



THE 2012 CTI ANNUAL CONFERENCE PROGRAM



The Technical Sessions will run simultaneously between two separate Ballrooms.
While every effort has been made to insure the accuracy of the program, CTI is not responsible for cancellations, changes, errors or omissions after the posting of the program.

Sunday, February 5, 2012

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 7, 2011

7:00a - 10:00a  Service

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

7:00a - 5:00p - Speakers' Breakfast

7:30a - 8:30a - Presidential Address

Long Range Planning

Eurovent Update

Multi Agencies Report

Certification Report

8:45a - 9:00a  Service

Monday, February 7, 2011

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8:45a - 9:00a  Service

Raphael Ballroom A (ES&M and P&T Sessions)

8:30a - 9:00a

TP12-01

Natural Draft Cooling Tower Ring Replacement: Unique Construction Challenges and Solutions

Gregory S. Mailen and Darin Baugher, EvapTech, Inc. Rory C. McCormick, PPL Generation



Gregory Mailen is Director of Construction at Evap-Tech, Inc. with corporate offices in Lenexa, Kansas. Greg has over 30 years of experience in business management, engineering, project management, field construction, thermal ratings, testing, product development, and R&D with Wet, Wet/Dry, and Dry Cooling Systems. Mr. Mailen holds a B.S. Degree from the University of Kansas, and an M.S. Degree from the University of Tennessee, both in Mechanical Engineering. He has been awarded numerous patents, has written and presented numerous technical papers, is a Registered Professional Engineer (Texas), and has Contractor's Licenses in several states. Greg has been an active participant, familiar and friendly face, and supporter of CTI since 1982. In his spare time, along with wife Diane, he raises "Organic Beef" at their Farm in East Central Kansas.

This paper presents the technical, logistical and scheduling challenges encountered to complete the project during a 49 day outage, which included preassembly of sixty-four (64), 15-ton pultruded structural fiberglass modules. More than 150 workers logged 94,000 man hours

Raphael Ballroom B (Water Treating Sessions)

8:30a - 9:00a

TP12-02

A Synergistic Combination of Advanced Separation and Chemical Scale Inhibitor Technologies for Efficient Use of Impaired Water in Cooling Towers

Jasbir S Gill, Ph.D.



Dr Gill Has been with Nalco R&D for 30 years. He obtained his Ph.D. in Chemical technology from the University of Roorkee in India. 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.

He is the 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. His research interest includes, ion exchange, Crystal Growth, Corrosion and Aqueous Thermodynamics and Kinetic Modeling. He is recipient of multiple times Chairman's award, Golden Odyssey, and IR-100 award. Water is essential to thermoelectric power plants, used primarily for cooling. Using impaired water in place of fresh water is a potentially attractive solution to the problems of water scarcity and competing demands. Nalco was awarded DOE grant to develop a cost effective integrated solution (chemical and physical) for the use of impaired water

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Navarro A Ballroom (ES&M and P&T Sessions)

with zero safety incidents, (2) days ahead of schedule, allowing early plant restart and commissioning. The completed tower provides PPL additional generation capacity while distributing 261,000 gpm, is 45 feet high and 400 feet in diameter.

9:00a - 9:30a

TP12-03

Replacement of the Concrete Cooling Tower by Steel Structure Cooling Tower During the Operation

Martin Kubicek, FANS, A.S. and Mohan Krishna Myneni, FANS Asia Pvt Ltd



Sales and Technical Manager – Africa & Asia Commercial Department, Six month trainee course in the FANS Company, Regarding long term business interests, commercial dealing with clients and suppliers in the Czech Republic and abroad, Commercial experiences with Indian mega tenders, Site experience during LO-TOS refinery project execution in Poland, Business trip experience – Slovakia, Poland, Germany, Egypt, Iran, Iraq, Malaysia, Jordan, India, United States of America.

The paper deals with cooling tower replacement, where concrete structure cooling tower has been replaced by steel structure cooling tower type CTF during the operation. The problem has been solved with two cells concrete cooling tower in the Czech Republic where only simple maintenance was planned. During the first days of work it was recognized that any type of refurbishment was not possible. Existing concrete cooling tower has been replaced by new steel structure cooling tower. Min advantage of CTF steel structure cooling tower is construction/erection speed, flexibility and finally price.

9:30a - 10:00a

TP12-05

Cooling Tower Modeling Approach

Magose Abraham Eju, Nigeria LNG Ltd



Magose Abraham Eju holds a Ph.D in Mechanical Engineering from the University of Strathclyde, Glasgow, UK and an MBA in Project Management from the University of Technology Owerri, Nigeria. He has over seventeen years of working experience in the oil and gas industry. Between 1991 and 1994, he worked with a multi-national marine company – Holt Leasing Marine - as a 3rd class marine engineer, having passed the required professional examination and certification. Between September 1997 and June 1998 he worked as a freelance inspection engineer with a multi-national inspection company - SGS Inspection Company Limited. By July 1998, he joined a multi-national liquefied natural gas company – Nigeria LNG Limited where he still works today as a process engineer. During this period, he has worked in the UK – on secondment to Shell Exploration and Production Company for nine months – and in Malaysia – on secondment to Malaysia LNG Company for three months.

