GOOD ROTATIONS

New primary lines at Carrier Lumber yield better rotation, recovery
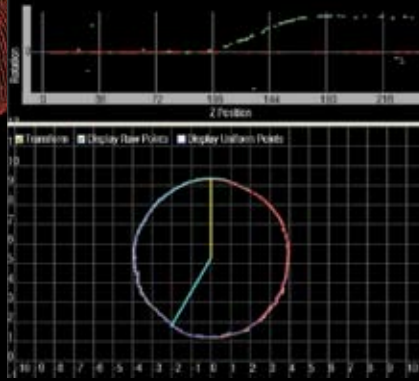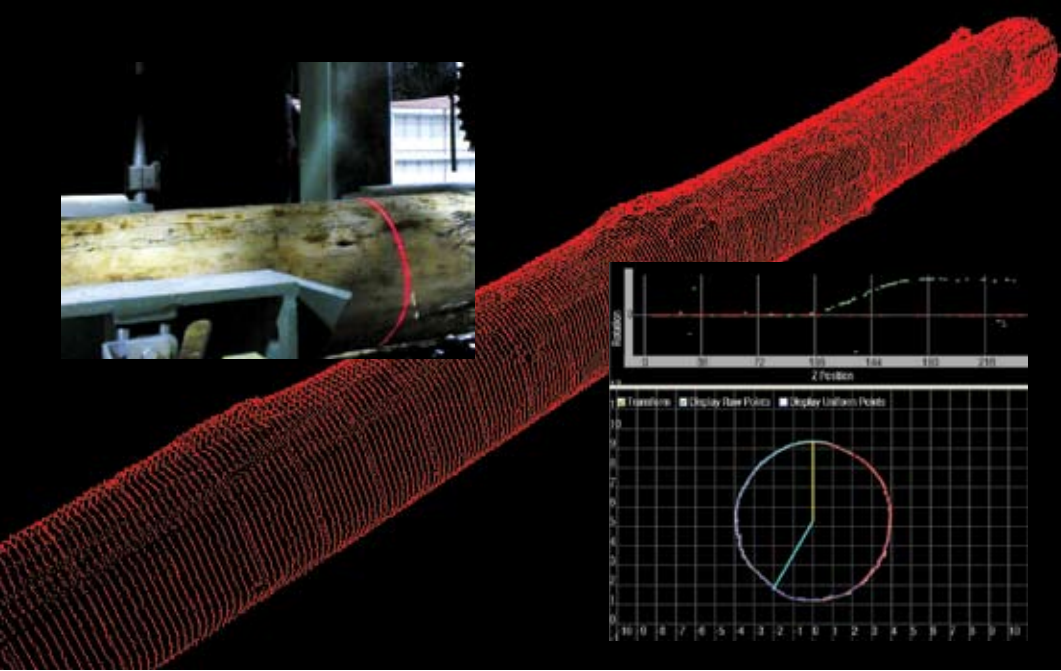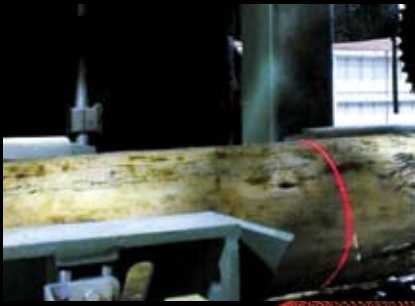
OUTSIDE THE CYLINDER

BlockPLUS enhances performance at Rainier Veneer

WEST FRASER MOVES TO VISION ON LHG

Ramping up for a market turnaround

USNR

Smart teams, smart solutions

The key to good products is finding the best technology for the task, and building it into a product that adds value to a customer's operation. The technology has to be right, but just as important is the application of that technology. That takes talent.

USNR is very fortunate to have assembled several accomplished teams of individuals. They are not only smart, they are creative. They thrive on searching out the latest technological advancements and employing them in innovative ways to solve complex problems.

In this issue we relate stories about new products and evolved products our teams have been working on. New products include our **Precision Geometric Log Rotation (PGLR)** system that employs laser profile scanning to correct the log's turn during the initial breakdown process, yielding higher recovery. Our **Lineal High Grader (LHG)** planer mill grading optimizer is changing fortunes for users who have implemented its vision module. Our **BlockPLUS** lathe charger scanning system has evolved with its latest software release, improving performance and adding new features to this industry leader.

We also introduce you to six members of one of our talented teams working on new adaptations in the field of grade scanning. When you read about their accomplishments, you'll see why these individuals are experts in their field.

Sincerely,
Colleen Schonheiter
Editor

Carrier Lumber: making every log count

NEW PATENTED TECHNOLOGY IMPROVES TURN ACCURACY, YIELD

Many mills in British Columbia are persevering despite a devastating pine beetle epidemic followed by an unprecedented market slump. Carrier Lumber's Tabor mill at Prince George, BC is in the heart of the beetle-killed region, and though times have been challenging the company has seen fit to continue its course of reinvestment to remain as competitive as possible. Two new log breakdown lines were its most recent pursuits, both equipped with smart technology to help achieve the greatest value and recovery possible from its logs.

Carrier history

Carrier Lumber dates back to the early 1950's, founded by William Kordyban Sr., and today is still privately owned. In 1976 the company built on its current location. Today it consists of a two line dimension sawmill, planer mill, dry sheds, a wood yard, and dry kilns. The mill has continually upgraded its equipment to enable it to maintain its reputation for producing high quality lumber, with output in the range of 220 mmbf annually and yielding 1x4 through 2x12 in 8' to 20' lengths of J-grade, Stud, 2&Btr, #3 and Economy. Logs are obtained through the mill's timber licenses supplemented with private wood, and are hauled from up to a 150 mile radius. The mill processes SPF logs with a 4" top and up to a 24" butt.

Sawmill operations in the Carrier group include Carrier Forest Products at Prince Albert, Saskatchewan, and a strategic alliance with First Nations and a local community that have spawned Cheslatta Forest Products at Ootsa Lake, BC. These mills have been built with the portable mill

concepts that have been developed through many years of research and development at Carrier's fabrication shop touted to be the largest in Northern British Columbia.

Partnering

Carrier Lumber has long advocated the chip-n-saw style of log breakdown. The Tabor mill's layout included two chip-n-saw lines, one for small and another for larger logs. Several years ago the decision was made to purchase a new small log line. USNR's vertical shape sawing (VSS) small log processor was the successful candidate for processing logs with smaller than a 10" butt, and was delivered in 2004. Carrier chose to test it in its fabrication shop rather than the mill, so as not to incur any downtime while taking advantage of the hot market. By mid-2008 the market had cooled and the new line was installed in the mill.

Concurrently USNR was developing a new process for log turn verification, one that didn't involve the use of ink to mark the end of the log. Carrier agreed the Tabor mill should be a beta test site for the new process, dubbed Precision Geometric Log Rotation (PGLR), on its new small log line. Over several ensuing months the USNR development team made many trips to site to tweak the system, with continuous progress.

PGLR on small log line

On the VSS line geometric SmartTriCam sensors scan the log before it enters the infeed section to measure it and determine its position. The slewing and skewing infeed positions the log for the turn, then it

Carrier Lumber's new primary lines are outfitted with the latest advances, including patented turn correction technology.

is scanned again while being turned. During the turn the PGLR's SmartTriCam sensors are scanning the log continually and feeding the measurement data to the optimization system to instruct the PLC to correct the turn as the log proceeds on through the turners. The log continues to be scanned until it is finally released by the turners. There is a full scan zone directly after the quad-roll log turner that confirms the log's position and provides feedback, through the optimizer, to the PLC to adjust the cutting tools accordingly. The PGLR system improves the machine's ability to achieve the optimal breakdown for each log as it is being processed; the final breakdown solution is based on the actual position/rotation of the log rather than on guesswork. In the midst of the PGLR beta project on the VSS line, it was put on the back burner as a new project was in the works at the mill.

Unique large log line

Bill Kordyban, son of the founder, serves as president and general manager for the Carrier operations. In

The large log line is fed by two feed modules, depending on the size of the log.

2009 he decided a new large log line for Tabor was the next step in modernizing the breakdown process, and again selected USNR to supply the equipment. The PGLR system was included as part of the scope of supply on that line as well, and it became the new beta for PGLR completion.

The large log line is nearly 260 feet in length. Two log bins are used to sort logs based on size, and feed them to the infeed conveyor. The logs are first scanned ahead of the turning rolls for optimized positioning. As each log enters the turning rolls it is scanned by the PGLR scanner, located at the entrance to the rolls, and continues to be scanned until the rolls release it onto the extended length infeed section. Throughout this scanning process the turning rolls are continually correcting the log's position based on feedback from the PGLR scanner.

