

PAPTAC Bleaching Committee
Section 7 – Mill Updates and Problems Roundtable
Kimberley, BC – October 5-7, 2014

Chemstone

Question: How are mills reacting to HW fiber supply issues? Is anyone increasing their timberland resources?

- IP saw this coming a few years ago and made changes to mitigate

Paper Excellence - Skookumchuck

- Started-up FTNIR with Texo control in recaust area
- Looking to significantly expand production in mill with capital projects being available
- Recently hired 8 engineers in all disciplines. Paper Excellence has hired 40 new engineers company-wide.
- Drilled 4 new mill water wells due to river water being unreliable

Question: Trying to reduce bleaching costs. Has anyone put dollars to converting the Do stage to MC or the value of BSW improvements?

- Carryover to Do should be <15 lbs Na₂SO₄/T squeezed. May see a 0.02 drop in KF.
- 1 lb/t Na₂SO₄ consumes 1 lb/t eq. Cl₂ (Gopal)
- New pre-bleach washer or press is usually also needed, confounds the issue (IP)
- MC Do concentration of ClO₂ is higher so reaction rate is 3X higher as well
- Open washer at Verso Quinnesec showed 4-5 lbs/T ClO₂ savings
- Expect a 10% reduction in ClO₂ (Harmac)
- MC D0 decreases D0 ClO₂ use by about 10% (IP/Paul Earl)
- HSPP – also looking at MC D0. Also consider caustic savings in E1.
- Focus on pre-O2D washing
- May want to look at differences in washing between using caustic and OWL on O₂ stage

Tom Mullen (asked by Laurier Morissette)

Question: How many mills are using OWL for O2D?

- Laurier captured the number responding

Question: Do people see better delignification from caustic or OWL?

- Verso Quinnesec – No difference at zero sulfidity OWL, with Sulfidity >7 see a negative impact
- Skookumchuck – OWL is better

Question: Do mills use OWL, NaOH, or both in O2D and how do they control it?

- Irving – Based on WL availability
- Canfor Intercon – One or the other based on WL inventory
- Weyerhaeuser – All mills can run either or in combination. Use more caustic if WL inventory is low.

Domtar Espanola

- New Diamond Back chip bin and Turbo Chip Meter were installed in May 2014
- New larger ICC for R10 also installed in May 2014
- Running SW campaigns on the HW line and having some issues

Question: Are seeing poor runnability of CB Filters on softwood. Has anyone else seen this?

- DMI Peace River has CB washers

Paper Excellence - Howe Sound

- O2D / BSW upgrade – have broken ground
- Evaporator 2nd line project under way
- CRP (chloride removal process) starting up soon
- Lots of efforts in getting Howe Sound to 500,000 TPY

Question: Have seen decrease in bleachability. Noted that washing has gotten worse and kappa from digester and O2D has decreased from 28 to 24 and 16 to 14 during this period of time. Thoughts?

- Issue is low kappa from digester. You're removing easy lignin in digester, leaving the harder to bleach lignin going to the bleach plant.
- Check residual WL after digester – could be getting re-precipitation. Also check O2D pH.
- Try caustic wash of digester pulp to check for lignin re-precipitation
- Likely a washing issue since the digester kappa is lower and there is more dissolved material

Question: Has anyone switched from Eop Kappa analyzer to brightness meter for control?

- Crofton is phasing out Eop Kappa and going to brightness. Production rate can make brightness a little flaky at times.
- Canfor Intercon – measure both brightness and kappa into D1. Decent relationship unless they change H₂O₂ application a lot.
- Clearwater Lewiston – Eop kappa and brightness, compensated brightness control

West Fraser – Hinton

- Completed first shutdown in 3 years
- Upgraded D2 stage washer
- Completed DCS upgrade project from ABB to Delta V in brownstock and bleach plant areas

Question: Looking at installing online dirt and brightness analyzers for finished pulp. Who has these?

