THE 2010 CTI ANNUAL CONFERENCE PROGRAM

The Technical Sessions will run simultaneously between two separate Ballrooms.

Sunday, February 7, 2010

1:00 - 2:30 (p) - New Board of Directors and Committee Chair(s) Meeting

3:00 - 5:00 (p) - Board of Directors Meeting

4:00 - 8:00 (a) - Registration

5:00 - 12:00 (a) - Hospitality Suite

6:00 - 8:00 (a) - Speaker Ready Room

Monday, February 8, 2010

7:00a - 10:00a Service

7:00a - 5:00p - Registration and Paper Sales

7:00a - 5:00p - Speaker Breakfast

7:30a - 8:30a - Presidential Address
Multi Agencies Report
Certification Report

8:45a - 9:00a Service

Monday, February 8, 2010

7:00a - 10:00a Service

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7:30a - 8:30a - Presidential Address
Multi Agencies Report
Certification Report

8:45a - 9:00a Service

Galleria I (ES&M and P&T Sessions)

8:30a - 9:00a

TP10-01

Your Cooling Tower Project: On Time, On Budget

David Suptic, David M. Suptic, P.E., L.L.C.

David M. Suptic P.E., PMP is a professional engineer and principal of David M. Suptic PE LLC of Overland Park, Kansas. Mr. Suptic has been involved for over 25 years in the cooling tower industry and has served as Co-Chair of the Enginering Standards and Maintenance Committee and as a Vice-Chair of the CTI Program Committee.

Mr. Suptic's consulting business provides services to the cooling tower industry including equipment commissioning, inspections, failure investigation, and training.

Mr. Suptic received a B.S. degree in Mechanical Engineering and an MBA degree both from the University of Kansas. He is also a registered professional engineer in the State of Kansas and a Certified Project Management Professional.

The successful completion of cooling tower construction and repair projects depends on the proper execution of many activities at the proper time. The paper describes the importance of applying professional project management knowledge to help identify and reduce the risks inherent in all complex projects. Following the principles contained in the "project management body of knowledge" will insure your cooling tower project achieves "on time, on budget" performance.

Galleria II & III (Water Treating Sessions)

8:30a - 9:00a

TP10-02

Silica Scale Inhibition - A Kinetic Study

Heinz Plaumann, Keith Hirsch, and Joseph Lipari, BASF Corporation

Dr. Plaumann:

- *University of Waterloo, Canada, Ph.D. Chemistry, M.A.Sc. Chem. Eng.*
- *Polysar Limited, 9 years, Synthetic rubber, Thermoplastic Elastomers, Composites, R&D/ Production, Sarnia/Canada*
- *BASF Group - 10 years Emulsion Polymers, R&D/Marketing, Sarnia/Canada, Ludwigshafen/Germany, Charlotte/NC; 7 years Urethanes, R&D, Schwarzheide/Germany, Wyandotte, MI; 2006 - Present, BASF Care/Performance Chemicals, R&D Wyandotte, MI*

**Experiences/Expertise: Broad range of polymer chemistries, syntheses, applications. Applied statistics, R&D/Technical Management. Hold ca. 25 patents, ca. 25 publications/presentations. College instructor, semi8nar leader.*

The formation of silica and silicate scales in the chemical process industries is a significant on-going problem with large economic consequences. The fouling of surfaces can reduce heat transfer and cooling efficiencies. This may also affect reaction kinetics. The removal of such scales is often a complex mechanical or chemical process and the up-front prevention of their formation is a much desired solution to the problem. In this presentation, we compare several chemistries for the inhibition of such scale formation, using various proprietary polymeric materials as

THE 2010 CTI ANNUAL CONFERENCE
PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

9:00a - 9:30a

TP10-03

The Importance of an ISO 9001 Component Supplier for the Cooling Tower Companies

Clint Smith, Strongwell

Clint Smith is the Manager, Corporate R&D, Quality and Laboratory for Strongwell. Clint holds a M.S. in Physics from The Ohio State University and a B.S. in Engineering Physics from St. Joseph's University. Clint is the current Chairman of ASTM D20.18 for Thermoset Plastics and also Chairs ASTM D20.18.02 for Pultruded Products. Clint has papers and magazine articles for a number of organizations and has previously presented three papers at CTI.

The ISO 9001 quality system originated in 1987 and has evolved since its inception becoming the standard quality system for the world. The ISO 9001 quality system presents an outline/philosophical approach for formalizing the quality system function within the manufacturing organization that does not interfere with the normal business operation. An important feature of this quality system approach is the independent verifciation. A formalized and verifiable quality system can translate into an improved product for the Cooling Tower customers regardless of the product purchased. The ISO 9001 quality system can be paraphrased as *making what the customer wants* and *plan to improve.*

9:30a - 10:00a

TP10-05

Complex Structural Analysis Simplifies Repair Phasing In Restoration Of Hyperbolic Cooling Towers

Narendra Gosain, Ph.D., P.E. and Frouk Mahama, Ph.D., Walter P. Moore & Associates, Inc.

