DENVER HELICOPTER JOB

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Denver Network Helicopter Job

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- Scope of Work
- Logistics
- Crew Make-up
- Equipment Staging
- Video Presentation
- Jobsite Performance
- Job Assessment

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Scope of Work

The Xcel Energy Denver network department was tasked with delivering 33 network protectors to the roof tops of 9 different buildings using a helicopter. There were 12 1875 network protectors, 21 2825 network protectors and 6 high lift pallet jacks. The project was scheduled for Sunday, September 22ND, 2019 starting at 7 am. The scheduled duration was to be 6 hours. The buildings were identified by the age and type of protectors, access to the vault and distance from the vault to the street.

Logistics

LOGISTAL NIGHTMARE!!!

The logistics encountered on this job were monumental. The first challenge was to find a helicopter with the lifting capacity as well as a pilot with the courage and skill to complete the job. The contractor had to get approved to be a qualified contractor. The next step was to get the city on board. The city initially said no to the project. They felt it was dangerous an unnecessary. Xcel ended up coordinated with the city events coordinator and the police department. The first hurdle was identifying a date.

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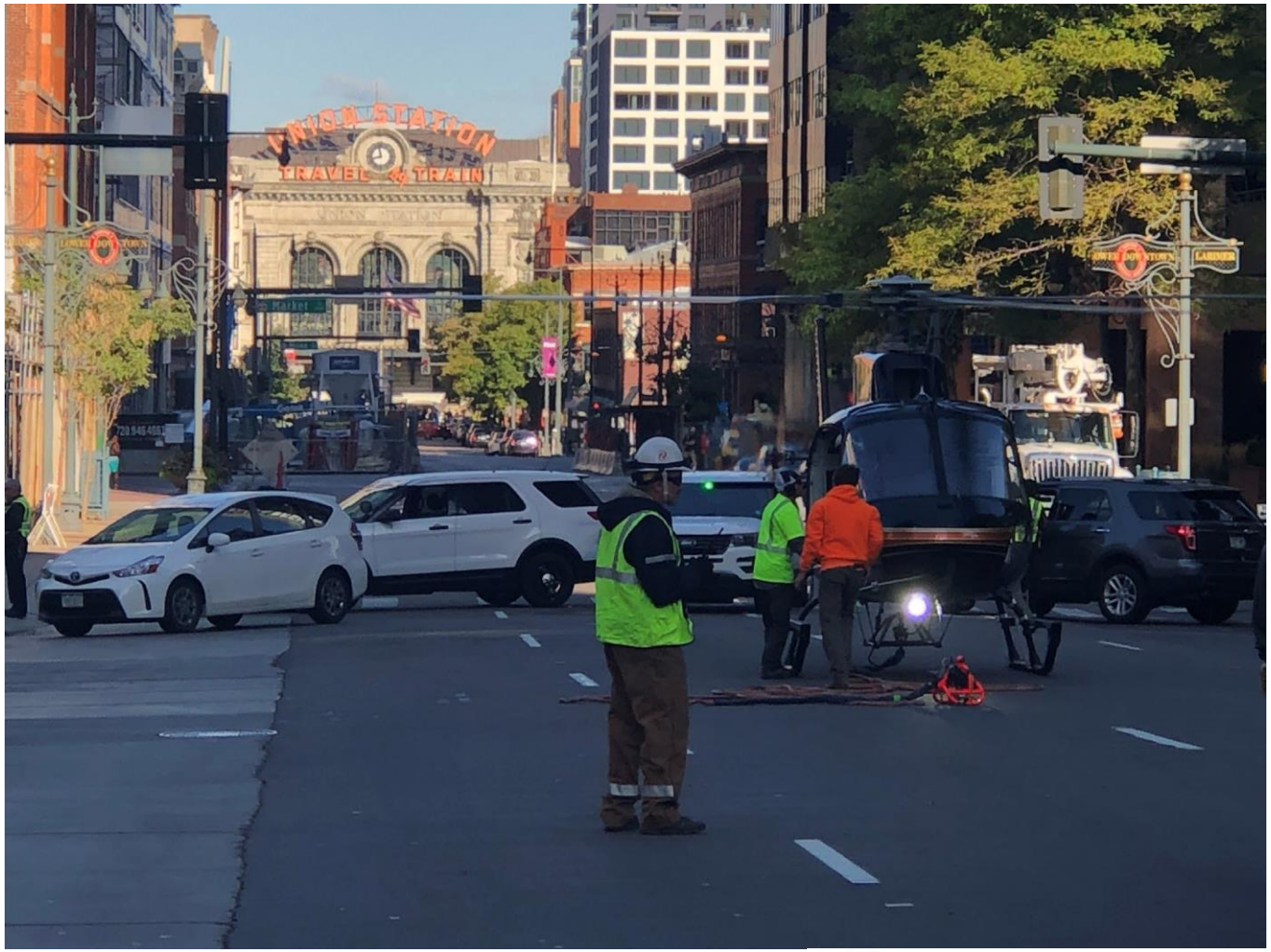
Logistics

