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INSIDE VT WOOD

Greetings from Cheatham Hall:

No, the picture is not of Cheatham, nor is it even on the Virginia Tech campus. One of the other hats I wear this year though, is that of President of the Forest Products Society and I wanted to take this opportunity to encourage you all to attend that meeting in Portland, Oregon, the third week of June. Visit fpsconvention.org

You might also be interested in helping to “Shape the Future of FPS” and to learn about activities the Board has been involved with, and how Strategic Planning efforts including both members and non-members have generated a new draft mission and vision for the Society. Currently the Board is mulling a name change for the Society to better fit our mission and vision statements, and also to position FPS to attract new members.



Closer to home, we are also exploring changes for the Department at Tech. As some of you may know, moving initiatives through University systems is never a rapid process ;-) and we are just in early stages of this. Currently we have proposed three new majors to better reflect our strengths in traditional forest products and innovation, and our newer strengths in biomaterials and bioenergy, and in packaging systems and design. It is too soon to say whether we actually will get approval for those new degree programs, but it is fair to say that we will continue to put strong emphasis on these areas in the future. We believe that these areas all have a bright future, and should help us in attracting new students into the Department.

The end of the semester nears, with final exams looming for the students (and grading for the faculty!) and graduation ceremonies barely two weeks away. At the Brooks Lab we will have an end of semester Picnic and “Student Ambassador” recognition ceremony this Friday afternoon, and our full day graduate seminar series will also be held this week to sum up the grad students’ research activities over the year. As always, we look forward to hearing from you to get your thoughts on our activities, the future of the Department, ideas that you may have to help us, or how we may be of service to you. Feel free to call or email me at any time.

Barry Goodell



Dr. Laszlo Horvath

DR. LASZLO HORVATH — Meet a new Faculty member and learn a bit about changes and growth in the field of Packaging Systems and Design, and new developments in the Department.

Dr. Laszlo Horvath joined the department in November, 2010. He has a wide range of experience from wood manufacturing system design to biotechnology. Dr. Horvath became involved with wood early in his life due to the influence of his father's wood manufacturing company. After finishing high school he decided to pursue a B.S. in Wood Technology at the University of West Hungary. During his education, he became interested in building design and decided to pursue an M.S. in Wood Engineering at the same university specializing in Wood Structural Design. For his Masters thesis, he designed a Hockey Stadium; primarily an engineered wood structure. During his Masters studies, he learned that management skills are essential for an engineer to be successful in the industry; thus, he dual majored in Engineering Management. After successful completion of his Masters, he continued his education at North Carolina State University to obtain his Ph.D. in Forest Biomaterials. His research mainly focused on the investigation of genetically modified *Populus tremuloides* Michx. The research provided a great opportunity to challenge his expertise in mechanical design at the cellular level. The research provided useful information to plant geneticists on the effect of genetic modification on the micromechanical performance of wood.

Dr. Horvath is one of two faculty members the Department has hired into our expanding Packaging program at Virginia Tec. This area historically was built with very strong expertise on the research and outreach sides of the Packaging coincident with the establishment of a tertiary packaging laboratory in 1976. For three decades, this laboratory served a relatively small segment of the packaging industry in the area of packaging distribution and transportation. However, due to the substantial growth, and current size of the industry, the Department determined that the scope of the packaging program should be expanded by including areas such as food and pharmaceutical packaging and packaging business and marketing. In recent years, the department of Wood Science and Forest Products has also been changing with add faculty interested in fields such as nanotechnology, bioenergy, and sustainability. In the packaging area, the group is working toward a B.S. in Packaging Systems and Design The new degree will be based on the vision of Dr. Mark White (Professor Emeritus) by focusing on the systematic packaging design. The B.S. in Packaging Systems and Design will be composed of three building blocks: 1) core packaging courses providing essential knowledge to students in the major packaging areas (marketing, distribution packaging, and packaging materials); 2) three focus areas allowing students to specialize in Packaging Materials and Production, Packaging Systems Engineering, and Packaging Management and Marketing; 3) Internship and Co-ops to provide practical experience in the industry environment. The curriculum will also place significant emphasis on LEAN manufacturing principles which is welcomed and valued greatly by the industry. With his strong engineering background, Dr. Horvath will conduct research in the field of distribution packaging and packaging engineering and teach “Packaging Design for Distribution”, “Packaging Distribution Systems”, “Wood Pallet, Container, and Unit Load Design”, and “Computer Aided Design in Packaging” courses.

