Integration of Sonic Testing into Wood Processor Heads

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• Why integrate sonics – the opportunity
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Fibre-gen

- Fibre-gen has been developing Sonics technology since 1999
- Company bought out in 2006 by its founders
- Markets include Aus, NZ, UK, Scandinavia, USA and Canada
- Installations and hand tools currently operational in all markets
- 21 patents registered across target market countries
- Only company globally providing end-to-end Sonic Systems
- Working with equipment suppliers and users to integrate sonics into processor head equipment and operations
Why integrate sonics?

- Value captured by measuring before processing
Why integrate sonics?

• Value is captured by measuring before processing:
  – Harvest planning and stumpage purchase
  – Log making and log supply
  – In mill yard for LVL and MSG
• Optimisation of stiffness-related value in logmaking
• Avoid delivery cost of logs to wrong customer
• Mills have limited ability to sort on-site
• Improved safety and logistics
• Harvester and processor improve profitability
Why? MSG Lumber Value

• MSG vs Industrial lumber price differential AU$200/m³
• Average log infeed velocity improvement of 0.1km/sec will increase MSG YIELD from the mill by 5%

This equates to:
• AU$1,500,000 for a 150,000 m³ (lumber) mill per annum

Measuring and managing stiffness will increase profit
Why integrate sonics?

• Example – find structural logs in marginal stand
• Mean log V = 3.2 and SD = 0.3
• Structural target set at 3.0 km/sec
• 75% structural
• Structural V = 3.29
• Non-struct = 2.82
• PH production 300m³ 70% sawlog and 75% at $15 premium = $2,362/day
Why integrate sonics?

- Example – send structural logs to structural mill
- Mean log V = 3.2 and SD = 0.3
- Structural target set at 3.0 km/sec
- 75% structural
- Truck to structural mill and sonic sort
- Truck non-structural say 30km @ $0.20/km/m³ plus load/unload $3.00/m³
- PH production 300m³, 70% sawlog, and 25% at $9 extra cost = $472/day
New development – processor head tool
Mechanical Integration
Operation

1. Processor head clamps tree
2. Hydraulics insert probes
3. Saw activated
4. Velocity measured
5. Probes retracted
6. Grade indicated in cab +/- log paint tagged
7. Log making decision for the log to be cut
8. Head moves to next cut position and repeats process
9. Potential to incorporate diameter input
10. Data stored for later download
Prototype Results

Prototypes designed to de-risk further development

• Three standalone prototypes, plus one head-mounted
• Clear acoustic signal through stem
• Stem signal significantly earlier than through steel frame
Prototype Results

Prototypes designed to de-risk further development

- Saw operation interferes with acoustic signal
- Options to resolve – change signal amplitude or timing
Prototype Results

Prototypes designed to de-risk further development

- Probes penetrate bark to assess sapwood
- Log surface marking insignificant
Performance

- Eyrewell 28 year old radiata pine example
- Selection based on ST300 on stem
Development Pathway

Stages to completion
• Mechanical & Hydraulic size reduction for smaller heads
• Integration with head hydraulic system and controls
• High speed hit capability & processing implementation
• Operator user interface
• Accelerated life test (HALT)
• Volume trial performance verification

Lead users are needed to work on implementation
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