The events coordinator for the city of Denver identified September 22nd as the only available day, 3 weeks before the original planned date. The helicopter would have to be refueled several time during the course of the job. Coors field agreed to let Xcel Energy use one of their parking lots as a fueling station. Unfortunately, Coors Field cancelled the agreement 3 days before the scheduled date. This meant the helicopter would have to land on the street.

Logistics

Xcel and the helicopter crew decided, with city approval, to fuel the helicopter on the street between lifts. A fire department crew was on site for helicopter refueling. The delivery route had to be identified and approved. Xcel developed a traffic plan. The city bagged parking meters. Xcel hired a police detail as a rolling traffic blockade and for pedestrian control.



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Logistics

The FAA had to review the flight plan as well as approve the project. The FAA would not allow the helicopter to fly the lifting line over any building that was not part of the project.
This would require several more street landings. Xcel coordinated with each building which did include outages on 4 of the 9 locations. Risk management was part of the process. Several of the buildings did not want to participate due to liability issues. These issues were negotiated thru the legal department. Xcel public relations and media relations were also involved. Xcel had to contact each of the local TV stations to inform the public of the project.

Logistics

On the evening of September 21St, the local TV news agencies broadcast a public information notification about the helicopter flying downtown. This was done to prevent public panic. Xcel media department was able to film the event as well as document with pictures. The crews also attached GoPro's to the equipment being lifted. Finally, new lift rigging was purchased. The rigging had to be rated for 5 times the weight of the heaviest pick. Final approval for the project was given Friday evening , less the 48 hours before the scheduled start.

Crew Make-up

Xcel energy had 28 employees involved in the project. This included all Denver network employees as well as an overhead line grew to assist in the delivery process and drop any overhead lines. The ground crew consisted of 5 delivery people and 3 men to “launch” the protectors and equipment.

