

VANDEVANTER ENGINEERING

MALDEN MO WWTP DOWN SERVICE CALL

AUGUST 30, 2021

Scope:

WWTP system is down. Jeff was in Caruthersville and came over to this site.

Case Notes:

(Use for Jeff Baur time on Monday 8/30/21) Call from Jason Burge stating they are having multiple issues at the newly taken over Dunklin County Sewer Dist. WWTP.

Work Performed:

WWTP - System is a vacuum system. There are 4 vacuum pumps that pull the sewage to a tank, then there are 2 sewage pumps that pull it from the tank and pump it to the lagoon about 3 miles away. The vacuum pumps maintain negative pressure with a pressure transducer sending a 4-20mA signal to a PLC. PLC then calls pumps as needed. There is also a pressure switch for back up. Tank level is read by a pressure transducer, with 2 float back up for alarms. Sewage pumps are called to run based on 4-20mA level sent to PLC. Sewage pumps are running off of VFDs.

Issues as I understand them. There is a Chatterbox and a Mission, Chatterbox is not functioning and the Mission was shut off because it was calling every 30 seconds. Both sewage pumps clogged, both check valves clogged, back up floats in the tank failed, overflow valve for the tank to the vacuum pumps failed, vacuum pumps continued to pump until they filled with sewage causing all four of them to fail.

Customer took apart all 4 vacuum pumps and filled with new oil, except for pump 1, it has more issues. Both sewage pumps and check valves were cleared of all debris, 2 new floats were installed in the tank. Once all this was completed the system was ran by the customer in hand. After a few minor issues it was running. Customer asked me to go through the panel and PLC to see if it was functioning properly. We were able to put all in auto and see full functions. Vacuum pumps pulled a vacuum and was bringing in sewage. Only issue here is that pump 1 is still out of service and the PLC for whatever reason seems to want to call it first. This was verified by seeing voltage at the output for pump 1. Not a major issue, just noting it because the PLC calls the next pumps as needed based on the vacuum pressure. Vacuum pressure, force main pressure, and liquid level were verified with the displays. Vacuum pressure was verified with mA clamp as well. Once level in tank was high enough the sewage pumps were called and ramped up to full speed, only full speed then off at off point. VFDs did not ramp up and down. Alternation of the sewage pumps is working as well. Low level and high-level alarms from the PLC are functioning properly. High level and low-level floats were working as well. All of these alarms were verified by the outer door indicator lights.

Before leaving the customer found that sewage pump 2 VFD tripped on overtemp. This was an internal overtemp not the pump. Both VFD fans were not spinning and the airflow for the heat sinks was completely clogged. The VFD was hot to the touch. We removed both fans, cleared all the gunk and put a floor fan underneath then VFDs. Air could be felt flowing through the top of both VFDs. This is only a temp fix, but should hold up for a while. Once system was up and running completely in auto the

sewage pumps would only run for about a minute then shut off for a couple of minutes. Worth noting that neither of the VFDs keypads appear to be functional.

The plc appears to still be functional, however the customer asked about simplifying the system by replacing the panel. I took pictures of the drawings. **Estimates to replace panel and simplify the system estimated \$75,000 - \$100,000.**

Overflow valve on top of the tank is not functioning. The PLC and selector switch does change the voltage on open and close to the valve, but it does nothing. The valve has a lock wrench on the handle, which implies this was the way the valve was closed and opened in the past. Customer would like a replacement actuator valve.