

## Hysham Notes for 5/09/2023

### Control Valve Troubleshooting (chopper valves)

- Reviewed why the air valve to the west CAC unit failed.
- A Bray solenoid valve from the east backwash water valve had to be used to get the failed valve to function. Two solenoids that were tested in February did not seem to work, but seemed to work when I tested them in February.
- We found that the plastic manifold connecting the solenoid to the valve can be reversed allowing the solenoid to act as either a 5-port/2-position valve or a 3-port/2-position valve. The valve won't work if the manifold is reversed. The plastic manifold has to be positioned so both ports show through the manifold and the plastic does not cover either of the ports. The "5/2" indicator will point away from the pilot on the solenoid. These details are not described in the equipment manuals from the vendors. We retested the solenoids on the east backwash water valve and both solenoids worked well. We re-labeled the solenoids with the current test date and replaced them in the spare parts area.
- We tested the solenoid that came off the malfunctioning west CAC air valve and found that it also worked well on the east backwash water valve. We noticed the air valve was a little sluggish even with the replaced solenoid, so we removed the air snubber on the exhaust. The valve acted much more quickly. It is possible that a partially plugged snubber was the root cause for the valve malfunction.

### Control Valve Troubleshooting (positioning valves)

- We evaluated troubles with the water feed control valve to the west CAC unit. This valve modulates to control flow rate at the operator set-point and performs the important function of closing to hold in CAC unit beads when water flow stops. Beads will flow backward out of the CAC unit and be lost if the valve fails to close.
- As a first step, we closed the upstream butterfly after the plant was off and tested the valve. We were surprised to find that the valve worked very well including quickly moving to set-point and accurately moving to the proper position. We tested it at 0, 25, 50, 75, and 100% open several times moving both open and closed.
- We don't know why the valve was not working well before. We theorize that an air issue may be to blame. Possibly a slug of wet air caused by high air loads on the system due to the leaking diversion valve cylinder. Roy is planning to replace the cylinder this week which may resolve the issue. Roy will monitor the valve's operation and make sure it closes when the plant shuts down.

### Reviewed the Monthly Compliance Report

- Roy and I compared how we prepare our monthly reports. Hysham has done a nice job improving their processes and I expect their May report to be very good quality with the new distribution samples included. A summary of what we discussed follows:
- The "Data Entry Form" tab is used differently than Forsyth, but our systems operate differently regarding clearwell level. Hysham uses a single max flow and minimum inventory

for the month while Forsyth uses different numbers each day. The Hysham peak flow of 560 gpm looks reasonable. The volume equates to about a 4.5 ft level in the clearwell which also seems reasonable. It is important for the calculation that flows don't exceed the 560 or levels don't drop below 4.5 ft or the form may have to be modified.

- Roy pulls the data for the "Individual Filter" tab from the daily logs like Forsyth does. I think Roy is using the highest NTU from the filter recorded even if the filter is diverted to waste. This is a conservative strategy, and I wonder if readings when a filter is diverted could safely not be included. The system diverts when turbidity is  $>0.3$ , so there should not be any reading greater than 0.3 NTU unless there is a diversion malfunction.
- Hysham plans to calibrate their turbidity analyzers each month for the "Turbidimeter Calibration" tab.
- Roy pulls the data for the "Turbidity Entry Form" tab from the daily logs like Forsyth does. He uses the reading from the distribution system point of entry which sometimes reads greater than 0.3 NTU due to known issues in the clearwell. Forsyth uses our combined filter effluent turbidity for this tab. We use a straight average of the two operating filters. We monitor the turbidity at the distribution point of entry, but don't report it on the monthly report. Both sites seem to have a sound strategy for their system. I will discuss with DEQ to make sure we are all on the same page.
- Roy has made recent improvements to the "Form F-5" tab with the daily collection of distribution residual samples on a posted schedule. I didn't see any other opportunities for this tab.