The extended length slewing, skewing and tilt (SST) infeed is capable to move the log in both vertical and horizontal planes. Here, two more scanners verify the log's position as the infeed

orients it prior to breakdown; the first scanner measures the latter half of the log, while the second scanner measures the first half. The log is then fed through the profiling canter section where it is processed by side chip heads and top and bottom profiling heads. Then the cant transfer conveyor transports the log to the sawboxes. This machine is equipped with two quad arbor sawboxes in line; logs smaller than 14" are processed through the first sawbox with the capability to take off four sideboards using thinner kerf saws, and larger logs go on through to the second sawbox with the capability to take off six sideboards using thicker kerf saws.

The sawboxes each have a pivoting top arbor saw that swings down in front of the bottom saw and cuts the top part of the log, while the bottom saw cuts the remainder. Speed is the advantage with this type of breakdown as it can cut faster than a bandmill. The pivoting top arbor design balances the cut between the two saws so each saw is required to cut

less, thus allowing the machine to cut faster. For example, an 8" log can be cut at the same speed as a single arbor saw cutting a 4" log. Balancing the cut also fills the gullets therefore minimizing the saw step or match line. This style of breakdown is typically used for smaller logs, but Kordyban also thought it was a good design for the large log line.

Customer focused innovations

USNR is cognizant of the value of customers like Carrier that are willing to test out new products such as the PGLR. USNR also knows that innovations are sometimes brought to light by customers that have inventive ideas about how to achieve their goals. By working together unique concepts can become the new reality. The mill floor is the proving ground for new innovations, and USNR appreciates the opportunity to work together with our customers to a common end. Every installation USNR is involved with has its own unique requirements, thus each line becomes a custom-fit.

A member of the Carrier team, Kelly Solmonson is coordinator for all of its mills. Kelly explains, "Our goal is to have equipment that is the best that is out there. Our team believes that when you take ownership of a piece of equipment you tend to look after it better and take pride in how it runs." Kelly went on to explain, "We're continuing to make improvements (on the large log line) to achieve the high standards that we are looking for in our equipment. USNR has been more than cooperative when we've wanted to make changes."

And what about the performance of the VSS machine? Carrier's preference was for the small log machine to do top and bottom profiling, with side boards still going to the edger. Kelly feels the small log line runs as well as any in the industry.

Testing for turn

Paul Green, optimization engineer who worked on the development of the PGLR system, explained the theory behind its design. "The PGLR system improves recovery by getting the log closer to the ideal rotation angle called for by the turn optimizer. Studies have shown that on log turners running without any correction, the standard deviation of the turn error can be much higher than most people think. Part of the reason this surprises people is that rotation accuracy studies are very time consuming to do, so most mills don't know how their machine is performing."

He went on to say, "USNR has a history of experience measuring the performance of log turners starting with manual angle measurements, Precision Log Rotation (PLR) using ink stripe and camera, and now our PGLR laser scanning system to measure and correct as the log is being turned. We are also developing a turn detector using image processing technology to measure the final turn accuracy of the log as it enters the cutting

The first sawbox takes up to four sideboards off each piece, while the second sawbox, located just downstream, is capable of taking off up to six sideboards.

tools. The turn detector can report the accuracy on every log, as well as a running average and end-of shift-reports. As these tools become available the typical accuracy for a log turner is becoming more widely understood. USNR's PGLR system is unique in that diagnostics show plots of the turn measurements throughout the turn and reports on-going turn accuracy over the previous 1000 logs."

Eye-opening results

USNR's experience with testing turn error/accuracy has yielded eye-opening results. The cutting devices on any log breakdown system are set assuming an almost perfect turn in the log turner. However in practical terms the turn is seldom perfect, resulting in lost recovery. Testing has shown that by rescanning to determine the exact position of the log, and the ability to reset the cutting tools accordingly, results in significant improvement in recovery. Turn error can typically improve from a average absolute turn error of over 8 degrees to an average absolute turn error of under 4 degrees with turn correction. This can yield recovery improvements from 91% to 96%. Many variables come into play when measuring turn accuracy; with larger logs high turn accuracy is typically much easier to achieve.

Final acceptance testing for the PGLR system on the large log line was run in May 2010, followed by the VSS line in October. The results of the two tests achieved standard deviations **a great deal better** than promised and required by contract. USNR was recently awarded patents covering the concept.

When asked his opinion of the results from the PGLR systems, Kelly said, "It is more of a confirmation that we are doing things right. The PGLR system, for us, is a second check to ensure that we have the recovery we were expecting to achieve."

A potent combination

Carrier Lumber believes strongly in the benefit of smart technology to reap the greatest value and recovery from its fiber supply. Carrier also believes its strength is in its team of people, and all play an integral role in how its equipment runs. Kelly elaborated, "If you get people buying into the equipment they'll make it work. Our installs go very well; Carrier Lumber employees understand that everyone has an opportunity to make a difference."

Future horizons

On the issue of the pine beetle epidemic in BC, Carrier feels that the epidemic has run its course and

the bulk of the mature pine stands have been killed. In retrospect, the right thing was done to manage the epidemic by having the mills salvage as much as possible. Carrier believes that all the mills have done an admirable job of dealing with the volume of wood processed.

Carrier continues to look at ways to improve so it can maintain its commitment to its customers to provide them with high quality lumber. With the latest advances in technology Carrier has made to its primary end, it is making every log count. 🌐
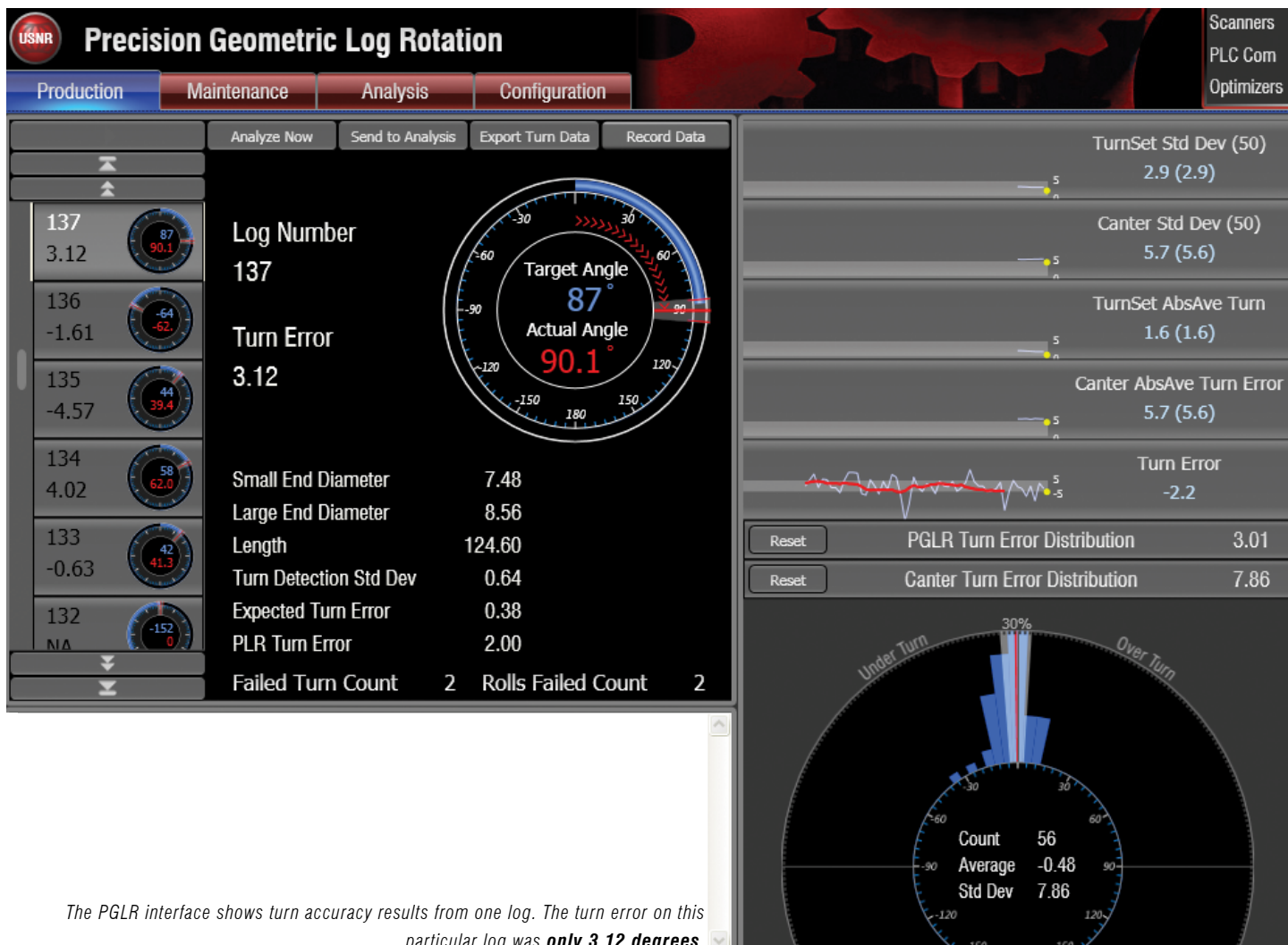
*The PGLR interface shows turn accuracy results from one log. The turn error on this particular log was **only 3.12 degrees**.*