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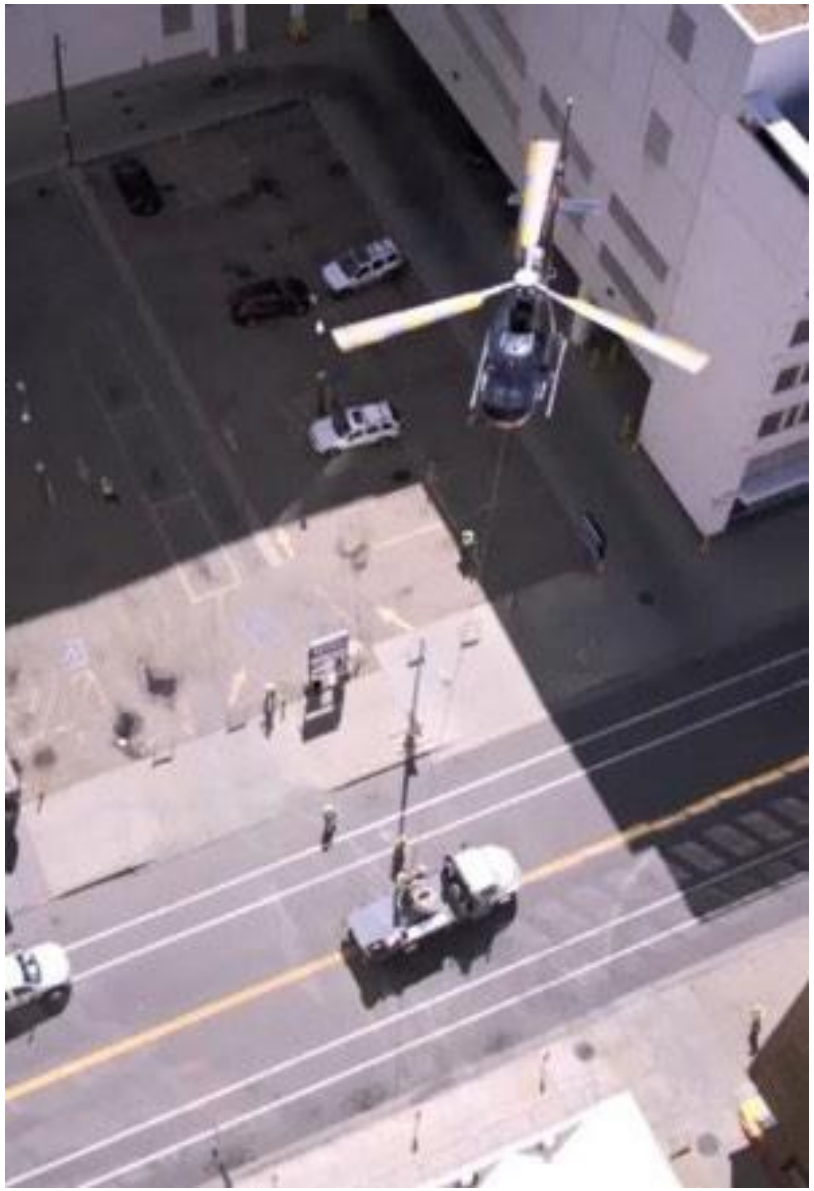
Crew Make-up

There were 3 “catch” crews staggered on the first 3 buildings. The crews were made up of 5 men, 2 to guide the protectors through the hatches and openings and 3 men to land and relocate the protectors. Each catch crew was assigned 3 locations and were responsible to have there locations ready for protector delivery one week prior to the start date. Each foreman decided which locations would require outages to safely land the protectors. After the protectors were delivered to the first location, the crew would bring the lift rigging down and move to their second location.

Equipment Staging

Xcel used 3 different trucks to deliver the protectors. One boom truck with an equipment trailer had 9 protectors. A flatbed truck with 6 protectors and a semi truck loaded with 18 protectors. All trucks were loaded on Thursday. Each protector was on a pallet with 2 tag lines attached to the pallet. 6 high lift pallet jacks were also loaded on the trucks staged with tag lines. Each tag line was 40’ long. Each truck had a predetermined route and was loaded appropriately.



The Video

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Jobsite Performance

The helicopter started at approximately 8 am. The expected duration of the job was 6 hours. The helicopter project took about 4 hours to complete. No employees were injured. The equipment was delivered with little to no damage or problems. No pedestrians were injured and no damage to public property. The job cost Xcel approximately $120,000. If a crane would have been used at each location, the cost for the crane alone would have been at least $275,000.

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Job Assessment

THE GOOD!

What went right? Good communication. Xcel was able to contract with an outstanding helicopter crew. Inter department support was also outstanding. Coordination with the police department was the key to the project success. Crew staffing was good. Truck and equipment staging was also good. Overall job planning was well developed.

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Job Assessment

What would we change? One of the biggest issues was time. Xcel could have used more time to coordinate all of the moving parts. More police officers would have helped keep pedestrians away. We could have used 2 tag lines on the pallet jacks instead of one. Identifying better landing spots for the helicopter.

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QUESTIONS?