Various approaches to cooling tower modeling have been used by different authors. Some of these modeling approaches include the work

Navarro B Ballroom (Water Treating Sessions)

and maximize the cycles of concentration. Argon National Laboratories under CRADA demonstrated the use of ED/RWEDI while Nalco developed scale inhibitors for the integrated solution.

9:00a - 9:30a

TP12-04

Novel Ultrasonic Microbiological Control System From Ashland Improves Cooling Water Treatment Performance

John Chapman, Ashland Water Technologies, Frank Florio, Ashland Water Technologies and Charles Edward, Mitsubishi Polyester Films, Inc



John S. Chapman earned a Ph.D. in Microbial Physiology from the University of California at Davis. He has been involved in the research, discovery and development of Microbial Control Technology for 25 years at Hoffman-LaRoche, Rohm & Haas, Procter & Gamble, and DuPont Central Research. He is currently the Technical Team Leader for Microbiology R&D at Ashland Water Technologies.

Improving worker safety, employing environmentally responsible technologies and managing costs are key objectives in water treatment program selection for many industrial facilities. Ultrasonic technology is a non-chemical treatment approach that has been proven successful in meeting these objectives. This paper will review this novel technology and provide an in-depth case study of a plant that implemented the ultrasonic technology. Program benefits include the elimination of traditional chemical biocide feed, storage and handling, improved cooling tower cleanliness, reduced corrosion, and water saving of more than 2.7 million gallons of water per year.

9:30a - 10:00a

TP12-06

Forward Osmosis Applied to Evaporative Cooling Make-Up Water

Peter Nicoll and Neil Thompson, Modern Water Plc



Peter Nicoll leads the multi-disciplined technical team at Modern Water where he has been instrumental in the planning, development, deployment and implementation of the Company's patented forward osmosis process. He has extensive experience in the design and operation of large desalination plants, business development, sales of capital equipment and professional services throughout the world. Peter is a Chartered Engineer and a Fellow of the Institution of Mechanical Engineers. His previous experience includes Director of Business Development for Fichtner Consulting Engineers and he has held a number of senior roles both technically and commercially at Weir Westgarth.

Modern Water is in the process of developing a number of manipulated / forward osmosis based technologies, ranging from desalination to power generation. This paper outlines the progress made to date on the development and commercial deployment of a forward osmosis process applied to evaporative cooling tower make-up water. This new technology shows significant promise in allowing various raw water sources, such as seawater, to be used directly in the manipulated osmosis step, thus releasing the use of scarce and valuable higher grade water for oth-

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Raphael Ballroom A (ES&M and P&T Sessions)

of Lebrun and Aparecida (2002) titled "Cooling Towers – Method and Experimental Validation" which presented a simplified method for analyzing the combined heat and mass transfer phenomena in a cooling tower using Merkel's theory as the theoretical basis for the model. Braun et al (1989) used the Effectiveness approach in their work titled, "Effectiveness Models for Cooling Tower and Cooling Coils". Lastly, in the "Toolkit for Primary HVAC System Energy Calculation", prepared for ASHRAE by Lebrun et al (1999), the model of the counterflow cooling tower was based on the Merkel's theory with the Lewis number assumed to equal unity. This paper describes the approach that was used by the author in modeling cooling tower as part of the scope of a research study undertaken to improve the thermal performance of cooling towers. Two simulation software tools have been used in the modeling of cooling tower. The challenges encountered are also discussed.

10:00a - 10:30a

TP12-07

How to Retrofit a Tower in Case of Fouling Issues

Helene Troncin, EDF Septen



Helene Troncin is an engineer graduated from the Polytechnic Institute of Grenoble in France. Since 1987, she works at Electricity of France (EDF), the only French company producing electricity with nuclear power stations. In 1996 she joins the Basic Design Department of EDF and begins to be involved in questions of the chemistry for the cooling circuits.

Her experience includes the cooling towers design, the qualification of the fill through its thermal performances and the problems of fouling.

As a utility company, EDF operates 32 cooling towers in France. The cooling towers of EDF NPP are located in various places fed by rivers. They were designed to function with untreated raw water as make-up. Sometimes we are applying acid treatments of the circulation water, against scaling. Last years, some towers suffered from important fouling issues and we had to clean, to remove and sometimes to change fills. EDF has to do the right choice when retrofitting a cooling tower. EDF made tests on thermal performances thanks to Mistral Test facility and installed pieces of different types of packing in weighing machines onsite.