Graduate Students Spring 2011 Symposium

Friday, April 29, 9:00 a.m. – 3:00 p.m., Fralin Auditorium

Please note that on April 29th, 2011, the Department will hold its' Spring Symposium, with graduate students and post-docs presenting updates on their research. As you can see below topics range from classic wood mechanics to wood supply issue, building construction, and forest products business. The public is welcome and encouraged to attend any part of the Symposium. Food will be provided.

For more information, download the symposium abstract, or RSVP to attend the symposium visit the [Graduate Student Symposium website](#)

Symposium Schedule

9:00 am – 9:10 am Opening Remarks

Session I

9:10 am – 9:40 am Profile of the U.S. wood pallet supply chain
[Scarlett Sanchez](#)

9:40 am – 10:10 am Assessing success factors to sustain continuous improvement. A multiple case study.
[Johanna Madrigal](#)

10:10 am – 10:30 am Coffee Break

Session II

10:30 am – 11:00 am Introduction to Lean Accounting
[Adrienn Andersch](#)

11:00 am – 11:30 am Designing a Fall Arrest System for Residential Construction Workers
[Lori Koch](#)

11:30 am – 12:00 pm Fracture Cleavage Testing in Adhesively-bonded Wood
[Xing Yang](#)

12:00 am – 12:30 pm Applying Lean Thinking to the Furniture Engineering Process
[Chao Wang](#)

12:30 pm – 1:30 pm Lunch Break

Session III

1:30 pm – 2:00 pm Quantitative Analysis of Compressive Stress Distributions across Pallet Surfaces
[Jiyoun Yoo](#)

2:00 pm – 2:30 pm Correlation of the elastic properties of stretch wrap and wrap pattern on containment
force when applied to a unit load
[James Bisha](#)

2:30 pm – 3:00 pm Investigations on the degradation of wood particles in extrusion process and x-ray scanning
of the particle orientation in Wood Polymer Composites
[Timo Grüneberg](#)

Introduction to Forest Products Marketing Students Learn About Lumber Trading and Supplying the Lumber Industry

Students in Dr. Bush's Introduction to Forest Products Marketing (WOOD 2614) course learned from two guests during the week of March 28th – Mr. Lance Johnson and Mr. Casey Mickelson.

Lance Johnson is District Sales Supervisor with ISK Biocides, Inc. He has over 15 years of experience selling chemical products to the sawmill industry and also has sold lumber. He spoke about supplying the lumber industry and of careers in sales. Students learned about market segmentation strategies, the importance of personal relationships, seasonality in markets, pricing strategies, and several other issues. Also, Mr. Johnson discussed opportunities for internships with ISK Biocides, Inc.

Casey Mickelson, President of Richmond International Forest Products, LLC, visited the class on March 30th. RIFP is located in Glen Allen, Virginia and employs three Wood Science and Forest Products graduates. Mr. Mickelson's enthusiastic and knowledgeable presentation described the business of trading lumber and panel products. He explained why wood product prices vary, why wholesalers exist, and the role of traders. Describing the "parameters of the sale" (price, tally, shipment, quality, trust) he led the students through the details of trading "short" and "long." Later in the day, Mr. Mickelson met with students to discuss career opportunities.

Our sincere thanks for both Mr. Johnson and Mr. Mickelson for taking time visit the Department and share their expertise with our students.



Mr. Casey Mickelson (Richmond International Forest Products, LLC) describes the business of lumber trading to students in WOOD 2614

SVHEC-VT Students Collaborate

Hope Harris-Gayles

When Ben Scarborough, John Barry, Scott McDonald, and Will Rand met on a recent SVHEC-Virginia Tech trip to Letterfrack, Ireland, they had no idea they would develop a friendship that would kindle collaborations back in the United States. Scarborough and Barry, Product Design & Development students at the Southern Virginia Higher Education Center (SVHEC) and McDonald and Rand, seniors in Virginia Tech's Wood Science program, met for the first time



on a trip to visit the Galway-Mayo Institute of Technology in Letterfrack, Ireland. While on the trip, they discovered common interests, and their conversations naturally turned to ways they could work together when they returned home.

