Campaign 3
Problems & Resolutions

UF Stan Mayfield Biorefinery Pilot Plant

Prepared by Joe Sagues, Director of Operations

Campaign Date: August 2014

Table of Contents

I. Pretreatment Knife Gate Gasket Material

Problem

Prior to Campaign 3, the high temp/high pressure silicone material which was thick and spongy became too difficult to handle when checking for insertion space clogs.

Resolution

We changed the material for a third time to a glass-infused PTFE material which was more rigid. This worked very well.

Status

Resolved.

II. Pretreatment Top Knife Gate Purge Ports

Problem

Prior to Campaign 3, the air purge lines for the top knife gate became clogged with biomass because check valves were not present.

Resolution

Check valves were installed to prevent this from happening again.

Status

Resolved.

III. Nutrient Lines

Problem

During Campaign 3, the nutrient lines to the fermenters experienced back flow which resulted in risk of exposure to GMO.

Resolution

Check valves were installed in the lines to prevent this from happening again.

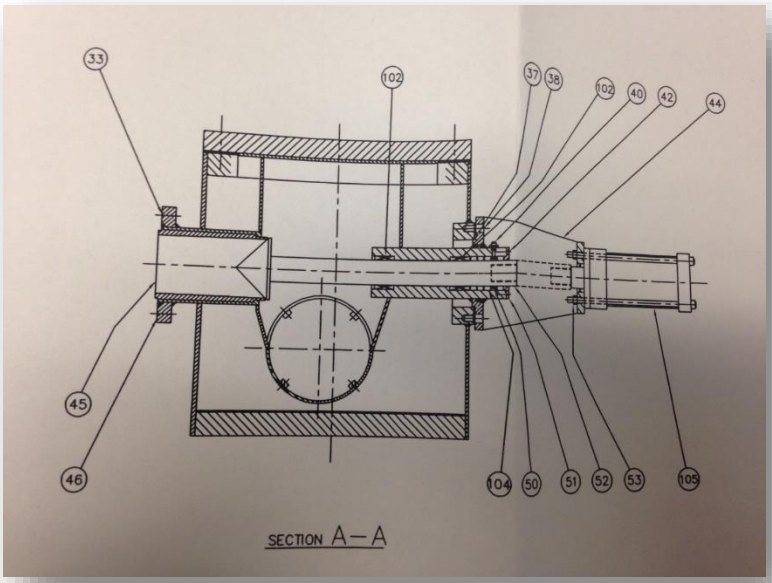
Status

Resolved.

IV. Biomass Plug

Problem

Prior to Campaign 3, the four polypak seals (item 104) to hold back pressure for the blow back dampner had become damaged/deformed. Also, the packing gland plate (item 51) had become warped. The likely cause of this was an accidental over-greasing, and a subsequent accidental improper re-installation of seals after inspection. The seals expand once they are hot and experiencing an applied force, so during operation the chamber pressure spiked and caused damage to seals. This led to a delayed response in the dampner. The delayed response eventually led to a lost plug and system depressurization.

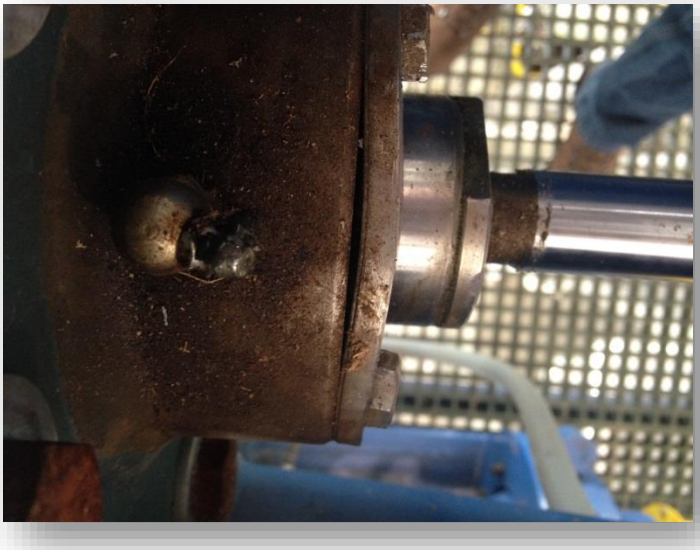


Blow back dampner drawing.

Damaged seals.

.

Seal orientation.



Warped gland plate.

Resolution

New seals and better procedures. The seals were ordered after Campaign 2, but the lead time was long since they are custom.

Status

Resolved for now.

V. Pretreatment Knife Gate Packing

Problem

During Campaign 3, the packing on the knife gates continued to leak steam, even with proper tightening. The issue most likely came from material wear due to the high frequency of valve cycles.

Resolution

A stronger material was bought to be tested, but it would not be implemented until Campaign 5.

Status

Resolved, but not until Campaign 5.

VI. Pre-Steam Transfer Conveyor Bearing

Problem

Prior to the Campaign, a bearing on the pre-steam transfer conveyor gave out. It seemed like it may have been an improper installation or just wear with time.

Resolution

We had a back-up on the shelf. Need to keep a close eye on it.

Status

Resolved for now.

VII. Decanter Chute

Problem

The solids from the decanter were frequently getting clogged in the tapered chute. Due to structural interference, we are unable to install a straight chute.

Resolution

We installed a small doorway in the taper such that we could clear out clogs when necessary.

Status

The doorway did not work well. Prior to Campaign 5, we got rid of the metal taper completely and installed a hanging tarp which worked great.