

An Electrician and an Electrical Helper Burned During Arc Flash Explosions

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Burn Injury Narrative
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A journeyman electrician and an electrical helper were at a worksite to install a new three-phase run of wire between an existing energized 480-volt circuit breaker panel and a new piece of machinery. During the process, the journeyman electrician attempted to install a missing bolt from a breaker mount on an energized 480-volt bus bar. The electrician used protective insulating gloves, but did not use safety glasses, shields, or any other safety equipment. While attempting to screw the bolt into place, he lost control of the bolt. Either the bolt or the mount (or both) then contacted another phase in the circuit breaker panel resulting in an arc flash. The electrician temporarily lost his sight and received first and second degree burns to his head, face, and forearm.

A few minutes later, the helper was demonstrating to the facility owner what had happened, when a second electrical arc flash occurred at the breaker panel. The cause of the second arc flash is not known. The helper received second-degree burns to his head, face, neck, arm, and hand. The nylon jacket he was wearing melted to his skin. He was not wearing any personal protective equipment. The helper had no formal electrical training.

The electrician was hospitalized for one day while the helper required multiple hospital visits to treat his burns.



Injuries such as these may be prevented by taking the following steps:

- Electrical systems should be worked on in a de-energized state.
 - Discuss with the site manager whether the required work could be performed de-energized. This can often be accomplished through pre-planning and scheduling.
 - Isolate and lockout energy sources.
 - Ensure that stored energy does not exist and apply appropriate grounding if necessary.
 - Use properly rated voltage testers to verify the absence of voltage at each energy point. This should only be done by a qualified person.
- If work must be performed energized, follow all requirements in NFPA 70E (2004).
 - All electrical companies should have a meaningful energized work policy.
 - Only qualified and well trained individuals should perform energized work.
 - Plan and review the job carefully. Review all possible energy sources and identify potential hazards and prevention methods before starting the job.
 - Wear appropriate personal protective equipment rated for the job, including flame-resistant clothing. Never wear clothing made of nylon, acetate, polyester, or rayon.
- Electrical apprentices and other electricians are the only people who should assist an electrician in the field.

Please consider the above information as you make safety decisions or recommendations for your company or constituency. The information in this narrative is based on preliminary data only and does not represent final determinations regarding the nature of the incident or conclusions regarding the cause of the injury.

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