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Tutorial 1: IEEE IAS/TAPPI Paper Machine Drives Short Course

(12 hour session: Thursday, June 21 thru Noon Friday, June 22, 2012)
Presented in conjunction with the IEEE Pulp and Paper Technical Conference

This course on paper machine drives will aid in the complete understanding of the selection, operation, troubleshooting, and maintenance of all paper machine drive systems, ac or dc.

Course Overview

Taught by paper machine drive engineers, all of whom have had many years of experience in drives on the paper machine, this course will help you understand the power demand calculations, the drive configurations for the sections, the detail application of ac drives, analysis of problems and the troubleshooting techniques, proper installation techniques and “gotchas” plus what to do to upgrade an existing drive system. All of this is directed to the drives of the paper machine.

This course focuses on the knowledge to apply basic paper machine drives to day-to-day operations, and will provide you with the know-how to evaluate and select paper machine drives, and modern machine configurations.

Why Attend?

- Increase your problem solving skills through team activities and practical problem-solving exercises
- Get personalized answers to specific questions and operating situations
- Learn how to use disturbance analysis for problem solving
- Achieve increased production volume due to less downtime

Who Should Attend?

Those who will benefit most include:

- Anyone in the mill with responsibility for the drives on a paper machine
- Anyone with corporate responsibility for the drives on a paper machine
- Consultants responsible for paper machine drives
- Mill/Plant Engineers
- Mill/Plant Maintenance Engineers and Lead Operators
- Application and Design Engineers (Controls and OEMs)
- Staff Engineers
- Electrical Superintendents
- Suppliers of Paper Mill Drives

Past Participants Have Said

"Now I'll be able to...

- Help solve the machine maintenance issues, reduce failures and improve future designs
- Apply this knowledge to more effectively communicate with drive maintenance technicians
- Look at PM drives for upgrades and sizing
- Look for adequate grounding for CMC and CMV causing bearing failures
- Look at capabilities for speed-up
- Troubleshoot drives"

Learning Outcomes:

After successfully completing this course, participants should be able to:

- Discuss the range of modern paper machinery and modern machine configurations
- Calculate drive HP using "unit constant" or "component value" theory
- Explain the fundamental relationships between mechanical and electrical systems and identify major application considerations of drive train components.
- Discuss AC drive selection and application, as well as installation and economic considerations of AC vs. C drives.
- Describe existing load and speed data for rebuilding a paper machine and evaluate data for HP selection
- Apply the fundamentals of disturbance analysis techniques to solve problems

Short Course Chairmen:

- Burt Judson, Rockwell Automation,
- Walter Jones, TMEIC Corporation

Preliminary Course Schedule

Thursday All Day

June 21 a.m. Wet End Drive Sizing (Power Calculations), *Tom Trueb, EFI Solutions, Inc.*

June 21 a.m. Dynamic Analysis and Troubleshooting, *John Bentley, Consultant*

12:00 p.m. Lunch

June 21 p.m. Wet End Control Configurations, *Alan Lowe, AMEC*

June 21 p.m. Dry End Drive Sizing, *Tom Trueb, EFI Solutions, Inc.*

June 21 p.m. Dry End Control Configurations, *Alan Lowe, AMEC*

June 21 p.m. Drive System Upgrades, *Walter Jones, TMEIC*

5:00pm Adjourn for the Day

Friday Morning:

June 22 a.m. Application and Selection Guidelines for AC System Drives, *Mark Weaver, Rockwell Automation*

June 22 a.m. Installation Practices: High Frequency Bonding and Motor Bearings, *Pat Link, Adjustable Speed Drive Services*

June 22 a.m. Disturbance Analysis and Troubleshooting, *Walt Jones, TMEIC*

June 22 Noon Course Ends

TAPPI Drives Short Course Biographies

Thursday & Friday, 21 & 22 June 2012

Presented in conjunction with the 2012 IEEE Pulp and Paper Technical Conference



Thomas O. Trueb P.E., President – efiSolutions, Inc; formerly Chief Engineer and Co-Founder of Dean Oliver & Associates. Tom has 40 years of paper industry experience as a paper mill project engineer, superintendent and engineering supervisor with Charmin Paper and later Union Camp followed by industry consulting experience with Simons-Eastern and Dean Oliver. Tom has authored several technical papers and has expertise in application of drives for extended nip presses, high intensity presses, multiwire fourdriniers, multiple headboxes and fan pumps, as well as paper machine dry end sections, coaters, embossers, rewinders, reelers and finishing winders. Tom has assumed leadership roles in TAPPI and other industry organizations culminating in TAPPI's EE Committee Chairman and PCE&I Division Chairman. Tom is the co-founder of the TAPPI Drives Short Course and has been involved as an instructor for the past 20 years. Tom also is experienced at restoring plant electrical systems from the effects of floods, hurricanes and fires.



