current

Fault current is the abnormal flow of electrical current due to an electrical fault condition. Overcurrent devices (i.e.: circuit breakers, fuses, etc.) are designed in electrical systems to protect electrical circuits from too much current flow. They work by interrupting fault currents. The method of protection is commonly known as "tripping a breaker" or "blowing a fuse." If a circuit is to be properly protected, the fault current must be high enough to operate the protective device within as short a time as possible. Also, the protective device must be able to withstand the fault current and extinguish any resulting arcs without sustaining the arc for any significant length of time.

Flash Hazard

A dangerous condition associated with the release of energy caused by an electric arc.

Hazard/Risk Category (HRC)

The Hazard /Risk category is the danger level of the potential arc flash incident. The category ratings range from 0 to 4. Category 0 represents little or no risk and Category 4 represents the greatest risk. *Figure 4* shows the types of PPE needed for each category.

| NFPA 70E 2004 EQUIPMENT REQUIREMENTS (PROPOSED) | | |
|---|--------------------------|--|
| CATEGORY | ENERGY LEVEL | TYPICAL PERSONAL PROTECTIVE EQUIPMENT REQUIRED (NFPA-70E) |
| 0 | <2 CAL / CM ² | NON-MELTING FLAMMABLE MATERIALS |
| 1 | 4 CAL / CM ² | FIRE RESISTANT (FR) SHIRT AND FR PANTS |
| 2 | 8 CAL / CM ² | FR SHIRT, FR PANTS, COTTON UNDERWARE |
| 3 | 25 CAL / CM ² | 2 LAYER FR CLOTHING, COTTON UNDERWARE |
| 4 | 40 CAL / CM ² | FR SHIRT, FR PANTS, MULTI LAYER FALSH SUIT, COTTON UNDERWARE |
| OTHER: FACE PROTECTION: FACE SHIELD AND/OR SAFETY GLASSES HAND PROTECTION: LEATHER OVER RUBBER FOR ARC FLASH PROTECTION LEATHER WORK BOOTS ABOVE 4 CAL / CM ² | | |

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Figure 4: *The table above is used after an Arc Flash Analysis is performed and is based on the expected Arc Flash energy level of the equipment being inspected.*

Qualified Worker

A qualified worker is defined as an individual who has received documented training in the hazards of working on energized equipment in general, and has been trained in the hazards of the particular equipment being serviced. Training must include the necessary information to protect him or herself from arc flash hazards including the use of proper procedures and the application of PPE.