

SnapShot - A New Approach to Pressure Filtration and Case Study



Skookumchuck Pulp Inc. & McFarlen Engineering Ltd.

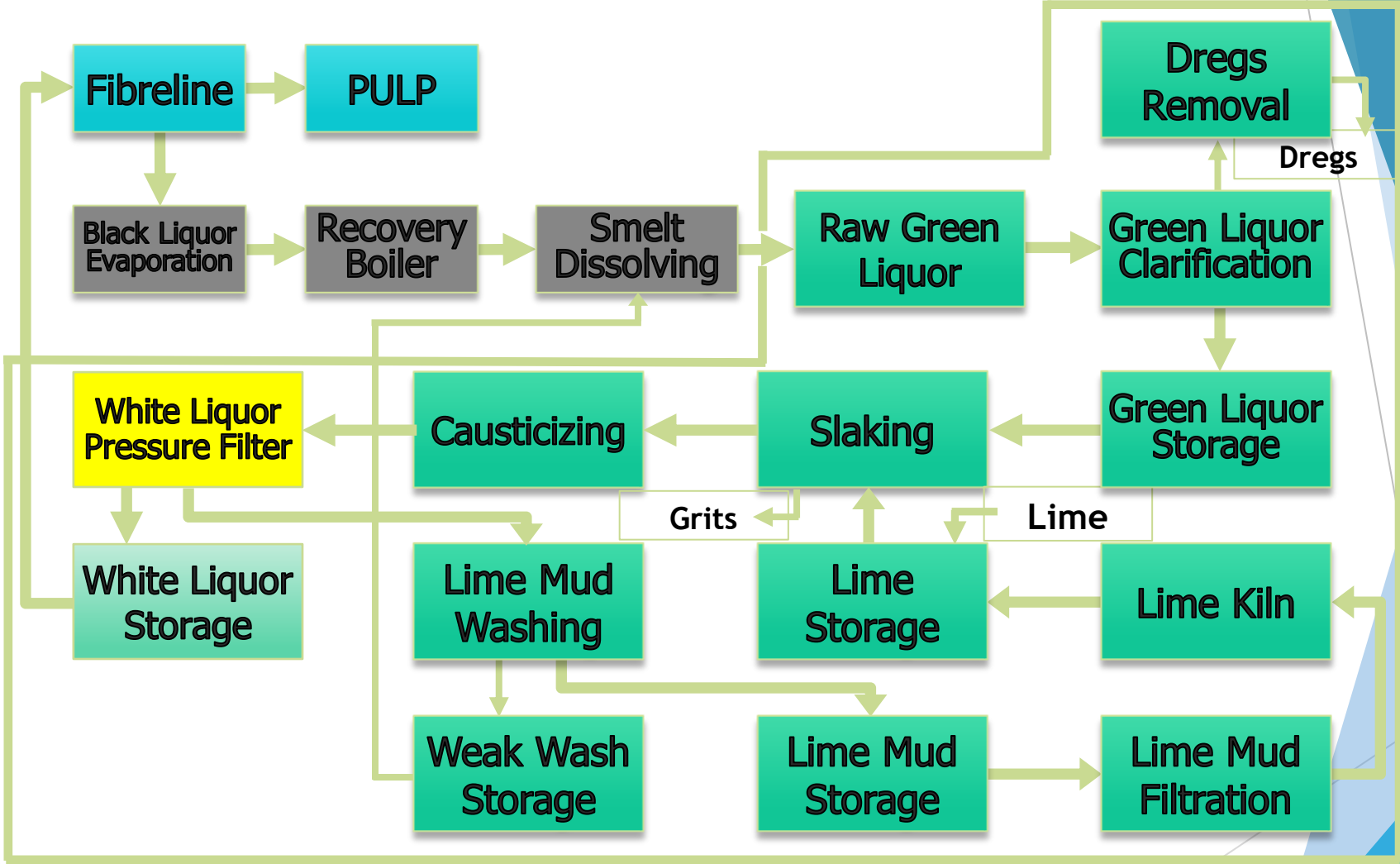


Presenters
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McFarlen Engineering Ltd.