10:30a - 11:00a

TP12-13

Drift Measurement Using Conductivity Methodology: Advantage and Limitation

Vincent Ganzitti, Hamon



Vincent Ganzitti is an electro-mechanical engineer. He graduated in 2001 in Belgium. Since then, he worked at several technical positions within Hamon Thermal Europe including thermal software development, technical design and on field testing. He is now responsible of the Hamon R&D center located near Brussels.

This paper intends to present the drift measurement using the conductivity methodology. It will show its advantages and

Raphael Ballroom B (Water Treating Sessions)

er more important uses. The paper presents theoretical and operational results for the process, where it is shown that the process can produce make-up water at a fraction of the opex of conventional processes. In particular power consumption which in some cases may be as low as 15%, compared to competing processes. Chemical additives to the cooling water (osmotic agent) are retained within the process, thus reducing their overall consumption. Furthermore the chemistry of the cooling water does not support the growth of *Legionella pneumophila*.

10:00a - 10:30a

TP12-08

An Update on ASHRAE Standard 188P: Prevention of Legionellosis Associated with Building Systems

William F McCoy, Phigenics and Paul Lindahl, Jr., SPX Cooling Technologies



For the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE), he serves as Chair of Standard Project Committee 188 writing Standard 188P: Prevention of Legionellosis Associated with Building Water Systems. Previously, he was elected to the Environmental Health Committee and then served as Chair. Most recently, Bill has been elected to serve a 4-year term on the ASHRAE Research Administration Committee (RAC) which manages an annual \$3 million budget.

The American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) has developed a proposed Standard Practice that specifies what is required to prevent legionellosis associated with building water systems. The proposed Standard Practice was approved in July 2010 for public review publication. The first public, review was completed in November 2010; there were many supportive comments posted and also many excellent suggestions to improve the Standard. A revision was produced in response to comments received during the public review. The second public review opened June 10, 2011 and closed July 25. This paper gives perspectives in relation to CTI Standard 159, Legionellosis Related Practices for Evaporative Cooling Water Systems, which is in process and could be public by the time of the presentation of this paper.

10:30a - 11:00a

TP12-10

Field Evaluation and Verification of Biological Control in Operating Cooling Tower Water Systems Utilizing a Non-Chemical Pulse Electric Field Device (PEFD)

Paul Puckorius, Puckorius & Associates, Inc



Paul R. Puckorius is president and CEO of Puckorius & Associates, Inc. with corporate offices in Arvada, Colorado and a regional office in Sebring, Florida. His corporation only provides consulting services and does not sell chemicals or equipment nor is associated with any water treatment service company. Started in 1976 projects have been done throughout the USA, Europe, South America, Mexico, Canada, and middle and far east countries. Paul has over 50 years of experience and knowl-

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Raphael Ballroom A (ES&M and P&T Sessions)

its limitations.

11:00a - 11:30a

TP12-11

Structural Integrity of Hyperbolic Cooling Tower with Imperfections in Geometry and Verticality

Narendra Gosain, Prasad Samarajiva and Farouk Mahama, Walter P Moore



Narendra Gosain, Ph.D., PE, is Senior Principal in the Structural Diagnostics Services Group of Walter P Moore. In his 39-year career with Walter P Moore, Dr. Gosain has designed and evaluated several significant structures throughout the United States, including commercial, industrial, and medical structures. As an adjunct professor for 16 years in the College of Civil Engineering at Rice University in Houston from 1982 to 1998, Dr. Gosain shared his expertise with later generations of structural engineers. In 1999, Dr. Gosain started a new service line in Walter P Moore called the Structural Diagnostics Services Group that is dedicated to structural restoration, rehabilitation, forensics and litigation support work. He served as the Executive Director of the group until February 2009. Dr. Gosain's focus is now on serving as technical consultant for complex structural rehabilitation challenges and forensics related work.

Due to the large sizes of the concrete hyperbolic cooling towers and the difficulties encountered during construction, it is not always possible to maintain the dimensional accuracy of the towers. Imperfections in the intended geometry and verticality do occur which can have an impact on the stresses in the thin concrete shell structure. Using an existing hyperbolic cooling tower as an example and some possible imperfection scenarios of the structure, the paper will provide a parametric study on when certain imperfections become critical for the safety of the cooling tower when subjected to wind.

11:30a - 12:00p

TP12-09

Alternate Chemical Analysis for Drift Losses Measurements

Michel Monjoie, Monjoie Cooling and Gene Culver, McHale & Associates, Inc.



Michel Monjoie graduated as an electromechanical engineer in 1969 from Liege University in Belgium. He has worked for Hamon Thermal Europe since 1970 and was R&D manager for more than twenty years. He is active in CTI, ASME, and EUROVENT and has helped to write standards for each organisation. He has since retired and founded a company named Monjoie Cooling Sprl as a consultant in cooling tower business.

