



IEEE PPIC Conference - June 21 - 23, 2021 – Virtual Conference

1	Update of the Generator Grounding Working Group
2	<u>Considerations for Adapting IEEE 1584-2002 Arc Flash Study Results to a Post IEEE 1584-2018 Risk Assessment Technical Panels</u>
3	<u>Applying Continuous Monitoring & Diagnosis (M&D) to Critical Rotating Machines With no Additional Device to Install</u>
4	<u>Implications of IEEE Guide 1584 (dec. 2018) Arc Flash Calculations</u>
5	<u>Leveraging Prevention Through Design Principles (PtD) in Electrical Installations</u>
6	<u>The Next Phase in the Evolution of Safety by Design – Digital Switchgear</u>
7	<u>IEC vs. ANSI MV Switchgear: Which one Should you use and does it Matter?</u>
8	<u>Paper Mill Case Study Field Testing for Power Transformers</u>
9	Introduction to IEEE Standard 1584 Guide for Performing Arc-Flash Hazard Calculations – 2018 Edition
10	<u>Motor Control Examined, Categorized and Optimized</u>
11	<u>Reducing Arc Flash in Common DC Bus Systems</u>
12	<u>Paper outlining conversion of (6) 1000hp DC fan pump motors to AC</u>
13	<u>Novel method to ensure the reliability of the DC motors controlled by an IGBT / PWM converter</u>
14	<u>A Review of Machinery Safety in the Pulp and Paper Industry</u>
15	<u>How to Sell an Investment in Electrical Safety and Maintenance</u>
16	<u>The Myths of used, repaired, re-conditioned, and retrofitting circuit breakers</u>
17	Protection of Small Low-Voltage Conductors Against High-Level Faults
18	Arc-Flash PPE – A Simplified Constant Energy Line Table Method
19	<u>The Autonomous Mill: Optimization Opportunities in the Pulp & Paper Mill</u>



IEEE PPFIC Conference - June 23 - 28, 2019 – Jacksonville, FL

Panel	Managing And Maintaining Obsolete Drive Systems
1	Impact of Improper Installation, Maintenance and Servicing of Electrical Equipment in Forest Products Industries
2	The Problem of Ground Faults on Overhead Lines with High Earth Return Resistance
3	Assessing the Health of an Electrical System
4	Application of Undervoltage Protection to Critical Motors
5	Underfrequency and Undervoltage Load Shedding in an Industrial Plant with Cogeneration Facilities
6	Making my Paper Mill Safer: An Arc-Flash Energy Reduction Story
7	Unique Challenges for Resistance Grounding of High Harmonic Content Power Systems
8	A Project to Correct Mill Power Factor - Selection and Deployment of a Second Capacitor Bank
9	A Hidden Hazard - Identifying, Understanding and Preventing Combustible Dust Explosions in Forest Industry Facilities
10	Strategies for Reliable Arc Flash Detection in Low Voltage Switchgear
11	Methods for Quantifying Rotor Condition in Synchronous Motors
12	A Design Guide to Neutral Grounding of Industrial Power Systems – Part II: Supplementary Topics
13	Vintage Low-Voltage Motor Control Centers – Replace or Upgrade?
14	Implementing an Intelligent Steam and Electrical Load-Shedding System for a Large Paper Mill: Design and Validation Using Dynamic Simulations
15	Review of the new IEEE STD. 3004.8 "Recommended Practice for Motor Protection in Industrial and Commercial Power Systems" with Focus on Forest Products
16	Most Common Mechanisms and Reasons for Electric Motor Failures in Industry
17	Oxygen at Extremely Low Levels In Transformer
18	Transformer Fuses - Mind The Gap
19	Nuggets of Knowledge - Transformer Service Life
20	Experiences of a Global Electrical Manufacturing Enterprise: The Journey to Become Industry 4.0 Ready
21	Process Control Networking - Bridging Between Process Control and Information Technology
22	Calculation of Degree of Polymerization in Cellulose from Methanol in Oil



IEEE PPFIC Conference - June 17 - 21, 2018 – Appleton, WI

Panel	Practical Application Of NFPA 70E Risk Assessment Process
Panel	Nuggets Of Knowledge - Transformer Service Life
Panel	Standards - Why You Should Be Involved?
1	Advances in Permanent Magnet Motors and Their Application in the Pulp, Paper, and Forest Products Industry
2	Elements of Tuning A Power System Stabilizer for NERC Compliance
3	Coming to Terms with PID
4	The Secret to That Old Black Magic – Commutation
5	How to Write a Mill Paper
6	Electrical Safety Training Requirements for All Personnel
7	Modeling and Evaluation of Paper Machine Coater Sections Part 1: 1-Coater Section and Tension Setpoints
8	Enhanced Productivity in Forest Product Industries with Lockout/Tagout Alternatives
9	Current Limiting Arc Flash Quenching System for Improved Incident Energy Reduction
10	Reducing the Arc-Flash Incident Energy in Secondary Bus of Medium and Low Voltage Substation Applications
11	How Close is Close Enough with DC Motors?
12	TRV (Transient Recovery Voltage) in High Voltage Current Interruption
13	Arc Flash in the National Electrical Code: Articles 240.87, 240.67; intent and reality, does the code achieve its goals? Do you achieve its goals?
14	Typical Power Circuit Breaker Maintenance Considerations
15	A Review of Intertie Protection
16	Insulation Monitoring On Common Grounding Methods in the Pulp and Paper Industry
17	A Phased Paper Machine Drive & Control System Upgrade
18	Transformer Fuse Sizing - The NEC is not the Last Word
19	Modeling and Evaluation of Paper Machine Coater Sections - Part 2: 2-Coater Section and Control Loop Bandwidths
20	Basics of Communication Networks for Electrical Engineers in the Forest Products Industries