Narendra K. Gosain, Ph.D., P.E., is Senior Principal of the Structural Diagnostics Group for Walter P. Moore and Associates. For more than a decade, Dr. Gosain has directed Walter P Moore's forensics, assessment, restoration, and rehabilitation team. Prior to this, he was the Managing Director of the Houston Structural Engineering Design Group. He has a broad experience in the analysis of specialized structures and rehabilitation challenges.

Concrete hyperbolic cooling towers built three to four decades back which have exposure to corrosion causing chlorides are susceptible to deterioration over a period of time. Such cooling towers are thin shell structures compared to their geometric proportions. As such, when a large areas of concrete gets removed from such structures during the repair work, their structural integrity may be compromised when subjected to lateral loads due to hurricanes and earthquakes. For the repair work to proceed in an efficient and safe manner, concrete removal and replacement must follow certain protocols determined using some complex structural analytical techniques.

Galleria II & III (Water Treating Sessions)

additives in an industry standard test. The resulting data have allowed us to develop a simple kinetic model comparing performance of the additives under various conditions and these results have provided us with direction for potential process improvements with reduction in scale formation.

9:00a - 9:30a

TP10-04

Antimicrobial Filtration

Jim Stephens, Sonitec, Inc. and Mark Miller, AquaShield™, Inc

Jim Stephen's career spans more than 36 years applying water treatment technologies, including chemical treatment, filtration, ion exchange and membranes; in HVAC, potable, desalination, ultra pure, process, industrial and waste water markets. Jim graduated with a degree in Engineering Technology and has worked as Business Unit Manager for USFilter, Industrial Sales Director for USFilter /Stranco, Director of Sales for Koch Membranes Systems and presently is President of Midwest Design Solutions, LLC. Jim represents Sonitec, Inc. products including filtration and membrane technologies.

This paper reviews a case study applying an innovative technology designed to remove TSS and waterborne pathogens using an environmentally neutral antimicrobial filter media. The filter media uses an EPA-registered antimicrobial agent that permanently bonds to the filter media. Treatment is instantaneous as an antimicrobial "sword" physically pierces the outer membrane of the microorganism on contact, providing for total pathogen destruction. Destroyed pathogens easily pass through the filter media with minimal reduction in flow rate. The media does not allow for mutation and provides for long term treatment. Independent 48-hour acute toxicity laboratory testing was performed following EPA guidelines to support that the antimicrobial agent does not leach, and the effluent (treated) water is non-toxic. Analysis of performance data obtained from independent laboratory tests and field pilots demonstrate that this same media technology can now provide a kill of 95 to 99% or greater kill for reduction of Escherichia coli (E. coli) and Legionella, in a single pass thought the media. A single technology can now be applied to provide TSS reductions to 98% and provide bacteria suppression control between 10^1 to 10^2 in a cooling tower. Applying this technology can provide a true Green Approach to treatment of cooling water systems.

THE 2010 CTI ANNUAL CONFERENCE
PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

10:00a - 10:30a

TP010-07

New Cooling Tower Nozzle; Features and Performance

Andreas Streng, Ph.D., CTS Cooling Tower Solutions GmbH

Consultation, engineering, project planning and delivery of cooling towers and components. First references have been achieved for engineering studies and newly designed and delivered equipment. Foundation of CTS Cooling Tower Solutions GmbH, Düsseldorf/Germany and a member of CTI.

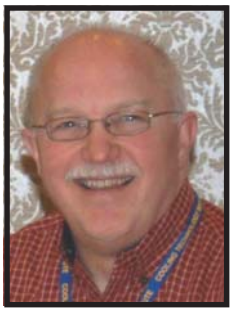
The new nozzle is characterized by a homogenous and even distribution pattern. This contributes remarkably to the cooling tower performance. The flow channel of the nozzle is very wide without any restriction and above all the necessary pressure drop meets the low pressure drop restrictions for large industrial towers.

10:30a - 11:00a

TP10-09

Plume Abatement - The Next Generation

Paul Lindahl and Ken Mortensen, SPX Cooling Technologies



Paul Lindahl is Director of Market Development for SPX Thermal Equipment and Services in Overland Park, Kansas. He is involved in numerous association roles at the Cooling Technology Institute, ASHRAE, ASME, AHRI, and Eurovent. He is a member of the US TAG, and is current Convener for the ISO Cooling Tower Test Code. Mr. Lindahl has been employed by SPX/Marley since 1968 in various roles in product development, thermal performance, marketing, customer productivity and business development. Mr. Lindahl received a B.S. in Nuclear Engineering from Kansas State University and an Executive Fellows MBA from Rockhurst University in Kansas City.

Cooling towers have been modified to reduce the visibility of their effluent water vapor plumes for about 40 years. The evolution, breadth of experience and technologies of plume abatement cooling towers will be described. An evolutionary improvement to existing plume abatement designs using a different heat transfer approach will be described, including some of the development and demonstration achievements to date. Differences from currently used coil-type wet/dry tower designs and benefits of the improved technology for cooling tower applications will be presented.