Atomic absorption analysis, recommended by CTI drift code (ATC-140) is one of the most accurate chemical analysis for drift losses measurement. Unfortunately, the results are never available immediately. It may introduce test uncertainty or even test miss-evaluation in case of, as example, a filter contamination, without possibility to run the test again. An alternate method using the measurement of the conductivity

Raphael Ballroom B (Water Treating Sessions)

edge of water treatment chemicals for use in cooling tower water systems. He provides expertise in problem solving and independent evaluation of water treatment programs. He has evaluated numerous cooling tower systems that use non-chemical devices for scale, corrosion and microbiological control. He is away interested in evaluating new technologies. He has provided training workshops on cooling water, boiler water, and waste water. He has authored over 150 technical papers covering all phases of water problems and practical water treatment.

Pulse Electric Field Devices (PEFDs) have been used as the sole source of water treatment in evaporative cooling water systems for over 10 years often with good results. Several field evaluations will be presented that provide detailed data on microbiological control entirely by the FEFDs. This paper will present both field and laboratory test data independently obtained from operating cooling tower water systems which rely solely on PEFDs for microbiological control. This data shows that adequate and acceptable control of both planktonic (bulk water) and sessile (biofilm) microbial populations in numerous full-sized cooling tower systems in being obtained. A comparison of field versus lab microbiological testing methods and results will be presented that indicate if proper Guidelines will be provided for field microbiological monitoring.

11:00a - 11:30a

TP12-14

Biocide Treatments for Controlling Amoeba Amplified Legionella in Cooling Towers

Paul Schook, and Jana Rajan, Dow Microbial Control



Paul Schook is Senior Microbiologist for Dow Microbial Control (DMC). He is a key member of the Water Treatment team, where he focuses on creating offerings for Legionella control, as well as developing molecular biology tools and methods.

At Dow Microbial Control, Paul is currently researching the efficacy of oxidizing and non-oxidizing biocides on the pathogenic bacteria *Legionella pneumophila* during various stages of its replication processes as they occur under real-world conditions. For this purpose, he has developed various model systems, including growing *Legionella* in multi-species biofilms and amoeba, and molecular techniques to monitor their physiological status. Paul joined DMC in 2010 following completion of his Ph.D. in Microbiology/Molecular Biology from Northwestern University Feinberg School of Medicine, Chicago, Ill. While at Northwestern, he conducted research to determine the unique molecular mechanisms of how pathogenic bacteria respond to externally generated oxidative damage. Paul also holds a B.A. in Biology from Lawrence University in Appleton, Wis. He is based in Buffalo Grove, Ill., United States.

There is an expanding body of evidence that highly prevalent free-living amoebae increase both the numbers and virulence of water based, human-pathogenic, amoeba-resisting microorganisms such as *Legionella*. We have focused on controlling amoeba-amplified forms of *Legionella* by various biocide regimes commonly used in water treatment and provide proof for a hypothesis that explains the inability of conventional treatments in controlling these hardy and relevant forms. Our studies demonstrate a need to revisit current biocide dosing practices in order to

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Raphael Ballroom A (ES&M and P&T Sessions)

of the filter washing water is easy to perform on site, gives immediate results allowing observing abnormal measurement. The paper describes the testing procedures and gives the limit of use to get accurate measurement. For the drift eliminator certification organized by EUROVENT in the Hamon lab during 2009 and 2010, both methods were used for evaluation of results. Some test on site has also used both methods. The paper will compare both methods in lab and on site.

Group Luncheon - 12:15p - 1:45p
Raphael Ballroom C&D

2:00p - 2:30p

TP12-15

Safe Cooling Tower Winter Operation

Michel Monjoie, Monjoie Cooling



Michel Monjoie graduated as an electromechanical engineer in 1969 from Liege University in Belgium. He has worked for Hamon Thermal Europe since 1970 and was R&D manager for more than twenty years. He is active in CTI, ASME, and EUROVENT and has helped to write standards for each organisation. He has since retired and founded a company named Monjoie Cooling Sprl as a consultant in cooling tower business.

Cooling tower freezing may damage the internal or even the structure of the cooling tower with the consequences in repair cost and degrade thermal performance. The paper describes the existing winter protection devices and procedure to avoid freezing damages in cooling tower: natural draft; fan assisted natural draft, mechanical draft, in relation with the air temperature and heat load. It covers the maintenance rules and check list to avoid uncontrolled freezing. It gives procedure for safe cold start up during winter.

Raphael Ballroom B (Water Treating Sessions)

meet the new guidelines for Legionella control in industrial water systems. This paper will discuss, with supporting data, some feasible alternatives that provide adequate control of amoeba-fed Legionella in cooling towers by employing a combination of US EPA approved organic biocides.