IEEE PPFIC Conference - June 18 – June 23, 2017 – Tacoma, WA

1	Document Management for Design Engineering, Construction, and Owner Operators for the New Enterprise
2	Absence of Voltage Testers: A Guide to Listing Requirements
3	Case Studies of Stator Winding Turn Insulation Failures in Medium Voltage Motors
4	Power System Study at a Century-Old Paper Mill
5	MV Generator Ground Fault Arcing Power Damage Assessment
6	Common Problems in Commissioning of HRG Systems
7	Ground-Fault Protection - All You Need to Know
8	Advanced Feeder Protection Applications
9	Optimization of MV Distribution System Designs
10	Arc Flash Hazards - When Over-Estimating Under-Estimates a Problem
11	Understanding of Above-NEMA Specification Options
12	Digital Excitation Systems - Growing Obsolescence of Aging Systems
13	Operation and Starting of PAM Motors Using Vacuum Contactors
14	Operation of Variable Frequency Drive Motor Systems with Source Voltage Unbalance
15	Type B Ground-Fault Protection on Adjustable Frequency Drives
16	Arc Flash Risks in Switchgear Metering Compartments
17	Installing, Operating, and Maintaining DC Motors in a Paper Mill Environment
18	What Do You Do When the Lights Go Out?
19	Successful Technology Upgrade Reduces Thermo-Mechanical Pulp Mill Energy Footprint
20	LED Performance and Application Considerations for Industrial Environments
21	Methanol as an Aging Marker for In-Service Transformers
22	On-Line Partial Discharge Condition Monitoring of Complete Networks for Pulp And Paper Industry: Challenges and Solutions Explained Through Case Studies
23	NFPA 70E-15 and Arc Flash Risk Assessment Best Practices

2017 Tutorials	IEEE IAS / TAPPI Paper Machine Drive Course	12 PDH
	2017 NEC Significant Industrial Changes	4 PDH
	Electrical Safe Work Practices for the Forest Industry – NFPA 70E and OSHA	2 PDH



IEEE PPFIC Conference - June 19 – June 23, 2016 – Austin, TX

1	Panel Discussion - DC Motor Total Cost of Ownership - Leveraging Reliability to Reduce Total Cost of Ownership
2	The Enterprise Smart Grid: The Future of Energy Management Systems
3	Electrical Safety by Design and Maintenance
4	Response of Thermal Overload Relays and Phase Monitors to Power Quality Events
5	Mill Experience Estimating Vacuum Interrupter Service Life Using MAC Testing - Phase II
6	Selective High Resistance Grounding System For a Cogeneration Facility
7	Converting Solidly Grounded Transformers to High Resistance Grounding Systems: Practical Applications Study
8	Considerations for the Application of a MV High Speed Grounding Switch for Arc Flash Mitigation of LV Equipment
9	Does Every Millisecond Really Count? A Comparison of Protection Based Arc Flash Mitigation Techniques
10	Considerations for Differential Protection in LV Buses
11	Generator Collector Enclosure DC Arc Flash Incident Energy Analysis
12	How Poor Communications Lead to a Near-Fatal Accident
13	The Making of IEEE 1683 - An Introduction and Behind-The-Scenes Look
14	The Art of Generator Synchronizing
15	Advanced Generator Ground Fault Protections in Pulp and Paper Mill Applications
16	The Benefits of Implementing & Practicing an Intimate DC Motor-Brush Program
17	Why Can't I Start My Motor: Lessons Learned from Bad Motor Protective Settings
18	Valve Control Sizing and Selection in Pulp and Paper - Getting It Right
19	Application of STATCOM to an Industrial Distribution System Connected to a Weak Utility System
20	Using Negative Sequence Current to Detect Line-To-Line Faults in Transformers
21	Medium Voltage Auto Transformer Failures: Explaining the Unexplained - Continuation Of The Story
22	The Impact of Switching Frequency on PWM AC Drive Efficiency
23	New Developments in Loss Minimizing Control For Drives Without Compromising Torque Dynamics
24	Proven Methodologies for the Selection of Suitable Applications for Adjustable Speed Drives
25	Process Modernization Upgrade: Selecting and Installing a New Medium-Voltage Motor Control Center

2016 Tutorials	The Importance of Performing a Plant Power System Study	4 PDH
	NFPA Updates and Safety Issues Pertaining to the NEC and NFPA70E	4 PDH
	Consideration in Specification and Selection of Induction and Synchronous Motors for Paper Mill Applications	2 PDH



IEEE PPIC Conference - June 14 – June 18, 2015 – Milwaukee, WI

1	Review of Upcoming Motor Efficiency Regulations In U.S.
2	Practical Application of the 2015 NFPA 70E Tables
3	Monitoring of Electrical Equipment Failure Indicators and Zero-Planned Outages: Past, Present And Future Maintenance Practices
4	Advanced Concepts in High Resistance Grounding
5	The Achievable Corporate Safety Program for the Forest Products Industry
6	Differential Protection Used With Motors, Motor Controllers and Adjustable Frequency Drives: What You Didn't Know!
7	Application of Multi-Function Motor Protection Relays to Variable Frequency Drive Connected Motors
8	Out-Of-Step and Single Phasing Protection of Synchronous Chipper Motors
9	Software vs Hardware Approach to Emissions Monitoring
10	MV-105 Cable-Field Acceptance Testing - A Cable Manufacturer's Perspective
11	Legacy Process Control System Migrations
12	New Pre-Emptive Arc Fault Detection Techniques in Medium Voltage Switchgear and Motor Controls
13	One Mill's Experience Using MAC Testing to Evaluate Vacuum Interrupter Integrity in 15KV Vacuum Switchgear
14	Anomalies in Interpretation of Transformer Oil Tests for Thermally Upgraded Paper - A Case History
15	Improving Pulp and Paper Plant MV Transformer Protection
16	The Experience Acquired Sizing Snubbers to Mitigate Switching Transients in Industrial Power Systems
17	Signature Analysis for On-Line Motor Diagnostics
18	Value of Insulated Bus Bars in Reducing Arcing Fault Duration in Low Voltage Systems
19	Electrical Safety Basics for Non-Electrical Personnel
20	Infrared Windows Applied in Switchgear Assemblies: Taking Another Look
21	Power and Efficiency Measurement of Motor-Variable Frequency Drive Systems
22	Installation and Maintenance of Synchronous Motors
23	Understanding Stator Installation In-Process Testing
24	Identification of False Rotor Fault Indications Produced by On-Line MCSA for Medium Voltage Induction Machines
25	Longevity of an Induction Motor

2015 Tutorials	Industrial Ethernet Communications	8 PDH
	OSHA 1910.269 & 1926 Subpart Revisions Applicable to the Pulp and Paper Industry	4 PDH
	Exposed to the Arc Flash Hazard	4 PDH
	Professional Engineering Ethics	2 PDH