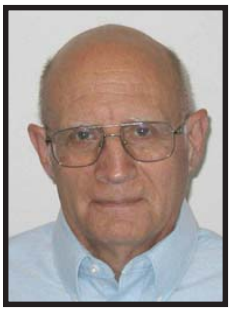
Galleria II & III (Water Treating Sessions)

9:30a - 10:00a

TP10-06

Physical Water Treatment Untillized In Food Manufacturing And Distribution

David McLachlan, Fluid Treatment Solutions, Inc.



David McLachlan has 30 plus years experience in small to large companies, focusing on technical development and product introduction for various industries, including nuclear power, electronics, and heavy manufacturing. David has taught at several universities and worked as a consultant for a number of years. He is now with Fluid Treatment Solutions working on developing PWT technologies.

This is technical review of the fundatmentals of high voltage PWT (Physcial Water Treatment) systems, delineate the thermodynamics and surface phenomena assoicated with the water chemistry in scale formation and connect the scientic methologies with field results found the the treated of cooling towers in the food industries. These cooling towers will cover a wide range of locations (AZ, KS, MO and FL) and feed water chemistries.

10:00a - 10:30a

TP10-08

Hybrid Approach To Zero Discharge Cooling Water Treatment

Jon J. Cohen and Henry A. Becker, H-O-H Water Technology

Jon has been involved in water treatment for over 18 years, all with H-O-H Water Technology, Inc. He is currently Director of Engineering at H-O-H and acts as product manager for chemical and mechanical products. Jon earned a bachelor's degree in Biology, a master's degree in chemical engineering and is currently finishing an MBA. Jon holds LEED-AP accreditation and CWT certification. Jon is also an active member in ASHRAE, AWT, and ECS

Global ecology, resource preservation and green technologies have become a focal point of manufacturing facilities, government agencies and new technology in every industry over the past decade. Water conservation is a critical approach to environmental and resource conservation. A unique approach is being used to address concerns of water reuse at a facility with zero permissible discharge and plant wastewater effluent for cooling tower make-up. A creative combination of electrochemical water treatment and chemicals was employed. This paper will discuss the approach and results used in this cooling tower application.

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PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

11:00a - 11:30a

TP10-11

A New Control Scheme Provides the Most Cooling for Your Money

Robbie McElveen, Baldor Electric Company

Robbie McElveen earned a Bachelor of Science degree in Electrical Engineering in 1993 and a Master of Science degree in Electrical Engineering in 1995 from Clemson University in Clemson, SC. He is currently a Senior Development Engineer for Variable Speed and Specialty motors, with a focus on salient pole permanent magnet motor development and application. Mr. McElveen is a member of IEEE and has authored several technical papers on both induction and permanent magnet motors and their use in industry.

Many cooling towers in place today operate below their maximum capability due to a number of factors. When setting the blade pitch, it is common for the cooling tower manufacturer to set the pitch a little lower than the pitch which would result in full amp draw from the motor. This allows for some "extra" capability on days where the temperature and humidity of the air cause the load on the motor to increase. This paper discusses a control scheme by which real time motor temperature data is used to insure maximum output while simultaneously protecting the motor from an overheating condition.

11:30a - 12:00p

TP10-13

Modeling Of The Performance Of Induced And Forced Cooling Tower

Dr. Hamid Reza Goshayshi, Azad University

Dr. Hamid Reza Goshayshi has an Hons Degree in Chemical Engineering, a MSc in Mechanical Engineering (Energy Engineering) and a Ph.D in Mechanical Engineering (Energy Engineering) from South Bank University in London and did his post doctoral research on "Improvement of the Rankine Cycle." He was an Industrial Trainee Engineer in the Black Wall Tunnel Refineries with his responsibilities being in energy management (i.e. savings, operation, policy). He also worked as a Lab Manager in the South Bank University School of Engineering. He served as Assistant Professor in Tehran & Mashad & Quchan Azad University (Iran) and presently is serving as Vice Chancellor for research in Mashad Azad University (Iran).

This paper presents a mathematical model for the numerical prediction of the performance of induced and forced draft cooling tower. The mathematical model is based on the heat and mass transfer equations. The leading parameters are the tower characteristic, mass transfer coefficient and Lewis number. This model is used to predict the thermal behavior of cooling tower which experimental data.

It has been found that the accuracy of 10% obtained by using the chosen model can be then taken into account whenever this model is used to

Galleria II & III (Water Treating Sessions)

10:30a - 11:00a

TP10-10

What is The Best Treatment For my Tower?

Bob Cunningham, Arthur Freedman and Associates

Bob has a B. S. in Chemistry from the University of Pittsburgh, and a M.B.A. from the University of Pittsburgh. Bob did Post-graduate work in Chemistry at The University of Pittsburgh and Post-graduate work in Business Administration at George Washington University in Washington, D.C.

