

1993 Process and Product Quality Division Conference

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The fall 1993 Process and Product Quality Conference convened in Atlanta, GA, from Oct. 30–Nov. 3 with a diverse audience of more than 100 registrants. As is the Division's custom, the committee meetings were held prior to the conference sessions (see accompanying story).

The conference opening session included award presentations by James Abbott of Procter & Gamble to three very active members of the Division. Patricia Hartman received the Division Service Award for her leadership of the Quality Management Committee as she retires as chairman of the committee.

Lucille Hahn was presented a plaque and pin recognizing her service as Division chairman. Hahn has made many contributions to the Division and provided direction in its approach to quality registration issues. This activity has drawn attention to the Process and Product Quality Division as the focal point for quality-related issues within TAPPI. The Division hopes that Hahn will continue to be active and provide feedback to the Division as she becomes the TAPPI representative on ISO/TC 176.

The third award went to Byron D. Jordan. Jordan received the Process and Product Quality Division Technical Award and the Richard S. Hunter Prize. Jordan, a member of TAPPI since 1980, received the award for his many contributions to the field

of optical properties and image analysis. His soft and persuasive voice has contributed direction to many issues that have been brought before the Optical Properties Committee.

As Division chairman, I would like to express my personal congratulations and best wishes from the Division to the award recipients. I hope these awards do not mark the end of their participation in the Division but serve as a milestone to their continued activity and leadership.

The keynote address, given by Mark Morrow, director, CEEM Information Systems, Fairfax, VA, raised two questions: "ISO 9000 Here Today, Gone Tomorrow? Or Just the Beginning?" The answer was provided immediately: It's just the beginning! ISO 9000 is changing the nature of business by bringing diverse market segments together. Morrow believes this will lead to increased business opportunities as the world moves toward a single global economy. These observations have developed through his past 2 1/2-year commitment to the study and dissemination of information through his *Quality Systems Update: A Global ISO 9000 Forum And Information Service* newsletter. A recent survey conducted through the newsletter of registered companies indicated the following:

Lucille Hahn receives Past Chairman's Plaque from **James Abbott**.



James Abbott presents the Division Service Award to **Patricia Hartman**, with Conference and Division Chairman **John W. Walkinshaw**.



Conference Report

Byron D. Jordan, recipient of the Division Technical Award and Richard S. Hunter Prize



- Companies paid an average of US\$ 245,000 for costs associated with registration, including auditing fees and internal expenses. Registrar fees averaged US\$ 21,000.
- This expense can be contrasted to reported averaged annual savings to these companies of US\$ 179,000 upon implementing ISO 9000. More than 50% of the companies that responded indicated that their payback would be less than 40 months.

Companies indicated that the many positive benefits from implementing ISO 9000 cannot be quantified in dollar amounts. These benefits are derived through positive cultural change within the companies as they proceed through the registration process. Other responses to the questionnaire on the important benefits of registration were: 32.4% of the respondents reported that better documentation was the greatest internal benefit, while 26.6% reported that improved customer satisfaction was the greatest external benefit.

Morrow made specific reference to the pulp and paper industry, delineated as Standard Industrial Classification (SIC) code 2600, responses to the questionnaire on benefits of ISO registration. As a guide to survey results, there were 34 respondents of a possible 83 registered companies. The companies responding listed several important reasons for attaining ISO 9000 registration. A summary of the overall responses were: market advantage (73.5%), quality benefits (64.7%), customer demand (52.9%), and reduced costs of production (23.5%). In addition, a relatively low percentage (23.5%) indicated that the company sought ISO 9000 registration to meet requirements of the European Community. This was once believed to be the prime mover of company interest in the registration process. The trend to continue the registration process was significant as 67% of the SIC 2600 respondents indicated that there were further plans to register additional domestic locations as contrasted to 20% of the respondents who indicated that they were working toward the Malcolm Baldrige Award.

Neil G. Vander Linden demonstrates how many hats fit total quality.



The first session of the conference, "Measurements for the Year 2000," chaired by Roland J. Trepanier, OpTest Equipment, Inc., dealt with two measurement techniques that are seeing significant interest these days. The first is the renewed interest in the Parker Print Surf (PPS) which is presently under review by the Physical Properties Committee for issue as a provisional method. In addition, ISO/TC6/SC2 has formed a Task Force with J. A. Bristow (STIF), convener, for the purpose of investigating the calibration of PPS instruments. The second portion of the session was devoted to developments in automated dirt counting procedures.

