Asset Optimization of Brown Stock Washing

WASH –X DIFFUSER
Optimization of a double stage atmospheric diffuser (2AD)

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Outline

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Mill Overview

Skookumchuck Pulp Inc.

- Located in the East Kootenays north of Cranbrook BC
- 900 admtpd Softwood fully bleached
  - SPF wood mix
  - Trucks and on-site chipper
- Hydraulic impregnation vessel followed by vapor phase continuous digester designed for 375atmtpd;
- Produces green power for export to the grid;
- Mill is well balanced and almost maxed out at recovery boiler and pulp machine

Drivers for optimization

- Several senior operators are to retire within years;
- Standardization of operation around the diffuser;
- Optimize double stage atmospheric diffuser;
  - Next to digester, best brown stock washer;
- Limitation in subsequent brown stock washing;
- Reduction of carry-over;
- Maintain strong weak black solids;

Issues

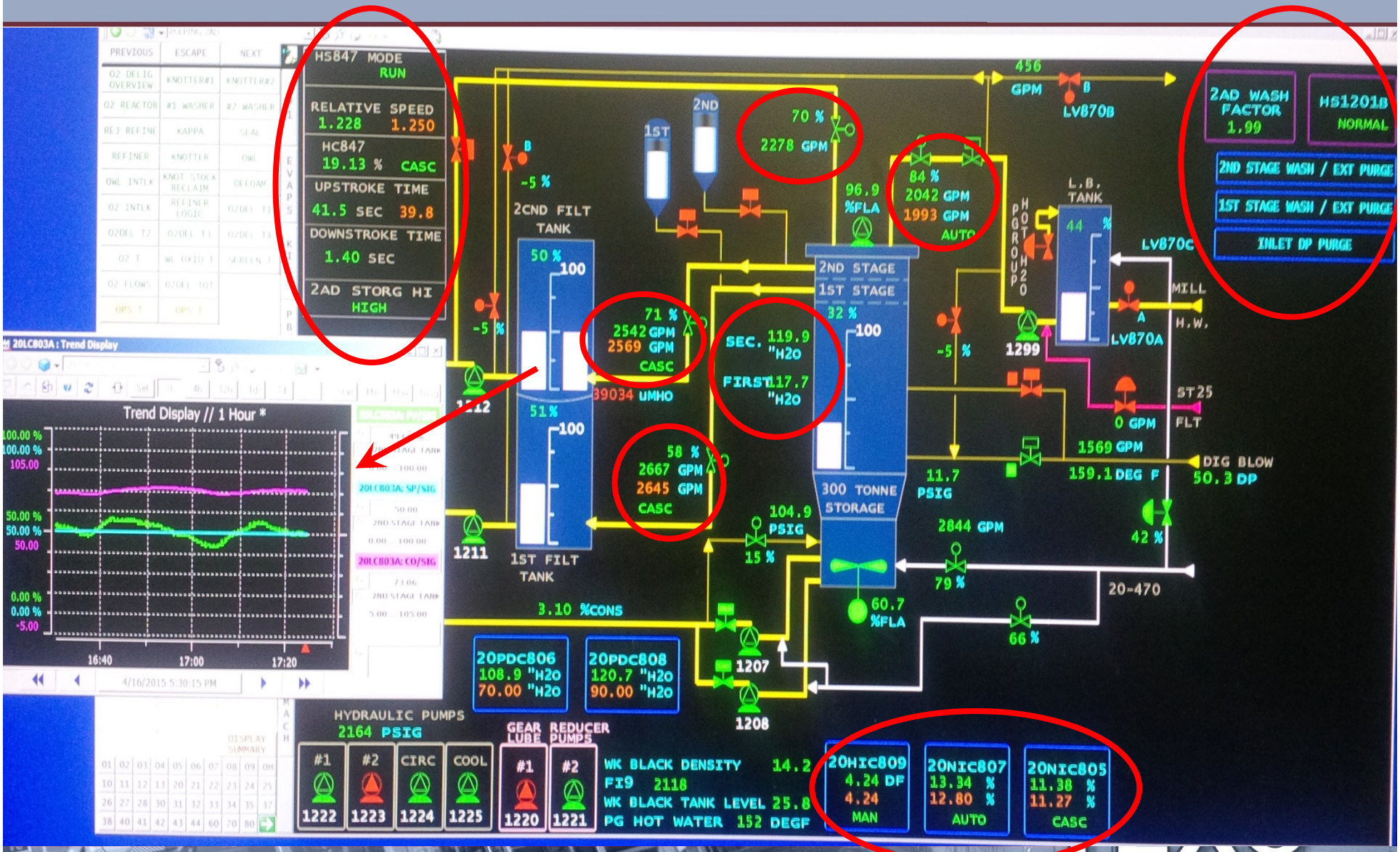
- Small blow line…at 900 admtpd;
- Limitations in wash and extraction flows;
- Only level control of second stage filtrate tank;
- Diffuser speed in manual running fast!;
- Have no idea of discharge consistency;
- Better brown stock washing equipment in the mill, but no optimization;
- All flows measured with orifice plate
  - Full balance doesn't quite add up…
- Peaks in DP at second stage.
  - Affects blow line flow control.

Deliverables

- Consistency control;
  - First Stage discharge;
  - Second stage discharge;
- Dilution factor control;
- Relative speed control of diffuser;

- Flow control of first/second stage extraction;
- Loop tuning;
  - Level control of second stage filtrate tank.
  - Second stage wash, and $1^{st}/2^{nd}$ extraction flows

Double stage atmospheric diffuser



Results

- Simple operator interface;
  - Forecast of instantaneous wash/extraction flows;
- Reduces filtrate conductivity to rest of brown stock;
- Slow down diffuser speed by up to 20% as a function of blow line production;
- Even out DP raises between 1st and 2nd stages;
- Currently operating at
  - 2.9% discharge consistency (Cs) higher than blow line
  - 4.2 dilution factor (DF)
- Raise blow line consistency by 0.1%;
- Allow a rise of up to 3.5% Cs from blow line Cs;
- Stabilize weak black concentration ~14.5%;
- On time and on budget!

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