Mr Cunningham has 40 years domestic and international field service and staff trouble shooting experience with several major national water treatment companies, involving boiler and cooling water, chemical cleaning, waste water treatment, process chemical treatment, paper chemicals treatment, oil production chemicals, and municipal water preparation .

This paper discusses the factors that must be considered in deciding not only what treatment program should be employed, but also what the testing, control, and monitoring protocols should look like.

The players in our industry (tower & fill manufacturers, exchanger manufacturers, regulators, water treatment suppliers & consultants, and "bean counters") have combined to create the perfect storm... We have optimized efficiency, and minimized foot print, cost, flexibility, and discharge impact to the point where operators frequently are unwittingly committed to knife edge control with no budget and no people to accomplish this.

11:00a - 11:30a

TP10-12

Copper Corrosion Control And Minimized Copper Discharge From Cooling Tower

Jasbir S Gill, Ph.D. and Ed Grodecki, Nalco Company

Dr. Gill has been with Nalco R&D for 30 years. He obtained his Ph.D. in Chemical technology from the University of Roorkee, inIndia. He was visiting scholar to the University of Perugia, Italy and University of Salford U.K. during 1974-76. After brief Post doc at SUNY Buffalo, he joined Calgon in 1979 where he managed scale/deposit/corrosion core-competency. Currently he is a Research Fellow at Nalco Company in the Water Centric/Oil-Sands R&D. He is the inventor/co-inventor on 24 US patents and several foreign patents. Dr. Gill has published and presented over 97 papers and has been invited speaker to various technical symposiums and training courses. He has chaired Technical session s at NACE, IWC, and ACS. His researchinterest includes, Ion Exchange, Crystal Growth, Corrosion and Aqueous Thermodynamics and Kinetic Modeling. He is recipient of multiple Chairman's award, Golden Odyssey, and IR-100 award. Dr. Gill is also Program Coordinator at NACE.

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Galleria I (ES&M and P&T Sessions)

predict other characteristics related to the cooling tower .

Group Luncheon - 12:15p - 1:45p
Plaza Ballroom, 3rd level

2:00p - 2:30p

TP10-15

Enhanced Cooling Tower For Colder Water, Energy Savings And Reduced Evaporation

Jarrell Wenger, P.E., Engineering Economics, Inc.

Jarrell holds a Bachelor's degree from Queen's University and a Master's degree from Colorado State University, both in Mechanical Engineering; he is a registered professional engineer in four states. In his 25 years in the building HVAC industry, Jarrell has worked in research, in consulting and as an expert witness on mechanical system and building performance issues from energy efficiency to indoor air quality. Jarrell currently utilizes peer review and commissioning to achieve high performance in new buildings, and system troubleshooting and retro-commissioning to improve energy efficiency and overall performance of existing facilities. Jarrell has served on national ASHRAE committees and has published a number of papers.

This paper describes a novel, patent pending, two-stage evaporative cooling tower dry ambient air conditions. A heat recovery system is utilized between cooling tower discharge and intake to pre-cool warm and dry entering air to reduce its wet bulb temperature, dropping the theoretical cold water temperature limit to ambient dew point. For given ambient conditions, performance can be engineered through a combination of cooling tower component sizing and heat recovery effectiveness. Initial performance modeling predicts potential cold water temperatures well below ambient wet bulb. When operated to duplicate conventional cooling tower output for a given application, fan power savings from 10% to more than 50% can be achieved along with water consumption savings from 10% to more than 30%. If the enhanced cooling tower is operated as an evaporative chiller that can completely displace refrigeration equipment, cooling energy savings can range from 50% to 75%.

Galleria II & III (Water Treating Sessions)

Many cooling towers and once through cooling systems' operators are facing tighter regulations on metals concentrations in cooling water discharge.

Chief among these metals is copper, which of course is the primary material in many condenser tubes. This paper discusses the results and lessons learned at a Power Plant faced with new NPDES discharge limits for copper discharge. The paper also discusses improvements that are underway to the biocide and scale-inhibitor feed systems, management of cooling system operation, optimization of pH control, and the application of newly developed halogen stable copper corrosion inhibitor to reduce copper discharge.

11:30a - 12:00p

TP10-14

Automated Feed Of Patented AseptrolR CW Oxidizing Biocide Provides "Best Practice" In Delivery Of Chlorine Dioxide to Small-Scale Systems

Keith Hirsch and John Byrne, BASF Corporation and BASF Catalysts, LLC

Keith joined BASF in April 2006 and is Development Leader for Water Treatment in the Care Chemicals & Formulators group in Wyandotte, Michigan. He serves as the primary technical resource for BASF's Water Treatment business in North America. Keith has spent the past eight years in Research & Development in various areas of water treatment, serving both industrial and consumer markets. Prior to joining BASF, Keith held positions at Arch Chemicals, Avecia, and National Starch and Chemical Company.

Keith obtained his Bachelor of Science in chemistry from Penn State University and his Ph.D. in organic chemistry from the University of Illinois at Urbana-Champaign. His work has been featured in both peer-reviewed journals and trade publications.

