

POWER OUTAGE GUIDELINES

ALL utility power comes into the site via the Otero Electric Cooperative (“Co-op”) (575-682-2521). The overhead lines are 34,000 volts phase-to-phase and 29,000 volts phase-to-ground, 3-phase, and are therefore extremely dangerous.

Always stay at least 10 feet away from any line that “might” be energized. When there is a line fault, the Co-op will send power burst down the line automatically to see if it will re-energize. Their circuit breakers require very high current to trip so even a line with a ground fault may not get shut off by their breakers.

Always assume a utility line is energized. The only safe line is one that a Co-Op person has disconnected and grounded.

In most cases when a utility power outage occurs several things happen seamlessly:

1. UPS units keep critical items (mostly computers) powered up via their internal batteries. This will only be sustained from 5 to 30 minutes depending upon the UPS.
2. The generator starts automatically in a few seconds
3. The main transfer in the utility area of the Operations building will transfer automatically to power the Operations building, dorms, 3.5m telescope, ARCSAT, NMSU 1m, Plug Lab and 2.5m telescope. This will be done in about 15 seconds.
4. The secondary transfer switch (on south wall of generator cabinet) will transfer to apply power to the “utility building” (a.k.a. shop/garage). This will take about 1 minute.
5. The LPG generator outside the SDSS Engineering trailer will start.
6. The transfer switch on the west wall of the SDSS engineering trailer will transfer to generator power. This will take about 1 minute.
7. The UPS units will return to normal operation (not running on batteries) once generator power is supplied to them.

Once power is restored by the Co-op all of these functions will go back to normal operation, usually seamlessly. The main differences are:

1. The switch from generator to utility is programmed to be about 10-15 minutes to ensure power is stable
2. The generators continue to run about 10-20 minutes longer to “cool down” after the load has transferred back to utility power.

What Do YOU Need To Do:

1. Verify main site generator starts or start it manually, if required. Procedure for this is here: <http://www.apo.nmsu.edu/Site/030107FacTrbleShoot/GeneratorTransferSwitch.pdf>

2. Verify BOTH transfer switches transfer normally; if not, do so manually. Procedure to transfer switches manually:
<http://www.apo.nmsu.edu/Site/030107FacTrbleShoot/GeneratorTransferSwitch.pdf>

3. Verify UPS units in Instrument Lab, and 2.5m and 3.5m telescopes have no alarms.

4. Verify air compressors in boiler room are operating, see:
<http://www.apo.nmsu.edu/Site/030107FacTrbleShoot/KaesersComp.pdf>

5. Verify HVAC unit in computer room is operating, see:
<http://www.apo.nmsu.edu/Site/030107FacTrbleShoot/default.html>

6. Verify generator #2 (SDSS engineering trailer) starts or start it manually, if required. Procedure for this is here:
<http://www.apo.nmsu.edu/Site/030107FacTrbleShoot/GeneratorTransferSwitch.pdf>

7. Call Co-Op at (575) 682-2521 to report outage.

If ANY of the above systems required manual intervention or are not operational, call: Ben Harris or Mark Klaene; Fritz Stauffer or Jon Brinkman (for Computer/IT), John Downey (for 2.5m), Bill Ketzbeck (for 3.5m).

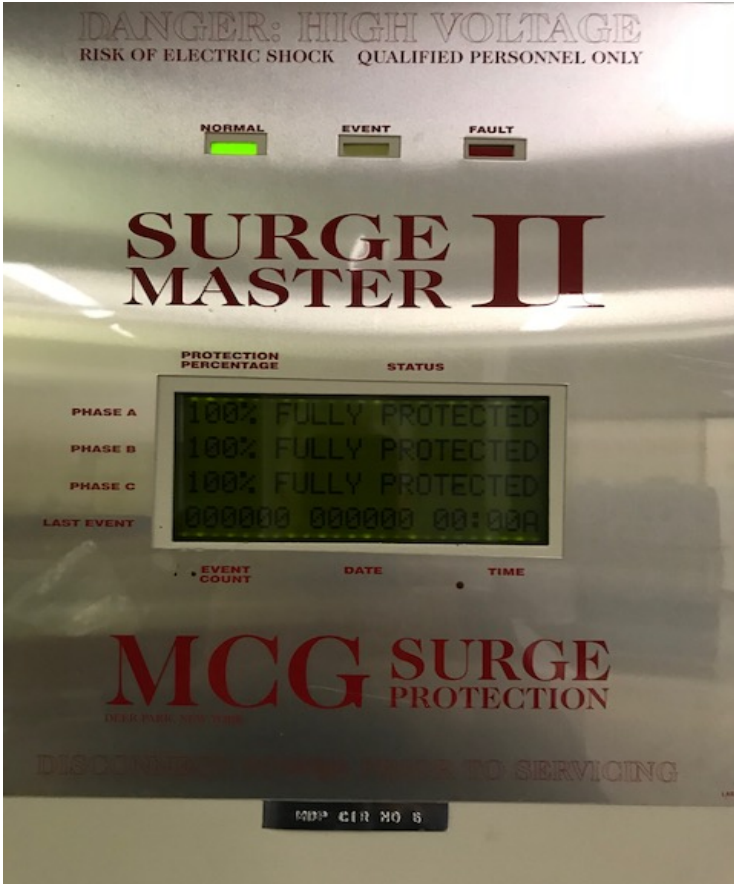
Potential Issues with utility power failure and 3-phase motors:

The Co-Op utility power has many interesting attributes that don't always go as planned. When a phase goes down we will often see high voltage on the remaining phase. This causes issues for some equipment. And as you might expect 3-phase motors don't like this at all. The air compressors and some HVAC units are 3-phase. They all protect themselves from these situations (usually) but they do so by shutting down. So depending on Co-op failure mode, which actually sometimes occurs when they repair a line, these conditions can get hard to understand, explain, and correct.

The best thing to do if you see things that don't make sense when on utility power, is go on generator power by forcing an outage, see:

<http://www.apo.nmsu.edu/Site/030107FacTrbleShoot/GeneratorTransferSwitch.pdf>

The easiest way to verify that utility power is coming into the site is to look at the surge protector in the utility area of the operations building. It should appear as in the photo below:



Note: NORMAL is lit in green; FAULT is not lit; Protection is 100% for each of the 3 phases.

An EVENT would be a surge from either lightning or possibly power line issue. Call Ben Harris or Mark Klaene if you suspect this or have questions.