The cross-institution collaborations began when Scarborough and Barry visited Virginia Tech for the College of Natural Resources and the Environment's Open House. While there, they did a process consultation for Rand and the student-run Wood Enterprise Institute (WEI). "The WEI is a student-run business, and each year we decide on a product to produce for the spring. This year we're producing solid wood coasters, and

we've had orders pouring in. Ben and John came up, did a process consultation, and worked out some problems we were having with the work cell to increase our efficiency," Rand said.

The SVHEC-VT student collaboration has also resulted in the students being able to gain access to technology that otherwise wouldn't have been available to them. This has opened up new possibilities for their original designs. McDonald is using VT's laser engraving technology to add a unique feature to a Product Design & Development project. The finished product will now have an enhanced design quality that otherwise couldn't be achieved by Scarborough and Barry.

In return, the Product Design & Development students are using the SVHEC's CNC router capabilities to collaborate with McDonald on a table he is hoping to enter in this year's AWFS national woodworking competition. "It's been really handy to email changes back and forth and have Ben send a digital mockup of the final product," McDonald said. "There's no reason to let hundreds of miles stand in the way of collaboration," Scarborough added with a smile.

McDonald and Rand recently made a trip to the SVHEC to work out final problems and have the product manufactured on the CNC router. "It's been really great to collaborate with the VT students and to use the exchange of technology to make all of us better craftsmen," Scarborough said.

Product Design & Development Instructor Clint Johnson stated, "It is extremely encouraging to see students begin to take the initiative to educate themselves through the utilization of unfamiliar technology, and to recognize possible opportunities to collaborate with other organizations. The ability to do this will greatly benefit them in the real world. It is not necessary for a particular entity to be able to do it all, as long as you possess a network of support that you can rely on. Being able to identify your strengths and weaknesses is crucial to this scenario, and the students from these two programs have done a great job of this. I look forward to being involved in future interaction between the students of these institutions."

Product Design & Development is an initiative of the Southern Virginia Higher Education Center offered in partnership with Danville Community College. For more information about the Business of Art programs in Product Design & Development or Digital Art & Design call 434-572-5440, toll free 1-800-283-0098, or email information@svhed.org.

IoPP Student Jamboree XVII

By Laszlo Horvath

The IoPP Student Jamboree is a nationwide annual event where packaging students meet, share ideas, and build lifelong connections. Every year, the jamboree is organized by a different packaging school and this year's XVII Packaging Jamboree was organized by the University of Wisconsin - Stout located in Menomonie, Wisconsin. Virginia Tech was represented by eight students and two faculty members (Dr. Kim and Dr. Horvath). The packaging group started the 20-hour drive to Menomonie at midnight on April 6, 2011. The long travel provided a great opportunity for the students and the faculty to get to know each other and to share common experiences. After a long day the exhausted group arrived to UW-Stout where a pizza social provided a great opportunity for the students to build friendships with other packaging school students



Students discussing sustainability in packaging after Mr. Klimko's presentation. Courtney Kepley (left), Russell Carr (middle), and Tyler Matusovich (right).

The first day was filled with great technical presentations and overview of future trends in packaging from packaging faculty and industry professionals. One of the first presenters was Bob Klimko from Orbis Corporation, which is the major supplier of sustainable packaging solutions in the U.S. Mr. Klimko spoke about the impacts of reusable packaging on sustainability. The topic raised many questions from the audience including VT students Jim Bisha and James Lassiter

who were interested in how the sustainability of reusable plastic containers could compare to the sustainability of corrugated packaging materials. Other topics covered next generation packaging design principles including finite element analysis and revolutionary packaging adhesives. Following the presentations, students had a chance to visit the packaging laboratories and the campus of University of Wisconsin - Stout and gain knowledge about the history of the program.

The afternoon program was composed of valued discussion with representatives of several major packaging companies (OMSO Corporation, General Mills, Boston Scientific, and HB Fuller). In



Students from all over the U.S. are cheering for the survival of the eggs during the Egg Drop Competition.