History and Location

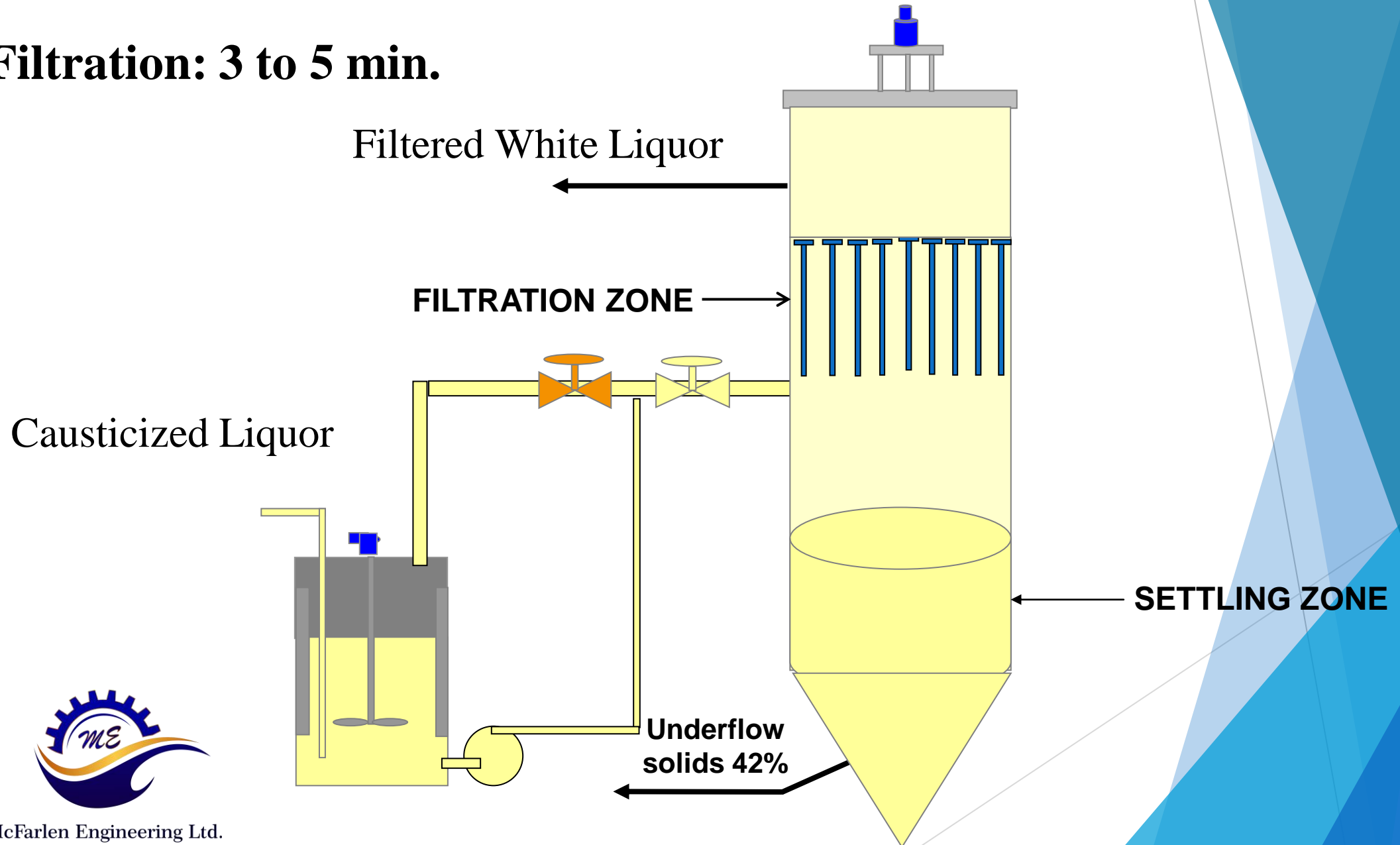


Perforated Tube and Filter Sock



Pressure Filtration

