Extraction Stage Optimization for Lowest D0/Eop Combined Stages Costs

PAPTAC Bleaching Committee

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Nanaimo BC

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Objectives

- Achieve lowest bleaching cost
- Get the most bleaching and delignification from peroxide in extraction stage

  Use as much peroxide as possible
  - Peroxide about half the cost of chlorine dioxide
- Preserve as much as possible peroxide for the duration of extraction stage
- Target ending with few ppm of residual peroxide concentration in extraction stage washer vat
- No residual peroxide to be left in pulp leaving extraction stage washer to D1 stage

Assumptions

- Chlorine dioxide charge in D0 stage is proportioned to incoming pulp Kappa number
- No change in production rate, brown stock, D0 and extraction stages washing
- Target same CEK on pulp at extraction stage washer outlet
- Target same or higher brightness on pulp at extraction stage washer outlet
- The maximum effective amount of peroxide in extraction stage is in the order of but not limited to:
  - 0.6% on SWD
  - 0.3% on HWD

Strategy **with no** residual peroxide in Eop washer vat

- Step 1:
  Increase peroxide charge by steps to get residual in washer vat
  - Limit peroxide charge to a maximum depending on wood species:
    - 0.6% on SWD
    - 0.3% on HWD
- Step 2:
  Once peroxide charge giving residual peroxide in washer vat is reached,
  start cutting chlorine dioxide in D0 stage up until no residual peroxide is detected in extraction stage washer vat
- Step 3:
  Go back to step 1 until maximum peroxide charge is reached

Strategy **with no** residual peroxide in Eop washer vat (cont'd)

- Step 4:
  If no residual peroxide is detected after completion of steps above, start cutting caustic charge at extraction stage inlet

- Step 5:
  Cut caustic until residual peroxide is detected in extraction stage washer vat

- Step 6:
  Stop caustic reduction if CEK exceed target or if pulp brightness entering D1 stage starts dropping

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