

INSIDE VT WOOD

Department of Wood Science and Forest Products presented two sessions during the 2010 East Coast Sawmill and Logging Equipment Exposition sponsored by the Virginia Forest Products Association and Virginia Tech.

Henry Quesada

Dr. Brian Bond and Dr. Henry Quesada, Associate and Assistant Professors in the Department of Wood Science and Forest Products, organized and presented two educational sessions during the Expo Richmond 2010 in Richmond, VA on May 20th. The first session was on solar kiln drying where 30 attendees had the opportunity to learn about the principles, construction, operation, and maintenance of a solar kiln for small and medium enterprises (SME).

The second session was on Business Management and had an attendance of 18. Dr. Earl Kline and Dr. Robert Bush, both Professors in the Department of Wood Science and Forest Products, participated as speakers in the afternoon session with presentations on Lean Thinking, Value Management, Marketing, and Business Strategy. Dr. Quesada also spoke during this session with an Introduction to Strategic Frameworks and the Role of Innovation in the Wood Products Industry. The workshop's organizers would like to thank the Virginia Forest Products Association, the Wood Education Research Center, and Virginia Cooperation Extension for sponsoring the workshop.



Dr. Earl Kline speaking on Lean Thinking during the afternoon session at the VFPA Expo 2010.

Collaboration Between VT and Galway-Mayo Institute of Technology Gains Momentum

Robert Bush

Members of the Galway – Mayo Institute of Technology (GMIT) faculty and administration visited the Department of Wood Science and Forest Products during the week of April 26, 2010. The party included Dr. Patrick Tobin, Program Coordinator; Mr. Sean Treacy, Program Coordinator; and Mr. Dermot O'Donovan, Head of Department. Also participating was Mr. Greg Porfido, Chief Operating Officer of Mark Richey Woodworking and supporter of the programs at both GMIT and VT.

Galway – Mayo Institute of Technology offers three and four year baccalaureate programs in *Furniture Design and Manufacturing*, *Furniture and Wood Technology*, *Architectural Woodworking and Interiors*, and *Design and Technology Education* at their campus in Letterfrack, Ireland. Their programs are highly

experiential and are a “blend of practical skills, science, technology, design, business and management.” Members of the WS&FP faculty, along with College of Natural Resources Dean Paul Winistorfer, believe that collaboration will benefit both organizations. In particular, collaboration could expand the learning opportunities for students at both the undergraduate and graduate levels.

During their time in Blacksburg, Patrick, Sean, Greg, and Dermot toured the T.M. Brooks Forest Products Center, toured Cheatham Hall and the main campus, and had discussions with several groups of faculty members. Also, Dr. Tobin presented a very interesting and well received lecture titled “*The Integration of Design into Business and Science Curricula.*”



Members of the Galway – Mayo Institute of Technology (GMIT) faculty and administration visited the Department of Wood Science and Forest Products during the week of April 26, 2010.

From left to right are Dr. Earl Kline, VT, Dr. Patrick Tobin, GMIT, Dr. Paul Winistorfer, CNR Dean, Mr. Sean Treacy, GMIT, Mr. Dermot O’Donovan, GMIT, Mr. Greg Porfido, Mark Richey Woodworking, and Dr. Robert Bush, VT.

The visit served as a follow-up to the trip to GMIT taken by Paul Winistorfer and Robert Bush and builds upon the recently signed *Memorandum of Understanding* between the two organizations. Meetings allowed the formulation of plans for specific activities, including:

- A special study course that will involve leading a group of students to the cities of Galway and Letterfrack on the western coast of Ireland. The course will include videoconference lectures from GMIT prior to departure from the United States. In Ireland, students will participate in lectures and hands-on wood science activities at GMIT-Letterfrack. Also, there will be time to visit cultural and historic locations in the Connemara region of Ireland. The course will take place during spring break 2011 and will be led by Drs. Bush and Hammett.
- Instituting a *Bilateral Student Exchange* agreement that will allow students to enroll in courses at the partner institution while paying home institution tuition. When in place, the agreement will eliminate a significant barrier to exchange and will allow students to include partner institution courses in their programs of study. The agreement has been drafted and awaits signatures. We hope to have it in place during fall 2010.
- We plan to exchange guest lecturers during the 2010-2011 academic year. These lectures will be used in existing courses to build on existing areas, provide an international aspect to the course, or introduce areas of study not typically addressed. Dr. Tobin is compiling a list of potential lectures for WS&FP faculty member review. Bush will do the same for GMIT-Letterfrack review.
- Dr. Tobin is under consideration for adjunct status with the Department of Wood Science and Forest Products. This status, if awarded, also will facilitate further collaboration.