This paper describes a new Aseptrol ClO2 delivery system that is capable of at least two months of unattended operation in small-to-medium-size cooling systems up to 30,000 gallons in capacity. Multiple safety features have been incorporated into the feeder to significantly minimize the risk of exposure to chlorine dioxide. Results from field trials will be reported in which Aseptrol biocide was dosed into cooling systems via this feeder, allowing for the effective control of microbiological (MB) growth, especially biofilm. Trial data showing MB counts, ATP data, Aseptrol biocide feed rates, ClO2 residuals, and corrosion rates will be presented.

Additionally, performance data from field trials will be presented that compares efficacy and cooling system operation during treatment with Aseptrol biocide to baseline data collected during treatment with other biocides.

Group Luncheon - 12:15p - 1:45p
Plaza Ballroom, 3rd level

THE 2010 CTI ANNUAL CONFERENCE
PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

2:30p - 3:00p

TP10-17

Corrosion Protection Of Concrete For Cooling Towers

Dilip Choudhuri, P.E., Walter P Moore And Associates

Dilip Choudhuri is a Principal and Executive Director of the Structural Diagnostics Services Group at Walter P Moore with more than 15 years of experience in the field of repair, restoration and forensics engineering. Mr. Choudhuri specializes in the areas of damage assessment, construction defects and structural failure analysis of steel, masonry, timber, concrete, and prestressed concrete systems. His expertise also includes evaluating engineering materials using laboratory techniques such as scanning electron microscopy and energy dispersive x-ray techniques. Prior to joining Walter P Moore in December 2001, Mr. Choudhuri held several consulting and research positions including one at the National Center for Earthquake Engineering Research (NCEER).

This paper will discuss the corrosion protection methodology for concrete as it relates to cooling tower structures. The paper will focus on the cementitious repair materials, high build coatings, sacrificial corrosion methods and impressed current corrosion technology. The paper will provide an basic overview of these technologies and will be focussed on the needs of owners, operators and facility managers of these type of structures.

3:00p - 3:30p

TP10-19

A Systematic Approach to Performing, Documenting, and Reporting Inspections of Field Erected Cooling

Casey Yurkovitch, GEA Power Cooling, Inc. and Philip Poll, OBR Cooling Towers, Inc.

Casey Yurkovitch is a Sales Engineer with GEA Power Cooling, Inc. At GEA his focus is on inspection and repair of field erected cooling towers in the Ohio River Valley. He attended the Ohio State University where he received a B.S. in Mechanical Engineering in 2003. Casey began working with thermal systems at Hydro Delta Corporation, a leading manufacturer of geothermal heat pumps. While at Hydro Delta his experience included engineering design and testing of new products, development of training programs and maintaining distribution channels.

A systematic approach is applied to the inspection of field erected cooling towers. Procedures for inspecting structural, mechanical and performance characteristics are investigated with an emphasis on identifying common failures and deficiencies. The distinction between counter-flow and cross-flow cooling tower inspections is examined. In conclusion, a method is outlined for documenting inspection results and the reporting process.

For afternoon activities - follow the schedule in the next column.

Galleria II & III (Water Treating Sessions)

2:00p - 3:30p

Water Treating Panel Discussion
(Galleria II & III)

3:00p - 4:00p

Break

3:45p - 5:00p

Technical Committee Meetings

- **Engineering Standards & Maintenance,** ***Galleria I***
- **Performance & Technology,** ***Galleria II & III***
- **Water Treating,** ***Sage***

5:00p - 12:00a

Hospitality Suite

(Bar Closes @ 9:30p) - Monarch Room, 24th Floor

6:00p - 10:00p

Dinner Party

County Line (information on page 15)

THE 2010 CTI ANNUAL CONFERENCE
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Galleria I (ES&M and P&T Sessions)

Tuesday, February 9, 2010

7:00a - 10:00a - New Member's Breakfast, *Westchester I*

7:00a - 10:00a - Service

7:00a - 5:00p - Registration and Paper Sales, *Galleria Foyer*

7:00a - 5:00p - Speakers' Breakfast, Photo Session & Prep Room, *Sage*

7:30a - 8:00a

TP10-21

Fire Wall Systems

Mike Bickerstaff, Composite Cooling Solutions, L.P.

David M. (Mike) Bickerstaff has three decades of cooling tower industry experience, including erection of cooling towers and air cooled condensers for HVAC and process and power applications. He held senior construction management roles with Marley Cooling Technologies and Ceramic Cooling Tower Company. Bickerstaff is an accomplished construction management strategist, emphasizing professional and safe working environments. Bickerstaff supervised the construction of numerous wood, FRP, concrete and metal tower projects valued to $40 million. His innovative construction planning system reduces both construction time and costs, while improving safety and health programs.

