EMERGENCY POWER OUTAGE PROCEDURES

First Operator on Premises

Step 1. First person on site: Verify Water Reclamation Facility (WRF), has an operator present or on the way to the facility. The gate to the WRF will be open if someone is there. Due to the WRF's superior notification process, facility staff are most likely aware of the problem and are on site.

Step 2. Second person on site, or first water operator, (generally the Lead Water Operator): Verify the WRF has a Plant Operator present. If no certified operator is present at the plant, notify the Lead Plant Operator. If no response, notify the District Manager.

Note: Steps 1 and 2 can be ignored if the water operator is confident that WRF personnel are responding.

Step 3. Verify the Lower Reservoir Generator is running. Pull into the District Office area if necessary in order to hear the generator running. If generator is running, it is fairly safe to assume you have power to the reservoir. You should also be able to hear the "familiar hum" of a pump running.

With the generator and pumps running, it is safe to proceed to Step 4. (The Lower Reservoir and the Main Lift Station are the two most important places to check, but cannot be viewed at the same time. If you can hear the Lower Reservoir Genset running, and you can hear a pump running, then you can proceed more quickly to the Main Lift Station without accessing the Lower Reservoir building). If you are unsure of Lower Reservoir operation, you will have to take the time to access the inside of the building.

If you enter the Lower Reservoir Building because you are unable to hear the generator and you cannot hear a pump running, upon first entering the building (if everything is dark and powered down), shine your flashlight at the power pole across the street…not the pole by the office. There is a knife switch on the power pole that may be tripped open. This switch is like a switch blade knife, and will kick

open in the event of a major short, or instantaneous massive power draw. If this switch is open or hanging down, the Emergency Generator should be running as there is no “shore power” to the building.

If the knife switch is closed or in the up position, assume it is intact and look at the building power meter. It should indicate shore power present by virtue of a lit LED and a blinking 4-piece pie chart showing phases. If the shore power is present, the generator should not be running with the exception of “cool down mode.” After the power comes back on, the generator may still be running in cool down mode. In order to lower its own temperature, it may run for a few minutes after the power comes back on as it will run a lower temperature with no load.

Today’s power meters have a round symbol that indicates phases. It consists of four parts that resemble a pie slice (triangle shaped). These will be constantly changing and it’s important to know how to verify these “phases” on all meters present at pumping stations. A shorted phase will cause a series of problems, such as single-phased pumps, or malfunctioning controls.

Meter L.E.D. is lit, and the round pie chart symbol will be constantly changing. This is an excellent indicator of proper shore power to your building or pump station.

It is important to be familiar with the transfer switch panel. The far-left arrow in this picture indicates shore power, (regular power from the PUD). This is labeled “S1”. The second arrow, to the right, indicates connection to the meter. The industry building in the photo represents your building, or station being powered. Note the first arrow to the left is pointing to a green light that is on. This means power is coming in. The second light is on, indicating connection is made from shore power side.

The third arrow to the right indicates generator power, and is normally not lit unless the generator is running and is in use. The fourth arrow indicates the generator itself and is labeled “S2”. When switched to the generator, the second arrow to the right will not be lit, and the third arrow to the right will be lit. “S2”, or the generator, is now supplying power.

Step 4: Main Sewer Lift Station : Verify that the generator for Lift Station No. 1 (Main Lift Station), is running. If you cannot hear a pump running, it may be between cycles. Lift the metal hatch cover and observe the lights coming on down below. If the lights come on, you have power coming through the station circuits.

The Main Lift Station also has a knife switch breaker on the power pole across the street. I have seen this knife switch trip open when power comes back on, due to high demand.

As with any knife switch, only the PUD can reset. The knife switch is shore power only. The generator does not run power through here. If the operator is confident that the Main Lift Station No. 1 is up and running, then proceed to Taylor. The operator should know by now whether power outage is total, or affecting only certain areas. Notify the PUD if the knife switch is tripped.

If the power outage is affecting the total area of Sunland, the District Manager should be notified. If unable to reach District Manager, operator still needs to notify the SWD crew.

If the crew members arrive soon enough, then assign them to Taylor Station, Upper Reservoir, and Highway Lift Station. Normally, it is the Lead Operator's responsibility to notify the District Manager and SWD staff of a total power outage. The Manager and WRF staff will most likely already know of the situation.

It is the Lead Operator's responsibility to establish the severity of the power outage. If the Lead Operator determines if the power outage is affecting only one area, the generator is running, and the station is still functioning. If so, the Lead Operator will decide whether or not to call in additional staff. Since the installation of new generators the past couple of years, there may be occasions where only one station is down and calling in extra staff won't have an effect.

In the event District Manager is not available, and the Lead Operator is not available, the responsibility to implement SWD's power outage procedure falls to the second and third operator. In this scenario, there are only two operators available and the second or third operator should also notify the lead operator at the WRF. All total power outages require a man on the scene.

