

TAPPI's Engineering Conference focuses on technology and competitiveness

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More than 1000 people converged on Boston, MA, during Sept. 14–17 to partake of the 1992 TAPPI Engineering Division Conference. William G. Cook, technical program chairman, led a 10-person team that developed a six-track, 23-session technical program. Committee meetings, a technology showcase, a trade fair, and the Paper Chase rounded out the week's events.

Opening plenary session

Division Chairman Jere W. Crouse introduced the division awardees who received their awards from TAPPI President's Representative Jerry Ballengee. Larry E. Butts and Terry C. Valo received Certificates of Merit. David L. Kraft and Hayes C. Orender were honored as coauthors of the best paper of the 1991 Engineering Conference, "Considerations using sludge as a fuel."

Einar B. Hoff Jr. was the recipient of the 1992 Division Leadership and Service Award. George Lane, sales manager for Valmet TAMPELLA, presented Hoff with a US\$ 1000 honorarium.

The Engineering Division Beloit Award and US\$ 5000 honorarium were presented to Charles E. Geisel by Greg L. Wedel, director of corporate engineering for Beloit.

Corrosion and materials

As mills close up their systems to meet environmental regulations, corrosives, particularly chlorides, build up in their process streams, causing increased corrosion rates and increasing the likelihood of stress-corrosion cracking failures. West Coast mills that use sea-floated logs already face many of the problems associated with high chloride concentrations.

Craig Reid and Angela Wensley (MacMillan Bloedel Research) described their successes and failures with a new class of construction alloys known as duplex stainless steels that is more resistant to corrosion and cracking than the conventional 300 series stainless steels but not much more expensive. Their case histories and the opinions of an alloy supplier, an equipment builder, a fabricator, and a foundry provided very useful points on materials selection for mills anticipating system closure in the near future. Reid gave another paper on practical guidelines

about the importance of light surface grinding to detect cracks in equipment inspection.

The Nonmetals Subcommittee of the Corrosion and Materials Engineering Committee has just completed the first 6 of 11 chapters in a book on the use, construction, inspection and repair of concrete structures in pulp and paper mills. These chapters will be published as a Technical Information Sheet during the next few months and will bring together a great deal of previously inaccessible expertise for our industry. For more details call Randy Nixon, Corrosion Probe Inc.

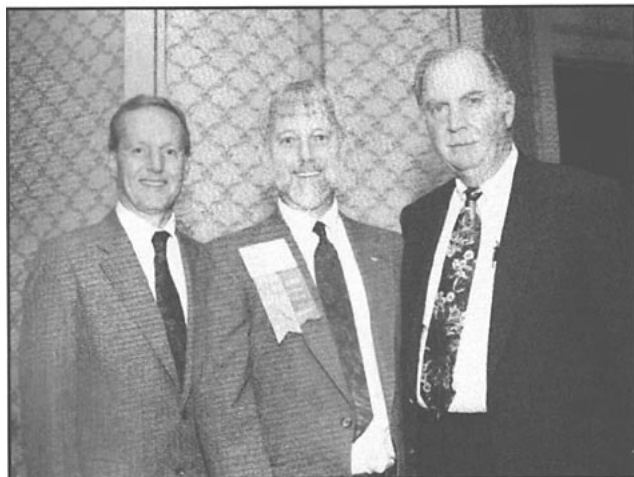
The rupture of the Ashland Oil tank a few years ago and growing public concern about chemical spills have prompted the American Petroleum Institute (API) to develop new codes and standards for the inspection, evaluation, and repair of storage tanks and piping and for the qualification of those certified to perform these activities. The tank inspection standard API 653 was implemented a year ago and the piping inspection standard API 570 was published in the fall of 1992. There is a great amount of confusion about the extent to which these standards should be regarded as appropriate or mandatory for the inspection, evaluation, and repair of tanks or piping in the pulp and paper industry. Summary reports of both documents were presented at the meeting of the Pressure Vessel and Tank Subcommittee of the Corrosion and Materials Engineering Committee, and a lively discussion followed. Since TAPPI is not a standards-developing institution, it will not develop a position about standards for the inspection of pulp and paper equipment. However, the information presented at this subcommittee meeting will help individual companies make their own decisions about how to proceed. For more information call Terry Clevenger, Industrial NDT; Steve Meiley, Champion International; or Dave Crowe, Union Camp Corp.

