

Campaign 2

Problems & Resolutions

UF Stan Mayfield Biorefinery Pilot Plant

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I. Air Compressor Circuit Breakers

Problem

Prior to Campaign 2, the air compressor breakers in the MCC were tripping frequently. It caused disturbance in pre-Campaign preparation. The breakers were 150A non-adjustable instantaneous with a thermo-magnetic trigger. The operating amperage for the compressors is around 100 A, but on startup there is an in-rush up to 300-400 A. This high in-rush was just barely over the allowable limit of the breaker. Sometimes it would trip, sometimes it would not.

Resolution

Initially, we bought new 250A breakers to solve the problem, but we then realized the wiring was rated for a maximum amperage under 250A. Our next best option was to replace the original breakers with 150A adjustable instantaneous breakers.



Status

Resolved.

II. Pretreatment Bottom Knife Gate Gasket

Problem

Prior to Campaign 2, the gasket for back plate on the bottom knife gate blew out during operation. The reason for the blow out was because an operator changed the material without notifying an engineer/supervisor. The material which was used was not rated for such high temperatures.

Resolution 1

A replacement gasket material made of AFLAS was bought and installed. This material was specified by the valve company. The operator was instructed to never install something without first letting a supervisor know.

Status 1

Not resolved. The replacement AFLAS gasket melted and clogged up the knife gate insertion spaces.



Resolution 2

A new gasket material made of high temp/high pressure silicone was bought and installed. This material worked, but it was thick and spongy which made it difficult to install.

Status 2

It worked but would be replaced in Campaign 3 due to difficulty of handling.

III. Feed System Metal Detector Chute

Problem

During Campaign 2, we experienced clogging in the chute at the bottom of the metal detector. A couple of times, biomass stacked all the way up the chute and risked jamming the cablevey system.

Resolution

An air purge system like the collecting conveyor.

Status

Resolved.

IV. Pumping from Bottom of Liquefaction & pH Adjustment Tank

Problem

Similar issues from the first Campaign.

Resolution

The implementation of the side ports in Campaign 3.

Status

Resolved but not until Campaign 3.

V. Base Addition Pumps

Problem

The base addition peristaltic pumps for the propagators and fermentors were not working well. This was due to eroded O-rings. The material was not compatible with ammonia hydroxide.

Resolution

O-rings made of aflas were ordered and installed.

Status

Resolved.

VI. Propagator pH Adjustment to 9.0

Problem

During Campaign 2, adjusting the pH of the hydrolysate solution in the propagators to 9.0 required too much base. Most of the base was needed to increase pH from 8.2 to 9.0.

Resolution

Experiments were performed in the lab which proved a pH adjustment to 8.0 was satisfactory. A change in procedure was made for a new target pH of 8.0. This helped the economics of the process.

Status

Resolved.

VII. Liquefaction Level

Problem

During Campaign 2, it was discovered that as the level of the liquefaction tank passes over the top impeller slurry is sprayed everywhere. The slurry ends up covering the level sensor enough to cause inaccurate readings. The level sensor is a cone which protrudes down from the top of the tank. It uses radar and does not read correctly when covered in slurry.

Resolution

A new procedure was created to turn the agitator speed down as the level passes through a certain range while filling up.

Status

Resolved.

VIII. Pretreatment Knife Gate Packing

Problem

During the Campaign, steam began leaking from the packing on both knife gates, with a more considerable leak coming from the top valve. This was most likely due to uneven tightening when the leak first began.

Resolution

A new procedure to ensure the packing is tightened evenly.

Status

Resolved.

IX. Phosphate Determination Method

Problem

The results from our phosphate determination method were not agreeing with the actual concentration of our acid solution.

Resolution

An error was found in the SOP.

Status

Resolved.