John M. Bentley, Drive Systems Consulting Engineer/Retired. John began his distinguished career in 1951 and has over 55 years of experience serving the pulp and paper industry holding various application engineering positions with Westinghouse Electric Corporation, Allen-Bradley/Stromberg and ABB Industrial Systems until his corporate retirement in 1996. John has applied his drives systems expertise at hundreds of paper mills world-wide. John was appointed to the status of TAPPI Fellow in 1986, and in 1999 was elected as an IEEE Fellow "For contributions to the application and design of electrical drive systems in the pulp and paper industry". The Fellow status is one of the most prestigious honors bestowed by TAPPI and IEEE, and John is the only living member that has been awarded the Fellow status by both organizations. He was a founding faculty member of the TAPPI Drives Short Course, and has continued as an instructor for over 35 years.



J. Alan Lowe, P.E., Drives Systems Consulting Engineer – AMEC Engineers. Alan has 28 years of experience in the pulp and paper industry, specializing in paper machine drives and drives systems. He has served as Lead or Staff engineer on over thirty new and rebuilt paper machine related drive projects including tissue, towel, paper and liner board machines. Projects have included DC, AC and combination drive systems, winders, supercalendars, fan pumps, rereelers, coaters and various machine configurations. Alan is a member of the TAPPI PCE&I and a Senior Member of IEEE Pulp and Paper Committee, serving as past Chairman of the Drives and Controls Subcommittee and is now Membership Chairman. He has served on the faculty of the TAPPI Paper Machine Drives Short Course since 1991.

TAPPI Drives Short Course Biographies



Mark D. Weaver P.E., Senior Project Engineer – Rockwell Automation, Global Drive Systems. Mark has over 29 years of experience in the pulp and paper industry serving as an Engineering Specialist for Weyerhaeuser and later moved into the consulting community with Universal Dynamics. Mark has been responsible for engineering, construction, commissioning and startup of numerous paper machines/paper machine drives, winders/winder drive systems and turbo-generators with particular interest in winder control systems. He is active at in the TAPPI PCE&C committee as well as the IEEE Pulp & Paper committee and is also a member of ISA and PAPTAC. Mark has served on the faculty of the TAPPI Paper Machine Drives Short Course since 1983.



Walter V. Jones P.E., Senior Drives Systems Application Engineer – General Electric. Walt has 32 years of experience as a Control Engineer, Supervisor of engineers and Drive System Application Engineer for pulp and paper system drives. He is an active member of TAPPI, the IEEE Pulp & Paper Industry Committee and the PAPTAC. He was a past chairman of the Drives and Controls Subcommittee. He has authored and presented technical papers at conferences for all three of these industry societies related to drives and drives systems applications as well as drive seminars in USA, Canada, Poland and Brazil. Walt has extensive paper machine drives systems commissioning and troubleshooting experience at mills all over the world. He has been an instructor supporting the TAPPI Drives Short Course for the past 18 years.



Patrick J. Link P.E., President Adjustable Speed Drive Services Inc. Pat has over 21 years of paper industry drives experience with specific expertise in the installation, repair and troubleshooting of AC and DC drives and drives systems for paper machines. He is one of North America's leading experts in the detection and remedies of "fluted" bearing failures of motors operated by drives and has authored several technical papers on this subject. Pat has served as an active member of the TAPPI Motors, Controls & Drives subcommittee of the PCE&I Division, as well as the Drives Controls and Systems subcommittee of the IEEE Pulp & Paper Industry Applications Society. He has served as an instructor of the TAPPI Drives Short Course for the past 11 years.

TAPPI Drives Short Course Biographies



Burton M. Judson Jr., Senior Application Engineer, Global Drive System for Rockwell Automation. Burt began his career with Reliance Electric in 1961, and in fact started as part of the Paper Group at that time. Now some 48 years later, Burt is still very active in developing and marketing Drive Systems to the Paper Industry. He is an active member of TAPPI and the IEEE Pulp and Paper Industry Committee, serving in many positions of leadership in both groups. He has authored and presented many technical papers at those conferences as well as the Canadian Pulp & Paper Association. His experience includes many new and rebuilt paper machines, winders and off-machine coaters. While not a presenter at this year's Drives Short Course, he was active in organizing it and coordinating the efforts to present it during this year's IEEE P & P Conference.