Egg Drop Competition. Courtney Kepley 1ST PLACE (left) and Tyler Matusevich (middle).

closing the presentation portion of the meeting, Tyler Pease, National IoPP President shared his thoughts on the importance of networking as one of the essential skills in the professional life. The most awaited moment of the Jamboree was the Egg Drop Competition, a tradition that was started when Virginia Tech organized the XVI Packaging Jamboree in 2010. Students had 90 minutes to design and build a packaging system which would protect two eggs dropped from 13-15 feet. They were only allowed to use one square foot of B flute corrugated board, two square feet of paperboard, 18 inches of fishing line, two large paper clips, 8 inches of packaging tape, two pipe cleaners, and four feathers. **This year, Courtney Kepley (Virginia Tech) won first place with her state-of-the-art design.** The day ended with a banquet where students had more opportunities to meet with industry representatives and build connections with each other. The next day another 20 hour exhausting drive waited for the group which was only interrupted to purchase some famous Wisconsin cheese. The IoPP student chapter is extremely grateful for the support of the department.



Wisconsin cheese had a permanent effect on everybody.

Student WEI Products for sale

By Earl Kline

The Wood Enterprise Institute (WEI) is now offering this year's product for sale—a drink coaster set. For ordering information, please visit the WEI website at vtwei.wordpress.com.



2011 WEI coasters—set of 4 coasters with VT laser engravings and holder—now available at vtwei.wordpress.com.

Student WEI Team Hosted Open House

By Earl Kline

The Wood Enterprise Institute (WEI) students hosted an Open House on March 29, 2011 to showcase their learning experiences in running their 2010-2011 business. Over 30 visitors from the Virginia Tech campus and friends from industry saw first-hand the WEI products, processes, and learning through displays, demonstrations, and conversation. The WEI's next event will be a formal presentation on culminating annual business report on May 3, 2011. For more information, please visit the WEI at vtwei.wordpress.com.

WEI students showcase their products, processes, and learning experiences to visitors at their Open House on March 29, 2011.



Earth Day Festival at Virginia Tech

During April 18-22, a weeklong celebration was organized by the Environmental Coalition at Virginia Tech to inspire awareness and appreciation for the Earth's natural environment. On April 22, the Earth Day Festival closed the weeklong event series.



Participants of the Institute of Packaging Professional (IoPP) Virginia Chapter in the Earth Day Festival at the Squires Plaza. (Dr. Young Tek Kim, Tyler Matusevich, Nick D'Amico, James Lassiter, Dr. Laszlo Horvath)

At the festival merchants and various organizations showed what Virginia Tech and Blacksburg are pursuing to create a more sustainable community. Students from the Institute of Packaging Professional (IoPP) Virginia Chapter also had a booth on the Earth Day Festival where the chapter was displaying sustainable packaging solutions including containers made of biodegradable plastic. Despite the rainy weather, the students were excited to show their peers how packaging science can reduce the effect of global warming and to make the world a better and cleaner place.

VT Faculty helps VA company save \$300,000

Masco Corporation located in Taylor, MI is one of the world's largest manufacturers of products for the home construction and improvement markets with annual sales in excess of eight billion dollars in 2008. Masco Corporation is the home of many well-known brands, such as Millgard Windows & Doors, Duraflex Ltd., Perless Faucet, Kraftmaid Cabinetry, and Merillat Kitchen Cabinets. Merillat, the largest kitchen cabinet producer in the U.S. has manufacturing and assembly plants all over the continental U.S., with three locations in Virginia (Atkins, Mount Jackson, and Culpeper).

As part of his extension activities, VT's Department of Wood Science and Forest Products Urs Buehlmann worked with Merillat's door plant in Atkins, VA on improving yield and productivity in the company's rough mill. Given that yield in a typical hardwood lumber rough mill is only around 50 percent, a large potential exists to save lumber and to increase the productivity of the operation since higher yield also means higher productivity as less lumber has to be processed for the same output. In dollar terms, given that the typical, average hardwood rough mill spends \$15 million on hardwood lumber per year, even small yield improvements result in large savings.