IEEE PPIC Conference - June 23 – June 27, 2014 – Atlanta, GA

1	Electrical Safety on Multi-Employer Worksites
2	Understanding Rotor Balance for Electric Motors
3	Industrial Ethernet - Overview and Best Practices
4	Developments in Fast Load Shedding
5	A Review of Commonly Used DC Arc Models
6	Exposed to The Arc-Flash Hazard
7	Electrical Safety-Related Maintenance Practices
8	High-Speed Bus Transfer Supervision
9	Motor Optimization for Drive Packages
10	Practical Approaches to Mitigate Mechanical Failures In ASD Driven Equipment
11	Practical Aspects of Rotor Cage Fault Detection for Medium-Voltage Induction Motors
12	Part II: Application Guidelines for High Resistance Grounding of Low-Voltage Common AC Bus & Common DC Bus PWM Drive Systems
13	Torrefied Wood Field Tests at a Coal-Fired Power Plant
14	Applying a New 480V Industrial GFCI for Personnel Protection in the Pulp and Paper Industry
15	Expert System for the Detection of Condensate Accumulation Inside Dryer Cylinders During Sections Starting
16	Experimental Evaluation of Low-Voltage Off-Line Testing for Induction Motor Rotor Fault Diagnostics
17	Auto Tuning Speeds Commissioning of the Generator Excitation System
18	Design and Application of a Second Order High Pass Damped Filter For 8000HP ID Fan Drives - A Case Study
19	Disaster Recovery: What To Do After the Storm
20	Expected Savings Using Loss-Minimizing Flux On IM Drives Part I: Optimal Flux and Power Savings for Minimum Losses
21	A Guide for the Ranking and Selection of Induction Motors
22	Application Considerations - Replacing Legacy Motors
23	Advances in Protective Device Interlocking for Improved Protection and Selectivity
24	Advanced Motor Monitoring and Diagnostics
25	The Effect of Drive System Design on Total Cost of Ownership
26	Selecting the Proper LED Light Fixture To Enhance Safety in Harsh & Hazardous Environments
27	Determining Circuit Breaker Health Using Vibration Analysis - A Field Study
28	Why Upgrade the Protection and Grounding of Generators at Pulp and Paper Mills?

2014 Tutorials	IEEE IAS / TAPPI Paper Machine Drive Course	12 PDH
	Upcoming Changes in NFPA 70E -2015 Standard for Electrical Safety in the Workplace	4 PDH
	Applying Motors on Pump Applications using Pump Curves	4 PDH



IEEE PPIC Conference - June 23 – June 27, 2013 – Charlotte, NC

1	Electrical and Mechanical Differences Between NEMA and IEC AC Low Voltage Random Wound Induction Motors
2	Root Cause Analysis of Motor Stator Failures
3	Totally Enclosed Fan Cooled (TEFC) Squirrel Cage Induction Motor Options
4	Understanding Infrared Windows and Their Effects on Infrared Readings
5	Review of Upcoming Motor Efficiency Regulations in the U.S.
6	Preparing for a Career in the Paper Industry: The Value of a Student Intern Experience
7	An Update on the Revisions to IEEE Standard 1566
8	Reducing Energy and Maintenance Costs While Improving Light Quality and Reliability With LED Lighting Technology
9	Generalized Correlations for the Estimation of Condensate Power in Flooded Cylinders
10	Reducing Downtime by Proper Motor Lubrication
11	Benefits of IEC 61850 Standard for Power Monitoring and Management Systems in Forest Products Industries
12	Management of Atmospheric Gases in High Reliability Outdoor Distribution Transformers
13	Arc-Flash Hazard Calculations in LV & MV DC Systems - Part I - Short-Circuit Calculations
14	Arc-Flash Hazard Calculations in LV & MV DC Systems - Part II – Analysis
15	Productively Safer Lock-Out Tag-Out Procedure with Permanent Electrical Safety Devices
16	A Novel Approach for Arc-Flash Detection And Mitigation: At The Speed of Light and Sound
17	Estimation of Condensate inside Dryer Cylinders during Sections Shut Down
18	Observer-Based Estimation of Modulus of Elasticity for Papermaking Process
19	Commissioning and Periodic Maintenance of Microprocessor-Based Protection Relays at Industrial Facilities
20	Induction Motor Single-Phasing Performance under Distribution Feeder Re-closer Operations
21	Higher Energy Efficiency Standards Coming from the Department of Energy for Distribution Transformers
22	Reliability Centered Maintenance for Electrical Equipment Critical to Worker Safety
23	Detection of Loss of Voltage Phase
24	Arc Flash Hazard Mitigation and Electrical Safety Considerations for LV Adjustable Speed Drives
25	Paper Machine Dryer Section Tuning
26	Factors to Consider When Determining Maintenance Intervals
27	Brushless Rotating Exciter Conversion to Main Field Static Exciter System

2013 Tutorials	Fundamentals of Electric Motors	4 PDH
	Generator - Outage Planning	4 PDH
	When Bad Things Happen to Good Instrument Transformers	4 PDH
	Protection of Medium Voltage Transformers at Industrial Facilities	4 PDH



IEEE PPIC Conference - June 17 – June 21, 2012 – Portland, OR

1	Update on IEEE NFPA Research Project On Arc Flash
2	Arc-Flash Hazard Analysis of Power Systems With Overduty or Series Rated Equipment
3	NEC Design Compliance, System Protection and Arc Flash Hazard
4	Maximizing Protection By Minimizing Arcing Times In Medium Voltage Systems
5	Safety Maintenance Requirements for Power Circuit Breakers
6	Practical Applications of Peer-to-Peer Messaging In Industrial Facilities
7	Current Transformer Saturation Effects on Coordinating Time Interval
8	Continuous Online Partial Discharge Monitoring of Medium Voltage Substations
9	An Experimental Evaluation of the Effect of Voltage Distortion on the Performance of Induction Motors
10	On-Site Biomass Co-Gen Case Study: Unleashing Power to Create Value for the Wood Products Industry
11	Study of the Effects of Mining Industry Contaminations on Protective Properties of Arc-Related Clothing ASTM F1959
12	Overview of Changes To IEEE 902 - Guide for Maintenance Operation and Safety of Industrial and Commercial Power Systems
13	Arc-Flash Study and Remediation Project in a Pulp and Paper Mill
14	Case History of a Mill-Wide Project for NFPA 70E Compliance and Arc-Flash Hazard Mitigation
15	The Effect of Reactive Compensators and Coordination with V/Hz Limiting
16	13.8 KV Selective High-Resistance Grounding System for a Geothermal Generating Plant - A Case Study
17	Fully Monitoring Industrial Protection & Control Systems
18	Using Numerical Protection Relays as Asset Management Tools
19	A Comparative Analysis of Voltage Magnitude Deviation and unbalance on Standard and Premium Efficient Induction Motors
20	Testing MV Cables
21	Using Magnetic Flux Monitoring to Detect Synchronous Motor Rotor Winding Shorts
22	Megawatt Increase Potential in Rewinding Generators
23	Choosing the Correct Transfer Switch
24	The Temperature Impact of Magnetic Wedges on TEFC Induction Motors