➤ **Filtration: 3 to 5 min.**

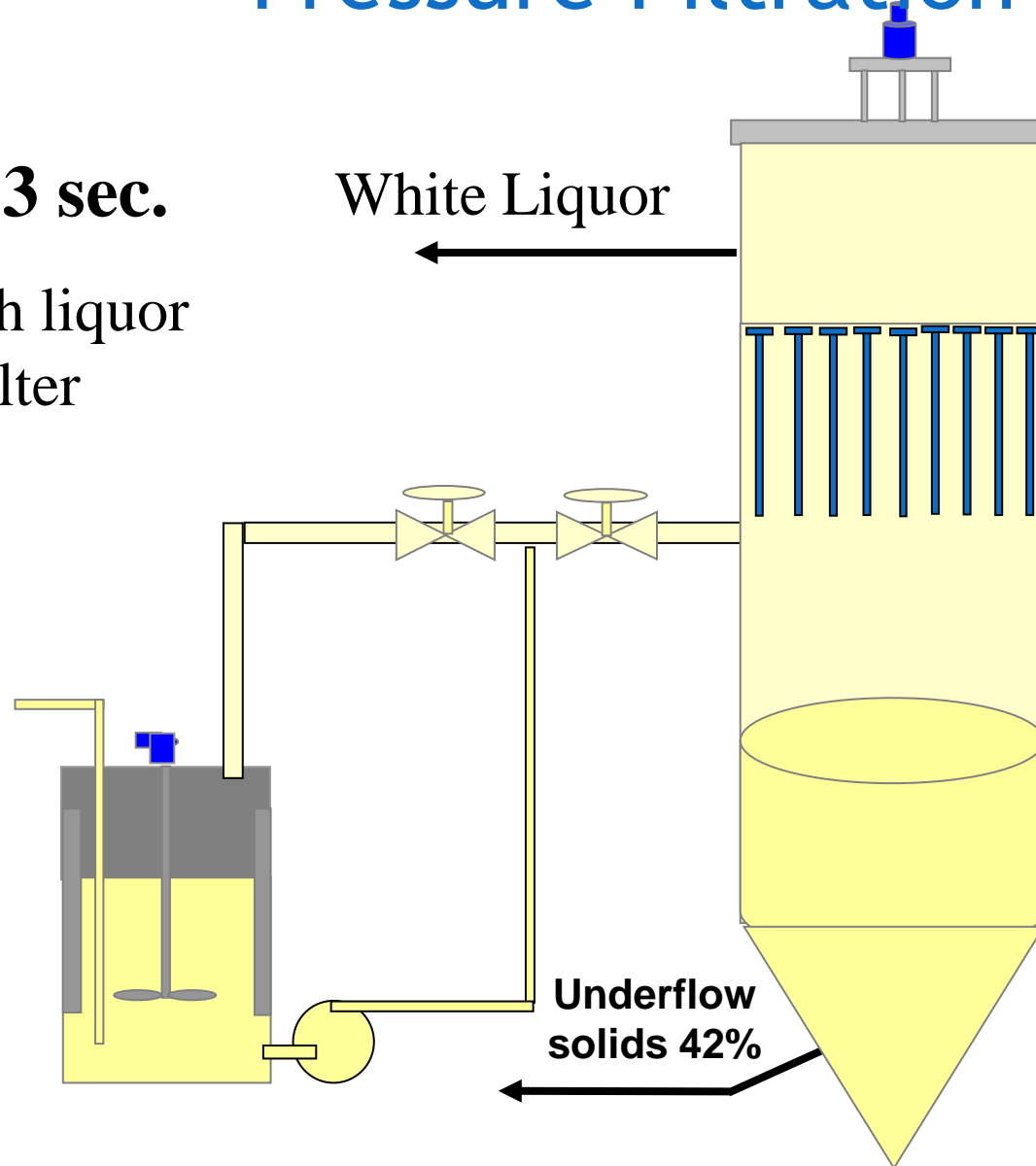


Pressure Filtration

➤ Backwash: 2 to 3 sec.

