



September 30th, 2023

Richmond Vermont

Visit Summary

Introduction

The purpose of this visit was to inspect the condition of the two channel Rotary Press located in Richmond Vermont and provide operational assistance to the personnel. The press has an estimated 45,000hrs on it. This is a two 36" channel press, model number 2-900/2000, and serial number PR-09-0/99.

Inspection

Screens: The facility only runs sludge through one channel and has recently complained about the filtrate quality. They do not run on the other channel due to damaged screens. Opening the restrictor arms on both channels and cleaning the channels out to inspect, I discovered that all four screens were very worn.

Frames: The frames on the channels were rusting and worn were the restrictor arms moved. You could see the yellow cover seal between the wheel and the frame starting to come through with trash.



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Shaft: The shaft of the press was in ok condition. The shaft only supports one channel on each side, so there was limited exposure to the atmosphere. There is some rust around on the end, however that should not effect the removal.



Three-way valve: The existing three-way valve does not work. It has been stuck in the dewatering position and does not turn. This causes problems with a proper startup. Sludge also leaks out of the supply tank, through the sludge pump and, because the valve is stuck in the dewatering position, into the channels.



Flocculator: The flocculator seal shaft has been leaking for some time. It's hard to tell the extent of the damage.



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Panel: The panel is the old style with speed dials for the flocculator speed and rotary press speed. The outlet pressure is controlled directly at the channel. If you adjust it on the panel, it doesn't do anything.



Channel Wash Manifold: The Festo valves on the channel wash manifold do not seem to work. The piping and spray bars are not in good condition.



Sludge Pump: The facility has a double disc sludge pump and is in good condition. However, the sludge tank gravity feeds past the pump when it is in the off position.



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Polymer System: The polymer system does not have an indication of concentration. A batch of diluted polymer is sent to a 50-gallon tank. From there it is pumped to the floccuator at a ratio of the sludge flow.



Conveyor System: The conveyor seems to be in good condition apart from a couple rusted out holes in the lower one. Also, on the inclined conveyor it is open at the top. The employees said this was from cake building up due to an unopened slide gate that has since been fixed.



Operation

The operators at the facility are operating the press as best as possible for the condition it is in. During a normal startup the three-way valve sends sludge down the drain, in recirculation, this gives the operator time to determine that they have a good flocculation. Because the valve does not work it sends it directly to the rotary press. If the sludge tank is full and the sludge supply valve is open to the pump, it passes the pump and goes into the rotary press without it even on or running. So, when they start instead of recirculating, they hit dewatering and it goes right to the rotary press. The first sludge the press receives is not flocculated. Once it starts to flocculate, the one operating channel begins to produce cake. However, a lot of solids are going through

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the worn screens and down the filtrate. Because they are running a blend of digested and septic sludge the press is still able to produce some cake. I believe if they were just running digested sludge, they would have a hard time getting anything to come out of the channel. The only way to keep sludge producing cake is to treat it gently. If they produce high pressure inside the channel sludge comes out the screens instead of out the front as cake. The key is low outlet pressure 5psi, low inlet pressure 1.2psi, and moderate rotary press speed 30%. This minimizes the sludge in the filtrate being sent to the head of the plant. The press still produces 25-30% cake dryness with a flow of 20-30gpm through the channel. Sludge total solids was 1.45% Polymer consumption was 26 active lbs/dry ton.

Observations and Conclusion

The Richmond, Vermont facility needs:

1. New Channels – Everything on the channels needs replacement so I would recommend whole new channels. Even if you could spare some parts, we might need to cut the wheels from the shaft.
2. New Flocculator Assembly – The top of the floccuator need to be dismantled and probably everything needs to be replaced below the gearbox.
3. Three-way Valve – I would suggest they replace them with two two-way valves.
4. Channel Wash Valves – If it doesn't already come with the new channels.
5. Air supply – A new air regulator needs to be installed. As of right now I do not believe they have air going to the three-way valve and they only have it to the bellows.

Possible upgrades needed:

1. Sludge pump - The sludge supply tank feeding the pump is gravity feeding through it. The pump may just need new interior parts. Or the sludge valve needs to be closed off when the press is not running.
2. Polymer system – We determined the polymer was making down a batch of 0.25% concentration, with a polymer to sludge ratio of 8% and a consumption of 26 active lbs/dry ton. An upgrade of the polymer system could produce lower consumption.

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3. Panel HMI – The installation of a new panel would make it easier for the operators to use the press. The current old program is outdated and not optimal.
4. Conveyor system – There are a couple holes that need to be patched or sections replaced.