- Canfor – Have a Metso DCD for dirt and brightness. Samples every 10 minutes
- Skookumchuck has a Metso DCD
- Verso Quinnesec has online brightness scanner
- Clearwater Paper Lewiston – has online dirt analyzer

Question: What basket size(s) are people running in brown stock? They are thinking of going to 0.006" from 0.008"

- Skookumchuck – 0.008" slots on softwood
- Northern Pulp – switching from 0.006" to 0.008"
- Valmet – Need to consider rotor design
- Irving – 0.008"
- Bancroft Western – Most screen baskets they sell are 0.008"
- Clearwater Paper – Lewiston – 0.006" on softwood

Question: Having a scale problem with caustic line – 10% nominal is actually 17%. What strength do people run?

- Canfor Intercon – 8% and clean line every 2 months
- Skookumchuck – 7% no scale
- Irving – 8%
- Lewiston – 12%
- Varies from 5 – 16% between mills
- You can clean out caustic lines with EDTA at 200-300 ppm without shutting down (Nalco - Jack Thomas) Domtar Espanola tried this – worked over 8 hours.

Clearwater Paper – Lewiston

- Installing sawdust line brightness and residual probes for Compensated KF control
- Installing KappaQ on sawdust line for final brightness
- Moving peroxide unloading area
- Installing brown stock heat exchanger on sawdust line

Question: Anyone running higher sulfidity (approx. 35%)?

- Verso Quinnesec pushing up to 35% on AA basis no issues seen. Lower WL flow for EA charge.
- Irving – saw higher TRS
- Cariboo – 32-35
- Castlegar runs high (no number given)

Question: Does temperature of the oxygen into the O₂ reactor matter? What do people control to?

- No responses

West Fraser - Cariboo

- Replaced SO₂ with Formic Acid for bleach scrubber cleaning
- Skipped annual digester acid cleaning due to improved anti-scale treatment program
- Have hired a number of Process and Maintenance Engineers

Question: Is anyone using chip washers for dust control instead of cyclones?

- No responses

Question: What are people running for Do pH? They raised theirs from 2.5 to 2.8 recently

- Harmac – running up to 3.2
- Irving running 3.0
- Paul Earl – check out bleaching survey results
- Many folks running this range or higher, up to 3.5

Question: Who is using a residual EA analyzer for digester control?

- Weyerhaeuser is using a Kajaani in two of their mills

DMI- Peace River

- Suffered a 3 day blackout due to a wind storm. Examining ways to be better prepared if it happens during winter.
- Installed a new (additional) white liquor pressure filter
- Installed new dust cyclone
- Ongoing project to improve digester pressure/level control to improve digester stability
- Looking at machine drainage, throughput issues

Question: Anyone measuring production off a Mud Filter?

- Texo – many measure before, no of no one measuring after. Flow meter and density meter.
- Several responded they measure before
- Can calculate using discharge moisture

Irving Pulp

- Upgraded brown stock washing press post screening
- Upgraded DCS to Delta V in brownstock
- Installing a Metso continuous digester in 2015
- Commenced engineering for a new pulp dryer
- Upgrading demineralizing plant
- New centrifugal air compressors

Question: What kind of life are folks getting on Canron type washers for the vacuum seal?

- Skookumchuck – Corrudek II felt seal 1/year

- Domtar Espanola – 4 Canron washers 1 seal every 4 months

Question: Generator liquor started to get cloudy. Saltcake looked ok. Filtrate sample if left to sit settled out. Saw filter performance degradation. Still cloudy after running through filter paper.

- Espanola – Saw cloudy liquor in R10 mode vs R8
- Problems with filter can result in fines in system, making liquor look cloudy

Question: What kind of filter are people using for saltcake removal from their generators? They have a Bird filter.

- All ERCO plants use the ERCO saltcake filters
- Canfor Intercon has a filter similar to the Bird

Question: Does anyone have an iron spec for Mag Sulfate?

- No responses

Question: Anyone have issues with green liquor dregs settling?