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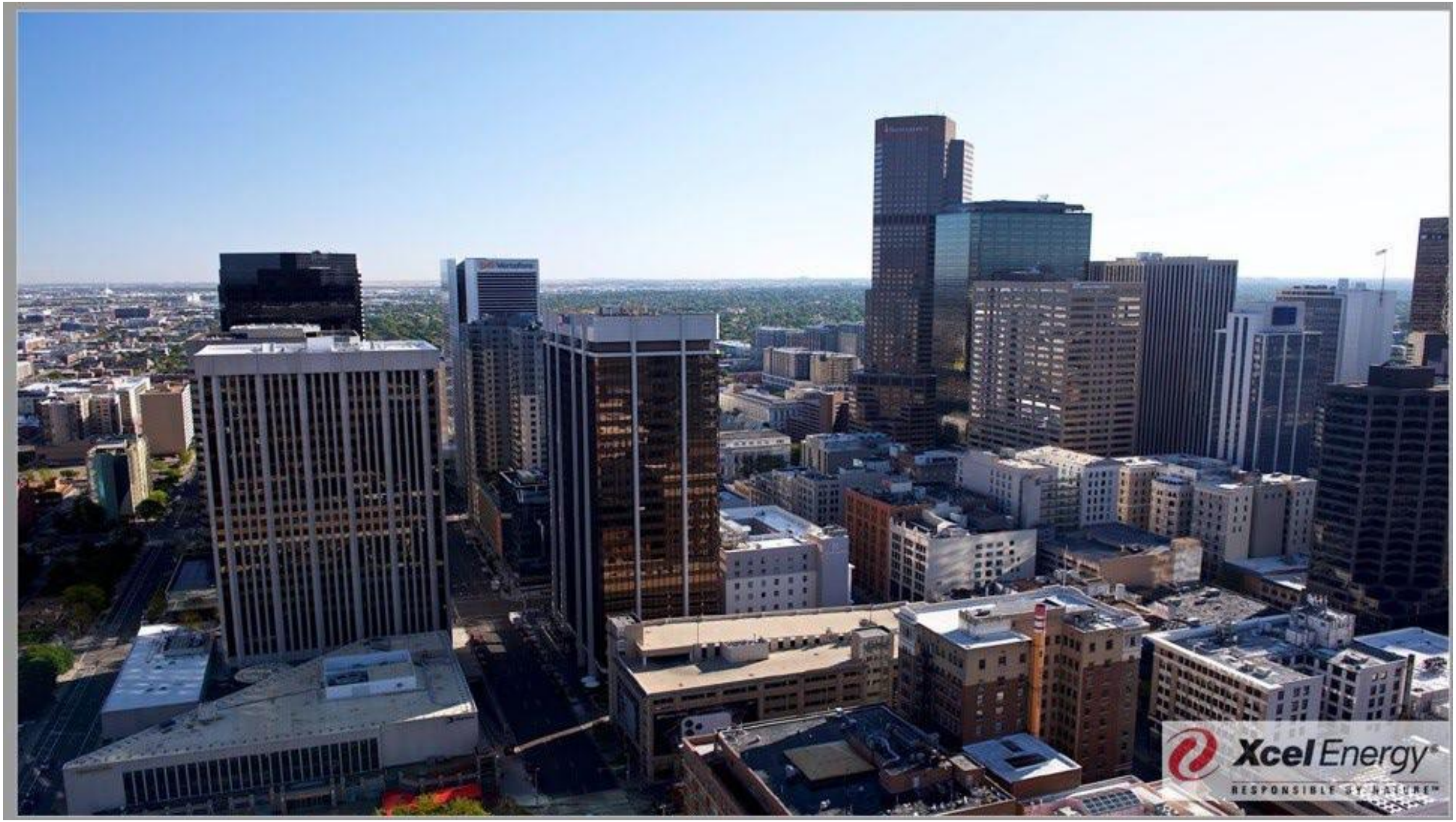
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The Accident

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The Accident

In April of 2019, an accident occurred on a customer owned piece of switchgear on our network. The incident involved a journeyman electrician and an apprentice electrician. They were going to remove a breaker from one set of switchgear and install it into another switchgear while the switchgear was still energized. The utility was not notified of the impending work. The journeyman opened 2 breakers that were labeled emergency disconnect. The journeyman thought this would de-energize the switchgear they were going to work on.