2012 Tutorials	IEEE IAS / TAPPI Paper Machine Drive Course	12 PDH
	NFPA 70E-2012: Standard for Electrical Safety in the Work Place	8 PDH
	Medium Voltage Transformer Failure due to Circuit Breaker Induced Switching Transients	4 PDH



IEEE PPIC Conference - June 19 – June 23, 2011 – Nashville, TN

1	Update on IEEE/NAPA Research Project on Arc Flash
2	Change and Enhancements to NFPA 70E for 2012 Edition
3	Electric Shock and Arc Flash Mitigation, A Total System Approach
4	Protective Relaying Methods for Reducing Arc Flash Energy
5	Protecting Large Machine from Arcing Faults
6	Improving Selectivity & Arc-Flash Protection Through Optimized Instantaneous Protection Settings
7	Arc Flash Energy Reduction Techniques Zone Selective Interlocking & Energy-Reducing Maintenance Switch
8	Practical Application of Ethernet within the Substation & Industrial Facilities
9	A Step Closer Towards Maintenance Free Gear
10	Application of UL Type MC-HL Cable - In The Pulp and Paper –Wood Products Industries
11	Recent Harmonization of ANSI/IEEE Standards for HV Breakers with IEC and its Impact on Application and Analysis
12	Improvements in Protection and Commissioning of Digital Transformer Relays at Medium Voltage Industry Facilities
13	Testing Numerical Transformer Differential Relays
14	Coordination of Excitation Limiters with Excitation Protection
15	Avoiding Loss of Voltage Sensing Runaway for Generating Excitation System
16	Estimation of Sheet Modulus of Elasticity Using Drive Field Signals
17	Motor Selection For Centrifugal Pump Applications Made Easy
18	Innovative Direct Drive Motor Applications for Pulp and Paper
19	DC Motor Cooling Air Considerations
20	Online Estimation of the Condensate Load in Dryer Cylinders during Section Starting
21	Protection of Remote Located Motors
22	Wound Rotor to Induction Motor/VFD Conversion Case Study
23	Rolling Element Bearing Basics in Large Electric Motors
24	Considerations in Network and Automation Options for L.V. Motor Control Centers

2011 Tutorials: Advance Look at the Changes to NFPA 70E 2012 Standard for Electrical Safety in the Workplace 4 PDH
 The Protection of MV Synchronous Generators 8 PDH
 Electrical Safety Management 4 PDH
 Changes in NFPA/2011 NEC That Affect Industry 4 PDH

IEEE PPIC Conference - June 20 – June 25, 2010 – San Antonio, TX

1	Solidly Grounded Low Voltage Source Contribution to Device Interrupting Duty
2	Un-Powered Thermal Memory Protection for Circuit Breakers
3	Impact of CT Errors on Protective Relays – Case Studies and Analyses
4	Tuned Capacitor Bank Component Selection – What Difference Does It Make?
5	Condensate Effects on Power and Torque Requirements During Starting of Dryer Sections
6	Efficient Applications of Bus Transfer Schemes
7	High-Speed Transfer of Two 4 KV Motor Bus Sources Using a Digital Motor Bus Transfer System
8	Transformer Failure Due to Circuit Breaker Induced Switching Transients
9	Demonstration of Very High Temperature Kiln for Drying Softwood Lumber
10	Arc Resistant Equipment for Low Voltage Motor Control Center Applications
11	Protection Planning and System Design to Reduce Arc Flash Incident Energy in a Multi-Voltage Level Distribution System to 8 CAL/CM2 (HRC2) or Less - Part I Methodology
12	Update on IEEE/NFPA Research Project on Arc Flash Protection Planning and System Design to Reduce Arc Flash Incident Energy in a Multi-Voltage Level Distribution System to 8 CAL/CM2 (HRC2) or Less - Part II Analysis
13	Protecting at the Speed of Light: Combining Arc Flash Sensing and Arc-Resistant Technologies
14	Considerations in Unit Substation Design to Optimize Reliability and Electrical Work Place Safety
15	Arc Flash Energy Mitigation by Fast Energy Capture
16	Adoption of the Energy Independence and Security Act of 2007
17	Flux Monitoring Improvements for On-line Condition Monitoring of Turbine Generator Rotors
18	Specifying Excitation Systems for Procurement
19	Introduction to IEEE 841-2009 For Severe Duty TEFC Squirrel Cage Induction Motors - Up To 370 KW (500 HP)
20	Fully Utilizing the IED Capability to Reduce Wiring
21	Higher Withstand MCC for Better Selective Coordination
22	Carbon Brush Performance On Slip Rings
23	Paper Mill Boosts Reliability Centered Maintenance Program With Cost Savings Generated by Its Infrared Window Program
24	Thermal Models for On-Line Detection of Pulp Obstructing the Cooling System of TEFC Induction Motors in Pulp Area
25	Enhanced Algorithm For Motor Rotor Broken Bar Detection
26	ID Fan Drive Efficiency Upgrade: MV AFD to Replace Mechanical Drive Steam Turbine
27	Specific Design Considerations for AC Induction Motors Connected to Adjustable Frequency Drives
28	Optimize the Life and Performance of Rotary Encoders Through Correct Mounting

2010 Tutorials:	Generator Maintenance and Failure Mode Analysis	4 PDH
	Motor Protection Principles	4 PDH
	Grounding	4 PDH
	Fundamentals of Induction Motor Applications	4 PDH