Add PGLR turn correction to your line now
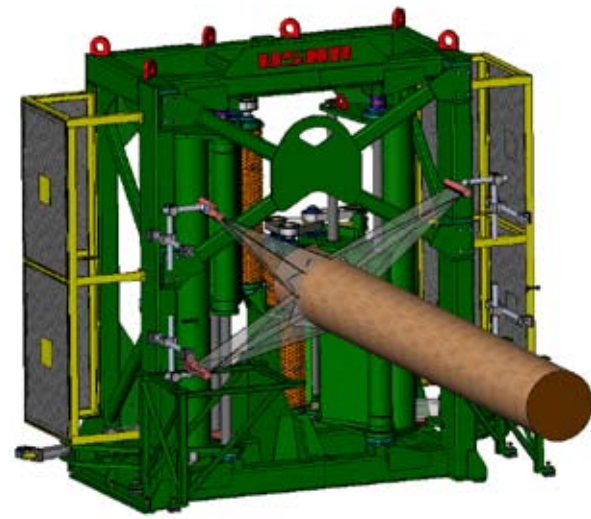
New patented turn correction technology available as an upgrade

USNR was recently granted patents covering methods for log turn correction. One patent covers systems that apply ink to mark the log's position before rotation. The log is scanned while being turned, using vision technology to monitor and correct the turn as the log travels through the turning rolls.

USNR's product developed for this method is called Precision Log Rotation (PLR), and the patent is #7,849,894. The other patent covers a range of methods that can be used to monitor and correct the turn on-the-fly, including PLR and Precision Geometric Log Rotation (PGLR), patent #7,857,021.

The Precision Geometric Log Rotation (PGLR) system monitors and corrects the log rotation process in real time to increase recovery by reducing log rotation error. Log rotation error is typically reduced by 50% or more. USNR's PGLR system utilizes the same high-resolution Smart TriCam 3D sensors as are used at the primary breakdown log scanner. This unique system can be added to your existing log breakdown line.

The scanning system is located at the log turner
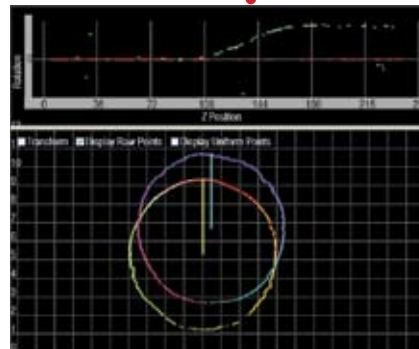
**Step 1: Initial scan**   **Step 2: PGLR rescan**   **Step 3: Final QC rescan**

Step 1: Initial scan *of the log by the auto rotation scanner. All cross sections of the log are collected as usual by the turner sacn zone. They are passed to the PGLR computer to be the reference to compare against scans at the PGLR scan zone.*

Step 2: PGLR rescan *and correction during the turning process. As cross sections are collected at the PGLR scan zone they are compared to the corresponding cross section from the original turner scan. The difference in rotation is calculated. During the turn, the difference in rotation will be used to project turn error and correct the current turn roll motion set. After the turn, the system continues to monitor turn accuracy and correct if necessary.*
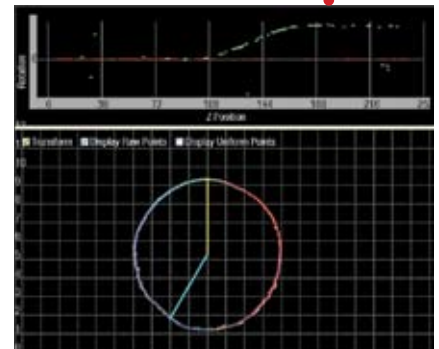
Step 3: Final QC rescan *by the log optimization scanner. For systems that have an existing scan zone on the log infeed or are planning to install one, the turn detector can provide continuous verification of the turn accuracy using the same technology used at the PGLR scanner. This system has the luxury of examining multiple cross sections to accurately gauge the final turn angle with better accuracy than can be hand measured, thus eliminating the need to run time consuming manual tests in order to confirm the turner operation.*

machine section. Four Smart TriCam 3D sensors scan the log in real time as it is being rotated. The current log rotation path is compared to the auto rotation optimizer's projected log rotation path to generate log rotation corrections. The log rotation corrections are transmitted to the PLC for correction of the log rotation path as it continues through the log turner.

PGLR works on dual or quad roll log turners, donut turners, sharp chain log turners and end dogger systems. It enables you to convert a manual system to semi-automatic, or a semi-automatic system to a fully automated precision log turning system. Currently PGLR is compatible with Smart TriCam scanning and MillExpert optimization. To upgrade a line without these components will also require conversion to these systems.

PGLR compensates for log turning errors

PGLR can compensate for log turning errors caused by the following.

► Mechanical wear
► Feed speed changes during the turn
► Irregularly shaped and crooked logs
► Transfers from one conveyor to the next
► Interaction with pressrolls
► Slippage and hesitations

The PGLR software is straightforward with a host of diagnostic tools to help tune the mechanical as well as the PLC control systems. Graphs and on-screen indicators permit early detection of problems and overall performance at a glance. Reports are generated to isolate issues relating to a particular class of log and to track longer term trends. This simple solution to an often hidden problem adds profit in the form of higher recovery and increased production of more boards, longer boards and more wane-free boards, all with no extra mechanical hardware. **Consider that a mis-turn of as little as 2° could wipe out an entire board in a small log.** Major benefits of PGLR include the following.

► Significantly improves cutting accuracy
► Increases uplift and recovery
► Allows you to cut more boards, longer boards and more wane-free boards.

Installs over a weekend

When you decide to upgrade your log breakdown line with PGLR, this is what you'll get. The PGLR system consists of four Smart TriCam sensors with associated hardware, wiring and a PGLR computer which is installed in the existing optimizer computer enclosure. The Smart TriCam sensors are mounted via a framework that is bolted to the existing frame housing the turning rolls. PGLR works with your existing log breakdown control system, with some software modifications. The whole upgrade can be performed over a weekend, then you'll start your new week making every log count!
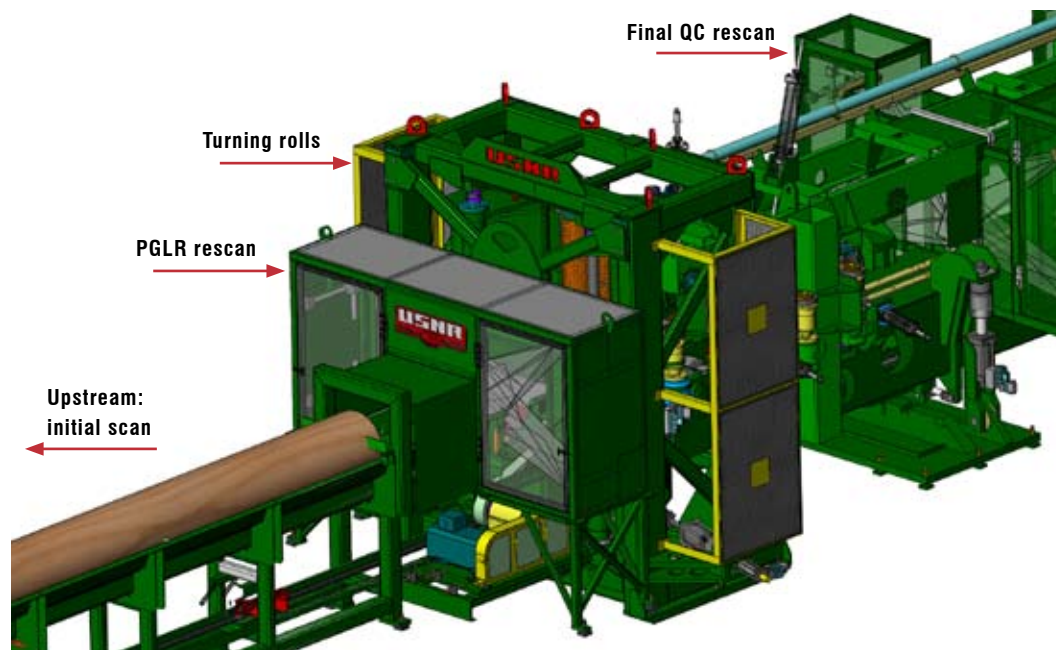
Performance results all day, every day

The reports built into the PGLR system provide diagnostics on how well your turning system is working, in real time. The mill can record historical trending for turn accuracy vs. recovery, enabling it to quantify performance. Piece-by-piece turn correction results and trends are available for up to the last 1000 logs, including various turn correction statistics to help diagnose and improve turning performance. It provides complete information on production and performance, and helps management make the right decisions at the right time.