- Verso Quinnesec: had black liquor getting in through contaminated condensate.
- Solenis - Look at organic carry-over and RB Reduction Efficiency
- Howe Sound - FTNIR saw char from boiler
- Metso – Mud seeding could help

Question: Anyone doing fiber fractionation?

- No responses

Harmac Pacific

- Lots of reliability issues
- New turbine is running and they are selling electricity
- Resolved digester runnability issues
- Adding showers to chips
- Focusing on projects < \$6000
- Found errors in Baume tests vs. solids tests
- Going back to 12 month outages from 18

Question: Where is the best location for a new washer (pre or post O2D)?

- Valmet - 120 Kg COD/T typical pre-O2D, 80 or less is very good
- Poor pre-O₂ washing can consume alkali in O2D
- Poor washing can cause many issues
- It's a cascading effect
- Clearwater Lewiston - Moved a POW to pre-O2D and saw improvements
- Castlegar – added a pressure diffuser for better pre-O2D washing

Question: If someone has a paper on the difference in O2D performance between OWL and caustic please send it to Honey.

Question: What is the recommended pressure for the first reactor in a 2-stage O2D system?

- First stage should have higher pressure and lower temperature than second reactor
- Irving - High temperature in first reactor will result in a different Kappa to viscosity ratio (lower viscosity for a kappa)

Verso Paper – Wally Mc Donald

Question: Do people track yield change over time periods shorter than a month?

- Measure BLS/ADT
- Mass balance

Question: What are folks using for material of construction for Chlorate piping?

- FRP common – (Irving/Canfor/McKenzie)
- Skookumchuck – Teflon lined pipe

Question: Is anyone running carbonate control on kilns?

- Spartan Controls – Knows of folks that have controls
- Irving – has advanced controls
- Solenis – watch availability and inerts
- Metso – has mills on control. They control carbonate and production
- Target carbonates between 2-3

Verso Paper – Androscoggin

- Installed an Andritz Maxton Roll on decker – may install one on second decker and BSW
- Trialing an Andritz Gas Free Valve on a BSW
- Converted their chipper to an Andritz HQ Plus Cassette Knife system

Question: Anyone running chip silos that has a strategy to keep them from freezing?

- Irving has 4 silos and during the winter they run them empty, it not they plug

Question: Is anyone running a smaller chip pile to be able to turn-over more frequently for improved yield?

- Clearwater Paper rotates their pile
- Quinnesec does, pins and fines segregate within pile
- Running short on inventory can result in slugs of different species
- Consider impact of dirt and rocks
- Irving – does a pile turn every year. Causes issues with blending.

Question: For WWTP Limitation issue, what about use of paper machine white water to brown stock?

- Paul Earl – If carbonate recycles back to around to Do it could cause scale on Eop stage.
- David Trzil – Got white water back into brown stock years ago and it caused significant scale. Would not recommend.

Verso Paper Quinnesec

- Completed an 11 day outage
- Announced closure of Bucksport Maine mill, now a 2 mill company

Question: Is anyone recovering water from press felts?

- Skookumchuck looked at what comes out in the press felt water and decided not to recover it – resin, felt hairs, etc.

Question: How many people are changing the tower dilution flow with production rate?

- 3-4 mills said they do, most don't. Not a focus by many folks

Question: Life of Neutral Saltcake Filter side seals?

- No responses

Question: Where are people adding caustic for Eop? We have seen build-up of scale in repulper and chute to steam mixer.

- Irving – have moved it to after the repulper

Catalyst - Crofton

- Ramping up production, pulp dryer upgrades and reliability improvements
- Sharpened focus on Kraft business, assessing debottlenecking opportunities

Question: The ClO₂ Generator is a bottleneck. Has anyone upgraded their generator for more capacity? It is running 40 TPD and was designed for 27.