1	Motor Maintenance Testing & Diagnostics
2	Active Stator Winding Thermal Protection For AC Motors
3	Utility Reclosing and Industrial Motors
4	Review of Upcoming Changes to Global Motor Efficiency Regulations
5	Commutation of DC Motors Operated At Reduced Field Current
6	Causes And Reduction Techniques Of Electromagnetic Noise In Induction Motors
7	Developing An Enterprise Wide Approach To Winder Safeguarding
8	Simple and Reliable Model for the Thermal Protection of Variable Speed Self-ventilated Induction Motor Drives
9	Professional Networking On The Internet
10	Use Of Third Party Electrical Equipment And Materials
11	Proper Testing of Protection Systems Ensures Against False Tripping and Unnecessary Outages
12	IEEE/NFPA Collaboration On Arc Flash Research And Testing
13	NFPA And Its Implications On Thermographic Inspections
14	Proper Application & Maintenance Of Molded Case Breakers To Assure Safe And Reliable Operation
15	Advancements in Technology Create Safer & Smarter HRG Systems
16	Considerations For Installing And Applying Arc Resistant Low And Medium Voltage Control Equipment In Forest Products Industries
17	Calculating Incident Energy Released with Varying Ground Fault Magnitudes on Solidly Grounded Systems
18	Digital Implementation Issues of Electronic Line Shafting
19	The Identification Of Opportunities to Improve Pump System Maintenance And Reduce System Energy Losses
20	Method For Determining Selective Capability of Current-Limiting Overcurrent Devices Using Peak-Let-Through Current
21	Managing Through Economic Downturns – Before, During and After Job Loss and Career Change - Panel
22	Experience With Partial Discharge Testing During Voltage Surges As Required By IEC 60034-18-41 and 60034-18-42
23	Experimental Evaluation and Modeling of Condensate Effects in Dryer Cylinders
24	Innovative, Robust And Secure Industrial Solutions Using Microprocessor Relays
25	Switching Transient Analysis and Specifications for Practical Hybrid High Resistance Grounded Generator Applications
26	Generator Failures in Pulp and Paper Mill Style Generators
27	Lessons Learned From Generator Tripping Events at Industrial Facilities
28	Calculations of Generator Source Short- Circuit Current According to ANSI/IEEE and IEC Standards, with EMTP Verifications

IEEE PPIC Conference - June 21 – June 26, 2009 – Birmingham, AL

2009 Tutorials: Symmetrical Components
TAPPI Paper Machine Drive Short Course
Relay Performance During Saturated CT Conditions

8 PDH
8 PDH
4 PDH



1	Estimating Key Parameters for Protection of Undocumented AC Motors
2	Forces And Stresses In Squirrel Cage Motors During Starting
3	Topics Of Common Interest To The Wood Products And Paper Industries
4	Online And Non-Intrusive Continuous Motor Energy And Condition Monitoring In Process Industries
5	Part I: Application Guidelines For High Resistance Grounding of Low Voltage Common AC Bus & Common DC Bus PWM Drive Systems
6	Dynamic On-line Sensing of Sheet Modulus of Elasticity
7	Heated Tubing: Prefabricated Or Field Trace & Insulate?
8	Evaluation Of The Proposed Retirement Of A Condensing Turbine Generator On The Paper Mill Electrical Distribution System And Utility Ties
9	Coordination Of Generator Protection With Generator Excitation Control And Generator Capability
10	Upgrading Power System Protection to Improve Safety, Monitoring, Protection, and Control
11	Learnings From Arc Flash Hazard Assessments
12	Case Studies In Arc Flash Reduction To Improve Safety And Productivity
13	Infrared Inspection In Forest Products Processing Environments
14	Effective Capital Project Commissioning
15	Effect Of Insulating Barriers In Arc Flash Testing
16	The Impact Of Arc Flash Test Conditions On The Arc Rating Of PPE
17	Modified Medium Voltage Arc Flash Incident Energy Calculation Method
18	One Mill's Response To A Specific Type Of Arc Flash Problem
19	Safety And Environmental Evaluation Of Insulating Media In Medium-Voltage Distribution Equipment
20	Application Of Medium Voltage Cable Predictive Diagnostics
21	Zone Based Protection For Low Voltage Systems; Zone Selective Interlocking, Bus Differential And The Single Processor Concept
22	Document Management For Design Engineering, Construction, And Owner Operators
23	Remote Monitoring And Expert Diagnostic Support For The Pulp & Paper Industry
24	Design And Application Of Low Ratio High Accuracy Split-Core, Core-Balance Current Transformer
25	The Final Frontier – Safety By Design: Emerging Standards And Designs In Low-Voltage Motor Control Assemblies
26	The Case For Interns
27	Permanent Magnet Motors For Power Density And Energy Savings In Industrial Applications
28	A Case History For Assessing Power Requirements On Line-Shaft Driven Sections For The Purpose Of Converting The Sections To Electrical Sections
29	Alternate Solutions To Replacing Aged Static Exciter Systems
30	Application of Digital Radio for Distribution Pilot Protection

IEEE PPIC Conference - June 22 – June 27, 2008 – Seattle, WA

2008 Tutorials:	NFPA 70E -2009 What Has Changed & Maintenance Requirements	8 PDH
	Power System Basics - System Design, Short Circuit Calculations, Surge Protection	8 PDH
	Changes in the 2008 NFPA70 National Electrical Code Parts 1 & 2	8 PDH
	Proper Selection, Installation and Maintenance of Tachometers & Encoders	4 PDH



1	Protection of Tuned Capacitor Banks
2	Insulation Problems In Medium Voltage Stator Coils Under Fast Repetitive Voltage Pulses
3	Considerations When Applying Microprocessor Relays in Chemically Harsh Environments
4	Distribution Equipment Modernization to Reduce Arc-Flash Hazards
5	Method for AC Powerline Impedance Measurement
6	Understanding Power System Stability
7	Electrical Testing Of Motors Rated 6Kv And Below
8	Power System Blackouts - Minimizing Their Impact on Industrial Co-Generation Facilities
9	Technical and Economic Considerations of Aluminum Conductors
10	Paper Mill Case Study in Safety Improvements for Generator On-Line Brush Changing
11	Comparison of Methods for the Mitigation of Line Disturbances due to PWM AC Drives
12/13	Lessons Learned Through Commissioning and Analyzing Data from Transformer Differential Installations - Part 1 & 2
14	Recruiting Young Engineers to the Pulp & Paper Industry - Perspectives from Recent Graduates
15	Industry Trends - Biorefineries: Project Comparison Reveals Leadership Gap
16	Process Control Security Journey
17	Applying LV Circuit Breakers to Limit Arc Energy
18	Robust sheet tension observer for Winders
19	Field Experience Identifying Electrically Induced Bearing Failures
20	Preventative Maintenance and Reliability of Low Voltage Overcurrent Protective Devices
21	Application of Existing Technologies to Reduce Arc- Flash Hazards
22	Capacitor Application Issues
23	Recent Revisions of IEEE 1068 Standard for Repair and Rewinding of AC Electric Motors
24	Computer-aided Controller Setting Procedure for Paper Machine Drive Systems
25	Panel Presentation - Energy Star - Industrial Focus For Pulp and Paper Mills
26	The Economics of Pre-EPACT Motors Operating in Industry
27	Considerations In Medium Voltage Reduced Voltage Motor Starting The Good, The Bad And The Ugly
28	Corrosion of Electrical Conductors in Pulp and Paper Industrial Applications
29	The Repair/Replace Decision from a Total Motor Management Perspective
30	Restoration and Upgrade of a Paper Mill's Electrical Generating System - A Case Study of Brownville Specialty Paper Products
31	Beyond the Calculations: Life After Arc Flash Analysis
32	Reducing Interrupting Duties of Medium Voltage Circuit Breakers by Increasing Contact Parting Time
33	The Influence Of Axial Magnetic Centering Forces On Sleeve Bearing Induction Motors