If there was one clear message that came out of the PPS session, it was that most users of this instrument do not change the backing as frequently as they should. Mike Moore, Messmer Instruments, Ltd., the first speaker of the session, listed this as well as other problems that are potential sources of error. Dummy calibration heads, available from all of the instrument manufacturers, offer an accurate method to calibrate the air measurement end of the instrument but do nothing to calibrate the actual measuring head and backing, Moore noted. To address this last issue, he indicated that there has been considerable development to produce plastic calibration disks for head calibration.

Leif A. Löjdmark of Lorentzen and Wettre Ab discussed typical values of repeatability of 0.04–0.10 microns for a measurement at 1 micron to 0.06–0.20 microns at 6 microns as determined from test data typical of tests made in Europe, Canada, and the United States. The reproducibility is 0.2–0.4 microns at 1 micron and 0.4–0.6 microns at a measurement level of 6 microns. He repeated Moore's comment that cleaning and backing replacement are critical to proper operation of the instrument. In addition, Löjdmark suggests the use of a master head that can be used in conjunction with the working heads to troubleshoot measurement problems.

Diane M. Lee, Champion International, discussed the use of films in the calibration of the PPS instrument. Lee stressed that films should be purchased in batches, evaluated when they arrive,



and then stored in the refrigerator until needed. Evaluating specimens from all of the batches of film when they arrive and checking that the instrument is working correctly helps to establish the roughness of the film and determine if the film is correctly marked. Later, if instrument readings are suspect and the instrument needs to be checked, you have confidence in the measured values of the film. Lee has established procedures for tracing through instrument measurements to pinpoint problem areas. Her troubleshooting guide has been published in *Tappi Journal* (December 1993, p. 111) as well as in the *Conference Proceedings*.

Patrice J. Mangin, PAPRICAN, outlined a much broader view on how to define the surface of a sheet of paper based on three fundamental laws:

- "True topographical surface of the paper cannot be defined from an open structure concept." That derives from the concept that the surface of the sheet is a state of mind, whereas paper is a porous or open structure.
- "Characterization of the paper surface is a function of the measuring instrument."
- "Characterization of the paper surface is a function of the measuring wand."

Mangin followed these concepts of paper surface with comparisons of how various instruments measure the "surface" and the interaction of the instrument to the structure below that surface.

A last-minute surprise was the introduction of Anthony Bristow, the convener of ISO/TC6/SC2/TF1. Bristow reviewed progress on the calibration procedures being developed on PPS-type instruments. He reported that L & W, TMI, and Messmer will all be put forward for approval under ISO 4094 for recognition as standardization laboratories and issuers of dummy heads for calibration of PPS instruments. He further indicated that the

manufacturers agree that the dummy heads are calibrated from first fundamentals and the measuring systems are linear so that only one calibration point "head" is required. However, the ISO PPS Standard will require calibration with at least three heads spaced over the range of use.

The second part of the session dealt with automated optical analysis for the determination of "dirt count." Byron Jordan, PAPRICAN, gave an excellent overview of the concept and pitfalls associated with automation of dirt count as contrasted to the visual use of the Dirt Count Chart. His contention is that cleanliness is a visual attribute and that the perceptions of the eye are important; that is, does one 5 mm² speck look as bad as five 1 mm² specks? Additionally, does a black spot look as bad on a brown surface as it does on a white surface? These concerns were included when the white dirt count card was developed and are the reasons why the transparent chart should not be used.

Christopher A. McNabb from Boise Cascade and Heiko Fastenau from LASOR LaserSorter GmbH reviewed practical examples where automation of dirt count analysis can lead to positive results. McNabb compared various instrument types to the monitoring of a recycle deinking process. Fastenau's presentation reviewed the use of on-line laser analysis of dirt in pulp and paper.

Charles S. Moss, Celleco Hedemora Inc., urged the industry to establish optical "dirt" standards by which instruments can be compared and calibrated. The task of calibration must take into account the size of the particle to be counted as well as the grey level of the background and the contrast between the particle and the background. Only then can instrument variables such as pixel size and detection grey level threshold be determined to permit instrument comparisons to be made on a common basis.

Tuesday morning offered a consciousness-raising session (under the banner of a Supplier Showcase) of 17 suppliers under the strict time requirements of Session Chairman Lucille D. Hahn, Champion International Corp. This rapid-fire session highlighted new technologies and new applications of existing technology. The session ended with both presenters and audience continuing the discussion on the exhibit floor, with lunch provided through the conference registration. This session was so well received by the conference attendees that a Supplier Showcase will be held next year at the meeting in Savannah, GA.