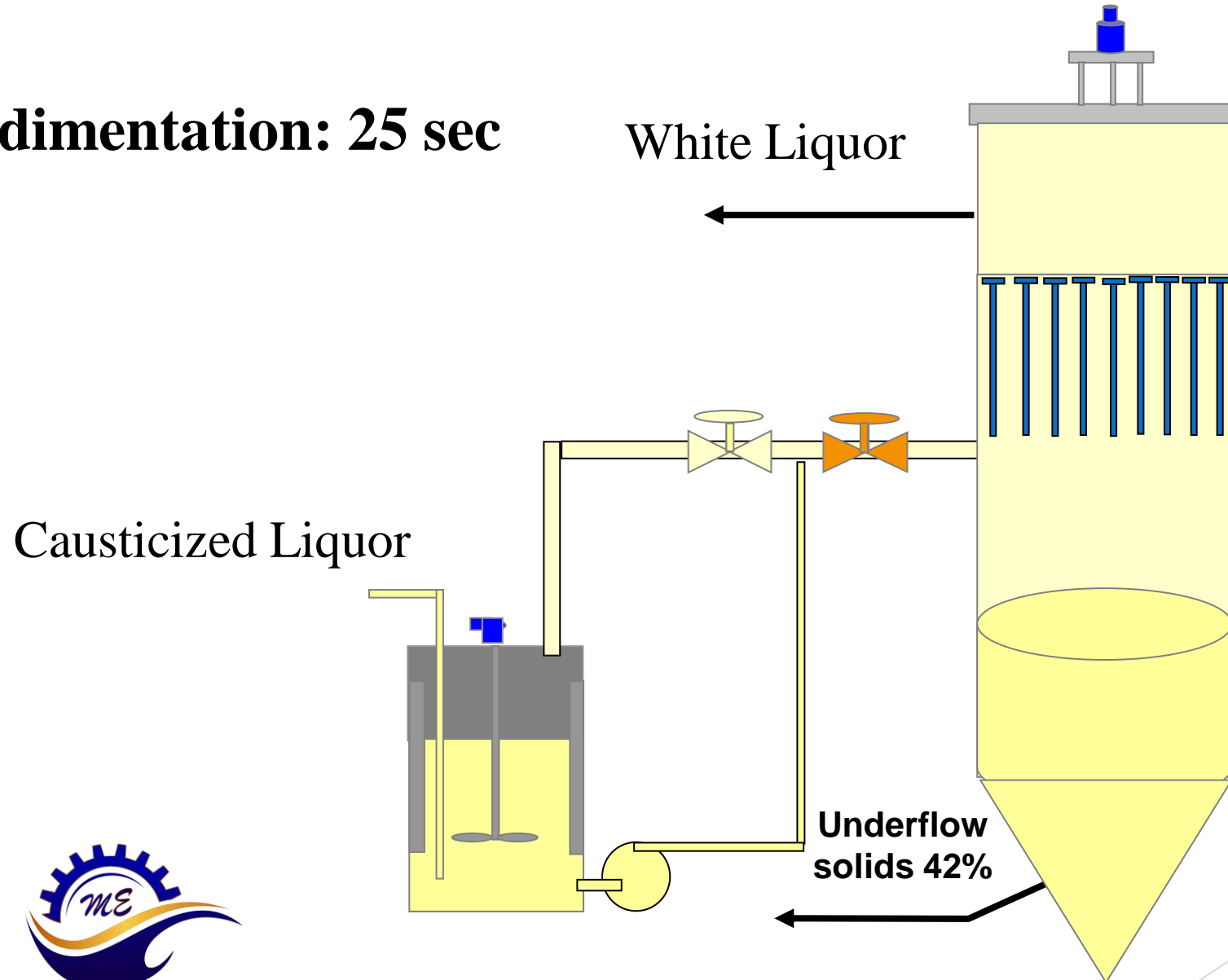
- about 14-16 inch liquor drop in top of filter