Winning solution catches on with customers

Since the product's launch in 2010, USNR has sold or installed eight PGLR systems. Of these, four are combined with other vendors' log breakdown lines. **One of the recent upgrade sites is so pleased with their results that a sister mill is also planning to implement PGLR.** Several more sites are currently appraising the product. To fully evaluate the benefits of upgrading your existing log breakdown system or include PGLR in your next new capital project, please contact your USNR representative. ⊕
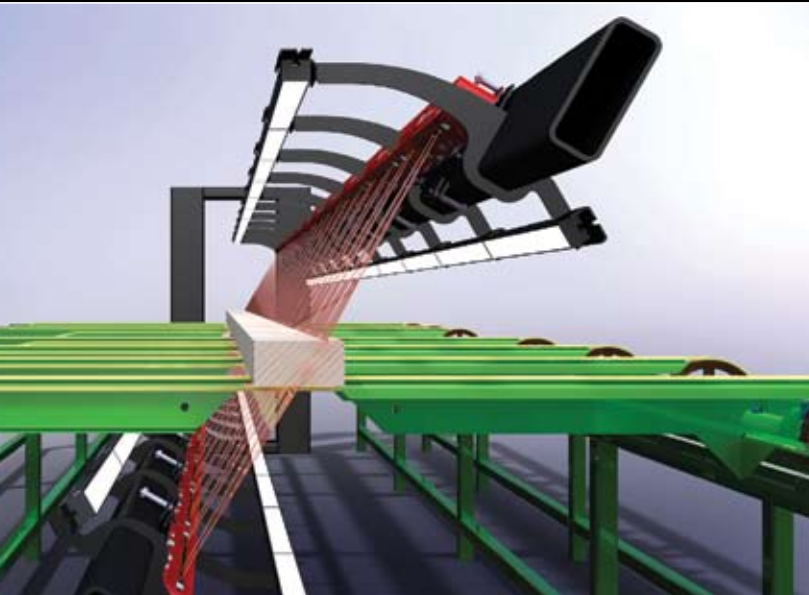

Final QC rescan

Turning rolls

PGLR rescan

Upstream:
initial scan

West Fraser LHGs: now all with vision

RAMPING UP FOR MARKET TURNAROUND WITH LHG UPGRADES

USNR's Lineal High Grader (LHG) is the industry's most advanced lumber grading system for planer mills, offering more capability than any other. With improved market conditions over the last year many customers have made the decision to upgrade their systems to add the latest vision component and software version, particularly in the southern US. The LHG is proven to produce excellent on-grade results for SYP with its unique defects. Like many other LHG customers, West Fraser recently chose to upgrade its systems at Augusta, Georgia and Huttig, Arkansas.

West Fraser was an early believer in the system's value, agreeing to beta several of the LHG's technology capabilities. After nearly a decade of experience with this system, the company remains a strong believer in the value the LHG has provided its operations.

Currently North America's largest producer, West Fraser now has 15 mills in the US and 13 in Canada producing lumber, with another 11 manufacturing either plywood, MDF, LVL or pulp and paper. The Augusta mill was acquired from International Paper in 2007 as part of a larger transfer of ownership of a total of 13 mills.

Vision upgrade

The LHG was first installed at Augusta early in 2004 for geometric scanning only. Since that time it has had no major upgrade work performed. In the fall of 2010 the system received a major overhaul comprising a vision system and retrofit to its feed frame. The LHG system at the Huttig mill was installed in May 2004, and also recently updated to add vision grading capability.
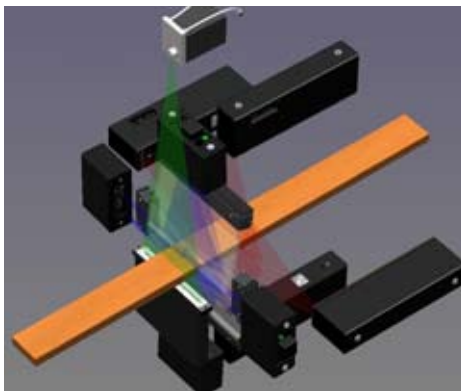
Depending on the existing LHG components, the vision upgrade may include the following.

▶ 4 vision sensors with corresponding mounting and LED lighting
▶ X-ray source and detector
▶ New computers and computer bay
▶ LHG V6.0 software

The vision module combines 4-face, multi-channel vision data with density data from X-rays and geometric data from laser profile sensors. Through DataFusion™ the optimizer evaluates and compares all of the data, and accurately grades each board based on the mill's product parameters. The LHG evaluates dimension lumber from 1x3 to 4x12 and 6x6, and from 6' to any length run in a batch process. Its processing power and intuitive interface make it easy to set up and configure even the most complex grade classifications. Today LHG systems are grading a variety of species in most regions of Canada and the US, as well as in Europe and Australia.

Jose Guthrie handles corporate process quality control for West Fraser's US divisions, based from the Huttig, Arkansas site. When asked about West Fraser's decision to upgrade these two sites, Jose commented. "We're pleased with our past results. We would have liked to have done the upgrades sooner, but market conditions being what they were it didn't make sense until now."

Accuracy, consistency, flexibility

West Fraser is well satisfied with the new features and functionality the LHG is providing. Jose said, "We are pleased with the LHG and its vision capability." To date, all of West Fraser's LHG systems have been upgraded to vision, or are soon to be. Jose went on to relate, "The accuracy, consistency and flexibility of the LHG system is very impressive. West Fraser has been pleased with our history with this system."

Jose's response echoes what USNR has been hearing from other customers, including substantial increases in sales and reductions in labor. The LHG has proven to produce excellent results grading a wide variety of species in global regions. As defects and grade parameters vary USNR has fine-tuned the LHG accordingly. This affords customers the flexibility to adjust their products on-the-fly to meet fluctuating market conditions. Today LHG delivers the smallest distribution of above/below grade on a pack-by-pack basis. And customers are ramping up; in just over a year USNR has sold or installed the LHG's vision component on 33 systems worldwide.

Jose commented that West Fraser is always looking for products to improve over time. USNR periodically releases new LHG software revisions that become available to benefit all LHG customers. When asked, Jose commented, "The products coming from (USNR) Salmon Arm just seem to continue to get better."

Jose is also optimistic about the future of the industry. "There is so much going on in the industry right now, and West Fraser wants to stay in the lead." With all of its LHG's outfitted with the vision and software components, West Fraser is in an even stronger position to take advantage of a return to better times. 🌐

In just over a year USNR has sold or installed the LHG's vision component on 33 systems worldwide.

*Once fully outfitted, the LHG houses all the technologies required for automated grading in a lineal configuration. Technologies include multi-channel vision, laser profile, and GrainMap™ laser mapping. X-rays are also employed to assist in determining the size and shape of knots, and the strength of the piece. LHG is the **only automated grading system to offer integrated MSR/MEL evaluation within its frame**, and it can be added at any time as your products and markets evolve.*

Use our checklist to improve your dryer's performance

For maximum production and uniform air and heat distribution, your jet dryer must be maintained in good condition. All jet boxes must be in place, all fans must be properly aligned and the dryer must be sealed tight. Following are some common problem areas you should check regularly to ensure good performance from your dryer.

1. Missing jet boxes

One missing box per set will cause uneven drying. Missing jet boxes should be paired up and their position closed over to avoid rapid short-circuiting of air and the possibility of uneven drying.

2. Closed, sealed clean-out doors

The clean-out doors on the pressure side between the foundation and bottom horizontal line of jet boxes must be in good repair, and closed when drying. If there is not a tight seal, a very rapid short circuiting of air will result with uneven drying.

3. Sealed jet boxes, clean-out holes

Jet box ends and clean-out holes must be closed and sealed tight to avoid short-circuiting the air. Even if most ends are in place and most clean-out holes closed, uneven drying may still result because the overall pressure will be reduced.

4. Clean jet boxes

Jet boxes must be free of wood fiber and pitch to be most effective.

5. Don't mix old and new jet boxes

New boxes are likely an improved design and may require a different fan or increased air volume. Mixing boxes of varied type and design will usually result in unbalanced conditions from side-to-side and deck-to-deck in a dryer section.

6. Uniform fan alignment

Poor alignment and positioning will reduce fan efficiency – as much as 50% or more – depending on the degree of misalignment.

Where propeller or axial type fans are used (usually older style jets), the fan must have a tight uniform clearance between the ends of the fan blade and the inlet cone. The outlet cone should extend one fan radius past the fan for best results.

Centrifugal type fan wheels should be positioned uniformly with the inlet cone, and the cone should extend approximately one inch into the eye of the fan for best results.

7. Prevent rotation of non-working fans

If you have a fan that is not working, it should be blocked to prevent rotation. If it is allowed to rotate the rotation will be in the wrong direction (backwards), which will rob air from the two adjacent fans and drastically reduce the volume of air delivery in the zone.

8. Correct stack damper position

The stack damper must be kept more closed rather than more open. If too open it will allow outside air to be brought in at the ends of the dryer and the doors on the fan side of the dryer will leak. This causes increased steam or gas demand, and usually results in reduced production and danger of fire.