*Water Treating Papers will continue
Tuesday, February 7, 2012 @ 7:30a*

Group Luncheon - 12:15p - 1:45p
Raphael Ballroom C&D

2:00p - 3:30p - **Water Treating Panel Discussion**
(Raphael Ballroom B)

3:00p - 4:00p  **Break**

3:45p - 5:00p **Technical Committee Meetings**

- Engineering Standards & Maintenance, *Salon B*
- Performance & Technology, *Salon A*
- Water Treating, *Salon 2*

5:00p - 12:00a **Hospitality Suite - Donatella**
(Bar Closes @ 9:30p)

6:00p - 10:00p **Dinner Party - Raphael Ballroom C&D**
Dinner, 6:00p to 7:15p
Games, 7:30p to 10:30p

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Raphael Ballroom A (ES&M and P&T Sessions)

2:30p - 3:00p

TP12-17

Permanent Magnet Direct Drive Motors: Lessons Learned

Robbie McElveen and Bill Martin, Balldor 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.

In recent years, the authors have presented several papers concerning the use of permanent magnet motors for the direct drive of cooling tower fans. The goal of this paper is to detail how the technology has evolved, communicate lessons learned from field installations and give the reader a practical guide to the installation and use of this type of motor. An in depth case study is presented detailing installation challenges and solutions for a large permanent magnet direct drive motor.

3:00p - 3:30p

TP12-19

Fan Testing Method Comparison

Sean D. Scott, AirFlo Cooling Technologies



Sean D. Scott received his BS in Mechanical Engineering from the University of Missouri at Rolla in 1990. He currently holds the position of Vice President of Engineering at AirFlo Cooling Technologies located in Tulsa, Oklahoma. Sean has been instrumental in the development of several product improvements and was the principal designer of the Fan Test Cell at AirFlo Cooling Technologies. Sean has been involved in testing, engineering, marketing and manufacturing for over twenty years.

A comparison of fan test methods and the differences developed between two test methods. The paper will focus on the wind tunnel type of test using nozzle walls to develop flow measurements and the method of pitot tube traverse on the exit of the fan to develop flow measurements. There are advantages to both methods, but one method should be used in preference to the other in developing fan performance data.

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

2:00p - 3:30p

Water Treating Panel Discussion (Raphael Ballroom B)

3:00p - 4:00p



3:45p - 5:00p

Technical Committee Meetings

- Engineering Standards & Maintenance, *Salon B*
- Performance & Technology, *Salon A*
- Water Treating, *Salon 2*

5:00p - 12:00a

Hospitality Suite

(Bar Closes @ 9:30p) - *Donatello*

6:00p - 10:00p

Dinner Party

Dinner, 6:00p to 7:15p - *Raphael Ballroom C&D*

Games, 7:30p to 10:30p - *Raphael Ballroom C&D*

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Donatello (ES&M and P&T Sessions)

Tuesday, February 7, 2012

- 7:00a - 10:00a - New Member's Breakfast, *Salon 10*
7:00a - 10:00a - ☕ Service, *Atrium*
7:00a - 5:00p - Registration and Paper Sales, *Atrium*
7:00a - 5:00p - Speakers' Breakfast, Photo Session & Prep Room, *Salon 1*
7:30a - 8:00a

TP12-21

Best Practices for Minimizing Drift Loss in a Cooling Tower

William C. Miller, Brentwood Industries, Inc.



Bill Miller is a Sales Engineer with Brentwood Industries, Inc., based in Reading, PA, and has been in the cooling tower industry since 1998. In 1993 he graduated with a Bachelor of Science in Aerospace Engineering from the Pennsylvania State University. His duties at Brentwood involve application engineering of Brentwood's vast array of cooling tower products to his customers' requirements, involvement in new product development, and acting as a technical advisor to the sales team. He is a member of Tau Beta Pi, the National Engineering Honor Society, and has earned E.I.T. certification in the Commonwealth of Pennsylvania. Bill has published and presented technical papers previously at Cooling Technology Institute (CTI) and Electric Power Research Institute (EPRI) conferences.

There are many factors associated with the drift loss potential of a cooling tower. With the greater restrictions on drift emissions that are now required in many locales, it is important to know all of these factors to make sure that the drift loss of a tower is minimized. This paper will explore the various factors involved for both counterflow and crossflow cooling towers.

8:00a - 8:30a

TP12-23

Film Fill Fouling: Updated Methods, Results, and Predictions

Ken Mortensen, SPX Cooling Technologies



Ken is presently the manager of research and development for SPX Cooling Technologies. He has managed several engineering and operations departments responsible for water quality, material selection, and physical application criteria for cooling towers and components, as well as design, manufacture and servicing of water treatment equipment and installations. Ken graduated in 1977 with a Bachelor of Science in Chemical Engineering from Massachusetts Institute of Technology and completed an MBA at Rockhurst University in Kansas City, Missouri in 2000.