The future paper machine

One of the more popular technical sessions focused on paper machine design 20 years from today. Bob Perrault moderated the session of experts—Malcolm Johnson, Rust International; Borg Skaugen, Beloit Corp.; Peter Seifert, Black Clawson Co.; Alfred Bubik, Sulzer-Escher Wyss; and Mike MacGregor, Voith Inc.

Conference Report

(Left to right): **David L. Kraft**, Division Vice-Chairman and General Conference Chairman **W.B.A. "Sandy" Sharp**, and **Hayes C. Orender**. Kraft and Orender, both of Babcock & Wilcox, were honored with the 1991 Best Paper Award.



Charles E. Geisel, at left, received the Engineering Division Beloit Award and US\$ 5000 honorarium from **Greg L. Wedel**.



Johnson addressed the economic factors that will influence change. Projected growth during the 1990s is 2.4% vs. a growth of 2.8% in the 1980s. Printing and writing grades should lead the demand gains while linerboard should experience increased growth in recycled use. Paper machine widths should not grow any wider than the current 400-in. limit, but speeds are expected to continue to increase.

Skaugen agreed that paper machine speeds will increase for all paper and board grades. With increased demand in recycled fiber, the "mini mill" concept will grow. The paper machine of the future will build on past successes in hydraulic headboxes, twin wire forming, and shoe presses and may move into some form of high-temperature pressing such as impulse drying. Restraint drying sections and hot calendering will continue to be optimized for various product benefits. As speeds increase, automated reeling and winding may merge.

Seifert stated that predicting the future paper machine could be like predicting the fall of the Berlin Wall. It is clear that legislation has demanded increased use of recycled fiber to make new products and that wastes such as sludge be burned or properly disposed of. Paper grades may become darker to reduce bleaching costs. Fiber will have to be fine screened to reduce contaminants. The paper product most likely will be made up in several layers to take advantage of desirable surface properties. There will be high consistency cleaners.

Bubik spoke of futuristic forming. At speeds above 1300 m/min, the fourdrinier will have no future. Gap formers should abound because of their high-speed capabilities and better CD profiles. Forming lengths of the twin wires will increase with machine speed. The machines will be highly computerized.

MacGregor pointed out that the variation in paper properties on the machines should be a major issue as we approach the 21st century. Our measurement systems of today will be inadequate tomorrow to detect and measure these microvariations that influence paper quality. A lot needs to be researched to establish the influences pressing has on cockles, curl, and paper properties. Important papermaking challenges like fiber orientation, small

particle distribution, differential shrinkage effects, hygroexpansivity effects, and many others will have to be addressed on a small scale. Even look-through improvements need to be quantified.

It is very difficult to accurately predict our future paper machines in this ever changing world. As new technologies are explored and developed, and existing technologies improved and optimized, the paper machine will evolve into its future form—as long as demand for products from our ever-renewable source of fiber remains strong.

Organochlorines

Concern for our environment and wrestling with legislated regulations, the engineer faces many challenges in current and new plant bleaching operations. The session on organochlorines, sponsored by the Process Engineering Committee, addressed this sensitive issue and presented various engineering options. Paul Wilson of Dean Oliver was session chairman.

A. Van Donkelaar, NLK Consultants Inc., presented the challenges and solutions. He referenced various technological remedies and emerging technologies, then presented the steps that can be taken to meet regulations, make easy upgrades, bleach without chlorine compounds, and finally design and operate an effluent-free mill.

Mark Minday, Eka Nobel, presented Simpson Tacoma's kraft operation to dioxin-free production. Being on Puget Sound (an environmentally sensitive area), Simpson must satisfy three groups—environmental causes, regulations, and their own customers. The objective was to operate "dioxin free" and chlorine (gas) free. With high percent ClO_2 substitution, the objectives were achieved to satisfy the regulatory agency. Peroxide had to be added to regain brightness to satisfy their customers. However, to operate dioxin-free involved additional costs above those predicted.