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The Accident

The apprentice checked the switchgear with a static pencil. The static pencil indicated the switchgear was still energized. The journeyman instructed the apprentice that it was only static electricity and the switchgear was in fact dead. They did not check the switchgear with the volt meter that was laying at the base of the switchgear. The 2 began to disassemble the switchgear to remove the breaker. The apprentice made a phase to phase contact with a wrench, causing an arc flash.

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The Accident

Neither the apprentice or the journeyman was wearing FR clothing. A 277/480 volt arc flash can reach a temperature of 35,000 degrees, the surface of the sun is about 10,000 degrees. The first of 3 arc flashes occur. The event was caught on vaultgard.

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The Accident - Recorded

Time	Time(seconds)	Device Display Name	Name	Value	Condition
22:51	43.144405	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	8714 (Caution - High Current Phase A)	Active
22:51	43.144405	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ib	8980 (Caution - High Current Phase B)	Active
22:51	43.144405	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	8948 (Caution - High Current Phase C)	Active
22:51	46.256009	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	154.49 (Caution - High Current Phase A)	Cleared
22:51	46.256009	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ib	138.49 (Caution - High Current Phase B)	Cleared
22:51	46.256009	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	158.99 (Caution - High Current Phase C)	Cleared
22:54	1.043625	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	8686 (Caution - High Current Phase A)	Active
22:54	1.043625	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	8766 (Caution - High Current Phase C)	Active
22:54	4.168012	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	145.49 (Caution - High Current Phase A)	Cleared
22:54	4.168012	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	159.49 (Caution - High Current Phase C)	Cleared
22:54	35.505058	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	4772 (Caution - High Current Phase A)	Active
22:54	38.628072	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	165 (Caution - High Current Phase A)	Cleared

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The Aftermath

Just by chance, a network crew was installing a new transformer and was just a few blocks away. The crew responded shortly after the accident. The switchgear was located near the loading dock. As the crew entered the loading dock area, the building was full of smoke. The ambulance had just left. This is what the crew observed.

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The Aftermath - Switchgear

This is a picture of the switchgear. You can see the static pencil on the ground laying right next to a volt meter.

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The Aftermath - Switchgear

The front of the burnt up switchgear.

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The Aftermath - Switchgear

This is a picture of the inside of the burnt up switchgear.

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The Aftermath – The Apprentice

After the initial flash, the apprentice ran from the switchgear room. His shoes were melting to the floor.

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The Aftermath – The Apprentice