Ken graduated in 1977 with a Bachelor of Science in Chemical Engineering from Massachusetts Institute of Technology and completed an MBA at Rockhurst University in Kansas City, Missouri in 2000.

Film fill fouling is an important problem in modern power plant and industrial process cooling. This paper will present current laboratory and field fouling evaluation methods. Also reviewed are the history of application of various film fill geometries, in-situ water conditions, and

De Vinci (Water Treating Sessions)

Tuesday, February 7, 2012

- 7:00a - 10:00a - New Member's Breakfast, *Salon 10*
7:00a - 10:00a - ☕ Service, *Atrium*
7:00a - 5:00p - Registration and Paper Sales, *Atrium*
7:00a - 5:00p - Speakers' Breakfast, Photo Session & Prep Room, *Salon 1*
7:30a - 8:00a

TP12-16

Green Technologies: Electronic Water Treatment System Successfully Evaluated for Water Conservation

Rodrigo F.V. Romo, Zeta Corporation and Soloman Williams, Air Force Civil Engineer Agency (Retired)



Rodrigo Romo grew up in Guadalajara, Mexico and earned his undergraduate degree in Chemical Engineering from ITESO University in Guadalajara in 1992. He began his career as a candidate and crew-member for the second mission enclosed inside Biosphere 2 near Tucson, Arizona, one of the world's most sophisticated facilities dedicated to the research and understanding of global scientific issues. Sealed inside for a period of six months, he was in charge of the instrumentation and air monitoring systems; including maintenance, troubleshooting, calibration, data acquisition and interpretation. After the mission, he became an air quality research specialist for the Biosphere 2 complex, and then served as Assistant Plant Manager for their 6 MW co-generating plant. Interested in environmentally sound advances over chemical treatment, Biosphere 2 had installed several Zeta Rod systems with highly successful results. Rodrigo joined Zeta in 1997, bringing his talents and discipline as a scientific researcher to the company. Mr. Romo has authored numerous peer-reviewed papers for publication, overseen independent research, and developed new applications for the technology. His research has been focused on fouling prevention in RO membranes, heat exchangers, and metal working fluids. As Vice President of Zeta Corporation, he is primarily in charge of international sales and travels extensively in that role. Rodrigo earned an MBA in 2002 from the University of Arizona, Eller School and has become a United States citizen. He became LEED AP accredited in 2009.

The U.S. Army Corps of Engineers Construction Engineering Research Laboratory and the Air Force Civil Engineer Agency evaluated a high voltage capacitance-based water treatment technology in evaporative cooling systems at four military installations in an extended study. The non-chemical technology was evaluated for control and prevention of corrosion, scaling and biological fouling in a side-by-side comparison to standard chemical treatment. Results confirmed that the technology delivered an average 20% reduction in make-up water and 48% reduction in blow-down wastewater, contributing to water conservation goals for agencies established under Executive Order 13423. This paper presents the findings from the study.

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Donatello (ES&M and P&T Sessions)

the resulting condition of those fills.

8:30a - 9:00a

TP12-25

Precision Shaft Alignment in Cooling Towers

Troy Broussard, Cascade MVS



Troy A. Broussard has been a chief consultant for all rotating and reciprocating machinery reliability based maintenance initiatives at Cascade Analytic since 2003. A graduate of Lamar University, he has extensive experience in the field of reliability and condition assessment monitoring since 1988. Mr. Broussard spent 9 years with 2 of the largest reliability monitoring equipment manufacturers in the U.S. and has 4 years of in-plant experience where he was an integral part of the reliability monitoring team for the largest refinery in the United States. The core of Cascade's business is sales, consulting, and analysis of rotating equipment reliability using the latest tools and techniques to analyze and diagnosis machinery problems. The tools include vibration and oil analysis, infrared, sonic & ultrasonic detection along with analysis software. Cascade's goal is to work with customers to improve reliability of equipment and minimize downtime and maintenance costs while helping them develop better maintenance techniques. Cascade also assists customers with balancing and aligning rotating equipment when needed.

Precision shaft alignment in cooling towers requires a different set of skills than for other rotating equipment. This presentation will discuss soft foot issues, base and foundation considerations, spacer shaft and special procedures required for cooling tower alignment. The presentation will also include the benefits of dual laser solutions in cooling tower applications and laser coning.

9:00a - 9:30a

TP12-27

Understanding Mast Climbers Systems

Kevin O'Shea, Mastclimbers, LLC



Kevin O'Shea is a training and safety director for Mastclimbers, LLC. He became a mechanical and production engineer through the Amalgamated Engineering Unions in the United Kingdom and has been involved in he aerial work platform industry since 1982. Kevin has been in the industry on both sides of the Atlantic for more than twenty-five years. For the past five years, he has driven initiatives for increased safety in the powered access industry in the United States. Kevin has raised awareness of mast climbing work platforms (MCWP) safety, developed training and safe use programs, and provided outreach material for users. Kevin is an active member of the Scaffold & Access Industry Association (SAIA), the International Powered Access Federation (IPAF) - AWPT, Inc. is the U.S. subsidiary, ANSI Committees and the OSHA/SIA Alliance. He received the IPAF International Safety Champion award in 2009 and 2010, and the SAIA Council Chairperson of the Year award in 2010.