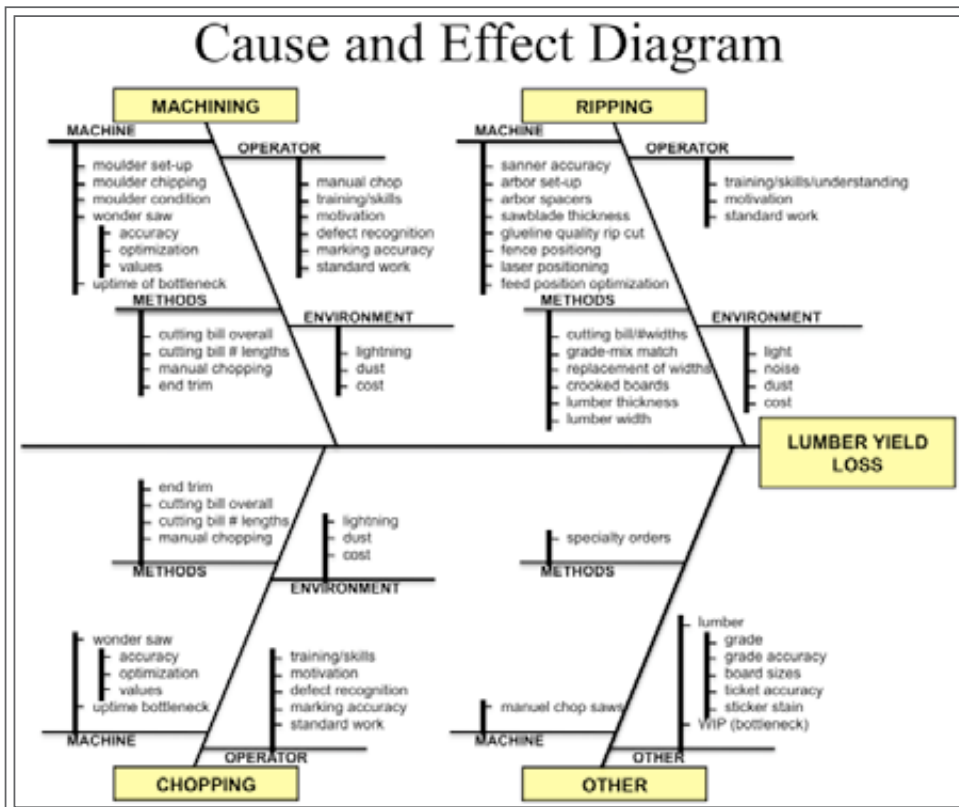


Two team members marking lumber in Merillat's Atkins, VA rough mill.

With the support of VT faculty Urs Buehlmann, Merillat's continuous improvement team for the rough mill consisting of Tommy Sykes and Charlie Burkett used Lean and Six Sigma principles to investigate ways to increase lumber yield and productivity in the plant's rough mill. Among other tools, the team used a cause and effect diagram (also called fishbone or Ishikawa diagram) shown in Cause and Effect Diagram to investigate all possible causes of yield losses.

Using a structured approach to investigate reasons for yield and productivity losses, four major causes were identified, causing losses of over 2 percent yield. These causes include insufficient lumber thickness, excessive end-trim, marker error, and the use of manual chopping stations. Once the team was aware of these major opportunities for cost savings, each problem was individually addressed and solutions were implemented. For example, to address the marker error

problem, a training program was created to periodically train the markers on how to best mark the strips. For all solutions suggested and implemented, verification systems were put in place to assure that the team does not fall back to the "old" ways, but uses the improvements and continues to look for further improvements.



Cause and Effect Diagram for lumber yield losses.

Why Lean Administration? Lean@VirginiaTech conducts Lean Administration workshop in Morrisville, NC

By Urs Buehlmann

Lean@VirginiaTech conducted a two-day workshop entitled “Why Lean Administration” on March 29 and 30, 2011 in Morrisville, NC. Twenty-one participants from industry and academia learned about the power of Lean in administration and were introduced to tools and practices that support Lean performance.

Guest-speaker Cindy Swank, Executive Vice President, Service Value Chain at LPL Financial, Charlotte, NC

introduced the workshop participants to the power of Lean in administration with a presentation entitled “Pioneering Lean in Services – Tales and Lessons from the Journey.” She described Lean as “Deceptively simple but incredibly hard to implement,” an assessment with which the VTLeanTeam full conjures. Another interesting statement from Ms. Swank included that “People like being firefighters but being Lean requires a scientific approach.” Such firefighting behavior, according to observations by the VTLeanTeam often is not only encouraged by human’s desire to show action, but is further encouraged by company’s performance assessment systems which rewards employees for being proactive in fighting problems, but does not reward root cause problem solving.