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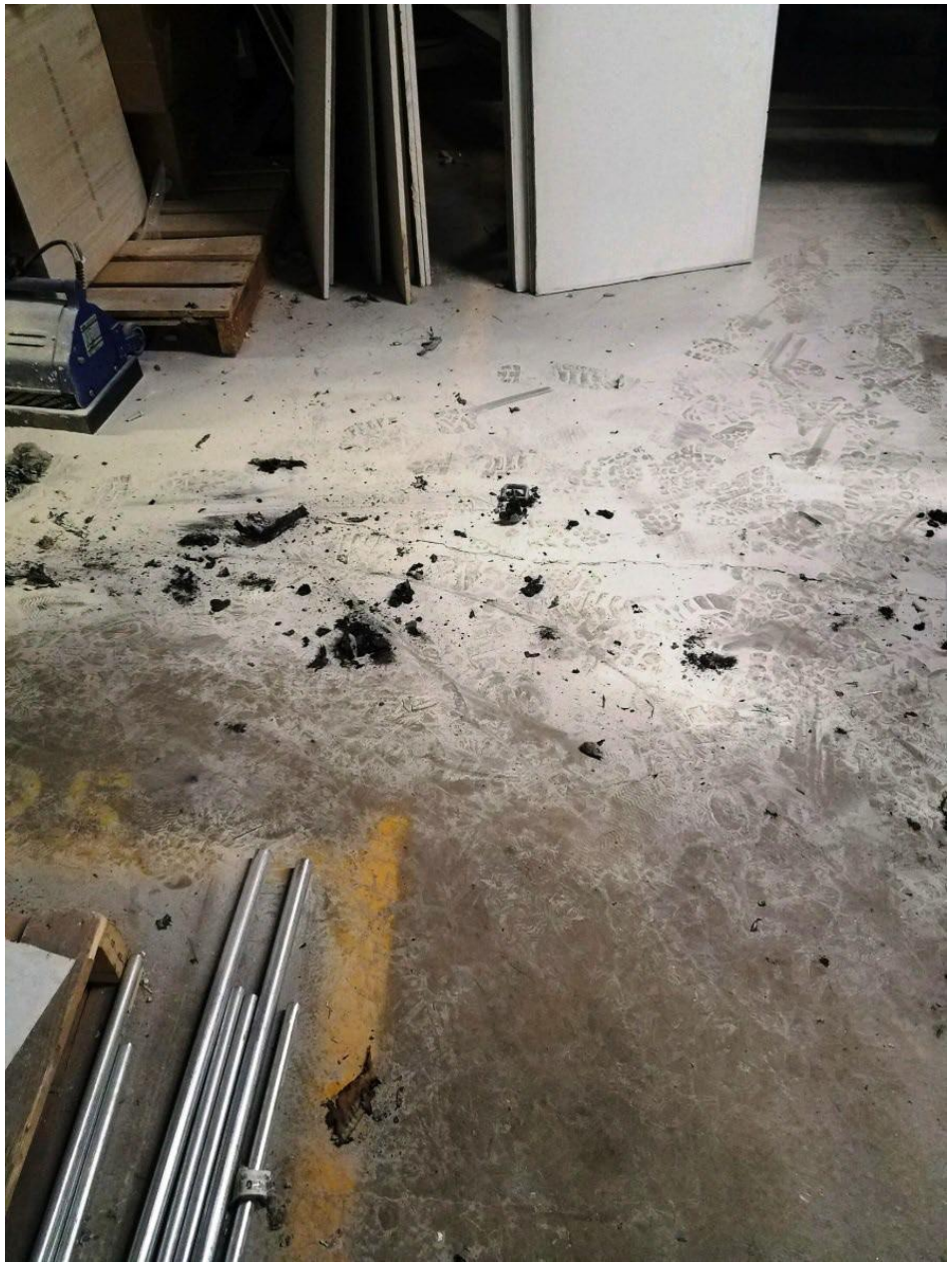
The Aftermath – The Apprentice



The apprentice fell as he turned a corner.

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The Aftermath – The Apprentice

What was left of his
belt, the buckle,
and jeans, the snap,
fell to the ground.