After visiting the Blacksburg campus, the group, accompanied by Drs. Bush and Kline, traveled to South Boston, Virginia, to visit the Southern Virginia Higher Education Center (SVHEC) - an active partner with both VT and GMIT. The group received a royal welcome in South Boston and the collaborative activities were enthusiastically supported by SVHEC staff and local community leaders.

Packaging Students Submit Designs to National Design Competition

James V. Bisha

The 2010 Paperboard Packaging Alliance Student Design Challenge was to design a sustainable and marketable package for a 2.5” decorative papier-mâché globe commemorating the 40th anniversary of Earth Day. There were several minor design constraints, while the two major design constraints included: 1) The package must be made out of paperboard 2) The package must include a functional aperture allowing the buyer to “touch and spin: the globe within the package. Our students’ designs are displayed in the picture below. They are hoping for a top prize of \$2000 cash prize themselves and \$2000 for the hosting department.

Some of the designs submitted by our students in the design challenge.

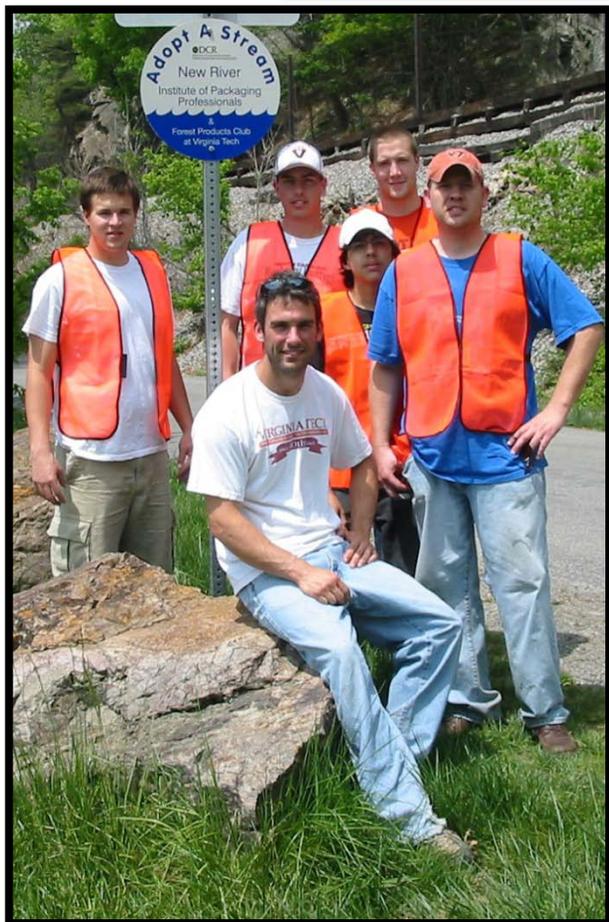


Institute of Packaging Professionals (IoPP) and Forest Products Club Help Re-new the New River

James V. Bisha

The IoPP and FPC semi-annual river cleanup was held on Saturday, May 1st. An entire truckload of trash was removed from the banks of the New River around McCoy Falls (aka, the Montgomery/ Giles county line). The clubs were working with the Virginia Department of Conservation and Recreation “Adopt-A Stream” Program. Special thanks to Will Rand, Carlos Espinoza, Anthony Muscatello, Shawn Crawford, Alex Hagedorn, and Jim Bisha. The next cleanup will be in the Fall, hope to see you there.

Pictured with the Adopt A Stream sign dedicated to the IoPP and FPC, are Anthony Muscatello, Will Rand, and Shawn Crawford, back row; Carlos Espinoza and Alex Hagedorn, middle row; and seated, Jim Bisha.