Mast Climbing Work Platforms (MCWP's) are becoming a popular method of access in the demolition and repair of cooling towers and stacks throughout the USA. With the flexibility of MCWP systems,

De Vinci (Water Treating Sessions)

8:00a - 8:30a

TP12-18

Polymer Detection in High Halogen Power Plant Cooling System Application

John P. Pilsits, Barbara E. Moriarty, Ph.D., and Daniel Cicero, Nalco Company



John Pilsits has over 32-years of Industrial Cooling and Boiler Water experience. He spent eight (8) years in the Power Industry responsible for Boiler Water Chemistry, Demineralizer Performance, and Cooling Water Chemistry. Mr. Pilsits has been with Nalco for the past twenty-four (24) years in Sales, Water Lab Management, Cooling Water Research, and for the last five (5) years as a member of the Technical Expertise Center supporting 3D TRASAR and Cooling Water applications, and as a Technical Trainer for Sales and Customers in these key areas. He has several Publications, a Patent, and has presented at Industrial Water Conferences.

High cycle operation, highly variable make-up water chemistry, and intermittent halogenations: all these factors make power plant cooling systems some of the most challenging to manage. Proper polymer monitoring allows one to understand true demand factors versus other artifacts that might negatively impact control. This paper discusses how high level halogen applications should be managed to provide optimal polymer control. Lab data will be presented, along with actual application data collected in a highly stressed power plant cooling system.

8:30a - 9:00a

TP12-20

Going it Alone: Lessons Learned from Managing Our Own Water Treatment Program

John Young, P.E., Cree, Inc.



Facilities Operations Manager for LED lighting manufacturer Cree, Inc. since 2000. Responsible for maintenance and operations of facilities, including 6 chilled water plants, 4 boiler plants and high voltage distribution. Prior to Cree, worked at North Carolina State University as AD for Building Maintenance and Operations, which included improving operations of their aging steam plants and steam distribution system. John is a Professional Engineer in North Carolina and holds a BS in Mechanical Engineering from NCSU. In 2006 Mr. Young founded FieldData Pro, Inc. to help companies better manage plant operating data and operator inspection data. He continues to work with FieldData Pro as VP of Engineering, helping develop new applications for mobile data collection technologies.

LED lighting manufacturer Cree took the management of water treatment for its numerous HVAC and process cooling systems in house after 12 years of full service water treatment from a national water treatment company. Cree now buys chemicals and treats its systems on their own. The road to independence was at times bumpy, but in the end it proved

THE 2011 CTI ANNUAL CONFERENCE

PROGRAM continued

The Technical Sessions will run simultaneously between two separate Ballrooms.

Donatello (ES&M and P&T Sessions)

specialist contractors are finding the equipment invaluable. Benefits of the system include: the ability of the mast to follow the profile of the cooling towers; the high capacity; the large working platform area; the ability of the platform to self-level; and the platforms's ability to be self sufficient, e.g. provides a working area which can facilitate the use of P.A.M. demolition units, store all necessary tools and materials, provide task lighting, weather protection, and can even hold a 'porta john' unit. Improvements in productivity, safety and quality are leading to increased use of the equipment in the cooling tower industry. The presentation describes how these benefits are achieved, looks at an overview of the types of system available and describes the technical considerations during the planning process.

This paper concludes the ES&M and P&T portion of the Technical Papers

10:00a - 12:00p - Technical Committee Work

- Engineering Standards & Maintenance, *Salon B*
- Performance & Technology, *Salon A*
- Water Treating, *Salon 2*

12:00p - 2:00p - Owner Operator Seminar (w/box lunch) *De Vinci*

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

2:00p - 3:00p - ☕ Services

2:00p - 4:30p - Seminar to..... *Donatello*

4:00p - 8:30p - Table Top Exhibits and Hospitality Suite (*Bar Closes @ 9:30p*), *Raphael Ballrooms A, B and C*

De Vinci (Water Treating Sessions)

to be an extremely rewarding journey.

9:00a - 9:30a

TP12-22

A State-of-the-Art Chemistry Based Toolset for Developing and Optimizing Power Plant Water Balance M



Daniel J Robinette, Rocky Mountain Water Engineering, LLC

Dan Robinette is a chemical process engineer with more than 30 years of professional experience serving large consumers and producers of water and energy. His expertise includes all aspects of water production and treatment, from high-purity water to concentrated brines. In 2001, he founded Rocky Mountain Water

Engineering (RMWE) – a consulting firm that applies its process simulation tools to diagnose and solve water-related problems. Dan has a BS degree in Chemical Engineering from Washington State University and is a registered professional engineer in the state of Colorado.