The afternoon featured a panel discussion on "ISO 9000 and Continuous Improvement," moderated by Donna D. Jarrell of Westvaco Corp. The panel and opening presentations consisted of: Jerry M. Buchheit, James River Corp., "Management Review;" Patricia K. Hartman, Westvaco Corp., "Corrective Action Element;" Richard Long, Boise Cascade Corp., "Internal Auditing Element;" and Larry Bissle, Union Camp Corp., "Continuous Improvement—Examples." Neil G. Vander Linden, Westvaco Corp., summarized the discussion.

The corrective action loop can be an eye opener, Hartman indicated, as the corrective action in the registration process forces firms to correct for lack of stabilization of nonconforming internal processes by seeking input from all. Bissle cited some of the benefits resulting from the registration process: 90% reduction in return tonnage, 55% reduction in employee turnover, 50% reduction in downtime, and 20% reduction in supplier problems.

Conference Report

For both the enthusiastic ISO and hockey fan, Vander Linden's ISO "hat trick" was a humorous way to show that ISO 9000 is a frame on which a company can hang the many hats of TQM, SPC, QC, etc. The ISO registration process will not be just another passing fad.

A question from the audience on "what are the Japanese doing in ISO 9000?" prompted the following response: They appear mystified as to why this is a problem as good business practice should be doing this right along. Another question on calibration found this response: An auditor asked if there was documentation on the calibration of the eyes of laboratory technicians performing visual inspections. Subsequent eye exams turned up three lab inspectors with vision defects.

Wednesday morning's session continued the ISO 9000 theme with a session on "ISO 9000 in the Year 2000," chaired by Peter A. Daisley of Daisley Associates Ltd. The session presentations included Baskar R. Kotte, Quality Systems Enhancement, Inc., "Future Revisions of ISO 9000 Series;" Michael J. Kemp, Quality Management International Ltd., "Managing Quality Systematically for Improvement;" Lars C. Ingman, Valmet Automation (USA) Inc., "The Evolution of Quality Management Systems;" Jim Heaton, Asten Dryer Fabrics, Inc., "ISO 9000: Improving Our Future;" and R. A. Peacock, MAINMAST Quality Leadership, "Accelerating Culture Change to the Year 2000."

This well-attended session outlined the future direction that ISO 9000 may be taking when the 1993 revision is printed. However, even as the first revision is being readied for the printer, work is continuing on the ISO 9000 Standards for the next five-year review in 1998. The best advice for those companies that are preparing for review, or follow-up audits, is to follow the current version but make arrangements with the registration auditor as to when, and how, the changeover will be handled. In general, the potential changes become more significant as the documents progress from ISO 9000 to ISO 9003. These changes are well-documented by Kotte in the text of his presentation. The comment by Kemp, that quality is the common language of the 1990s, will take on added emphasis through global economies and increased competition.

The last session, chaired by John L. Sullivan, Testing Machines Inc., dealt with "The Use of Ultrasonics in Testing of Paper." It drew near full conference attendance and closed the conference on a positive note. The opening paper by John F. Waterhouse, IPST, presented a comprehensive review of the fundamental principle and application of ultrasonic testing. Jeff Bott, Testing Machines Inc., discussed the relationship of the minimum and maximum values of wave velocity and the relationship to Mullen burst strength. An interesting approach to reduce the warp of combined corrugated board by matching the angles of ultrasonic "orientation" of the top and bottom liners was discussed by Maclin S. Hall of IPST. His presentation also covered the development and use of robotics for sheet systems and drum-mounted sensors for web measurements of in-plane ultrasonic propagation velocity on an 80-kHz pulse width signal. The drum-mounted system should promote the extension of the measurement concept onto the paper machine or other web process-based converting operation.

Paper machine applications for ultrasonic testing of fiber orientation will lead to on-line determination of tensile stiffness index and the tensile stiffness orientation of the web, noted Magnus Titus, Lorentzen & Wettre Sweden. This may develop into an effective control method for draw tension and the control of shrinkage during drying. The out-of-plane ultrasonic testing for paper properties was the subject of the paper presented by Pierre Brodeur of IPST. His approach to the measurement system was to use two liquid-filled rubber wheels, one containing a transmitter while the other contained a receiver. As the paper passed between the wheels, the out-of-plane measurement of wave propagation can be determined. An interesting outcome of this work is that by measuring the transmitted and reflected time intervals, the distance of propagation can be calculated. This distance correlates well with the soft-platen caliper of the sheet. The problem is that neither of the caliper measurement methods has a direct true calibration procedure. From the attentiveness of the audience, and the questions asked, the potential of ultrasonic testing technology is just beginning. This will be a topic worth returning to in the future.

Further details of each paper presented at the conference are contained in the *Conference Proceedings*, available through TAPPI PRESS.