Dampers that are too open reduce air delivery to the supply or pressure side. This could cause an imbalance and result in more wet veneers developing on the top roll lines.

Uniform air and heat distribution is required for maximum quality production. When there are problems you will notice more wets show up on the top roll lines, while the bottom roll line will be over-dried. Keep your dryer in good repair, keep it sealed tight, and keep the air system balanced for the shortest drying times and the best veneer quality.

ONLY Coe jet nozzles maximize performance

Optimum spacing of orifices maximizes thermal dispersion.

Self-sealing nozzle flange delivers 100% of the energy to the veneer.

Critical jet design ensures efficient energy distribution and thermal dispersion.
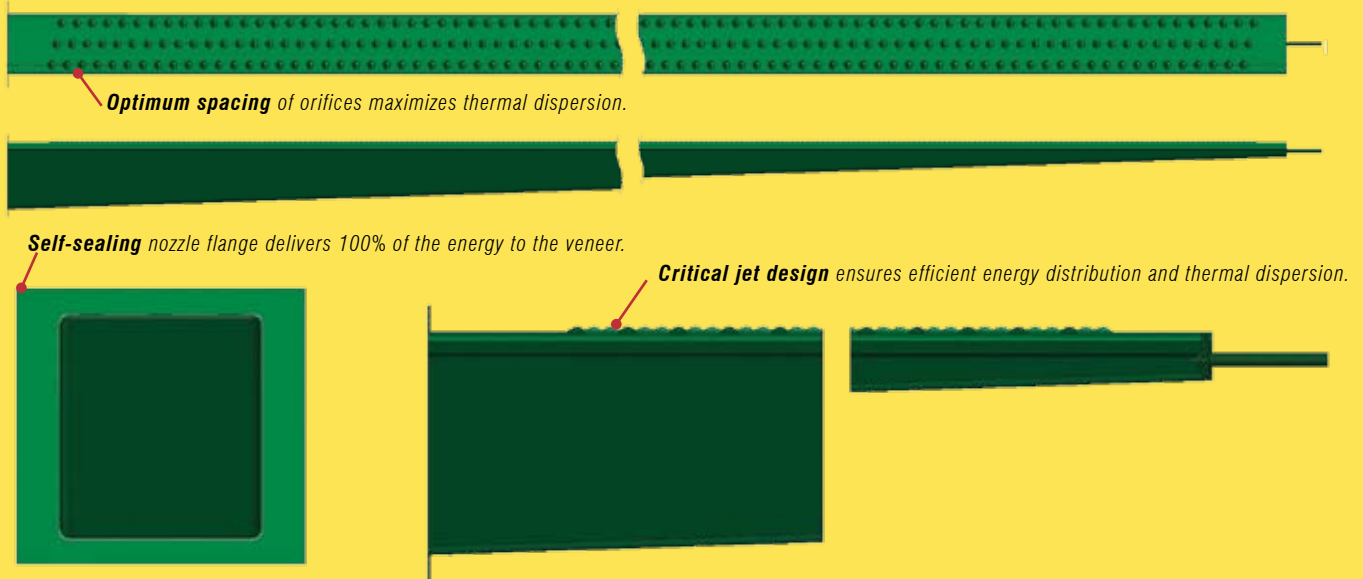
Don't be fooled by look-alikes. Only Coe-USNR high-performance 303 jet nozzles are designed to maximize the performance of Coe fans and heating systems.

The importance of this energy distribution system can be underrated, but the Coe jet nozzle is the only dryer distribution system specifically designed and tested to satisfy the fan, heater, and plenum requirements of Coe veneer dryers. Here are some advantages you may not be aware of.

► Proprietary orifice configuration ensures efficient energy distribution and thermal dispersion

► **Critical jet design** minimizes fiber accumulation

► **Self-sealing** nozzle flange delivers 100% of the drying energy to the veneer

► Provides exceptional opportunity to balance productivity and veneer quality requirements

► Cost-effective, robust construction resists damage due to fire, plug-ups and routine cleaning

► Priced to benefit even the most staunch technology skeptics!

Contacts are Greg Rigby in our Jacksonville, Florida facility, and Cliff Banta in our Woodland, Washington location.

Greg has over 30 years' experience with Coe parts and he knows these systems intimately. Contact him at greg.rigby@usnr.com, direct at 904.380.8460, fax 904.632.4923, or toll free 1-800-BUY-USNR.

For over 10 years Cliff has helped customers like you get the Coe parts you need, when you need them. Contact him at cliff.banta@usnr.com, direct at 360.841.6344, fax 360.225.7146, or toll free 1-800-BUY-USNR. 🌐

BlockPLUS: modeling the optimal cylinder
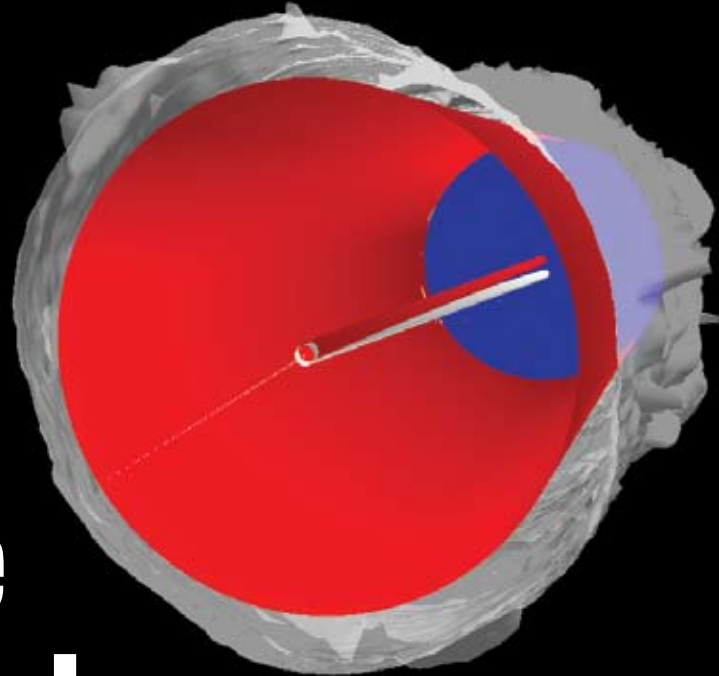
WITH THE NEW SOFTWARE RELEASE IT'S BETTER THAN EVER!

The BlockPLUS lathe charger optimizer delivers the most precise scan in the industry, providing customers with the greatest opportunity for recovery and throughput available. Applying the new technology was clear sailing right from the start for Rainier Veneer when they installed their BlockPLUS scanning system in July 2007. The company immediately recognized the added value BlockPLUS delivered. A new software release recently improved the BlockPLUS performance, and now is just icing on the cake.

Rainier started as North Pacific Plywood, a plywood cooperative situated at its present location at Graham, Washington since 1974. The plant changed hands several times before being purchased by the Rigby family of Oregon in 1992. In 1993 the plant switched from plywood production to specializing in veneer only. It purchases its raw timber on the open market and employs around 70 people. Jim Herold has been general manager of the plant since he joined the Rainier team in 1998. Earlier he worked for Roseburg Forest Products in its plywood plant.

The Rainier plant processes approximately two-thirds Douglas fir and the rest is hemlock, and markets its veneer close to home - primarily to Hardel Plywood at Chehalis, Washington. Currently the mill is running two shifts and annual capacity is about 175 million square feet of veneer.

The logs peeled are mostly from 7" to 30" in diameter, all are 8' long. Rainier peels down to two core sizes; 3-3/4" for thick peel, and 3-1/4" for thin. Thinner veneer produces better quality plywood; plywood using thinner veneer requires more veneer layers so the knots are dispersed. Generally sold by the square foot, thicker veneer actually brings in a premium compared with thinner veneer which takes longer to produce and contains less product.

Embracing technology
Most of the equipment at this plant is from Coe. The XY charger scanning system originally installed (2003) used IDS (image displacement scanner) sensors. It was upgraded to a BlockPLUS system in July 2007. Jim explains the rationale behind the investment. "The biggest expense in our industry by far is the raw material. Over half of what we spend every month goes to logs. Anything we can do that improves the return on that cost has a big payback."

Jim explained how Rainier discovered BlockPLUS and decided to implement it at the plant. "Owner Don Rigby was at the machinery show in Portland and saw it, and I had seen it two years prior. We have a Coe lathe and most of our equipment is Coe, so we were familiar with the company and knew Coe had a reputation of making it work. Our existing scanning system was an older generation, and BlockPLUS looked like it made sense." Jim is also satisfied with the service and support he has received over the years from Coe (now USNR).

The value of precise data
BlockPLUS is a scanning system that takes very high resolution profile measurements of the complete circumference of the log, creates a model of its optimal cylinder, and generates an optimized solution for peeling. BlockPLUS has been proven to achieve greater recovery and reduce peeling cycle time, in turn improving overall throughput.

"We expected to increase recovery, and we're getting a higher percentage of veneer out for the same volume of wood in." For Rainier, the benefit of a recent software upgrade is just icing on the cake.