Robert Yant, Quantum Technologies, presented an economical alternative for molecular chlorine free bleaching. The objective is to replace ClO_2 with a weak hypochlorous acid plus

Einar B. Hoff Jr. was honored with the Engineering Division Leadership and Service Award. Hoff, at left, was presented with a US\$ 1000 honorarium by **James M. Nelson**.



additive to lower capital and operating costs. A further objective was to achieve equal pulp quality at the Temple-Inland mill installation in Evadale, TX, where this alternative is operating. As an added benefit, effluent color was dramatically decreased.

Bob Kinstrey, Rust International, pointed to our industry's bad press and the fact that the paper industry has done a lot to reduce the environmental impact. The dioxin problem may not have been the problem we thought; nevertheless, regulations require significant dioxin reduction. He pointed to delignification processes before the bleaching sequence, changes in bleaching compounds, or the bleaching sequence as alternatives to the use of chlorine in bleaching. The paper industry has responded to legislative pressure and has reduced dioxin releases by more than 75% just through modification of the pulping and bleaching processes.

Finally, Paul Stockburger presented a paper about purchasing the next bleach plant. He reviewed the various options (integrated vs. nonintegrated plants), discussed the process and operational considerations along with relative economics, and then presented three newer technologies. The selection of the next chlorine dioxide plant requires thoughtful planning not only of current, but future needs and circumstances.

The session attracted many mill personnel even though travel restrictions prevented large numbers of mill people from attending. The published papers, however, should serve as an important reference to mill engineers and decision makers who must choose the future course for the mill based on regulations and environmental concerns.

Engineering and maintenance management

Several practical engineering management and maintenance management topics received attention at the conference and attendees learned how to run an effective student co-operative education (co-op) program, conduct project planning and risk management, and bring a project in on budget and on schedule. One session dealt specifically with engineering, designing, operating,

and maintaining paper machine dryers.

In a session on "Developing Future Engineers," an academic administrator, a college student, and an administrator for a paper manufacturer presented their views of co-op programs.

Marty Williams sees co-op education as a win-win situation: a way for students to meld work-related experience with a college curriculum and for companies to gain talented support cost-effectively. Williams, director of cooperative education, Clemson University, said that administration, supervision, orientation, and evaluation are critical to an effective co-op program.

According to Williams, co-op is a three-way partnership among the student, the university, and the employer that is based on communication, responsibility, and reliability.

Todd Varner, a co-op student at Clemson University, gave his perspective on working in a co-op program for a nearby mill. Co-op, says Varner, provides job experience, an opportunity for real-world problem-solving, financial assistance to help pay for school, and familiarity with real work life. For Varner, co-op makes a student a better employee and communicator through on-the-job training, and a better student by bringing practical experience gained in the mill back to the classroom.

Robbie Love, director of administration, corporate engineering, Mead Corp., presented cooperative education as the means to ensure the future technical workforce. She focused on a joint study recently conducted by Mead and the University of Cincinnati that focused on the hiring of engineering co-op students. Co-op supervisors at the company participated in a detailed survey of co-op students employed over a seven-year period. The supervisors provided their perceptions of the students' productivity, supervision required, and job worth.

The study shows that hiring former co-op students was 74% more effective than hiring non-co-op students and, bottom line, the company would save more than US\$ 26,000 per hire.

Effective project management

A series of papers presented attendees with almost a step-by-step guide to project management from planning and implementation to routine maintenance. The perspectives of mill and consultant engineers provided the audience with a range of philosophical approaches and viewpoints.

Tom Allen and Hans Kask, Weyerhaeuser Paper Co., presented a standardized five-step planning process that can assist mill engineers with mill projects. The five-step process—feasibility, scoping, planning, implementation, and operation—is applied to all projects at Weyerhaeuser, large and small. Checklists for each phase ensure that the approach for each project is consistent.