Mike has been through Professional development courses: OSHA 500/ 502, Safety Audits and Job Analysis, and PRAXIS. He is a Licensed Asbestos Project Supervisor. Mike received his BS from the University of Southern Mississippi. He is serving on the Hazard Protection and Environmental Task Group, (2007-2009) with Cooling Technology Institute. He has authored the following paper; TP00-16: Safe Construction of Field Erected Cooling Towers and co-authored TP03-07: Crossflow to Counterflow Natural Draft Tower Conversion. He also holds the US Patent 5,348,692, Retractable Cover Unit for Hot Water Basin of Crossflow Cooling TowerPapers; (2000) TP00-16: Safe Construction of Field Erected Cooling Towers and (2003) TP03-07: Crossflow to Counterflow Natural Draft Tower Conversion. He also holds the US Patent 5,348,692, Retractable Cover Unit for Hot Water Basin of Crossflow Cooling Tower

This paper will review the systematic approach that should be followed when selecting an appropriate fire wall system. The paper will also review the test results from the full scale fire test that will be conducted for the purpose of providing information for this paper. Finally, the paper will elaborate on the special design considerations that are necessary to achieve a fire wall system that meets the design parameters, minimum maintenance requirements, and the extended service life that are being demanded for today's critical cooling tower systems.

Galleria II & III (Water Treating Sessions)

Tuesday, February 9, 2010

7:00a - 10:00a - New Member's Breakfast, *Westchester I*

7:00a - 10:00a - Service

7:00a - 5:00p - Registration and Paper Sales, *Galleria Foyer*

7:00a - 5:00p - Speakers' Breakfast, Photo Session & Prep Room, *Sage*

7:30a - 8:00a

TP10-16

Water/Energy Nexus, Comparing The Relative Value Of Water Versus Energy Resources

Jennifer Hamilton, Tom Bugler, and John Lane, Evapco, Inc.

Jennifer Hamilton holds a Bachelors of Science in Chemical Engineering and a Minor in Environmental Engineering from Penn State University. She spent several years working as a consultant to the Environmental Protection Agency (EPA) where she developed effluent guidelines for the metals processing industry, assessed the environmental impact of new chemicals prior to market release and wrote compliance assistance documents for the construction industry. Jennifer has been with Evapco for four years and is the Product Manager of the Closed Circuit Cooler Department.

Both water and energy are critical natural resources that are interelated in both their production and delivery. In addition, water and energy are used in HVAC and industrial cooling processes. In may cases, energy can be conserved through the use of water, and water can be conserved if energy usage is allowed to increase.

This paper proposes a simple way to compare the use of both resources through an index of the ratio of power saved divided by the water invested.

This index could be utilized to set relative values on water and energy usage for codes or for guidance in "green" applications. The index could be determined for regional or even local climate conditions.

8:00a - 8:30a

TP10-18

Oil-In-Water UV Fluorescence Sensor In Cooling Tower And Other Industrial Applications

Vadim B. Malkov, Hach

Dr. Vadim Malkov has worked for Hach Company as an R&D chemist and then in Product Management for 7 years, specializing in the area of process analysis and instrumentation. Prior to Hach, Vadim worked as a chemist, manager, and was also teaching chemistry at a higher education institution in Russia. Dr. Malkov graduated from Kazán State University in Russia where he received master's degree and earn then his PhD in organic chemis-

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The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

8:00a - 8:30a

TP10-23

Condition Assessment Of Reinforced Concrete Cooling Tower Structures

Kevin Michols and Leandro Etcheverry, Wiss, Janney, Elstner

Kevin A. Michols is a Principal at Wiss, Janney, Elstner Associates, Inc., an interdisciplinary firm of architects, structural engineers, and materials scientists that specializes in the investigation, analysis, testing, and design of repairs for historic and contemporary structures. He has 28 years experience in evaluation of existing structures, rehabilitation and retrofit design, and troubleshooting construction related problems. Areas of significant experience include existing condition assessment, structural integrity evaluation, durability enhancement, nondestructive testing, and repair design. Project experience includes buildings, bridges, stadiums, tunnels, piers, cooling towers, tanks, dams, utility structures, and industrial facilities.

He holds professional registrations in 16 states and is an active member of the International Concrete Repair Institute, American Concrete Institute, American Society of Civil Engineers, and Structural Engineers Association of Illinois.

As reinforced concrete cooling towers age, their harsh operating environments can lead to deterioration and structural distress. Both mechanical and natural-draft cooling towers present unique conditions inherent to their type of construction and exposure conditions. With time, process and environmental exposure conditions render the towers susceptible to corrosion of embedded steel reinforcing, concrete cracking and spalling, and in cold climates freeze-thaw deterioration. Operational cycling and construction defects can accelerate deterioration. Condition assessment of cooling tower structures is essential to identify safety and structural concerns, determine the root cause of distress, and plan maintenance needs.

Condition assessments typically involve visual inspections and various nondestructive testing techniques. Depending on observed conditions, concrete core sampling and laboratory testing are used to characterize materials quality and durability. Structural analysis may be required to evaluate structural capacity. Condition assessments are typically conducted during short-duration outages. Depending on the elements to be surveyed, manlifts, suspended swing stages, or fixed scaffolding are used to provide up close access. Condition assessment of cooling towers is a key component of an overall facility maintenance program. Case studies will be presented to illustrate condition assessment methods and results. Information from the assessments provide the knowledge necessary to monitor structural conditions, plan maintenance, and when necessary prioritize repairs to maximize the service life of cooling towers.