BlockPLUS is stocked with many features that make the most of the raw material.

In the absence of a densely accurate profile the operator must assist the system by guessing how far to retract the knife carriage. The knife carriage is retracted to a conservative distance from the surface of the block to ensure sufficient clearance for the worst-case protrusion. If the retraction is insufficient, there is risk of a spinout resulting in lost time to clear the block, as well as wasted fiber because the block could not be peeled. If the retraction is too great, the extra retract plus extra distance to return to the block is wasted time that makes a significant difference to throughput over the course of a shift. With the precisely accurate profile

data BlockPLUS provides, the carriage is positioned to just clear the block charging to the lathe, thereby eliminating wasted carriage motion. A key benefit of carriage retract optimization enables BlockPLUS to exactly model all protrusions from the optimal cylinder, minimizing carriage retract and maximizing throughput.

With accurate block profiling improved block centering is also achieved, and the optimal cylinder is identified allowing the lathe system to produce full ribbon veneer at the optimal diameter.

Half a million data points

The predecessor to BlockPLUS used IDS sensors to scan the log. Up to eight sensors were used for a typical 8' log. In the early model IDS systems the scan interval was 15 degrees with five sensors which produced 120 data points along the full length and circumference of the log. Later systems reduced the scan interval to five degrees with eight sensors, producing 576 data points. With BlockPLUS four sensors collect data along the full length of the spinning log, with close to 500,000 data points stored to measure and create a model of the log; competitive systems tout 36,000 data points.

BlockPLUS is unmatched for increased throughput. Several customers have praised the improvement with BlockPLUS, noting that peeling starts during the first revolution and there are no spinouts from insufficient retract. BlockPLUS is clearly the better choice to achieve maximum benefit from your investment.

Product evolution

Not everyone has been satisfied with the BlockPLUS performance. Like any new technology, BlockPLUS experienced growing pains. Over time the design engineers have evolved the technology, and all existing systems have been upgraded with a new software version that enhances the BlockPLUS performance. But right from the start Rainier Veneer was not a site that experienced any dissatisfaction. When asked if they have always been happy with their decision to invest in BlockPLUS, Jim says, "Yes we were. It's done what we expected. We expected to increase recovery, and we're getting a higher percentage of veneer out for the same volume of wood in."

The software upgrade at Rainier was done in November 2010. USNR's Larry Serfass, field service technician, performed the upgrade at Rainier with plant personnel, and trained them with the new software and interface screens. With the upgrade he noted an improvement in centering the block to the lathe and several checks were run to test the system. Larry explained, "We did a lot of testing on the auto retract feature. The auto retracts looked really good, they were really close to the block. The operator wasn't used to that, he was used to seeing a much bigger gap." He also described the new butt logic feature the upgrade provides. "With blocks that have a flared butt the operators used to have to manually retract the carriage for that, but now BlockPLUS does it automatically."

Diversifying markets

To help Rainier stay in the game it has found a market for a byproduct of its process that is diversifying its risk and its revenue stream. The company is using some of its chips to produce fiber that is used for landscape mulch. The chips are treated with steam and refined to a point where they become stringy fibers, looking similar to steel wool. The fiber is sold for hydroseeding throughout the Pacific Northwest. When mixed with water, fertilizer and grass seed, the resulting slurry is sprayed on prepared areas to promote seed germination and control erosion.

When asked about the state of the plywood market, Jim related, "The lumber guys are having all the fun right now. The growth in the Chinese market is really hurting veneer and plywood because they are buying lumber, which impacts the supply of logs. We're having trouble buying logs at a good price." He said that the past spring the market was pretty good, which some were attributing to the earthquake in Chile. Rainier is hoping the market for plywood improves in 2011. Jim says, "I think we're kind of on an upswing. We're looking for a modest improvement in the market."

And BlockPLUS continues to evolve. To date there are 12 BlockPLUS systems installed or sold; nine are in North America and three in Russia. USNR engineers continue the work to bring new features to BlockPLUS, and create even more value for its users. If you are interested in an evaluation of your plant and the opportunity BlockPLUS can provide for your operation, call us at 1-800-BUY-USNR. 🌐
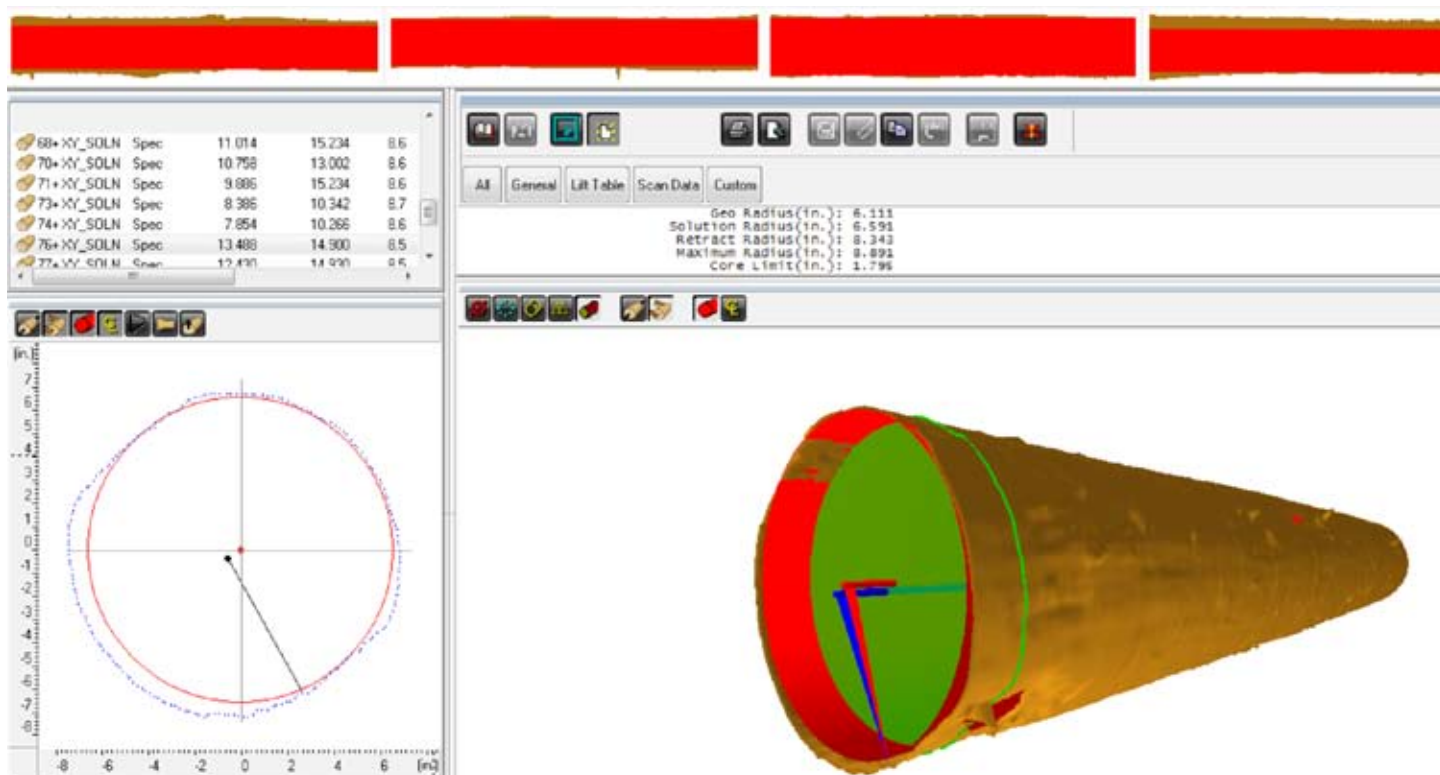
The BlockPLUS solution screen shows the model that is created using the hundreds of thousands of data points, precisely measuring the log's length and circumference. The optimal cylinder for peeling is determined to achieve the greatest recovery from the block.

BLOCKPLUS

Captures More Recovery.

Dramatically improves throughput

BlockPLUS™ is the most accurate block profile and lathe charger control system in the industry. BlockPLUS solutions go beyond the traditional "optimum cylinder" to capture more recovery and maximize throughput.

BlockPLUS delivers more results

▶ Highest density lathe scanning system with **500,000 data points**

▶ Reduces peeling cycle time by 5-7%

▶ Improves recovery by 2-5%

▶ Recovers veneer with the largest plant-acceptable voids

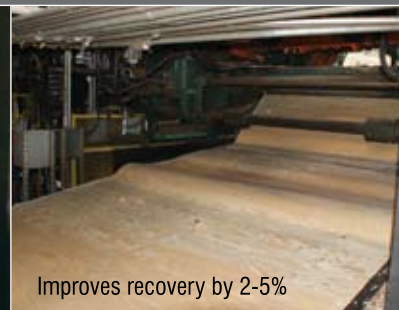▶ Delivers more usable veneer

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NEW PROJECTS

Battle Lumber - Carriage optimizer upgrade
Battle Lumber at Wadley, Georgia is updating its hardwood carriage optimizer to YieldMaster G3.