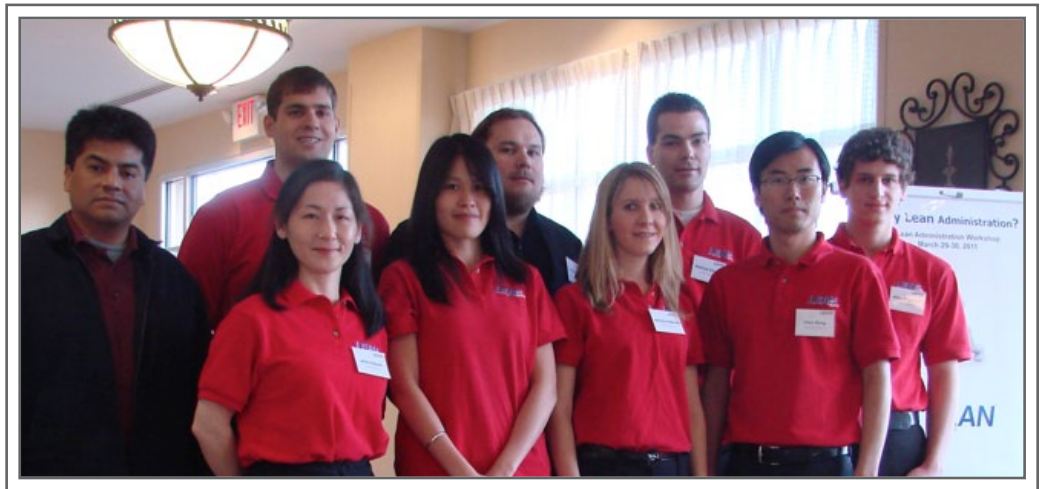
Using the team’s newly developed Lean Administration simulation, workshop participants engaged in three sets of simulating real-world administrative processes – current state, improved state without Lean knowledge, and future state (e.g., state using Lean principles). Large performance improvements were achieved by using Lean principles to improve the processes in an administration. While the workshop participants in the current state were only able to produce one complete order, the improved state without Lean knowledge produced 12 complete orders, and the Lean state (e.g., future state) produced 40 complete orders. At the same time, total work in process within the administration decreased from 14 orders to nine and one order, for the current state, the improved state without Lean knowledge, and the Lean state (e.g., future state), respectively. Picture 2 shows workshop participants discussing the current state simulation.



Workshop participants Jan Boutersee, Emilia Jardin, Nancy Sue Lands, and Ricardo Balleirini Dos Santos discussing their administration’s performance in the current state.

other topics relevant to Lean implementation and Value Stream Mapping. Picture 2 shows the current state value stream map created with observation of the current state administration simulation performed at the workshop.

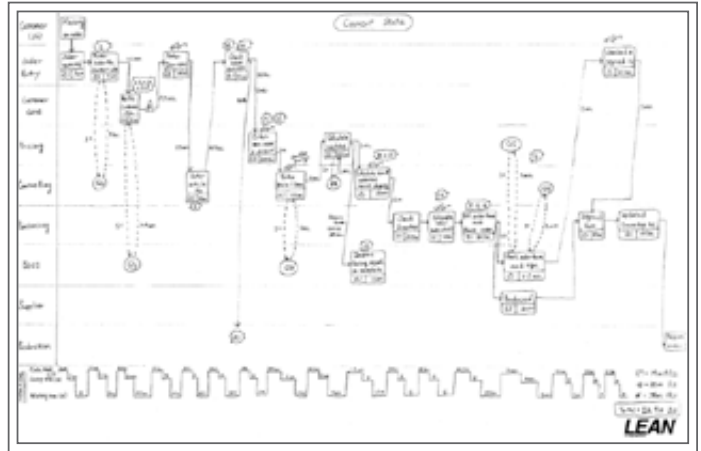
Using the knowledge acquired in the teaching sessions, workshop participants increased their administration’s productivity over 15 times and decreased work-in-process inventory (WIP) by 33% percent when comparing current and future state. The two-day workshop was concluded with a discussion about problem solving using the



The VTLeanTeam prior to the Why Lean Administration? Workshop in Morrisville, NC (from left to right, front row: Akiko Nakata, Yu(Angela) Zhou, Adrienn Andersch, Chao Wang; back row: Omar Espinoza, Laszlo Horvath, Timo Grueneberg, Mathias Schmitt, and Michael Sperber).

