



005: Arc Blast Hazards

Why an arc blast is serious business

An arc blast generates temperatures four times hotter than the surface of the sun. It will vaporize any material in its path.

An arc blast creates a pressure wave that can kill by percussion alone. This pressure wave can also introduce additional electrical hazards and additional impact hazards.

Hearing damage from an arc blast can be permanent.

The blast can force molten copper through the skin.

PPE for high-risk areas

Replace insertable earplugs with earmuffs. The acoustic pressure from the blast could drive an insertable earplug into the ear.

Wear flame-resistant clothing or a flash suit, even if you are not directly involved in the work. This suit greatly decreases the amount of injury you might receive.

Wear a face shield and hood with the flash suit. Safety glasses will not protect your face, though you do need to wear them with the face shield for additional projectile protection.

Do not wear synthetic clothing under the flash suit. Should that clothing catch fire from a hot object driven through the flash suit, you will not get clothing off in time to prevent serious burns or death. This applies to socks and underwear, also. Wear natural fibers only.

Arc blast prevention

Certain situations are high risk. For example, Medium Voltage switchgear handles a high-energy load. Perhaps you wish to operate this switchgear to take the load offline. The proper way to do this is to shut off the smaller loads (the branches) and work your way up the “energy tree” to the MV switchgear (the trunk). When you take this approach, you greatly reduce the amount of energy jumping across the contacts or from the contacts to ground.

When connecting or disconnecting test equipment, work with one lead at a time. If you remove test leads simultaneously from energized equipment, you will very likely create an ionized path that makes a phase to ground fault almost a certainty.

Use tools insulated for the voltage levels at which the equipment is rated, regardless of whether the equipment is energized or not. If this is a new installation with no incoming power wiring, this caution doesn't apply.

If you can de-energize the equipment and ground it out, always do so.

If you must work hot, reduce the working load on the equipment as much as possible.

If you must work hot, ask operations people to suspend use of the equipment as much as possible. Your goal is to reduce the number of variables and the number of changes that could result in a fault.

Use only tools and test equipment rated for use on the equipment you are working on.

Discussion leader duties for this session:

Obtain a flash suit, so you can demonstrate proper use during the discussion session.

What this Safety Talk covers:

How to reduce the likelihood of an injury from arc blasts, and how to reduce the likelihood of a blast in the first place.

Discussion notes :

