This is what caused that shocking blue glow over New York City

The night sky over New York City glowed bright as day Thursday evening, pulsating with a strange blue light after a fire at an electrical substation caused transformers to explode, sending electricity arcing through the air.

Luckily, the fire quickly went out, and there were no injuries, despite the mind-boggling light display. Nearby, LaGuardia airport suffered a brief power outage, but otherwise, effects were minimal. New Yorkers did manage to get some incredible photos and video of the event.

> *There was a brief electrical fire at our substation on 20th Avenue & 32nd Street in Astoria this evening, which caused a transmission dip in the area. All power lines serving the area are in service and the system is stable. Photo: Michael Friedl, New York Times pic.twitter.com/vq2Ao46rhk*
>
> *— Con Edison (@ConEdison) December 28, 2018*

The power company that runs the substation, Con Edison, said the blue light was caused by an "electrical arc flash," according to a statement reported by *ABC News*. When a strong electrical current passes through the air, it causes a blinding light, called an electric arc. The current alters the particles in the air and creates a charged gas. You might have seen the same thing briefly when a lightbulb burns out, watching construction workers weld steel, or simply when lightning strikes.

So what actually happened here? We don't have a play by play yet of how this particular fire was set off, but we do have a

general idea of how events like these unfold.

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On Thursday night the NYPD confirmed on Twitter that the incident was caused by a transformer explosion. Transformer explosions can be especially large because of what's inside a transformer in the first place. A transformer's job is to *transform* electricity flowing through the grid, switching it from higher voltages that are used to distribute power over long distances to lower voltages designed to be used in homes and businesses. That means that transformers usually have a lot of electricity flowing through them. To keep everything cool and insulated inside, the transformers are filled with a liquid called transformer oil or mineral oil.

Under normal situations, mineral oil – which is made from petroleum – works just fine. But when something goes wrong, it goes wrong with a vengeance. Mineral oil ignites at the relatively low temperature of around 300 degrees Fahrenheit, and since large volumes of oil are used in transformers, even a small malfunction can set off a powerful blaze.

This malfunction can be as simple as an electrical spike. As Cassie Rodenberg reported at *Popular Mechanics*; "As transformers detect an energy spike, they're programmed to turn off, but it can take up to 60 milliseconds for the shutdown. However fast those milliseconds may seem, they still may be too slow to stop the electrical overload."

Blue lights seen over New York City
Matt White

Some researchers are looking into alternatives for mineral oil

in transformers. They’re focusing on materials that are less flammable and more environmentally friendly, including chemicals called esters, and even vegetable oil.

Exploding transformers and the accompanying eerie blue light of electrical arcs have startled other cities in the past. In 2011, a series of transformers blew in Fort Worth, Texas during a lightning storm, lighting up the sky for about half an hour.

New York City has seen this before too, when the powerful remains of Hurricane Sandy slammed into the region in 2012. During the storm, a transformer blew in Manhattan, a situation that was believed to be caused by water getting into the electrical system, causing a massive explosion.+

[embedded content]

In the aftermath of that storm, 1.1 million people lost power. As a result, the power company, Con Edison, spent $847 million on repairs, overhauling some of New York City’s electrical systems in the process.

Again, it’s still not clear what exactly caused the more recent substation fire in Queens, but the effects of this outage appear to be far more minor than those suffered during Sandy. The New York Times reported that within a few hours of the explosion, only 50 households were without power. By 12:30 am, only 11 customers were without power, according to Con Edison’s website.

Investigators will continue to look into the cause of the fire, but there’s one explanation that has already been ruled out. It’s not aliens.

https://www.theverge.com/2018/12/28/18158660/blue-glow-new-york-city-exploding-transformers