A3 method. Participants left with a new set of ideas and tools on how to improve their administrative processes and Lean@VirginiaTech offered their help for workshop participants' efforts to implement Lean in their operation. One participant shared the following comment with the VTLeanTeam: "I very much enjoyed the workshop, it was well presented and very informative. I am grateful for the opportunity to discuss administrative issues and get advice from experts."

The next Lean@VirginiaTech workshop will be conducted on October 26 and 27, 2011 and will focus on "Why Lean Safety." For more information visit www.vtlean.org or email info@vtlean.org.



Value Stream Map (VSM) of the current state of the administration simulation conducted at the "Why Lean Administration" workshop.

CNRE Cancer Crushers faculty and staff team joins in the 2011 VT Relay for Life

By Tom Hammett and Audrey Zink-Sharp

We took up the challenge to raise money to help fight cancer. Even though it was really chilly and rather wet, our CNRE Cancer Crushers team got in some laps around the VT Relay for Life track on the Drillfield on Friday, April 22, 2011. At press time, our team has raised a grand total of \$2,465.00 in donations to the American Cancer Society to help fight back against the disease.

Relay for Life began in 1985 when Dr. Gordy Klatt, a colorectal surgeon in Tacoma, Washington, ran and walked around a track for 24 hours to raise money for the American Cancer Society. Since then, Relay has grown from a single person's passion to fight cancer into the world's largest movement to end the disease. Each year more than 3.5 million people in 5,000 communities in the United States gather to take part in this global phenomena and raise funds and awareness to save lives from cancer. A number of other Relays were also happening around the country this year about the same time as ours, but Virginia Tech's Relay for Life was the first collegiate relay in Relay for Life history to



CNRE Cancer Crushers team front row, left to right: Arlice Banks, Audrey Zink-Sharp, Cathy Barker, Dean Stauffer; back row left to right: Tracey Sherman, Jesse Sherman, Tom Hammett; Not pictured Alan Raflo, Harold Burkhardt, and Eric Hallerman.



raise more than \$600,000 as we helped bring the total funds raised to \$614,000 this year.

Our CNRE team members were Arlice Banks, Cathy Barker, Harold Burkhardt, Eric Hallerman, Tom Hammett, Alan Raflo, Jesse Sherman, Tracey Sherman, and Audrey Zink-Sharp. Despite ugly weather on event day, we really had fun getting together, working as a team, and raising money for this worthy effort. We extend our sincerest appreciation to all in the college,

Tracey and Jesse Sherman (right) and Audrey Zink-Sharp (left) crossing through a finish line.



and our family and friends for their donations to our team.

Burruss Hall and many of the VT Relay for Life participants at the opening ceremony.

UPCOMING Workshops

International Marketing Workshop for Forest Products Industries

Charlottesville, VA

June 14, 2011

Registration is \$50 and covers materials, coffee breaks, and lunch.

For more details including registration information, please visit the web site <http://www.woodinnovation.org/?p=649#more-649> . The tentative agenda is shown below:

- 9:00-9:10 Welcoming message. Charlie Becker, Virginia Department of Forestry.
- 9:10-10:10 Basics of Marketing for Exports. Robert Smith, Virginia Tech
- 10:10-10:30 Coffee Break
- 10:30-11:15 Supply Chain Management Issues. Henry Quesada, Virginia Tech
- 11:15-12:00 Hardwood Export Statistics. Mike Snow, AHEC Executive Director
- 11:45-12:45 Box lunch
- 12:45-1:30 Marketing Intelligence for Exports. Joel Stopha, International Marketing Specialist at VDACS
- 1:30-2:15 Research Update: Exporting Opportunities to Central America. Scott Lyon, Virginia Tech
- 2:15-2:30 Coffee Break
- 2:30-2:45 Roundtable/Panel Discussion. All speakers
- 2:45 Conclusion Remarks. Henry Quesada, Virginia Tech