Tom Hammett and the Department are involved in a series of wood products workshops in the Northeast

Tom Hammett

In October 2009, Steve Rhode, President, and Colin Miller, Director, Wood Products Initiatives, visited the Department to discuss opportunities to collaborate in a Regional Wood Products Consortium to develop the forest products industries in the North East. Their initial visit here was organized by Urs Buehlmann. While on campus they met with several of our faculty, toured our faculties, and discussed long-term plan for collaboration. While Steve and Colin visited with many of the companies throughout the Northeast, they found that the key needs the region's wood products industry included enhancing market development and access, use of new technologies, chain of custody certification, and lean manufacturing. Virginia Tech was asked to play a role in a series of workshops each offered in several locations in New York and New England to help these companies meet these needs.

Recently, Tom Hammett and several others on the faculty in our department were asked to help organize and participate as instructors in a series of Specialized Innovation Workshops organized by the Regional Wood Products Consortium and designed to increase competitiveness of wood products industry in the Northeast. The first series of workshops was held in May and focused on developing new marketing strategies with workshops held in Montpelier, VT, Glens Falls, NY, Utica, NY, Augusta, ME, and Concord, NH. The participants in the workshops represented a cross-section of wood products industry in the region and included company and industry association executives. Tom taught sessions on penetrating international markets at both the Augusta and Concord workshops, and assisted on sessions on marketing, and green markets. These workshops are quite different as they offer time and support on-site one-on-one mentoring to participating company representatives at the conclusion of each workshop, and the Consortium has funding to support for the presenters to visit companies to further plan and implement marketing improvements after the workshops. Meeting individually with company representatives Tom discussed in detail each firm's production capabilities and export market opportunities, developed focused follow-up activities and made plans for future assistance through the Regional Wood Products Consortium.

Tom encouraged Greg Porfido, Chief Operating Officer of Mark Richey Woodworking in Newburyport, Massachusetts, to participate during Greg's his recent visit to the VT campus. Greg is a partner in our new program with Galway-Mayo Institute of Technology. Tom took advantage of this meeting to give Greg an update on progress under the new collaboration between Greg's company, our Department, the Southern Virginia Higher Education Center, and GMIT. Greg was interested in the next step - a study abroad trip to GMIT for students and faculty during spring break in March 2011.

The next series of workshops entitled "Making Effective Use of Technological Advances". Our department's Dr. Dan Hindman will be an instructor in this series of workshops which begins on June 2 in Utica, New York.



Greg Porfido and Tom Hammett discuss opportunities for increasing export marketing in India and the Middle East.



Organizers and Instructors for the Specialized Innovation Workshop:
“Developing New Marketing Strategies” held in 5 locations in the Northeast during May 2010.

Front: Nora McDougall-Collins, Web Services Coordinator, Missoula, MT; mid-row: Tim Holmes, Holmes and Associates, Saranac Lake, NY, and Steve Rhodes, President, Sustainable Forest Futures, Concord, NH; back row (l to r) Collin Miller, Director, Wood Products Initiatives, Sustainable Forest Futures, Concord, NH, Rich Brooks, President, Flyte New Media, Portland, ME, Steve Bratkovich, Dovetail Partners, Minneapolis, MN, Tom Hammett, VT, and Jeff Howe, Chair of the Board, Dovetail Partners, Minneapolis, MN.

VOLVO Trucks’ “Race to Excellence”

Urs Buehlmann

On May 14, 2010 the VTLeanTeam was invited to visit the New River Valley plant of Volvo Trucks North America. The 300-acre site located in Dublin, VA, is Volvo’s largest truck manufacturing plant worldwide. A workforce of about 1,200 employees manufacture the Volvo VN and VHD models of Class 8 heavy duty trucks. Volvo Trucks is the second largest truck manufacturer in the world, and produced over 47,000 vehicles in 2009.

Lean systems, continuous improvement efforts, and Volvo’s “Race to Excellence” were the focus of the visit. After a warm welcome and a brief introduction to the world of Volvo Trucks by Patrick Collignon, Vice President and General Manager of the New River Valley plant, the team went on an extensive plant tour to gain an overview of the truck assembly process. The tour was lead by Antonio Servidoni, Director of Industrial Engineering and Lean Manufacturing, and was accompanied by Franky Marchand, Director of Logistics, Gary Forget, Director of Human Resources, Marcus Thompson, Inspiration Manager, as well as Brent Cooper, VPS Manager. The truck assembly process starts with the delivery of the chassis frame, then goes on to the "marriage" of chassis, engine, and cabin and ends with final testing.