Begin and Begin - 75" Disc chipper
Begin and Begin has ordered a new disc chipper for its mill at Lots Renverses, Quebec. The 75" chipper will have a 22" spout, and will be outfitted with a kick out anvil, one man knife system, top discharge and cyclone.

Canfor - Multi-Track fences
Two new Multi-Track Fences are slated to be installed at the Canfor sawmill at Houston, BC. These are the fourth and fifth fences sold to Canfor sites, and a total of 15 fences sold since the product's launch in 2010.

Deltic Timber - MillExpert upgrades
Deltic Timber's sites at Ola and Waldo, Arkansas are both receiving upgrades. The Waldo mill is upgrading its existing edger optimizer (B800 scanning) to the latest MillExpert optimization platform. The Ola site is upgrading its edger and trimmer lines to MillExpert optimization. Scanning on the edger is M6, and the trimmer uses B800 scanners.

H.W. Culp Lumber - Multi-Track Fence
A sawmill Multi-Track Fence will be installed at H.W. Culp Lumber at New London, North Carolina.

Hampton Affiliates - MillExpert, Smart TriCam
The Hampton Affiliates mill at Darrington, Washington is upgrading its sharp chain optimization system. The existing TriCam sensors will be replaced with new Smart TriCam's and the latest MillExpert optimization software will be installed.

Jordan Lumber - MillExpert, LASAR upgrade
Jordan Lumber at Mount Gilead, North Carolina has ordered upgrades to its carriage optimizer to incorporate LASAR scanning with MillExpert optimization.

Langdale Forest Products - Planer upgrades
The existing Newman planer at Langdale Forest Products at Valdosta, Georgia will receive several upgrades to its infeed table and bridge. Included are electric drive upgrades, new pineapple and aggressive rolls, powered shear, and powered holddown assembly. Also to be installed is a shifting pineapple assembly to accommodate feeding wide material.

Louisiana Hardwoods - Edger Maximizer
The hardwood edger line at Louisiana Hardwoods of Lemoyen, Louisiana will be updated with a new Edger Maximizer infeed system, which will significantly improve feeding and piece count for this line. As part of the project the MillExpert optimization software will be upgraded to the latest version release, the PLC will be updated to the ControlLogix platform, and a new MillTrak system will monitor the infeed flow.

Magna Foremost SDN BHD - Coe press retrofit
A leading supplier of doors and door facings located at Bintulu, Malaysia, Magna Foremost SDN BHD is retrofitting its Coe press with new main cylinder bodies and rams.

Midway United - MillExpert Log Merchandiser
Midway United of Sosnovoborsk, Russia has ordered a MillExpert log merchandising optimizer system, with Smart TriCam lineal scanning system. The plant processes pine, larch and birch logs with diameters ranging from 7" to 24".

The system features full 3-D scanning of logs as they are fed into the mill. The benefits include true log volume calculation in real time, and provides the bucking system operator with the information necessary to decide the most optimal bucking solution. The MillExpert log merchandising optimizer system also allows for future expansion plans and provides the opportunity to optimize the log for other products in addition to plywood.

Rosboro plywood plant - Coe and Moore veneer dryer upgrades
The plywood plant at Rosboro Lumber of Springfield, Oregon will upgrade two of its veneer dryers, Coe and Moore models. Wall and roof panels and doors will be replaced.

Stratton Lumber - LHG upgrade
The LHG system at Stratton Lumber, Stratton, Maine will be upgraded with Ver. 6.0 software and all new computer hardware. The LHG was installed at this site in January 2003 to grade Eastern spruce and pine.

New Lineal High Grader (LHG) sales
USNR recently sold two new LHG lines to mills in BC. These systems will be outfitted with all the capability that LHG has to offer for grading SPF and for MSR/MEL evaluation.

Team efforts

Pictured above are some of the additional members of the grade scanning team who are based at USNR's Salmon Arm, BC facility.

This article focuses on six members of our grade scanning team that is blazing new trails. The technology may be cool, but it takes the talent of many people to make it work.

Product development and ongoing support takes a team effort. USNR has over 250 professionals, engineers and technicians working to develop, enrich and support our broad range of products. It is the contributions of our many teams that makes USNR successful.

This article focuses on six individuals who are members of a larger team responsible for the development and continued health and support of USNR's automated grading offerings.

Dr. Jacek (Jack) Biernacki is an advanced technology advisor and senior software developer. He is based at Salmon Arm, BC, Canada.

Jack was born and educated in Warsaw, Poland where he obtained a degree in Wood Technology Engineering from the Warsaw Agricultural University. He went on to study at the University of California where he earned his doctorate in Wood Science

and Technology. He continued his studies with concentrations in wood engineering, non-destructive evaluation and intelligent systems at the University of British Columbia, in Canada.

Jack began his career with then CAE Forestry Systems (formerly Newnes Machine, now USNR) in 1999 as an engineering scientist and advanced technology advisor. He has a host of credentials including patents, awards, lectures, published papers, and more.

In his current role, Jack is involved with the investigation of rot detection methods and technologies, MSR evaluation and defect classification support and development. He says, "I enjoy contributing to the new technologies that improve on the grade accuracy and value of the finished wood products. Today we are employing technology to do a better job of what was once done manually, and in the process get the greatest value from the resource and improve the efficiency of the mill's operation."

Besides English and Polish, Jack also speaks German and some Russian. In his off time he enjoys outdoor activities like skiing, mountain biking and hiking, which all fit in well with his passion for photography.

Carl has a passion for new technology. "In my current position as sensor designer I investigate new technology for use in our products, which I find particularly interesting and fulfilling. I enjoy playing a part in the continual evolution of our products."

Several awards and patents are accredited to the work Carl has undertaken over the years. He was a key member of the team that developed USNR's AddVantage optimizer for chop and rip applications that launched the company into the reman sector a decade ago. He has also designed sensors for the AddVantage and LHG scanners, as well as the BlockPLUS lathe charger scanner.

Carl, his wife Donna, and their two teenaged children enjoy adventure travels with treks to South Africa, Peru, Costa Rica and several parts of Canada.

Carl Flatman is a sensor designer, based at Salmon Arm, BC, Canada.

With a degree in Electrical Engineering from the University of Alberta (Canada), Carl began his career in the industry at Newnes Machine in 1996. Over his tenure Carl has performed several roles in the optimization field including product development engineer, sensor team leader and R&D project manager.

How DataFusion™ works:

Steve Woods is a software designer, based at Salmon Arm, BC, Canada.

Following completion of a degree in computer science from Simon Fraser University in Burnaby, BC, Steve began his career in the wood products industry at then Newnes Automation Inc. (now USNR) in 1991.

Steve's expertise is system architecture and design, image processing, data acquisition and sensor interface. His first role was in sawmill optimization developing technologies for use with trimmers and edgers, and briefly with curve sawing. An opportunity arose to work on the development of the X-ray Lumber Gauge product (lumber strength evaluation), which led him into the realm of grade scanning. Steve was a key player in the design and development of the AddVantage (chop saw optimization) product and the Lineal High Grader, and later with veneer grading technology. His current focus is the Transverse High Grader, as well as further development of technologies for defect analysis across all USNR's product lines. His work on the BioLuma transverse sensors yielded the design and development of the interface by which the sensors communicate data to the optimization platform.

Steve comments, "I enjoy the challenge of identifying and solving difficult problems that new technologies, and their applications, offer. My involvement in the grade scanning products from their infancy at Newnes more than a decade ago, allows me to draw on those years of experience to help design and develop the next generation of scanning technologies at USNR. I am very excited about the new systems we have to offer our customers. Just like the first optimization systems took the industry by storm in the early 1990's, I believe this next generation of scanning technologies at USNR will revolutionize lumber grading."

Steve is an avid sports fan, involved in coaching soccer and ice hockey. His daughters have reached the age to leave the nest for university, which will allow Steve and his wife more time to return to downhill skiing and other outdoor activities they love.

Mike Vukadinovic is a software engineer at USNR in Salmon Arm, BC, Canada.

Mike Vukadinovic has a BSc in Electrical Engineering from the University of Alberta and MASc in Digital Signal Processing from the University of Ottawa. This led him to a five-year stint at Nortel Networks in digital communication before coming to Newnes (now USNR) in 2000.

About his current role, Mike says, "I mostly work on image processing for defect detection using X-ray, laser profiling and vision technology. I enjoy being able to work on abstract algorithms, and at the same time see the practical application of that work to real life problems."

When asked about the development projects he has been involved with, Mike explains, "The projects that stand out are the initial efforts to bring vision-based knot detection to the LHG as well as subsequent projects to augment the defect detection capabilities of the LHG. I've particularly enjoyed turning the defect detection algorithms from concepts into fully functional software that meets the demanding requirements of our customers. These developments are providing value to the customer by increasing yield of high grade product, providing more flexible grading capabilities, and leading to more automation of the entire process."