- Canfor Northwood – upgraded 32 to 65 TPD, required capital
- Paul Earl - A limiting factor at some point will be the mass flux (adequate surface area of generator)

Question: Anyone doing "Poor Man's O2D"? Injecting O₂ into the stock line ahead of the Brown HD

- Harmac – 20 minutes, 55 psi at top, 1% O₂ & 1% NaOH
- Consider putting peroxide in a Hi-D instead of O₂
- You need alkali for O₂
- If you just add caustic you can get alkali leaching
- Verso Androscoggin Mill does a version of "Poor Man's" O2D

Question: Has anyone seen channeling in a D1 tower and what did you do about it?

- Some people have an inverted cone in the pre-tube
- Paul Earl – Can get diffuser / distributor, but will not help with low consistency

International Paper

- CEO retiring after 42 years with company. New CEO is a mechanical engineer.

Nalco

- Looking into AQ replacement chemistry

Bancroft Western

- Representatives for GL&V and BTG

Spartan Controls

- APC controls
- Energy management controls at Hinton and Canfor

Canfor Intercon

- Had to replace caustic effluent line. Underground, so ended up combining acid and alkaline effluent in single line.
- New recovery boiler attemperator
- New weak black liquor fiber filter
- New Forte system on Pulp Dryer
- New residual and brightness probes for Do and D1
- D1 tower lined with duplex stainless steel
- Replaced D1 washer vat, ran 3-stage bleaching for a while
- Looking to justify raw water treatment in the future for spring runoff
- New lime kiln dust scrubber
- Going to 2-stage O2D next year
- Installing a moisture analyzer

Question: Are seeing CaCO₃ and MgSiO₂ scale on E2 washer. Are others seeing this issue?

- Gopal Goyal – Could be talc
- Mike Kjerulf – Has talc quality changed?
- Paul Earl – Would expect to see this kind of deposit in Eop. Mag silicate is a talc issue – may be co-depositing and contributing to carbonate scaling

Question: Who monitors chlorate carryover in generator saltcake? Do you correct for chlorate concentration in generator? Measure other than using a titration?

- Paul Earl – should do every 2 weeks. Bulk of Cl in saltcake is from chlorate. No one adjusts for chlorate concentration
- Irving – Every 2 weeks.
- Kent Robarge – Manual test to know what goes to the Recovery cycle

Paper Excellence - Northern Pulp

- New Recovery Boiler Precipitator, new nozzles in RB scrubber
- Converted Kiln and power boiler to natural gas
- Installed pH probe in D1
- ERCO SMARTS to be installed in the future
- Still looking at O2D

Question: Is anyone running a ClO₂ heat exchanger?

- Verso – The Verso Androscoggin Mill is running a lamella style HX
- Paul Earl – Some mills are running Do filtrate to reduce scaling tendency
- Irving – Running one seasonally
- Most mills have stopped using them due to scaling
- Verso Quinnesec is running as a pre-chiller
- Cariboo is running a HX

Question: What type of defoamer are people using? They use oil based.

- Silicone
- Some water based
- Silicone carryover to paper machine is bad
- Verso targets < 10 ppm silicone and no silicone based after O₂ delig
- Hinton no longer uses silicone for customer requirements

Paper Excellence - Mackenzie

- Re-started in 2010
- Increasing liquor to wood ratio on digester and working on moisture analyzer
- Anti-scale trial in digester
- Working on bleach Plant automation
- Using Eo stage for mini-O₂ delig; promising but too unstable for 3-stage DED bleaching.
- Installed ABB DCS
- Upgrading evaporators
- Bleaching costs are high in the 5-stage bleach plant
- High kappa no. variation – looking at kappa analyzer.
- Peroxide trial

Question: In a 5 stage BP, what should the Do ClO₂ charge be on softwood?

- Doug Reid – 55-60% of total charge. D1 should have 75% of the remaining charge.
- Meredith Kaknevicus – 60% to Do / 30% to D1 / 10% to D2
- Gopal Goyal – Do KF 0.20-0.25, D1 .75%, D2 0.3-0.35%

Question: Who has an online chip moisture analyzer?