Causticized Liquor



Pressure Filtration

➤ **Sedimentation: 25 sec**

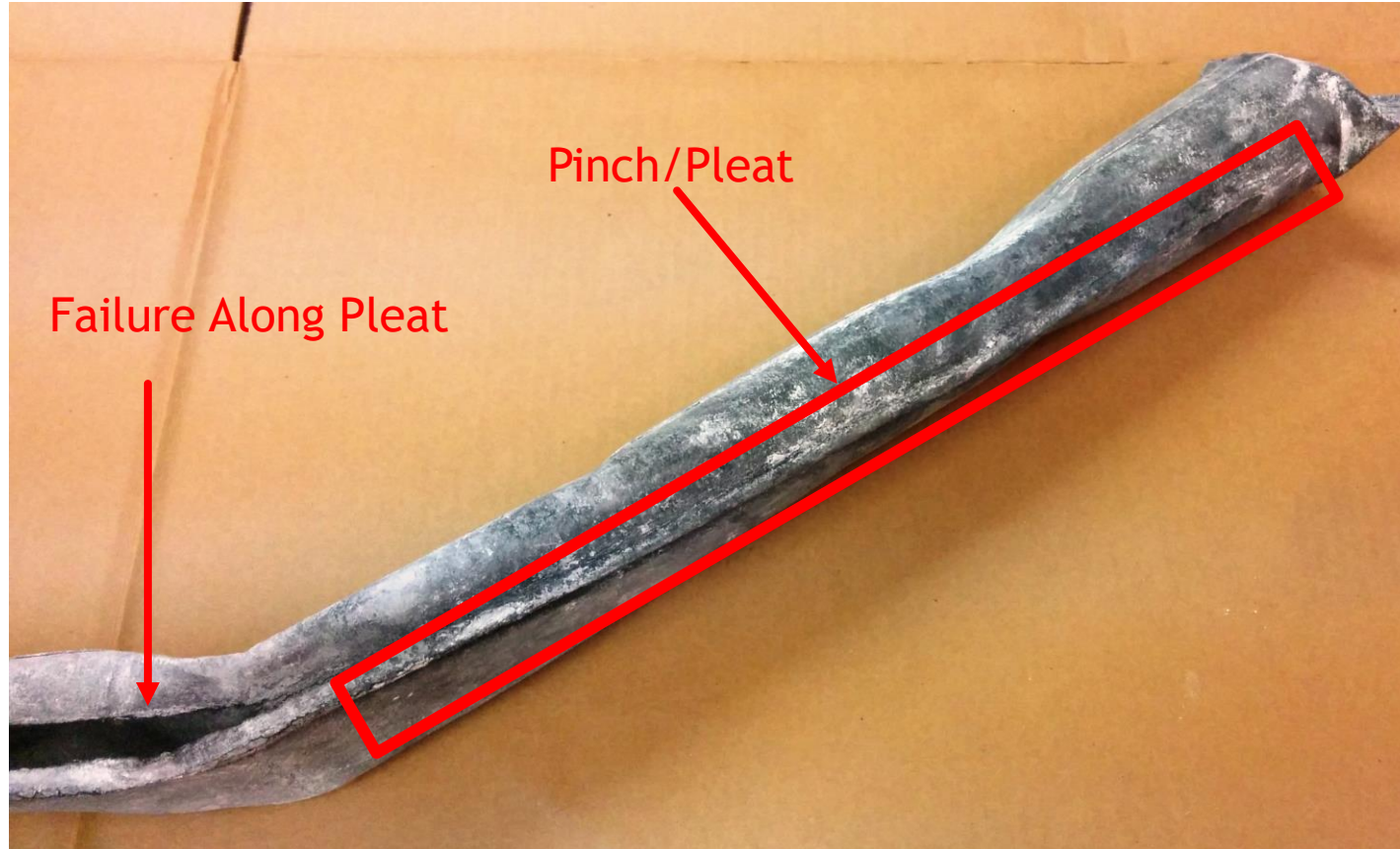


Historical Problems and Challenges

- ▶ As production rates increased, longer filter elements were used, some up to eight feet
- ▶ Sock changes became more time consuming and more physically demanding
- ▶ Acid washing frequency increased with liquor demand
- ▶ Sock pinch or pleat is a point of failure
- ▶ Longer sock life is required to meet new maintenance outage timeframes



Historical Problems and Challenges



SnapShot Support Elements

- ▶ New and innovated approach for filter media support, replaces perforated tubes
- ▶ Designed with three key considerations in mind
 - ▶ Safety and Ergonomics
 - ▶ Process and Maintenance Optimization
 - ▶ Economics and Cost Benefit



Safety and Ergonomics

- ▶ SnapShots are lighter and stronger reducing physical effort during handling and removal of tubes
- ▶ Arm and back strain is minimized
- ▶ Sock changes take much less time
- ▶ Cranes, chain falls, and speciality removal equipment are no longer necessary
- ▶ Cleaning SnapShots is effortless and often not required



