



Recovering From the Unthinkable: Safely Starting Up a WWTP After a Prolonged Power Outage

City of Cincinnati Metropolitan Sewer District

2023



INDIANAPOLIS
FIVE CITIES PLUS

MSD At A Glance

MSD treats 190 million gallons of wastewater a day



MSD has 10 treatment plants and other assets

MSD maintains more than 3,000 miles of sewer pipe



MSD serves >225,000 residential, commercial and industrial customers

Background of Event

- Mill Creek WWTP.
- Replacing 45 (about) year old transformers and substations.
- Normally have 2 electrical feeds available at all times.
- East substation and transformer were replaced first and were in use under full load.
- West substation and transformer were disconnected and in the process of being disassembled.



Day of Event

- Morning of March 5th.
- Newly installed transformer failed causing plant wide power outage.
- MSD Safety On Call was notified of loss of power in the CSD building by Lab staff.
- Treatment Management had identified that the transformer had failed, and all of the Mill Creek Campus had lost power.
- Treatment closed all influent gates.



Initial Safety Response



- Sunday morning MSD Safety was instructed to go on-site to address an oil spill from the transformer and to help with mitigation of hazard created by outage.
- Safety met with treatment operators and maintenance to explain that personal gas meters must be used since HVAC systems were not operating.
- WWE building had power since it was on a separate grid. This was used for charging and bump/calibration of gas meters.
- Safety met with lab staff to ensure they had proper lighting.
- Doors needed to be propped open since badge system was inoperable.
- Since fire alarm systems were down, a fire watch was put into place for the entire campus with the help of Operations and Lab staff.

First Day Fully Staffed

- Still no power to process areas.
- Powered restored to office buildings using trailer mounted generator.
- Placed all fire panels in test since we were receiving hourly alarm notifications from monitoring company on an hourly basis for 10 panels.
- Safety continued the Fire Watch with help of Operations.
- Treatment took advantage of total power outage to perform maintenance tasks.
 - Dived Influent Diversion structure to remove debris and make modifications to gates.
 - Safety helped to review LOTO and ensure a verification was completed prior to CSE.
- Sump pump pipe failure in the dry well. Allied installed hydraulic pump.



Tuesday March 7th

- 6:00AM traffic/access control for work area.
- Generators arriving on site.
- Boots on ground until 9:00PM to monitor generator hook up.

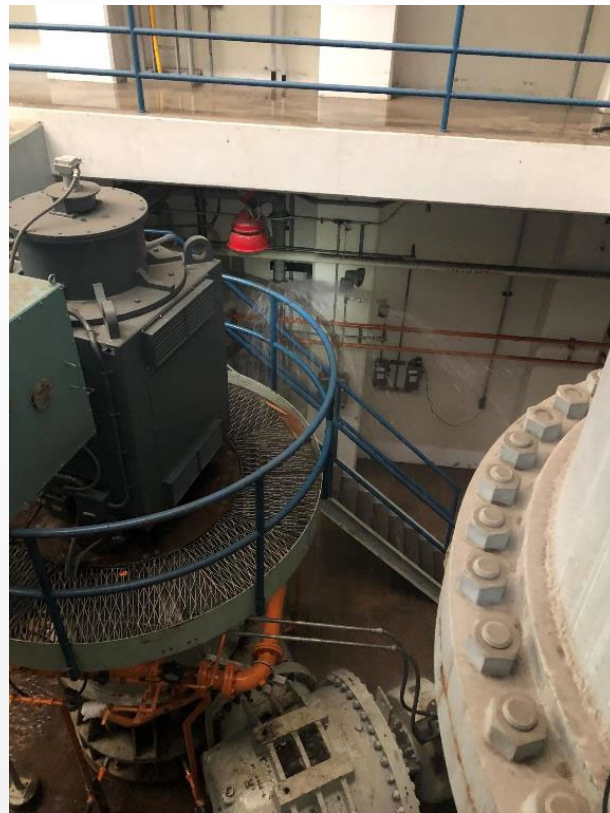


Wednesday March 8th



- Generator hook up completed for all generators, transformers, and fuel oil tanks.
- Started power to treatment processes. Continued to keep gates closed.
 - Aeration Blower
 - **Network issues**
 - Employees not wearing proper PPE in field
 - **Employees in the field that are not normally in the field**
 - Primary thickening
 - **Sense urgency created unsafe situations (ex. electricians not wearing Arc flash PPE while throwing switches)**
 - Primary Settling
 - Grit Tanks

