Campaign 15

Operations Summary

Stan Mayfield Biorefinery
Cellulosic Research and Demonstration Plant

Prepared by Joe Sagues, Director of Operations
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Operations - Campaign 15
05/19/2015 – 05/23/2015

Operation problems & resolutions:

1. Pre-steam bin agitator
    a. Problem:
        i. While operating the feed system, the pre-steam bin agitator came loose to the point where it was hanging by one bolt.
    b. Resolution:
        i. We kept running with the broken agitator because we could not afford to stop. A plan was established which would have the control room operator shutdown the system very quickly if the agitator fell off (there is a live camera feed inside the bin).
        ii. Once the campaign was over we strengthened the agitator supports and then contracted Yates to reinstall the agitator. We could not reinstall it ourselves given that it was a confined space.
    c. Status:
        i. Resolved.
2. Clogged transfer lines
    a. Problem:
        i. This was our first campaign trying a 2.5% enzyme loading, which led to a less-digested slurry. When first trying to pump to the pH adjustment tank, we had several clogs which required back-flushing with high pressure process water.
    b. Resolution:
        i. Since we were doing a batch liquefaction, the slurry became more pumpable as time went on.
    c. Status:
        i. Resolved for long retention times, but we're not sure how it will go during a true continuous (6-hour retention time) liquefaction.
3. Propagator 2 level sensors
    a. Problem:
        i. When preparing the propagator 2 tanks prior to inoculation of the seed, while performing the UV water addition (step 1, prior to hydrolysate addition), we could not get a reliable level reading for the 17 gallon mark (our target level). The 17 gallon mark was too low for the level sensors to register reliably.
    b. Resolution:
        i. We decided to fill up to a level we knew the sensor would read reliably and then drained out the necessary amount to leave 17 gallons in the tank. We used the sterile sample port for draining and a 3 liter pitcher for measuring the volume.
        ii. The HPLC results showed that our dilutions looked correct.
    c. Status:

        i. Resolved

4. Chute clogging
    a. Problem:
        i. The chute from the transfer conveyor to the plug-screw clogged badly with biomass at a point where we could not afford to shut down.
    b. Resolution:
        i. Two working personnel, suited up with the appropriate PPE, hit the chute from both sides with hammers until the clog came free.
        ii. In retrospect, the personnel should not have done what they did due to safety concerns – when the chute starts to clog, the plug screw is at high risk of a blow-back, which could have resulted in injury.
    c. Status:
        i. Resolved.