Process and Maintenance

- ▶ SnapShot has increased open area allowing for higher throughput, reduces filter media fouling and operating pressure
- ▶ Sock area utilization has been increased
- ▶ Sock “Pleat” a point of failure, is eliminated allowing for extending sock life
- ▶ Concave to convex ballooning action during backwash ejects mud particles efficiently
- ▶ Reduction in acid washing

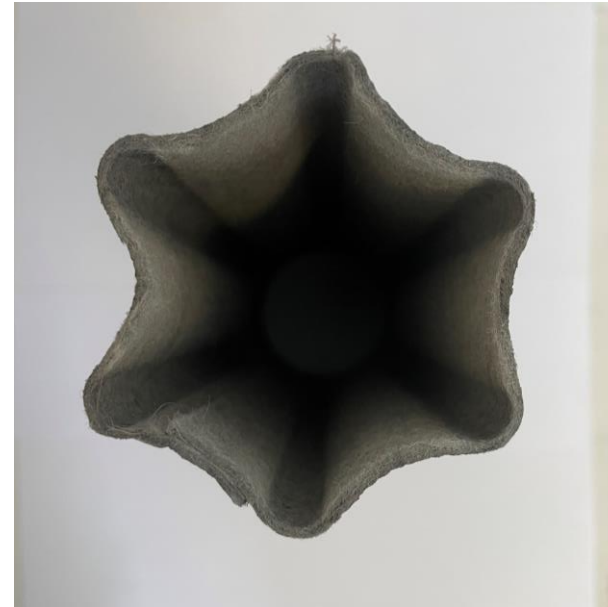


Process and Maintenance

Concave / Convex
sections →



Pleat Eliminated

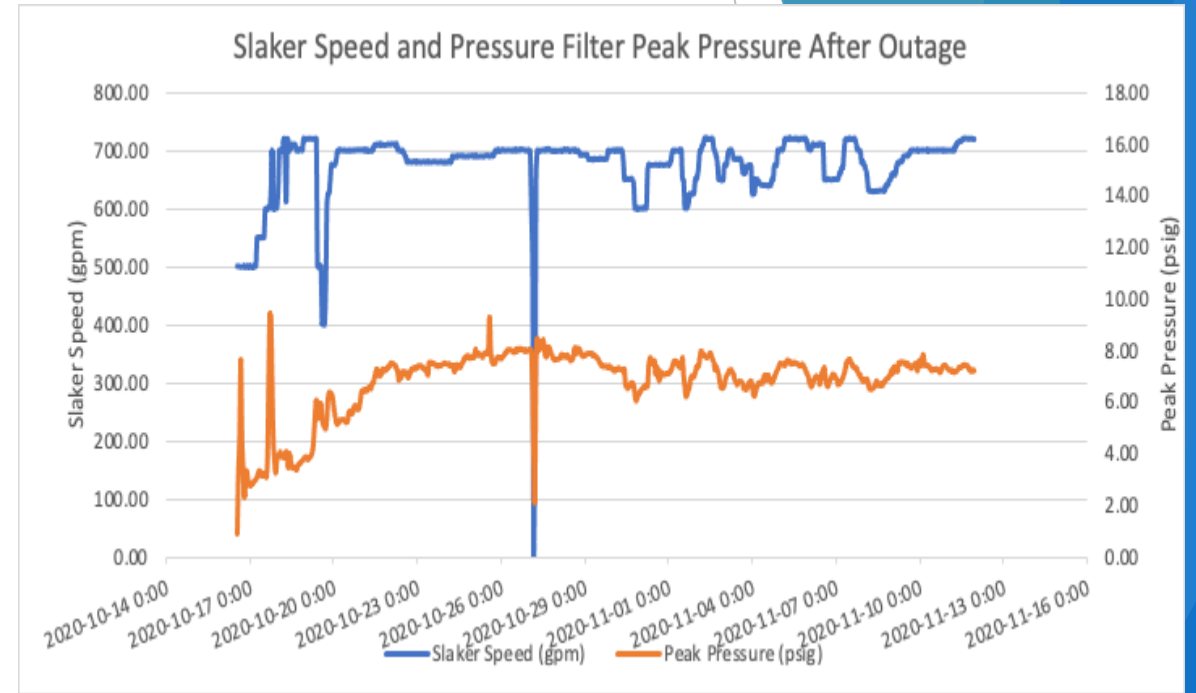
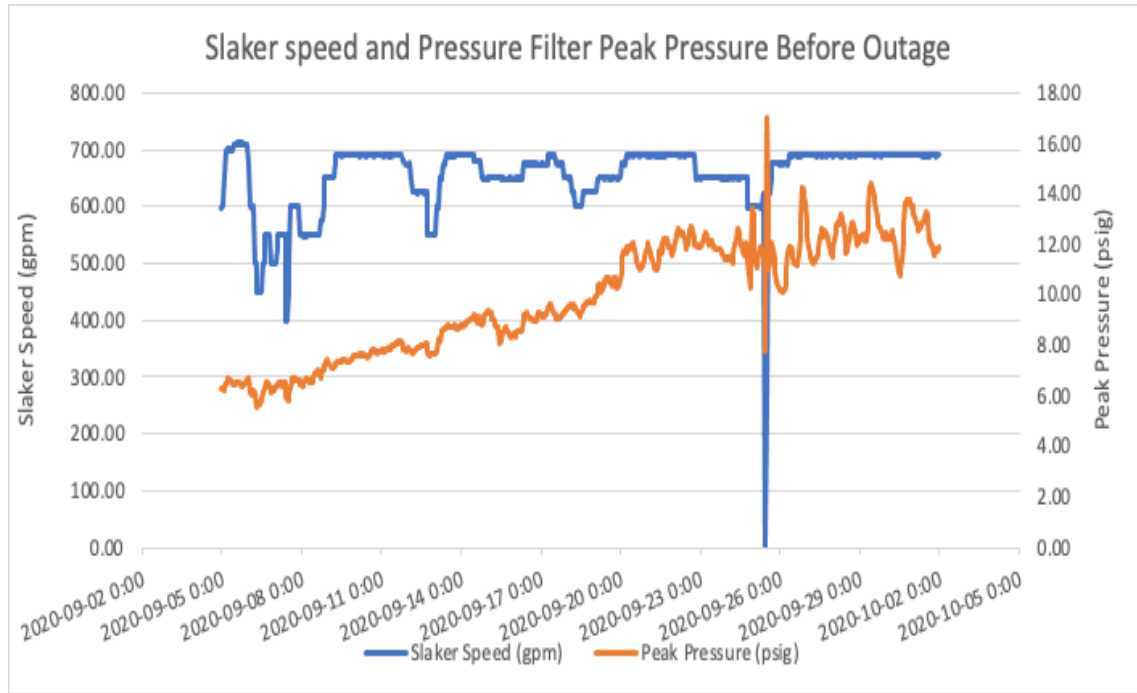


Process and Maintenance

- ▶ Differential pressure resilience in upset conditions
i.e. over liming or dregs excursions
- ▶ SnapShot is constructed to minimize contact with the sock allowing easy removal
- ▶ Open structure allows for easy cleaning and stacking
- ▶ Snapshot supports are effortless to install and drop into place
- ▶ Sock changes require fewer maintenance personnel



Slaker Rate vs. Peak Pressure



Tubes

SnapShot



Economics and Payback

- ▶ Longer filter media life
- ▶ Reduced acid washing frequency
- ▶ Reduced maintenance
- ▶ Filter Capacity
 - ❖ SnapShot - significant increase in support open area
 - ❖ Filter media surface area - pleat eliminated
 - ❖ Increased liquor capacity
 - ❖ Lower operating pressure at normal production
- ▶ Filter Reliability



Case Study - Skookumchuck Pulp

- ▶ SnapShots Installed Since: Mid 2019
- ▶ Total Slaker Flow: 750 GPM
- ▶ Causticizing Efficiency Target: 81-82%
- ▶ Filter sequence : 5 minutes, 3 seconds, 22 seconds
- ▶ Causticizing Time: 150 min



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Case Study - Skookumchuck Pulp