Like many of his counterparts, Mike is an avid outdoorsman and family man. Canada's four distinct seasons allow him to exercise his passion for skiing, hiking, canoeing and biking, and in Mike's words, "of course spending as much time with family as possible. I've got two daughters, five and six years old, to keep me busy."

Allen Larsen is product group manager for secondary optimization. He is based at Parksville, BC, Canada.

Allen Larsen's career in this industry started at the Parksville, BC office of Perceptron in November 1999, which was subsequently acquired by USNR in 2002.
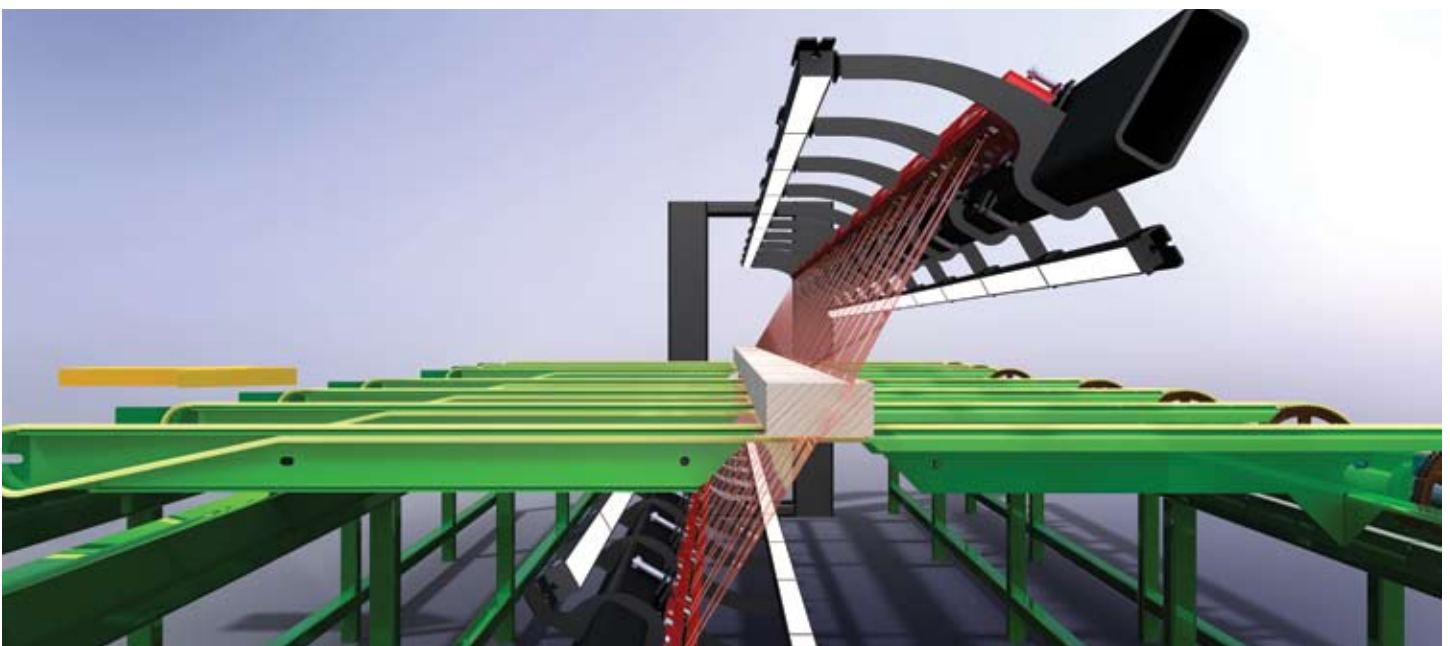
With a BSc in Computer Science from the University of Victoria (BC, Canada), Allen's first role at Perceptron was as a software engineer. Early on he was assigned to work on trimmer optimization, and the transverse TriCam sensors. In 2001 he was appointed product manager for secondary optimization systems at the Parksville division, which role he still fulfills today.

Allen describes some of the projects he has been involved with. "The largest single project that I was involved with was the MVG project, a grader assist system for planer mills. Through this effort the MillExpert trimmer optimizer software was largely re-written and the transverse TriCam scanning and software support was substantially improved."

Working with other experts at USNR's Eugene, Oregon facility, Allen is responsible for the development of edger and trimmer optimization products for the hardwood lumber market. "The NHLA (National Hardwood Lumber Association) rules require a more indepth analysis to ensure that boards make the projected grade, which is an order of magnitude more complex than softwood grading. These hardwood optimization products really speak the same language as our hardwood processing customers."

Another facet of Allen's role is collaborating to design the architecture for USNR's software platforms. He is very excited to be involved in the development and application of USNR's new transverse BioLuma sensors. "I see this new technology as the future of scanning in our industry."

When he is not busy at the drawing board, Allen and his wife are busy with their two young children.

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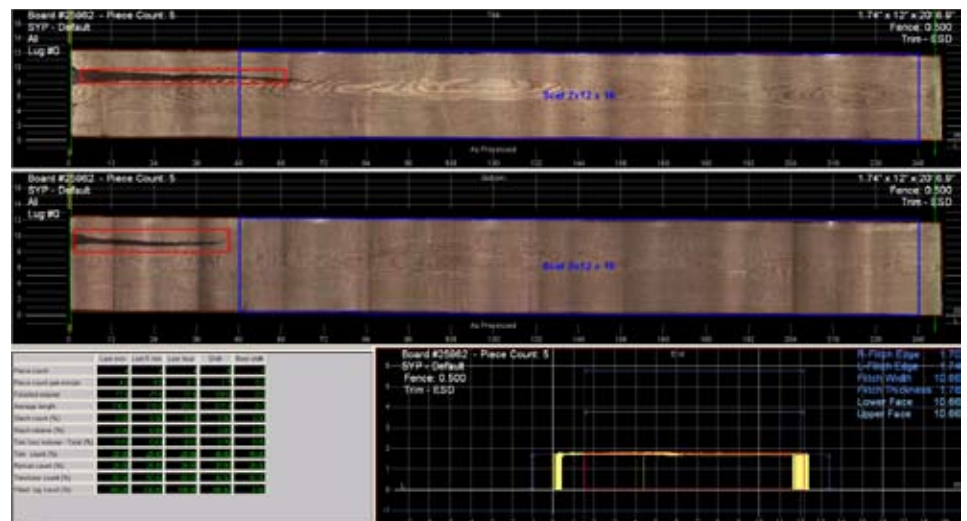**Bob Arnold is a product development manager, and is based in Eugene, OR.**

Bob started his career at then Newnes Automation Inc. (now USNR) in 1989 after completing his Bachelor of Computer Engineering from the University of Victoria in BC, Canada. In the ensuing years he also worked for Applied Scanning Technology before settling in with Inovec/USNR in 2002.

At right, BioVision detects rot in a SYP board, and decides where to trim to recover the greatest value.

His passion for applying scanning technology to wood processing has led him to serve on teams that reworked the Newnes V5 edger and cant optimizers, developed the Newnes primary breakdown and log bucking optimizers, developed the G3 optimization platform, and most recently the BioVision product. Bob's team in Eugene is responsible for bringing to life the BioVision sawmill grade scanning technology that is steadily gaining acceptance, with systems operating on both edgers and trimmers.

Bob says, "The increase in computing power over the past two decades has opened up new opportunities for automation throughout the sawmill. I enjoy working to identify problems and develop solutions, and value the chance to make a substantive difference in the day-to-day operations of our customers."

Together with his wife, Laurel, Bob has three teenaged children. Besides managing software development, Bob is an avid table tennis player and occasional woodworker. 🌐

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PROFILE

Steve Dalby is a regional sales manager at USNR, based in Salmon Arm, BC, Canada.

Steve's career with USNR began in 1997. Upon completion of his education at BCIT (B.C. Institute of Technology) near Vancouver, BC he worked in plastics, fluid power and electrical industries prior to coming to USNR.

Over the past 13 years his roles have been in sales and project management. He notes major projects he has particularly enjoyed being involved with have been for such customers as Tolko Industries, Dunkley Lumber and Carrier Lumber because, "These customers are willing to be innovative and evolutionary with their systems that USNR supplies. They take ownership of the equipment from the start and make it the best it can be."

Steve has several passions in his life besides sales. A few years ago he moved from the Vancouver area to his current home at Kelowna, BC to be closer to the action for the four seasons. He loves skiing, mountain biking and swimming, and his enthusiasm for hockey even led him to build an outdoor skating rink in his back yard to enjoy with his family. Steve also greatly enjoys cooking and trying out new foods.

UPCOMING EVENTS

MAR. 14-16
HMA
Charleston, SC

MAR. 23-25
Small Log Conference
Coeur d'Alene, ID

MAY 30-JUNE 3
Ligna
Hannover, Germany

JULY 7-10
MLMA
Biloxi, MS

AUG. 11-12
SFPA Expo
Atlanta, Georgia