In the more immediate future, the next Process and Product Quality Division Committee meeting in Atlanta will be part of TAPPI 94. In addition to the regular committee meetings, plenty of time will be scheduled for subcommittee activity on automatic dirt count procedures, the development of a recommended procedure for laboratories for the maintenance of standards and master instruments, and discussions on the scope of the Division.

The follow-up to this conference will be the 1994 Process and Product Quality Conference to be held in the Hyatt Regency, Savannah, GA, during the week of October 17, 1994. This conference will prove interesting to a wide group within TAPPI, including those members of the Southeast Local Section of TAPPI which will have its meeting overlap with the last day of our session. Registration arrangements are being made for cross-registration for both the Conference and Local Section meeting, including a tour of Herty Foundation's new laboratory facility and high-speed paper machine.

Planned session topics are to include: "Technology, Evaluation, and Measurement of Input Quality," with topics that will look at pulp and other raw material evaluation techniques and the control of quality. Session developers will be Lars Ingman, Gary Thurman, and Norman Shroyer. Lucille Hahn will again moderate a Supplier Showcase. "Practical Methods to Managing Quality" will determine the best of, and the application for, the traditional measures of a quality control program to determine best benefit within a mill situation. Ann Timberlake will be session developer. The last sessions will focus on the measurement and control of environmental quality issues. The morning will be devoted to instrumental methods of environmental measurements. The afternoon will look at the impact of ISO/TC207 on dealing with registration to environmental quality management standards. If you are interested in attending or participating in the conference you may contact TAPPI or myself for further information.

Activities of Process and Product Quality committees summarized

The various committees of the Process and Product Quality Division met in Atlanta, GA, just before the Division's conference. Summary reports from each follow:

Steering Committee. The next meeting of the Process and Product Quality Division will be in Atlanta as part of TAPPI 94. In addition to the regular committee meetings, meetings of the task group on development of a recommended practice for laboratory standards manufacture and maintenance of "master instruments" are planned. A group also will meet to discuss the Division's scope in light of the present activities of the Division. Your input is welcome.

Test Methods Management Committee. TMMC announced that new guidelines for Test Method development and review are nearly ready for Board approval.

Collaborative Testing Subcommittee. Through the efforts of the TMMC and the Collaborative Testing Services, Inc. a mechanism has been established to use Division funding to run round-robin tests to establish repeatability and reproducibility of information. These data will be required for all methods if the new TMMC guidelines for methods are adopted. The CTS program remains strong with modest increases in participation over last year and improved graphical data analysis.

Chemical Properties Committee. The use of benzene in some extraction methods is still a problem. The present proposal is to develop a Recommended Practice that will outline the various solvent(s) that have been tried as replacements. The individual Test Methods will reference the Recommended Practice with an indication of the expected results. The users of the method will be responsible for the solvent selection which must be reported as part of the results section.

Pulp Properties Committee. The committee reversed an earlier decision to report the handsheet index values calculated on an oven-dried basis as contrasted to the present conditioned-weight basis. This will involve adding a section to the method for determining representative specimens from the scrap to dry for the determination of average moisture content.

Optical Properties Committee. The Optical Properties Committee meeting made progress in moving along methods to meet the deadline for the next publication of the Test Methods Book in 1994. Following the Committee meeting was the task group discussion on the development of the methodology for the automation of the TAPPI Dirt Counting Procedures. A Provisional Method has been balloted and the discussion centered on the resolution of comments. The group decided that the next step would be the development and production of a calibration chart for the instrumentation. The chart will permit run assessments of the various pieces of analytical equipment now available in the market. This information will prove helpful to the development of the new method.

Quality Management Committee. The chair of the Committee, Patricia Hartman, gave an excellent presentation on the revisions pending in ISO 9000 and the future direction of the next revision to the Standards. The 1993 revised draft is available from ANSI. Planned implementation will take effect upon publication of the Standards. Technical Committee 176 is continuing to work on the revisions which will be part of the anticipated 1998 five-year review of ISO 9000. We are fortunate to have excellent representation on this Committee. If you have input relative to future revisions for the next Committee Meeting, Feb. 28, 1994, you may contact one of our representatives:

- Patricia K. Hartman, Westvaco Co., Covington, VA, who is the AFPA delegate presently on the TC 176 Committee
- Lucille D. Hahn, Champion International Co., W. Nyack, NY, who is currently being balloted by the committee as the TAPPI delegate
- Brian D. Wood, Weyerhaeuser Paper Co., Tacoma, WA, who will be the AFPA alternate starting in 1994.

Industry input was instrumental in the establishment of TC 207 as the home for environmental quality management and not with TC 176 for the quality management standard. Your input is needed now!