IEEE PPIC Conference - June 24 – June 29, 2007 – Williamsburg, VA

2007 Tutorials:	Understanding NFPA 70E-2004 Requirements	4 PDH
	Marginal Economics of Steam Production vs Generation	4 PDH
	Personal Protective Equipment for Electrical Safety	4 PDH
	Use of Adjustable Speed Drives for Energy Savings & Productivity Improvements	4 PDH
	Grounding and Ground Fault Protection of Medium Voltage Industrial Generators	4 PDH
	Electrical Safety in the Workplace: NFPA 70E, CSA Z462 and OSHA Regulations	4 PDH



For Electrical Safety
Protective Relay Coordination



8 PDH
8 PDH



IEEE PPIC Conference - June 18 – June 23, 2006 – Appleton, WI

1	Dryden Operations Improved Power Distribution System Reliability - A Case Study
2	Effects of Power Quality Distortions on Electrical Drives and Transformer Life in Paper Industries: Simulations and Real Time Measurements
3	Application of IEEE STD 519-1992 Harmonic Limits
4	Ground Fault Protection for Bus Connected Generators in an Interconnected 13.8kv System
5	Is My UPS Distribution System Coordinated?
6	Proper Cable Installation Practices for AC drives
7	Ground Fault Location in Low-Voltage High-Resistance Grounded Systems via the Single-Processor Concept for Circuit Protection
8	Engineering Selection for an ID Fan Drive: Steam Turbine or VFD Electric Motor Drive
9	Effect of Protecting Covers for TEFC Induction Motors Covered by Pulp
10	Integrate Protection and Control Systems with Continuous Self Testing
11	Optimizing Waste Fuel Boiler Control with Multivariable Predictive Controls
12	PLC Based Turbine Governor System
13	Power System Stabilizer Performance with Summing Point type VAR/Power Factor Controllers
14	Improved Coordinated Response and Disturbance Rejection in the Critical Sections of Paper Machines
15	Line Shaft Experience with Partial Sectionalization of a Paper Machine
16	Real-Time Web-Based System Monitoring
17	Applying Wireless Sensor Networks in Industrial Plant Energy Evaluation and Planning Systems
18	Panel – Energy Incentives and Programs Available to the Pulp and Paper Industry
19	Electrical Hazards Analysis
20	Using IR Sightglasses to Protect Against Arc Flash Exposure
21	Testing and Certification of MV Motor Control Centers to Arc Resistant Standards
22	Use of Instantaneous Trip Functions and Current Limiting Fuses to Reduce Arc Flash Energy
23	Arc Flash Hazards Calculations - Myths, Facts, Solutions

2006 Tutorials:	Understanding Arc Flash	8 PDH
	Power Cable Applications for Adjustable Speed Drive (ASD) Systems	4 PDH
	The Selection, Care and Feeding of Rolling Element Electric Motor Bearings	4 PDH
	for AC and DC Motors Through 500 HP (370 KW) on IEEE 841 Size Motors	
	Protection of Medium Voltage Transformers at Industrial Facilities – Morning Session	8 PDH



IEEE PPIC Conference - June 20 – June 24, 2005 – Jacksonville, FL

1	Comparison Testing of IEEE Standard 841 Motors: Revisited
2	Fundamentals of a Motor Thermal Model and its Applications in Motor Protection
3	Sealed Insulation Systems for Electric Motors
4	Techniques in Motor Starting
5	Selection of Electric Motor Bearings for Coupled and Belted Loads
6	Plant Efficiencies Benefit by Selection of Synchronous Motor
7	Dynamic Compensation of Torsional Oscillation in Paper Machine Sections
8	Evaluating Tuned Capacitor Banks for South America
9	Selection, Application and Interchangeability of Medium Voltage Power Fuses in Motor Control Centers
10	On the Use of IEEE 802-15.4 to Enable Wireless Sensor Networks in Pulp and Paper Industry
11	Experiences of Monitoring Partial Discharges in a Pulp and Paper Mill
12	Objective Methods to Interpret Partial Discharge Data on Rotating Machines
13	Changing the National Electrical Code
14	Analysis and Control of Large Shunt Capacitor Bank Switching Transients
15	Life Prediction Modeling of Bus Capacitors in AC Variable Frequency Drives
16	Mill Requirements for Drive System Trending HMI
17	Dispersed Generation Interconnection – Utility Perspective
18	Tension Control of a Two Drum Winder Using Paper Tension Estimation
19	Design Aspects of Industrial Distribution Systems to Limit Arc Flash Hazard
20	Practical Methods in Reducing the Dangerous Arc Flash Hazard Areas in Large Industrial Facilities
21	An Introduction to American Petroleum Industry Standard API547 for 250-3000HP Motors
22	Training Electrical Maintenance Employees to be Qualified
23	NFPA 70E-2004 Overview and Future Directions
24	Reducing Outage Maintenance Costs by Performance Based Maintenance
25	Reconditioning Pulp and Paper Mill Generators for Reliable Service
26	Ground Fault Detection in Multiple Source Solidly Grounded Systems via the Single-Processor Concept for Circuit Protection
27	Beyond Electrical Heat Tracing: Safety Showers Update
28	Protection and Commissioning of Multifunction Digital Transformer Relays at Medium Voltage Industrial Facilities
29	Applying Microprocessor-Based Protective Relays in Switchgear with AC Control Power
30	Generator Protection and CT Saturation Problems and Solutions
31	The Use of Infrared Viewing Systems in Electrical Control Equipment
32	Web Inspection Using Gradient-Indexed Optics