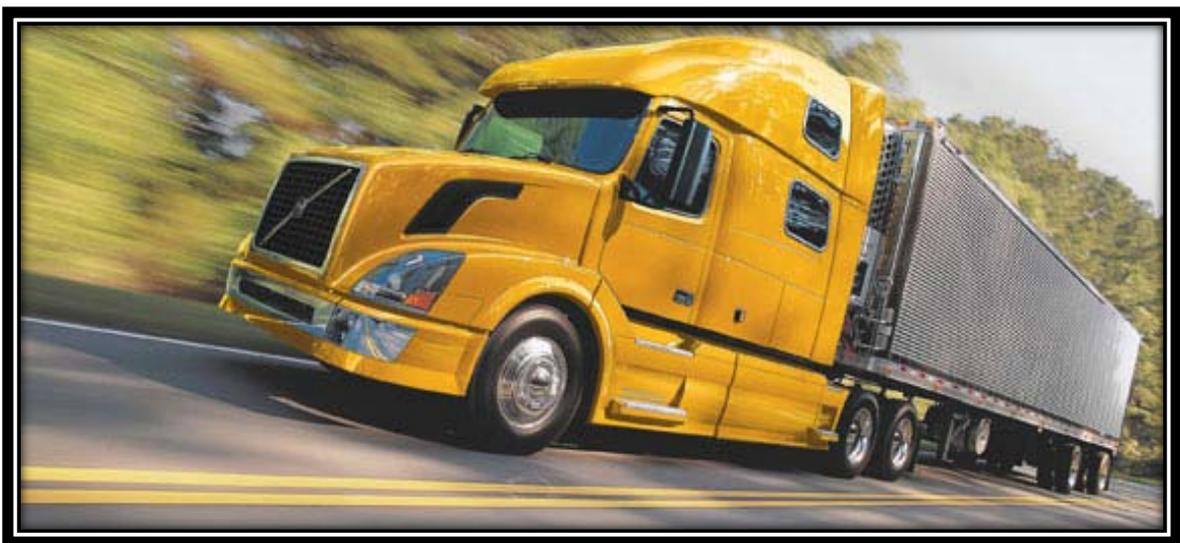
During the four-hour tour, the VTLeanTeam was provided with details of Volvo Trucks’ Lean manufacturing system, known as the Volvo Production System. One remarkable aspect is Volvo’s approach to

encourage employee engagement: A KAIZEN workshop located next to the assembly line is openly accessible to give every employee the space and tools to work on improving their own assembly line equipment, such as, for example, their tool cart. *“Initially, it took some time before the employees started to accept the opportunity to improve their own working environment,”* Antonio Servidoni explained. Also, Volvo abstained from implementing a bureaucratic documentation system to track improvements to keep the system as simple as possible. Once the first employees successfully improved their own work processes and tools, word spread and PULL was created leading to more and more workers wanting to improve the process. However, this approach demands time, patience, and the acknowledgement that individual improvements initially might not be the best solution. But the approach creates a motivated, self-driven workforce that accepts and supports improvement efforts, which ultimately becomes the basis for sustainable lean transformations. Volvo’s success and achievements on their “Race to Excellence” proves them right. After an extended discussion about Lean transformations and areas for future collaboration with the Volvo team, the VTLeanTeam left the plant with new motivation to continue its work and with a sincere "THANK YOU" to all Volvo employees who made this unique opportunity possible.



The VTLeanTeam with the team from Volvo Trucks in the New River Valley Volvo plant.

From left to right: Antonio Servidoni, Earl Kline, Urs Buehlmann, Adrienne Andersch, Franky Marchand, Becky Buck, Brent Cooper, Christian Fricke, and Chao Wang.



The Volvo VNL 780, manufactured at the New River Valley plant in Dublin, VA.
(source: <http://www.volvotrucks.com/trucks/na/en-us/products/vn/vn780/pages/overview.aspx>)

VTLeanTeam discovers canoeing

Urs Buehlmann

On Thursday May 13, 2010, the VTLeanTeam took a day out of studying and working to adventure beyond daily chores. This semester, the team set out to discover the New River. Renting three canoes and one kayak, the eight team members started their journey five miles upstream from Pembroke, VA. After a leisurely first half of the trip, the team used a small clearing along the river for lunch.