- ▶ Lower differential pressure
- ▶ Acid washing intervals improved from 10-15 days to 90+ days
- ▶ Filter is resilient and able to handle process upsets like dregs excursions and over-liming
 - ❖ Including running Recast on straight purchased lime without issue

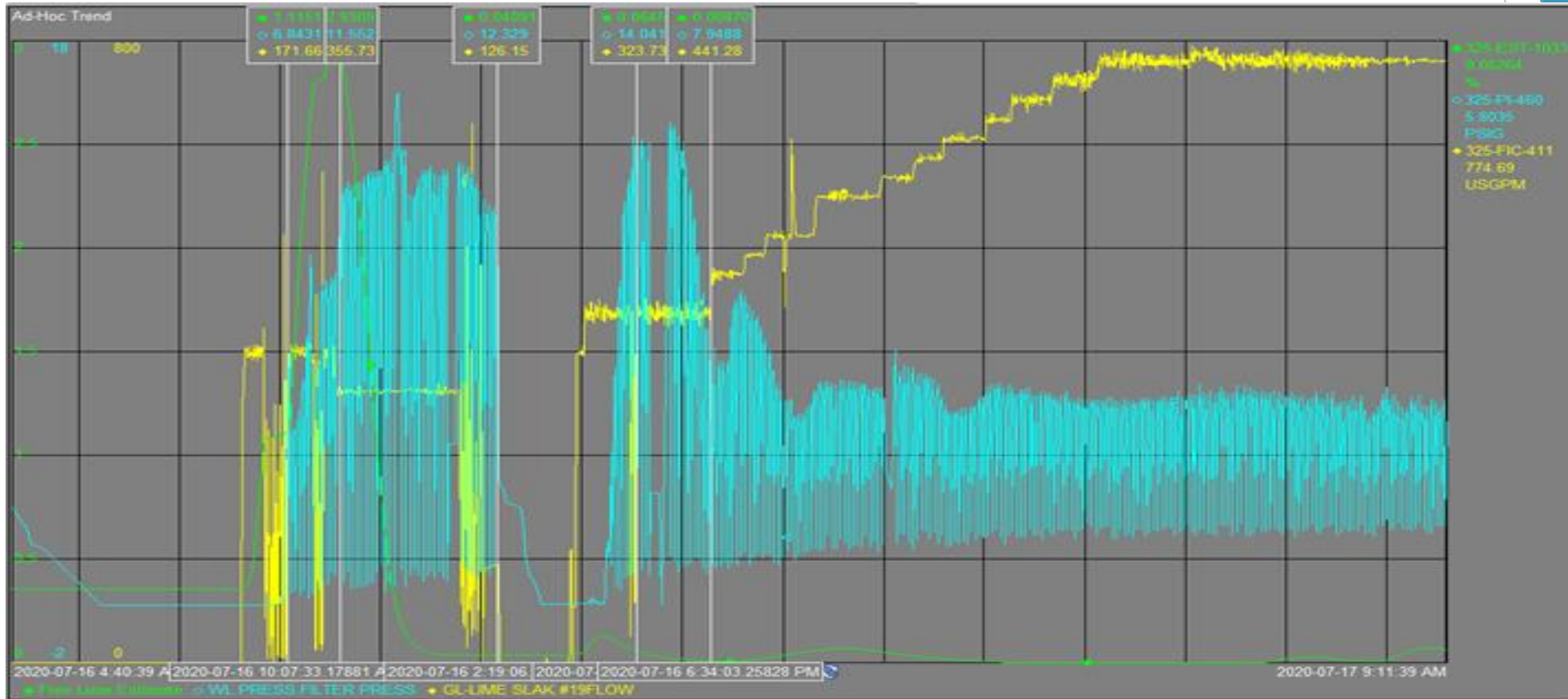


Case Study - Skookumchuck Pulp

- ▶ Liquor production increased nearly 45%
 - ❖ Filter can run at normal rate with two sections by-passed
- ▶ Lost tonnes associated to the white liquor pressure filter have been eliminated



Over-liming



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Future Pressure Filter Improvement

- ▶ Increase filtration time
- ▶ Add thickening bars to improve underflow solids
 - ❖ Reduced system dead load, improved operability and increase white liquor production



Questions

Thank you



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