2005 Tutorials: Power System Harmonics
Fundamentals of Harmonics
The 2005 National Electric Code (NEC) - "What's New?"

6 PDH
3 PDH
4 PDH



IEEE PPIC Conference - June 27 – July 1, 2004 – Victoria, BC, Canada

1	Comparison of IEEE 841 1994 to 2001. Where Might The Standard Go On The Next Revision Cycle?
2	Thermal Derating of TEFC Induction Motors Coated Or Partially Coated By Spilled Pulp.
3	Evaluation Of Torsional Oscillations In Paper Machine Sections.
4	A Review Of The Design Considerations Of Replacement Drive System Installation.
5	Replacement of Mechanical PIV's by AC Drives – Off-Machine Coater Rebuild – Lineshaft To Sectional
6	A Unique Paper Machine Drive System Revamp.
7	Safety Aspects Of Permanent Magnet Motors In Paper Machine Applications.
8	Direct Drive Induction Motors.
9	Understanding the EASA Mechanical Repair Guideline.
10	Assessment Of Non-Intrusive Motor Efficiency Estimators.
11	Proactive Motor Management Can Help Reduce Operating Costs In The Pulp & Paper Industry.
12	Medium Voltage Reduced Voltage Autotransformer Starter Failures – Explaining The Unexplained.
13	Transient Stability Study Of Small Plant Generators Connected To A Weak Utility System – A Case Study.
14	Advances In Generator Field Ground Protection Using Digital Technology.
15	Tuning a PID Controller For A Digital Excitation Control System.
16	Selecting The Excitation System For The Additional Turbine Generator At The Port Wentworth Mill.
17	A Practical Approach To Arc Flash Hazard Analysis And Reduction.
18	Understanding Arc Flash Hazards.
19	Circuit Breaker Interrupting Capacity And Short-Time Current Ratings.
20	Smart Industrial Substations – A Modern Integrated Approach.
21	Protection, Control, Reliability And Diagnostic Improvements Via Single-Processor Control Of Circuit Breakers In Low-Voltage Switchgear.
22	Misapplication Of Power Capacitors In Distribution Systems With Non-Linear Loads – Three Case Histories.
23	Optimizing NEMA TP1 Transformers For Process Industry Substation Service.
24	Maximizing Energy Savings With Enterprise Energy Management Systems.
25	Commissioning & Maintenance Testing Of Multifunction Digital Relays.
26	Primary High Current Testing Of Relays With Low Ratio Current Transformers.
27	Field Commissioning And Maintenance Of Small Power Liquid-Filled Transformers.
28	Protective Devices Maintenance As It Applies To The Arc/Flash Hazard.

2004 Tutorials: Engineering: A Craft in Crisis
Arc Flash Hazard Analysis
AC Motors Protection

8 PDH
8 PDH
8 PDH

2004 Tour: Herzberg Institute of Astrophysics



IEEE PPIC Conference - June 16 – 23, 2003 - Charleston, SC

1	Practical Approach for Determining Motor Efficiency in the Field Using Calculated and Measured Values
2	Proper Selection of Induction Motor Tests
3	Estimation of Induction Motor Parameters by a Genetic Algorithm
4	Optimal Induction Motor Bearing Selection
5	Die-Cast Copper Rotors for Improved Motor Performance
6	Impulse Testing and Turn Insulation Deterioration in Electric Motors
7	Grounding and Ground Fault Protection of Multiple Generator Installations on Medium-Voltage Industrial and Commercial Power Systems - Part 1: The Problem Defined
8	Grounding and Ground Fault Protection of Multiple Generator Installations on Medium-Voltage Industrial and Commercial Power Systems - Part 2: Grounding Methods
9	Grounding and Ground Fault Protection of Multiple Generator Installations on Medium-Voltage Industrial and Commercial Power Systems - Part 3: Protection Methods
10	Grounding and Ground Fault Protection of Multiple Generator Installations on Medium-Voltage Industrial and Commercial Power Systems - Part 4: Conclusion & Bibliography
11	MV Generator Low-Resistance Grounding and Stator Ground Fault Damage
12	Future Control Technologies in Motor Diagnostics and System Wellness
13	Application of a Hybrid Grounding Scheme to a Paper Mill 13.8KV Generator
14	Advantages of Continuous Monitoring of Partial Discharges in Rotating Equipment and Switchgear
15	An Overview of the State-of-the Art in Electrical Safety Technology, Work Practices and Management Systems
16	Establishing Safety of Electric Equipment in Industry
17	Expert System for integrated Control and Supervision of Dry- End Sections of Paper Machines
18	Regulation Effects of a Nipped, Soft Covered Roll
19	Energy Efficiency of Variable Speed Drive Systems
20	Thermal Evaluation of TEFC Induction Motors Operating on Frequency Controlled Variable Speed Drives
21	Direct Drive — Opening a New Era in Many Applications
22	Room Construction and Sealing Standards for Atmospheric Corrosion Protection
23	Passive Filters Potentialities and Limitations
24	Even Harmonic Resonance - An Unusual Problem
25	Weyerhaeuser's Process Control Performance Measurement System Yields Improved Business Performance
26	Efficiency Standards for Low Voltage Substation Transformers
27	NERC Policies Affecting the Power Industry

2003 Tutorials: Disturbance Monitoring / Power Quality Monitoring
Synchronous Generator Protection
Coordinated Paper Machine Drive Systems