Lunch break for the VTLeanTeam.

Clockwise starting upper left, Angela (Yu) Zhou, Mathias Schmitt and Christian Fricke, Adrienne Andersch, Kevin Knight, and Becky Buck.

Continuing their journey and enjoying the most gorgeous scenery along the New River, the VTLeanTeam arrived in Pembroke, VA after four hours on the New River. The day was concluded in The Cellar in Blacksburg for an early dinner, where Gavin Wherry, a graduate from the team now working for Universal Forest Products in Riverside, CA was waiting. Stories are that the one-day VTLeanTeam event in fact only ended the next day with an early breakfast...

The VTLeanTeam (Chao Wang, Urs Buehlmann, Christian Fricke, Yu (Angela) Zhuo, Mathias Schmitt, and Becky Buck; enjoying the scenery on the New River; not pictured are Adrienn Andersch & Kevin Knight).



VTLeanTeam supports Lean Transformation at Swan Corp, St. Louis, Illinois

Urs Buehlmann

Swan Corp offered the VTLeanTeam an opportunity to apply their Lean knowledge and to conduct Lean studies by executing two lean transformation events in the company's Centralia, IL manufacturing facility. Swan Corp is headquartered in St. Louis, IO and is a solid-surface producer for the kitchen and bath industry and currently has revenues of \$80 million and employs 279 team members. Thus, the VTLeanTeam, on Sunday, May 16, 2010, traveled to Centralia, IL and conducted five days of lean transformation events conjointly with 15 Swan Corp team members Two Lean transformation projects, a SMED (Single Minute Exchange of Die) project and a One-Piece-Flow project, were the focus of this five days event.



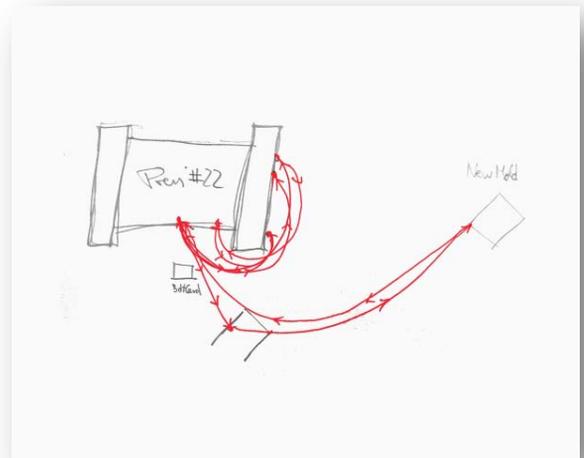
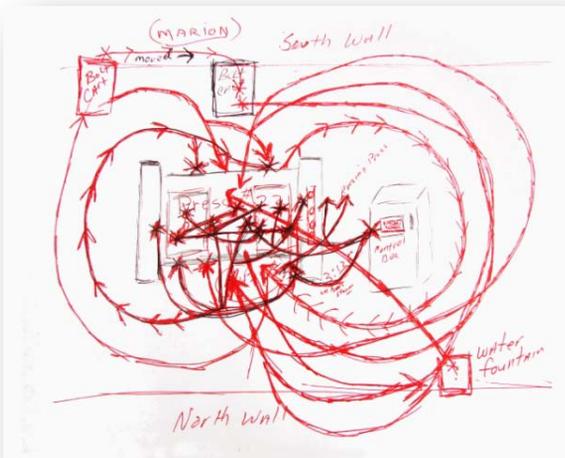
VT's Department of Wood Science and Forest Products VTLeanTeam and Swan Corp's team members in the manufacturing facility in Centralia, Illinois. (first row left to right: Nancy Martin, Denise Gansauer, Adrienne Andersch, Yu (Angela) Zhou, Chao Wang, and Christian Fricke; second row left to right: Pat Stumpy, Brenda Geraldts, Rhonda Simorka, John Dodson, Bobby Grimes, Rebecca Buck, Mike Williams, Brent Herrin, Kenny Buonara, Eric Fagan, Martin Phillips, Ron Smith; third row left to right: Gary Moore, Mathias Schmitt, Dave Hicks).

