

Arc Flash Results in Dual Injuries

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Burn Injury Narrative
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A journeyman electrician with over 25 years of experience and an electrical apprentice were removing a circuit from a 480 volt, 600 amp main breaker panelboard in the electrical room of a large public building. The breaker which supplied power to the entire building was in the off position; however, the conductors into the top of the breaker were still energized. The journeyman was in the process of removing a circuit from the upper left hand side of the enclosure. The apprentice was standing on a ladder 4 to 5 feet to the left and was manually supporting the conduit that held the circuit wires. The ground wire being removed was still connected at its other terminal. Electrical tape was not used to insulate this wire or the conducting wires. Shielding material was not used to protect the exposed energized conductors entering the main breaker.



Apparently, the ground wire contacted the energized terminals on the main circuit breaker. The apprentice witnessed a large flash and loud noise, followed rapidly by two more explosive noises. He then noticed that the synthetic clothing that his work partner was wearing was in flames. The apprentice patted out the flames on his partner with his hands and burned himself in the process. He then led the journeyman electrician out of the smoke filled room and notified 911.

The journeyman sustained second and third degree burns covering nearly 50% of his body. He required surgery for removal of destroyed skin and restorative skin grafts. He needed physical therapy for nearly a year. He returned to work after several months and to full time after about a year. The apprentice was treated for second degree burns.

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

- Establish an electrically safe work condition whenever possible. This includes the de-energizing, lockout/tagging of disconnecting devices, grounding to protect against stored or induced electrical energy and testing to ensure the absence of voltage.
- If work must be performed on energized equipment, the work should be performed under an effective energized work policy that meets all requirements in NFPA 70E, 130.1-130.7, (2004). This standard includes an *Energized Electrical Work Permit* with an acceptable justification for the live work to be performed and a description of the safe work practices to be employed.
- Electricians should wear flame resistant clothing and appropriate PPE for arc flash/blast exposure.
- Electrical panels should be updated to ensure compliance with current codes and safety requirements.

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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