A Late Night And An Early Morning



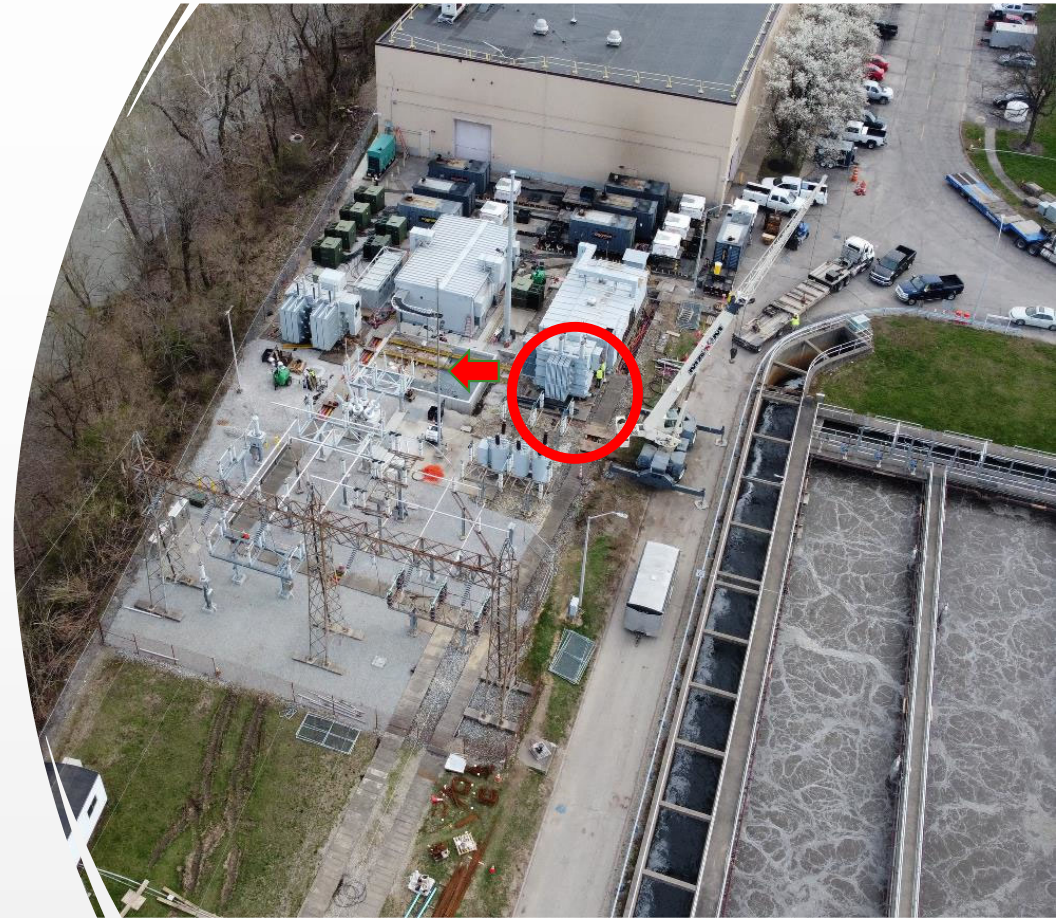
- Started influent pumps.
- Partially opened Mill Creek interceptor gates to allow flow into plant.
 - Had to restart SCADA
- Safety came on site at 2:00AM to support Operations.
- Safety assisted Operations in flow issues.

Generator Failure



- Caused power outage to office buildings.
- Another generator onsite within hours.

Back To Normal?



- Situation started to stabilize and no longer by-passing treatment plant.
 - Able treat up to 130 mgd through primary only.
- Safety continued to observe Operations and Plant Maintenance crews while they performed common and uncommon task.
- Original transformer re-installed to power the plant.
- Continued observing for another 2 weeks.

Lessons Learned

- The presence of Safety is vital for safe working practices during uncommon work tasks/situations.
- Safety used as a deterrent for unsafe work practices.
- Communication is very important!
 - City Employee Safety was not notified of situation until Tuesday March 7th.
- Need to update business continuity plan to refer to in the case of plant wide power outage.
- Lack of PPE was noticeable throughout beginning of power outage.
- Better documentation of fire systems.
- Traffic Control
 - No centralized storage area for traffic control devices
 - Lack of communication caused confusion for new traffic route
 - Some employees ignored traffic control devices



Thank You