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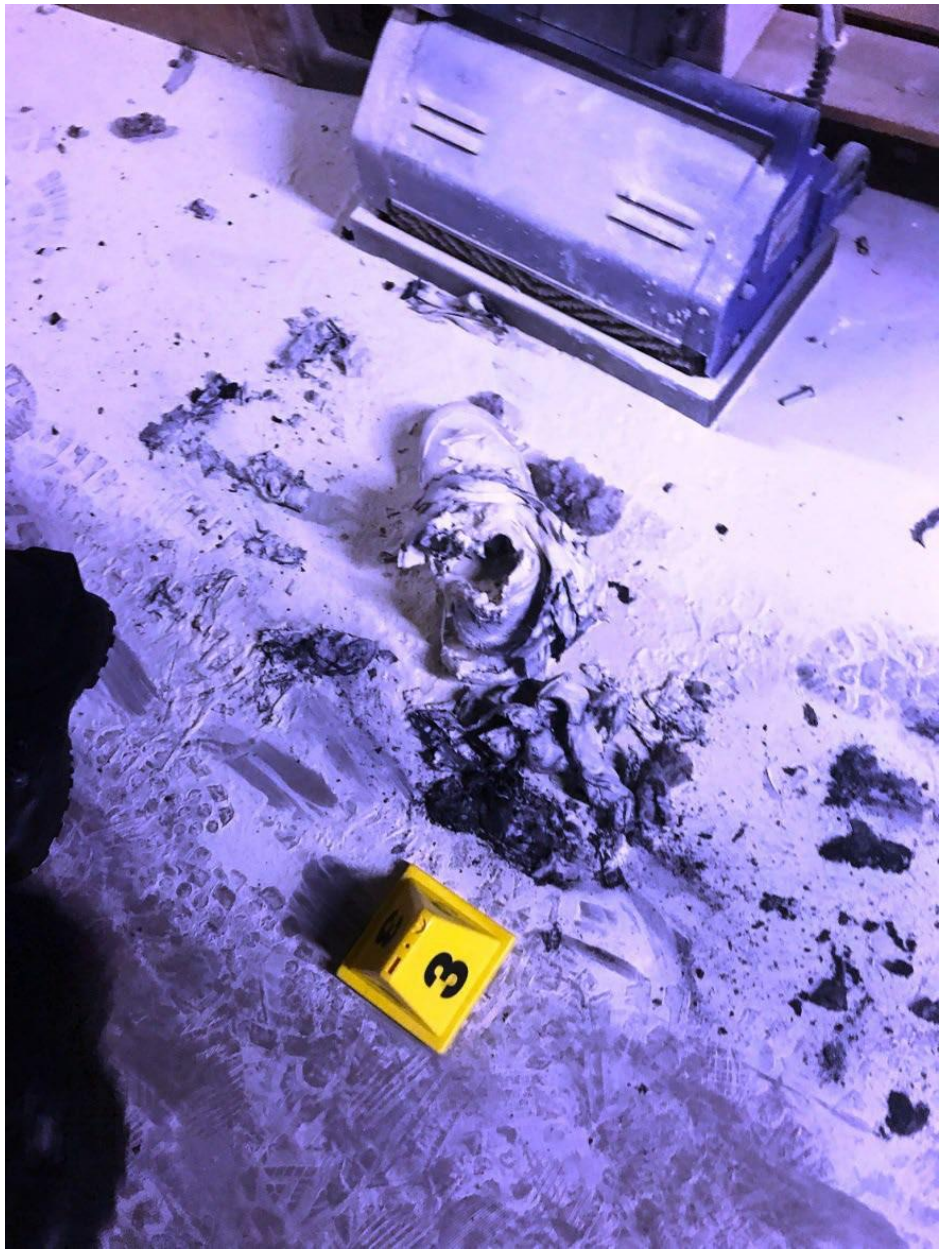
The Aftermath – The Apprentice



A few more steps and the one of the melted shoes stuck to the ground.

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The Aftermath – The Apprentice

And finally, the second shoe melted to the ground.

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The Aftermath – The Apprentice

The apprentice collapsed on the ground still on fire. One of the other workers unfortunately used a chemical fire extinguisher to put the fire out. As of the middle of September 2019, the apprentice has had over 12 surgeries and is in a medically induced coma.

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The Update

This gentleman did survive the accident. I did see the apprentice in June of 2022. He was with a lawyer and the were revisiting the scene of the accident. The gentleman's face was in good shape. The apprentice was covered from the neck down so the amount of trauma was unknown. Thankfully he is alive and moving around.

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CM52 – The Future of Protectors

- **Dead front protector.**
- **Higher interrupting and fault close ratings.**
- **Standardized modular components.**
- **No adjustments required and fewer replacement parts.**
- **Built-in wear gauge.**

- **Remote racking ability. The CM-52 remote racking device provides a means of remotely connecting and disconnecting a network protector from the energized bus-work.**

- **CM52 is set up for NPARMS. Network Protector Arc Reduction Maintenance System (NPARMS) senses fault current in either forward or reverse direction in addition to providing the utmost in arc flash protection. When enabled, the innovative Arc Reduction Maintenance System establishes a preset instantaneous trip level that overrides the time delay function of traditional over current relays and schemes of the associated breaker.**

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The Rule to Live By!

ALWAYS REMEMBER

NOT GROUNDED, NOT DEAD!

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