For most of the industrial era, water has essentially been viewed as a free or very low-cost commodity but this perception of a plentiful resource is changing rapidly as communities across the country begin to face limitations in fresh water supply. This scarcity of water, coupled with population growth, is driving competition for fresh water between people and power plants. Two frequently used methods of reducing fresh water consumption at power plants are to: 1) replace fresh water with water of degraded quality, and 2) increase the internal recycling of water within the plant. Both of these water conservation methods are technically challenging to evaluate and require affordable tools that can perform the necessary calculations. This paper describes a new chemistry based toolset that enables power industry personnel to build inexpensive yet sophisticated water balance models that are extremely useful for evaluating water saving alternatives.

9:30a - 10:00a

TP12-24

Biosperse XD3899 Microbiocide: A Novel Microbial Control Agent For Cooling Towers



Chris Baron and Dwight Emerich, Ashland Inc.

Chris Baron has been with Ashland Inc. for over thirteen years. His graduate thesis project at Purdue University involved studying the formation, equilibration, and decomposition kinetics and mechanisms of bromamines and bromochloramines. Other professional areas of interest include corrosion control and interfacing of analytical instrumentation with cooling and boiler

systems.

A novel oxidizing biocide produced from the stoichiometric reaction of ammonium bromide and bleach is used to control growth of microorganisms in recirculating cooling systems. Data will be presented showing the superiority of this biocide compared to traditional MB control agents like bleach, bromine, chlorine dioxide, and non-oxidizing biocides. Efficacy

THE 2012 CTI ANNUAL CONFERENCE

PROGRAM continued

Continuation of Tuesday's Schedule as follows:

- 10:00a - 12:00p** - Technical Committee Work
- Engineering Standards & Maintenance, *Salon B*
 - Performance & Technology, *Salon A*
 - Water Treating, *Salon 2*
- 12:00p - 2:00p** - Owner Operator Seminar (w/box lunch)
De Vinci
- 12:00p - 2:00p** - Lunch on your own
- 2:00p - 3:00p** -  Services
- 2:00p - 4:30p** - Seminar to.....  *Donatello*
- 4:00p - 8:30p** - Table Top Exhibits and Hospitality Suite (*Bar Closes @ 9:30p*), *Raphael Ballrooms A, B and C*

De Vinci (Water Treating Sessions)

of this substance against Legionella will also be given.

10:00a - 10:30a

TP12-26

How "Green" is the Cooling System?


Roy A. Holliday, Gary E. Geiger, Peter Geuns, GE Water & Process Technologies



50 years experience in water treatment, particularly Cooling Water Treatment, in a Technical capacity troubleshooting, program design and product development. 8 years working in Power Stations for the UK Central Electricity Generating Board. 3 years working for British Steel Tubes Division at a fully integrated Iron and Steel and Finishing Plant (tubes) at Corby, Northamptonshire, UK. 39 years GE, with responsibilities for UK, South East Asia, Europe, Middle East and Africa. Has been hired as a consultant by International Oil Corporations and Food and Beverage Industry Companies. Written, presented and had published several papers for various organisations or conferences.

Design, operation and treatment of cooling systems can encompass many techniques to fulfill both the desires of Industry and Management to improve its environmental image. Environmental impact reaches much further than the "greenness" of a given cooling water treatment chemical in the discharge from a cooling system. When assessed in depth, "traditional" chemicals or treatments may be "greener" than conventionally imagined or portrayed. Non-Chemical Devices (NCDs) have great appeal when talking of the impact of treatment chemicals. "Marketing" of some treatment chemicals emphasizes their "biodegradability". Some

Wednesday, February 8, 2012

- 7:00a - 10:00a**  Services
- 7:00a - 5:00p** - Registration and Paper Sales, *Atrium*
- 7:00a - 8:00a** - Speakers' Breakfast, *Salon 1*
- 8:00a - 12:00p** - Educational Seminar, *Raphael Ballroom A*
- 12:00p - 1:30p** - Lunch on your own
- 1:30p - 5:00p** - Technical Committee Meetings
- Engineering Standards & Maintenance, *Salon B*
 - Performance & Technology, *Salon A*
 - Water Treating, *Salon 2*
- 2:00p - 3:00p** -  Services
- 5:00p - 8:00p** - Hospitality Suite (*Bar closes @ 8:00p*) *Donatello*

Thursday, February 9, 2012

Thursday's activities involve the Board of Directors and Committee chairs only

- 7:30a - 8:15a** Board of Directors' (includes Committee Chairs) Breakfast, *Campabello*
- 8:30a - 2:00p** Board of Directors' Meeting, *Salon 3*