Limited power outages, such as just one station out, still require a man on the scene, but may not require the entire staff. The station may be running fine on a generator, but there will be a reason why the regular shore power is out. This is where it is good to know about the knife pole switches, and the power meter

phase symbol. It is recommended to notify PUD if the shore power is out. They will be able to tell you why the SunLand Water District has experienced burned neutral lines, and burned positive power lines underground.

Step 5: On the way to Upper Reservoir No. 1, verify the Taylor Lift station No. 3 generator is running. You will hear the Taylor generator running as it has a distinctive sound. You may also hear a VFD (Variable Frequency Drive) start up and a pump come on and start pumping. When the operator is confident the station is running, proceed to the Upper Reservoir. If the Taylor Life Station generator is not running, and the power meter shows no shore power, then the (1) generator needs to manually run, (2) the maintenance mode has shut it down, or (3) the transfer switch has failed to operate. For maintenance mode shut down, the steps for bypassing this mode and restoring the generator are written in the manual which is kept in the generator cabinet. If the transfer switch has failed, notify the PUD that the Taylor Lift Station has no power. Although the transfer switch repair will be SunLand's responsibility, the PUD will at least verify this is the issue.

Step 6: Verify the Upper Reservoir generator is running. The power will not always be out at both reservoirs. Verify the Upper Reservoir is running on the generator or on AC shore power. If the Upper Reservoir is running on shore power and not on the generator, the power is not out across all of SunLand. (The exception would be if the power comes back on while the operator is driving between stations.) The goal here is to make sure the Lower Reservoir is pumping water first. Proceed to the Upper Reservoir quickly in this scenario. The objective is to not lose system pressure. If the Upper Reservoir is pumping water, system pressures will be maintained to a level that avoids a Boil Water Order. Whenever SunLand Water is running on only one Reservoir, then all large irrigation systems must be disabled. The District Manager or Lead Operator is responsible to dispatch a crew member to turn off all 2" irrigation feeds, and then as many 1" irrigation systems as possible. The water district can maintain system pressure on just one or two booster pumps.

Step 7: Verify the Fawnwood Lift station is not at flood stage. This can be from 2 to 4.5 hours. It is prudent to visit Fawnwood at this step and get a visual inspection of the sewer tank liquids level. Note inflows and weather for an idea of how much time you have. Verify that the 4-inch emergency trash pump is fueled up, and suction plus output hoses are ready to go. The Fawnwood Station does not have an emergency generator, so the emergency trash pump is normally kept fuel ready, with designated hoses in assigned places at the barn building. At the Fawnwood station, it will likely be necessary to drain the force main in order to get the emergency trash pump to prime and pump. Allow 2 to 3 ft of space in the wet well for back draining the force main.

There is a second containment tank present at Fawnwood. Note the pipe opening to the second tank which is inside the wet well. The operator should know or be trained to recognize this opening. When the water level during a power outage rises to the bottom of that pipe opening to second tank, that is where the force main backflush should proceed. Prime and run the emergency trash pump and it will get underway. In most cases, the shore power is back on before the emergency trash pump is needed at Fawnwood. This is due to the slower influent volumes to this tank.

Step 8: Check Highway Lift Station No. 4. This lift station can take 4 to 8 hours to flood, depending on usage, time of day, and weather. The Highway Lift Station is set up the same as Fawnwood. It has an auxiliary bypass valve. The pumps can be bypassed using the emergency 4-inch trash pump. It may also be necessary to drain off the force main to achieve starting prime with the trash pump, so leave 2 or 3 ft of rise for the force main contents to be back drained.

It is very unlikely the emergency trash pump will be used at the Highway Lift Station. It is the last on this check list because it has the lowest volume of influent out of all SWD lift stations.

Summary of Essential Training for Emergency Response to Lift Stations

Operators should be able to verify telephone pole knife switches.

Operators should be able to verify if the power meter power is on.

Operators should be able to read LCDs on pump panels and transfer switch panels.

Operators should be familiar with breakers in question and how to reset them.

Operators should be familiar with the emergency trash pump and how to run it.

Operators should be able to do basic trouble shooting of pump failures.

Operators should always maintain fuel levels in any vehicle to a minimum of ¼ tank of fuel.

Operators should strive to learn operating pressures at both the Lower and Upper Reservoirs.

Operators should strive to increase waterline repair skills and keep trucks and tools ready, clean and greased, for emergency repairs. (A sense of organization is a plus.)

Operators shall share knowledge of updates, changes, and documentation with other operators as it becomes available.

Operators shall be aware of where and how to find emergency phone numbers quickly and be aware of changes. 911 is an emergency number only, but has been used when loss of utilities threatens loss of life and no other avenue presents.

Operators should be familiar with calling in locates, especially emergency locates.

Operators should pursue a First Aid Course and know how to perform CPR.

Operators should know safety rules and always be looking out for fellow operators.