Three VTLeanTeam members (Yu (Angela), Chao, and Christian) worked with Swan team members on the Single Minute Exchange of Die (SMED) lean transformation project. Changing dies on the large presses operating in Swan Corp's facility is a time-consuming operation requiring four employees and interrupting the press cycle for an average of 58 minutes.



Die change at Press 22. Since the dies can weigh several tons, heavy equipment is needed to move them. Angela Yu far right with clipboard.

While observing the current die-change process, the SMED team identified operational procedures that waste time and effort. The team then analyzed the procedures and redesigned the process such that all activities that can be done without interrupting the press (such as, for example, cleaning the die that will be used next), are done prior to stopping the press. Then, the team reduced the time needed to actually change the die by moving the staging area for the new die next to the press instead of having the die sitting in its storage rack several hundred feet away from the press. Also, technical improvements to expedite the die change process were implemented, such as labeling the hoses with different functions with color codes to reduce the time needed to identify the correct hoses, replacing old hose joints with quick connectors, or substituting wires with hooks to hang hoses. The largest impact, however, was gained from simplifying the four Swan Corp team members' operating procedures. In the pictures below, the left shows operator 2's movements during a die change, while the right shows the same operator's movements using the new procedure designed by the SMED team.



Operator 2's movement before the SMED Lean transformation event (left) and after the event (right).

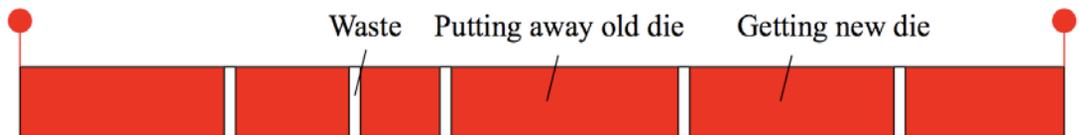
After three days of focusing on die change improvements, the SMED team arrived at a die change time of 19 minutes (from 58 minutes, a 67 percent improvement) without negatively impacting team member safety, quality, or equipment wear. See diagram below.



SMED team members conducting die change observations. (from left to right: Yu (Angela) Zhou, Bobby Grimes, Christian Fricke, Chao Wang, and Gary Moore).

Original

58 minutes



1. Improvement

Dividing into internal and external



2. Improvement

Improving operational efficiency



Schematic representation of the die change-time reduction achieved. The red bars indicate the time when the press is stopped (internal times), green indicates time when the press is working (external times).

As most large-scale producers of commodities, Swan Corp manufactures its products in large batches and then stores them in Finished Goods Inventory. Long lead times, high inventory costs, low quality, and low per employee productivity are just some of the negative results of batch production. Three VTLeanTeam members (Adrienne, Becky, and Mathias, pictured below) worked with Swan Corp employees on testing the feasibility of One-Piece-Flow.



One-Piece-Flow VTLeanTeam members working in the plant.
(Adrienne Andersch, Rebecca Buck, Mathias Schmitt).

The VTLeanTeam used its own One-Piece-Flow simulation to demonstrate the principles and the benefits to Swan Corp employees. Then the team mapped and video taped the value stream of one product category to identify process constraints/bottlenecks. To apply one-piece flow and to realize on-demand production (e.g. what gets shipped tomorrow is produced today), the team evaluated lead times, inventory levels, transportation times, and executed necessary changes to aspects of the product value stream. As die change time limitations still exist, the team, instead of adopting One-Piece-Flow, chose a small batch system "every product every day" to displace the large batch production.

By Friday, a close variation of "One-Piece-Flow" was implemented without substantial loss of production capacity, but with a substantial reduction of inventory and a larger than 90 percent improvement in lead-time. Swan Corp CEO Steve Anderson expressed his gratitude to the VTLeanTeam and his team members, stating that "*...these are exactly the type of changes that need to occur for Swan Corp to remain a premier supplier of high-end building products.*" He also offered the VTLeanTeam an open door to conduct future lean studies in his operation.

One-Piece-Flow shipping area. Each pallet represents a different product to be shipped the next day. VTLeanTeam members Adrienne Andersch, Mathias Schmitt, Becky Buck, and Swan Corp team member Eric Fagan are seen working in the area.