Galleria II & III (Water Treating Sessions)

try. He is affiliated with American Chemical Society, American Water Works Association, ASTM, AWT and some other professional societies. He has published more than 15 papers in both Russian and American scientific and professional journals as well as co-authored one US patent.

In order to simplify and accelerate the analyses of oil and grease in industrial waters, particularly used in cooling water in heat exchangers, a UV-fluorescent sensor sensitive to polycyclic aromatic hydrocarbons (PAH) being part of refined oil products was tested. The testing was also conducted in several applications involving wastewater treatment and confirmed a relationship between oil-in-water concentration and content of the PAH. While qualitative response is always strong and fast, OIW quantification can be achieved in samples containing stable content and type of oils.

8:30a-9:00a

TP10-20

A Novel Deposit Monitoring Technique For Industrial Cooling Water And Process Systems

Daniel M. Cicero, Nalco Company

Daniel Cicero is the Industry Developement Manager for Nalco's Power Group. He has been with Nalco for over 18 years in a variety of sales, product management and new product development roles, including brand manager for *Nalco's 3D TRASAR technology. He has presented and published a number of papers discussing cooling and boiler water treatment, control and monitoring at the International Water Conference (IWC), Cooling Technology Institute (CTI), IDEA, NACE, EPRI, Building Owners and Managers Association (BOMA) and in various technical journals and trade publications including Chemical Engineering and Plant Engineering.*

In hard waters, high cycle operation risks mineral scale formation. Operating a cooling system at lower cycles reduces the risk of scale formation, but increases operating costs. Basing the concentration ratio setpoint on average or bulk water conditions risks missing localized high stress conditions. The result: scaling and loss of heat exchange capacity in critical processes. Recent advances in quartz crystal microbalance technology provide valuable insight into the effects of temperature, water chemistry and operational changes. By measuring the formation of scale, in situ, at various, pre-selected temperatures, the actual scale forming tendencies of a water can be quantified in terms of deposit weight. This paper discusses quartz crystal microbalance technology and its use. Data from field evaluations will be presented.

THE 2010 CTI ANNUAL CONFERENCE
PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

9:30a - 10:00a

TP10-24

Correlation Of Pin Bearing Strength To In Situ Laboratory Joint Testing

Dustin L. Troutman and Jeremy D. Mostoller, Creative Pultrusions, Inc.

Dustin L. Troutman received his BS in Civil Engineering Technology from the University of Pittsburgh located in Johnstown, Pennsylvania, in 1993. He currently holds the position of Director of Marketing and Product Development for Creative Pultrusions, Inc., (CPI) located in Alum Bank, PA. Dustin also oversees Quality Control and the sales of Utility Products including distribution poles and cross arms. Dustin has been instrumental in the development of major pultrusion products and product lines. He holds four patents related to pultrusion systems. He has been involved in sales, marketing and engineering for fifteen years at CPI. Dustin is a member of ASCE and is currently the President of the Pultrusion Industry Council.

This paper aims to demonstrate a correlation between coupon level pin bearing tests and in situ laboratory testing of FRP joints commonly utilized in cooling towers and other structures designed and built with pultruded FRP structural members. The investigation includes 4% hole elongation bearing strength as compared to ultimate bolt bearing with various bolt sizes and hole tolerances, as well as, the effects of threads acting on the bearing surface.

9:00a - 9:30a

TP10-25

Recent Developments in Motor Technology Allow Direct Drive of Low Speed Cooling Tower Fans: Part II

Robbie McElveen and Bill Martin, Baldor Electric Company

Robbie McElveen earned a BS degree in Electrical Engineering in 1993 and a MS degree in Electrical Engineering in 1995 from Clemson University in Clemson, SC. He is currently a Senior Development Engineer for Variable Speed and Specialty motors, with a focus on salient pole permanent magnet motor development and application. Robbie is a member of IEEE and has authored several technical papers on both induction and permanent magnet motors and their use in industry.

This paper is a follow-up to a paper presented in 2009 concerning the use of permanent magnet motors for direct drive of cooling tower fans. In the previous paper, the authors presented a case study where an existing tower was retrofitted with a motor of this type. After a year in operation, the motor was removed from service, completely disassembled and inspected to determine how it performed in the harsh environment inside the cooling tower. Data is supplied on subsequent field installations and the feasibility of larger horsepower machines is considered.

Galleria II & III (Water Treating Sessions)

9:00a - 9:30a

TP10-22

Computer Modeling Of Blended Streams For Water Reuse And Discharge

Robert J. Ferguson and Baron R. Ferguson, French Creek Software, Inc.