8 PDH
8 PDH
8 PDH

2003 Tour: Power Cable Manufacturing Plant



IEEE PPIC Conference - June 17 – 21, 2002 – Toronto, Canada

1	AC Electric Motor Efficiency Designations and Standard Tables
2	TMP Optimization Using Multivariate Analysis
3	Mill Benefits From Upgrading Generator Protective Relaying
4	Calibration of Segmented Tension Roll Transducing Systems
5	Voltage Versus VAR/Power Factor Regulation On Synchronous Generators
6	Sensorless Tension Control In Paper Machines
7	Cutter Distance Sensor for an Adaptive Position-/Torque Control in Cross Cutters
8	A Lime Kiln Drive From DC to AC
9	24 VDC Control – An Emerging Alternative to Legacy 120 VAC Control Applications in North America
10	Reliability Considerations of Multifunction Protection
11	Thermal Evaluation for Applying TEFC Induction Motors on Short-Time and Intermittent Duty Cycles
12	Retrofitting SCT-PPT Excitation Systems with Digital Control
13	E-Mail Etiquette (Netiquette)
14	Motor Temperature Considerations for Pulp and Paper Mill Applications
15	Bus Transfer Systems: Requirements, Implementation, and Experiences
16	Surges Transferred Through Transformers
17	Power Factor Correction in Industrial Facilities Using Adaptive Excitation Control of Synchronous Machines
18	Changes in Insulated Cable Standards
19	The Evolution of Power Quality Data Acquisition Systems – Triggering to Capture Power Quality Events
20	The Benefits Of Intelligent Recipe Management
21	Making Transformer Losses Part of the Purchasing Decision
22	AC Induction Motor Specifications An Update on Currently Available Procedures and Options
23	Applying The Directional Neutral, 67N, Function in Microprocessor Multifunction Relays
24	Complete Relay Protection of Multi-String Fuseless Capacitor Banks
25	Web Embedded Field Devices

2002 Tutorials: Fundamentals of AC & DC Motors and Related Adjustable Speed Drives Used in the P&P Industry 8 PDH
Application and Protection Considerations of Medium Voltage AC Motors in the P&P Industry 8 PDH

2002 Tour: Niagara Falls Hydroelectric Generation Stations



IEEE PPIC Conference - June 18 – 22, 2001 – Portland, Oregon

1	Installation of an Integrated Turbine-Generator Control System for a Pulp Mill
2	Comparison Testing of IEEE Standard 841 Motors
3	What is in Store for DCS Systems? Where are they Headed?
4	Proper Use of Active Harmonic Filters to Benefit Pulp and Paper Mills
5	Laser Guided Loading Systems
6	Failure Contributors of MV Electrical Equipment and Condition Assessment Program Development
7	Selection of Best Induction Motor Rotor Construction Method
8	Preventive Maintenance Testing of Shielded Power Cables
9	The Hows and Whys of PC Based Control
10	#3 Paper Machine Drive Upgrade
11	Commissioning Numerical Relays
12	Failure Modes and Field Testing of Medium Voltage Motor Windings
13	Motor Bearing Systems for Forest Products Applications
14	Proper Grounding for the Automation Industry
15	Increasing the Electrical Output of a Co-generation Plant
16	Information Integration Of Modern Pulp And Paper Industry
17	Electrical Safety Programs
18	Bearing Fluting in AC Motors, DC Motors, and Rolls on Paper Machines
19	Changes in the 2002 National Electric Code
20	The Usage of Decentralized Observers in Continuous Moving Webs
21	Silver Corrosion and Whiskers Growth on Power Contacts in Industrial Atmosphere of Pulp and Paper Plants
22	Modern On-Line Testing of Induction Motors for Predictive Maintenance and Monitoring
23	The Importance of Power Quality Management in the Pulp and Paper Industry
24	Heat Tracing Technology for the 21st Century
25	Relative Impulse Strength of Magnet Wire at Room Temperature
26	Carbon Brush Performance and Application in the Pulp and Paper Environment
27	Coordination of Surge Arrestors with Medium Voltage Current Limiting Fuses
28	Motor Repair Specifications for Forest Products Industry
29	Considerations In Application and Selection of Unit Substation Transformers
30	Maintenance Concerns for Good Operation of DC Motors
31	Startup and Commissioning Procedures for Electronically Line- Shafted Paper Machine Drives
32	Applying Human Factors in Graphical Operator Interfaces

2001 Tutorials: Electrical Safety Tutorial
Short Course in Power System Engineering

8 PDH
6 PDH

2001 Tour: Bonneville Dam & Second Powerhouse, Bonneville Fish Hatchery, Multnomah Falls



IEEE PPIC Conference - June 19 – 23, 2000 – Atlanta, GA

1	Bowater Implements Millwide Energy Conservation Program at Catawba, SC
2	Five Levels of Outsourcing Operations and Maintenance in the Pulp and Paper Industry
3	Short-Circuit Studies, Coordination Studies and Harmonic Analysis/Studies
4	Reducing the Damaging Effects of Lightning-Induced Voltage Fluctuations and Power Outages in an Industrial Co-generation Plant
5	Application Considerations for High Resistance Ground Retrofits in Pulp and Paper Mills
6	Digital Excitation System Provides Enhanced Performance and Improved Diagnostics
7	Alternate Drive For A Paper Machine Lineshaft
8	Squirrel Cage Rotor Options for AC Induction Motors
9	OPC - Plug and Play Integration To Legacy Systems
10	Comparison Testing of an Adjustable-Speed Permanent-Magnet Eddy-Current Coupling
11	Power System Data Base Management
12	Digital Excitation System Provides Enhanced Tuning Over Analog Systems
13	Upgrading Power Distribution Equipment - Making the Right Choices for Reliable Paper Mill Operations
14	Electronic Line Shafting Control for Paper Machine Drives
15	Reliability Program for Mill Maintenance
16	Arcing Flash/Blast Review with Safety Suggestions for Design and Maintenance
17	Optimal State Estimation in Paper Measurement Systems
18	Using Fiber Optics to Create A Unified Cabling System For Process Control
19	Ratings of Semiconductors for AC Drives
20	Ambient Proportional Control Reduces Electrical Heat Tracing Costs
21	Service-Life Evaluations of Low-Voltage Power Circuit Breakers and Molded-Case Circuit Breakers
22	Diagnosing Motor Vibration Problems
23	Lighting Upgrades and Maintenance From a Mill Perspective
24	Carbon Brush Wear Caused by Silane Additives
25	Evaluating Medium Voltage Cable Splices and Terminations
26	Standards and Ratings for the Application of Molded Case, Insulated Case, and Power Circuit Breakers
27	Industrial Application of Current Signature Analysis to Diagnose Faults in 3-phase Squirrel Cage Induction Motors
28	Methods To Determine Which Inverter Drives Need Upgraded Motor Stator Windings

2000 Tutorials: Application of Generator and Excitation System Industrial Plants 8 PDH
Establishing a Plant / Company-Wide Electrical Safety Program 4 PDH

2000 Tour: Siemens And Intecolor Facilities In Alpharetta