- Texo – Celgar has one running
- Irving – had one without much luck
- Metso has a lab unit that measure in ~ 2 minutes vs 12 hours.
- Catalyst Elk Falls – Had an Acrowood moisture analyzer on sawdust line. Used in control.
- Verso Quinnesec – Senfit unit

Question: In a 5 stage BP running to 87 brightness, what should the D1 target be?

- Paul Earl – 78-80 brightness, , with peroxide in E2

Question: Have a low dilution factor on BSW but low evaporator solids. What can be done? How do you calculate DF for entire line?

- Check for tramp water entering system
- Look for manual valves that are open into tanks
- Check flow meters

- Yes, DF can be done on entire line or individual washers

Weyerhaeuser

- Flint River has new Do and Eop stage wash presses, partial DCS upgrade to Delta V, and significant recovery boiler upgrade
- Moving headquarter to Seattle in a couple of years
- New Bern got a new headbox
- Longview going to Downflow Cooking, upgrade to #3 Machine

Question: Anything to watch out for when storing brown stock during an extended S/D (20 days)?

- Mona Henderson – Have seen sludge type material develop from prolonged storage
- Irving – Irving: stored it in Hi-D for a couple weeks. Run agitator every 3-4 hours – it gets too hot in the bottom if run continuously.
- Consider putting in biocide & agitating periodically
- Make sure to have H₂S monitor if you start sewerage or running pulp

Canfor Northwood

- Pulp machines are new focus as bottleneck moves away from recovery boiler
- New focus on energy / management projects. Re-purposing heat exchangers to save steam
- Glulam beam repairs going on in mill
- Looking to install a new R8 chiller in 2015
- Developing training videos to address high turnover rates and information loss

Question: Any reason for seasonal bleaching costs? Low in February, high in August

- Irving – Different species and chip size impacts ClO₂ and yield
- Solenis – Do you have to add more alkali? Yes. Check if the digester residuals are higher in the winter?
- Kent Robarge – Will need more alkali in winter because moisture higher, so concentration in fibre will be lower.
- Change in ClO₂ strength
- Look at water quality / turbidity differences

Question: Have an obsolete LiBr Absorption Chiller. What are people installing?

- Harmac – Trane liquid chiller. No steam. No problems. Electric. Centrifugal. Did not add recirc system. Have trouble during shoulder seasons because recirc not there.
- DMI – more of a need to purge LiBr over the years but due to lack of PMs. Brought in a rental chiller this year. Will forward along recommendations from when they started looking at replacing it.
- Verso Quinnesec- just replaced LiBr with screw chiller and centrifugal chillers. May need a mixture of two different types depending on whether you need to ramp up and down, for example. Centrifugal – total water use will go up.

Canfor Prince George (PG Pulp)

- The Pulp Eye testing system installed 2 years ago is struggling with performance guarantee
- Compensating for pH with temperature
- Running a digester trial with Chemstone

Question: How are people controlling defoamer use?

- Irving and Verso Quinnesec add on production rate
- Northern Pulp adds on vat level
- Harmac – production and species

- HSPP paper re: defoamer usage where defoamer increases if washer starts speeding up past target
 - Operator has a bias with a timer that brings it back to original setpoint when the timer expires
- Question: Currently putting 80% of ClO₂ in 3-stage plant to the Do stage (final brightness = 83). Is this a good practice?
- Consensus is that there should be more in 2nd D stage

Evonik

Question: Why is the metals content (in wood) so different between coastal and interior woods?

- Soil pH, species differences, rainfall, sea spray, geology?
- No one has the answer

AkzoNobel

- Selling paper chemicals division to Kemira. Bleaching chemicals stay with AkzoNobel.

Peroxychem

- FMC divested peroxide, persulfate, and peracetic acid business (7 facilities, 650 people), now called Peroxychem. Owned by equity firm.
- PacWest 2015 will be in Whistler June 10-13

Texo

- Updated generator controls
- Many recaust projects going on
- Releasing new wood chip analyzer

Solenis

- New company that was the spin-off from Ashland Chemicals water technologies and Hercules pulp and paper chemicals
- Owned by private investors