Rob Ferguson began modeling cooling water chemistry in the early seventies and wrote much of the software in use today for cooling water evaluation and control. Major career accomplishments are reflected in publications on developing scale and corrosion inhibitor models, real time control of scale inhibitor feed rate, and computer profiling of the entire operating range for a cooling system. He considers his major accomplishment to be the popularization and application of advanced physical chemistry evaluations to operating systems. Mr Ferguson worked in R & D, marketing and software development for several major water treatment service companies prior to joining French Creek Software in 1990. He did his undergraduate work at the United States Naval Academy and the University of Minnesota, receiving a BS in Biochemistry from Minnesota in 1971.

Optimizing water usage within a facility is a formidable task. Mixing of available water sources within a plant can help to minimize discharge. Computer modeling of blended streams and their impact upon maximum cycles and treatment options is discussed. Blending of streams such as RO concentrates and cooling tower blowdown can also minimize water discharge. Modeling of injection wells for discharge is described. A visual chemistry approach is used for data presentation to clearly define options and safe ranges.

10:00a - 12:00p - Technical Committee Work
- **Engineering Standards & Maintenance,** ***Tanglewood***
- **Performance & Technology,** ***Post Oak***
- **Water Treating,** ***Bellaire***

12:00p - 2:00p - Owner Operator Seminar (w/box lunch) - information on page 4 - ***Galleria I***

12:00p - 2:00p - Lunch on your own

2:00p - 3:00p - Services

2:00p - 4:30p - Seminar to..... Ask the EXPERT **?** ***Galleria II & III***

4:00p - 8:30p - Table Top Exhibits and Hospitality Suite (*Bar Closes @ 9:30p*), ***Woodway II & III***

THE 2010 CTI ANNUAL CONFERENCE
PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Galleria I (ES&M and P&T Sessions)

8:30a - 9:00a

TP10-26

Cooling Tower Basin Leakage Assessment & Mitigation

Thomas R. Kline, Structural Group, Inc.

Tom Kline is the Engineering Services Division Manager in the Structural Group Inc.'s Houston Office. He is a graduate Construction Engineer with more than 30 years experience in concrete distress and failure investigations. Kline is a member of the American Concrete Institute (ACI), American Society of Civil Engineers (ASCE), American Society for Testing and Materials (ASTM) and the International Concrete Repair Institute (ICRI) having served on it's Board of Directors as well as on many of its Technical Committees. Mr. Kline has also lectured and presented numerous Technical Papers and published articles relative to Forensic Engineering and Infrastructure Restoration both in the U.S. and internationally.

Cooling Technology in the form of Cooling Towers has been in use for decades and almost from the beginning, the term "make-up water" has been part of the cooling equation. While designers allow for cooling water evaporation into the atmosphere, excessive amounts of cooling water loss requiring "make-up water" has become a larger issue, especially in those semi-arid to arid regions where water conservation is at an absolute premium. Water losses, not associated with process evaporation, usually can be traced to containment losses. These containment losses occur because the retaining vessel materials of construction, most commonly reinforced concrete, is relatively porous, designed with maintenance-prone construction/expansion joints and subject to long-term material shrinkage cracking. As such, techniques have been developed to assess and determine cooling water leakage, joint adequacy, and the presence of subsurface voids. Once assessed, Means & Methods have been developed to repair, stabilize and subseal voids to provide significant water-tightness to existing Cooling Tower Basins, regardless of the technology (i.e., Natural Draft vs. Mechanical Draft.).

10:00a - 12:00p - **Technical Committee Work**
- **Engineering Standards & Maintenance,** *Tanglewood*
- **Performance & Technology,** *Post Oak*
- **Water Treating,** *Bellaire*

12:00p - 2:00p - **Owner Operator Seminar (w/box lunch) - info on page 4 -** *Galleria I*

12:00p - 2:00p - **Lunch on your own**

2:00p - 3:00p - **Services**

2:00p - 4:30p - **Ask-The-Expert Seminar -** *Galleria II & III*

4:00p - 8:30p - **Table Top Exhibits and Hospitality Suite (***Bar Closes @ 9:30p***),** *Woodway II & III*

Wednesday, February 10, 2010

7:00a - 10:00a **Services**

7:00a - 5:00p - **Registration and Paper Sales,** *Galleria Foyer*

7:00a - 8:00a - **Speakers' Breakfast,** *Westminster*

8:00a - 12:00p - **Educational Seminar,** *Galleria I*

12:00p - 1:30p - **Lunch on your own**

1:30p - 5:00p - **Technical Committee Meetings**
- **Engineering Standards & Maintenance,** *Tanglewood*
- **Performance & Technology,** *Post Oak*
- **Water Treating,** *Bellaire*

2:00p - 3:00p - **Services**

5:00p - 8:00p - **Hospitality Suite (***Bar closes @ 8:00p***)** *Monarch Room, 24th Fl*

Thursday, February 11, 2010

7:30a - 8:15a

Board of Directors' (includes Committee Chairs) Breakfast, *Chevy Chase*

8:30a - 2:00p

Board of Directors' Meeting, *Sage*