Our view of the Mountain from the Mill

Case study

Effect of using water on Band Mill Saws to improve production, sawing accuracy with better control of operating saw temperatures.
Objectives

1. To research the impact of cutting temperatures of the Saws.

2. Investigate the amount of saw changes which were unplanned and the reason why they were changed.

3. Create a cleaner work environment which will be good for H&S.

4. Cost savings if any?

5. Maximise saw productivity.

6. Decrease sawing deviation in cut.

Background for Research

- Have spoken to the saw suppliers and Saw Doctors, they have said that once a saw has heat in the steel body, you don't get the same performance. The objective is to keep the steel cool at all times during cutting for best performance.

- Lube sticks to everything and builds up on lenses and sensors. The oil prices on the way up so lube price is too.

- Consistency in the saws
  End result less deviation in the Timber which we will be able to minimize our call size.

- In return we will get a better conversion return of timber and grade value from the resource. We don't have to buy as many logs to produce the same amount of timber, which is a huge saving with the price of our logs today.
Boundaries

- The speed at which the sawing process occurs places tremendous forces along the cutting edges. With the effects of heat added, saw and knife steels must contain a number of special properties. These include ability to:

  - Resist wear from elements in the wood.
  - Withstand the effects of heat generated during sawing.
  - Resist metal fatigue and stress failure resulting from continuous internal movement of steel when it is heated, cooled, levelled, and tensioned, set, or welded.

Positives

1. Better uptime due to less unplanned saw Changes.
2. Increased saw life due to less friction in cut. (Less purchases of saws.)
3. Better production due to steel holding lower temperature longer which will mean it doesn't lose tension in blade.
4. Cutting accuracy improvement.
5. Reduction in green sawn call size.
6. Increase in conversion.
7. Less log cost.
Take the resistance out of the cut to make cutting easier

The negatives that we came up against from using water on Saws

- It may create a little extra wear in bearings - But bearings are paid for in just 1 saw change.
- Guide wear? We still use a small percentage of oil to minimize wear.
- Wet sawdust? With controlled misting of water on Saws, while under controlled application of volume, moisture content of Sawdust can be kept to a minimum.
- Wheel wear? Wheels are cheap, if you can increase your uptime and within board deviation.
Findings from our Trial 1\textsuperscript{st} month

In the 1\textsuperscript{st} month we measured the saw temperatures and tracked the unplanned saw changes with just running oil on the Saws for lube on saw blade.

**Horizontal Saw 6 Foot Kockums**

- Rim speed 10500sftpm.
- Band strain 19000lb.
- Current feed speed 288sftpm.
- Saw Temperature Just Running not cutting 28°C
- Saw Temperature in cut 54.5°C
- 12 unplanned saw changes. Which equaled 120mins downtime.
- Standard Deviation within board average .42mm

Findings from our Trial 2\textsuperscript{nd} month

In the 2\textsuperscript{nd} month we measured the saw temperatures and tracked the unplanned saw changes. With just running on 33\% oil and 1.5litres per minute of water while the saw blade is in cut.

**Horizontal Saw 6 Foot Kockums**

- Rim speed 10500sftpm.
- Band strain 19000lb.
- Current feed speed 288sftpm.
- Saw temperature just running not cutting 28°C
- Saw temperature in is cut 31°C a drop in cutting temperature by 23.5°C.
- 4 unplanned saw changes. Which equaled 40mins downtime a increase of 80 minutes in production.
- Standard deviation within board .37mm
- No real impact on sawdust moisture content.
Findings from our Trial 3rd month

In the 3rd month we measured the saw temperatures and tracked the unplanned saw changes. With just running on 25% oil and 1.5 litres per minute of water while the saw blade is in cut.

Horizontal Saw 6 Foot Kockums

- Rim speed 10500 sftpm.
- Band strain 19000lb.
- Current feed speed 288 sftpm.
- Saw temperature Just Running not cutting 28°C
- Saw temperature in is cut 31°C a drop in cutting temperature by 23.5°C.
- 0 unplanned Saw changes. Which equaled 0 mins downtime a increase of 120 minutes in production.
- Standard Deviation within board average .33mm.
- No real impact on Sawdust moisture content.

Research from Another Mill

- Water is going great. Best thing we ever did! Have put water on our 6 foot Kokum’s Hori now. This system I made myself with galvanized pipe and some spray nozzles tapped into them. System works beautifully.
- We have, since we last spoke averaged up to 398 m³ per shift. An increase of up to 50m³ per shift. Saw reliability increased and work in the saw shop has decreased. Everything is cleaner and is free of the residue saw guide oil leaves behind.
- Standard deviation is sitting at 0.77mm or 0.385mm per side which is not too bad. It initially dropped to 0.65mm but has risen due to increased feed speed. We are cutting S-30 and M-30 grade logs. It has been noted that we have not had any complaints from the boiler operators as far as added moisture content goes in the sawdust.
- I strongly recommend getting back to the basics. I am not looking back that’s for sure!
Current Pump in use

Current jets being used to apply water.
Timeframe

• We performed this trial over a 3 month period and still finding gains as time goes on.

• The next step is to work on increasing our Feed speeds.

• Introduce the same systems to the other Saws.

• Monitor our sizing so our call sizes may be reduced.

Conclusion

• Lube will be immediate savings.

• Uptime due to less saw changes.

• Wood savings and conversion increase over time.

• Payback for the pump and applicators in 2 weeks.

• Happier Saw Doctors with less cracks and less benching.