L. Richard Hyatt, project manager, CRS Sistine Engineers, Inc., explained from a consultant's perspective the necessary ingredients for implementing a successful recycled fiber installation. Establishing and maintaining effective communication is the foundation on which the project's success depends. An engineering team that is mature and technically qualified is basic to a project's success, as are spelling out, agreeing on, and following a quality philosophy that places a proactive emphasis on how the project is handled.

Jones duo clinches 10th Paper Chase

Paddy Jones of ABB Combustion Systems and her spouse Andy Jones, also of ABB Combustion Systems, captured the first place positions in the women's and men's divisions, respectively, of the 10th Anniversary Paper Chase held at the TAPPI Engineering Conference. Paddy Jones finished with a 20:02 time for the 5K run, and spouse Andy finished with a 15:04 time in the men's division.

Mary Larson of Babcock & Wilcox placed second in the women's division with a time of 22:57, and Laura Thompson, a doctoral candidate at the Institute of Paper Science and Technology, crossed the finish line in 23:59 to place third in the women's division.

Finishing with a time of 16:47, Frank Sutman of Betz Paperchem placed second in the men's division. John Holton of Sulzer Escher Wyss came in at 17:26, to finish third.

A special trophy went to Jules Gommi of Weyerhaeuser. He has run every Paper Chase since 1983, and completed his first race in cowboy boots.

The Paper Chase drew 77 entrants and raised scholarship money for 10 pulp and paper programs at universities across the United States. BE&K Engineering and Construction organized the event that was sponsored by: *American Papermaker*, Beloit Corp., Core Link, CRS Serrine Engineers, Eichleay Constructors, Environmental Elements Corp., Escoweld Epoxy Grout Systems, Fluor Daniel, Huyck Formex, Johnson Corp., Kamyr, KITZ Corporation of America, Krieger Corp., Longview Inspection, Magnesium Elektron, Marathon Electric, Nash, Clark & Vicario, Peerless Pump, *PIMA Magazine*, *Pulp and Paper*, Rust International Corp., Scapa Group, Stone & Webster, *Tappi Journal*, Thompson-Avant International, Valmet Paper Machinery, and VOITH.

—Scott Robertson, BE&K Inc.

D.H. Andrew, James River Corp., offered the Construction Industry Institute's (CII) "Constructability Implementation Guide," a document developed by CII's Task Force 34 to address the cultural, procedural, awareness, and incentive barriers that the Task Force concluded impede project development. Defining "constructability" as "the optimum use of construction knowledge and experience in planning, design, procurement, and field operations to achieve overall project objectives," Andrew cited how the implementation guide brings effective tools to project management.

Paul Hebert, senior vice president, Rust International Corp., defined a risk as any situation or event outside of the direct control of the project. By looking at risk management as an element of a project plan, the project team can proactively identify risks, quantify and rank those risks based on their probability, develop response plans to deal with those risks, and control the project once it is under way by routinely evaluating the project's progress.

Those who understand that fundamental project management basics may be overlooked at times can appreciate the solid presentations on project budgeting and scheduling. Sam Collier, senior project manager of Mead Corp., pointed out "Ten ways to screw up a project." Collier's overview of common mistakes may assist project planners by suggesting how not to do business.

Charles Humphrey, manager of pulp and paper construction for Stone and Webster Engineering Corp., suggested that construction projects can improve if project planning includes good construction contract language, innovative labor policies,

constructability reviews, and construction-driven design. The mill should try to match the type of contract with the type of work to be done, said Humphrey. The biggest risk to a contractor is manhours, he noted.

World-class maintenance, said Christer Idhammar, president and CEO of Idcon, Inc., can be referenced as maintenance without waste. A lot of priorities are emotional, said Idhammar, but if personnel shift from fixing things to doing things correctly, he speculated that this causes people to modify their attitudes and approach production as a joint venture between operations and maintenance.

Technology showcase, trade fair

The Technology Showcase, new this year, provided 17 suppliers with an opportunity to present information in such areas as recovery, bleach plant, paper machine, and dewatering technology.

The trade fair gave attendees an opportunity to see 85 exhibitors representing chemical, consulting, corrosion, environmental, equipment, and other interests. ■