30th Anniversary with Cooling Technology Institute for Virginia Manser

Virginia Alicia Gutierrez Pena Manser, better known to you as Vicky, began her career with CTI in 1981 serving as the assistant to Dorothy Garrison. Vicky’s first CTI Meeting was a Committee Workshop in Seattle.

Here are some little known facts concerning Vicky. She started her American education by attending Mary Help of Christian School (seventh grade - 1968) in Laredo, Texas, at which time she spoke no English. A star in basketball (All-State), she challenged the hoop at St. Augustine High School (1972) in Laredo and earned a major write-up and photograph in Beaumont’s Newspaper in 1974.

Moving to the United States in 1975 she has lived in Florida, Mississippi and settled in Texas. 1993 was an exciting year for Vicky. She took the oath of American Citizenship while also becoming CTI’s acting Director. She has served the position of CTI Administrator and the institute well for the last seventeen (17) years.

Vicky has two (2) sons, Andrew (25) and Daniel (20). Virginia will be honored at the Monday luncheon by her peers be sure to be a part of this special presentation.

Your Program Committee invites you to the 2011 winter CTI conference in San Antonio, Texas. February 6-10 2011 at The Westin River Walk.

The program committee would like to invite you and your company to the 2011 Annual Conference, this year held in San Antonio, Texas, at The Westin Riverwalk. The city of San Antonio is full of heritage and culture with many interesting things to see and do.

Along with the outstanding location, we have a great program lined up with a full offering of information, education and an opportunity to participate in some of the ongoing work on standards and codes. We believe it is our responsibility to make sure what we have to offer you can be shared with others at your company. Because of our mission as a nonprofit technical organization, we are charged to bring the most timely and latest information in the industry.

We have 28 papers being presented in a concurrent format on Monday and part of Tuesday. Water Treating will have one session and Performance & Technology (P&T) and Engineering Standards & Maintenance (ES&M) will have the other. This format will allow a better opportunity to take full advantage of the papers being offered. We hope you will find its benefit, with our trying to add more to our programming. You will find a list of the papers, the times they are being presented, their authors w/company, a brief bio of the author and a brief description of the paper starting on page 10 of this newsletter.

Committee Work Shop Time

We will offer an extended time for committee work to be done. In past Annual Conferences we had only a very short amount of time set aside to do the committee work. This year we have allowed much more time to do the work so important to the CTI. Please refer to the CTI news for times, committee and work to be done.

Owner/Operator Session - Tuesday 12:00p - 2:00p - Come and meet with other Owner Operators of Cooling Towers. Jon Bickford from Alliant Energy is the Chairperson of the Owner/Operator Council and has put together a terrific program for the Owner Operators on Tuesday, February 8th from 10:00a – 2:00p. Be sure to check on the registration form that you will be attending so we will have enough seating and enough lunches for everyone. As always there will be time to discuss concerns and issues that other Owner Operators have about their Cooling Towers. If you have any issue you would like addressed at this meeting please e-mail Jon Bickford in advance. (jnubickford@alliantenergy.com)

Ask The Expert - Tuesday 2:00p – 4:30p

This very popular session is back by demand, come prepared with your questions for the panel of experts. We will have folks from all the standing committees ready to support your questions with good qualified answers.

Education Program Session - Wednesday 8:00a – 12:00p This year the Education Program will cover the following topics: FRP Fir Retardant Properties and Standards for Cooling Tower Industry (presented by Bhryav Mutmri, Bedford Reinforced Plastics Inc.); MPPA 214 Standard on Water-Cooling Towers (presented by Larry Edwards, F.E., Moran Special Hazard Systems); Fire Wall Systems (presented by Mike Bickerstaff, Composite Cooling Solution, LP).

Water Treating Panel Discussion - Tuesday 2:00p – 3:30p Matt Wangerin will host this years, panel discussion session. The Cooling Technology Institute will present a panel discussion where industry experts will review and discuss the topical issues surrounding water reuse and conservation. Beyond representing an opportunistic example of current sustainability, water reuse possesses ramifications of technological and economic necessity in certain geographies. The panel will address these key points. If you don’t attend any other cooling tower related meeting or conference this year, you don’t want to miss this. The CTI program committee has put together a program that will offer the best opportunity to inform, educate and expand your knowledge about this industry. We hope you come prepared to take full advantage of everything we have to offer you, a great location, outstanding food, entertainment and a conference that will give back to the membership what you want – Information.

Make sure you take the time to evaluate the Speakers, Education Program, and your overall experience during the conference. We want to hear from you.

Don’t forget the Table Top Exhibition. There will be thirty-eight (as of this writing) manufacturers, suppliers, and support companies with products and information. It’s the time set aside to have a cold beverage, a bite to eat and learn what’s new in the industry. Who knows you might run into an old friend or even make a new one.

I, Glenn Rees, along with Paul Nelissen, Brandon Rees, and Gary Geiger, your program committee, invite and welcome you to the 2011 winter conference and meeting. Check out our announcement on the CTI web site. See you in San Antonio, Texas.

Glenn Rees, CTI Chairman Program 2011

If you are new to our conference and seem to be a little overwhelmed look for the CTI Ambassadors (the members with 'Yellow' name badges). These members will be able to help you and answer any questions you may have.
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2011 Education Seminar
Wednesday, February 9, 2011
8:00a - 12:00p

Message From The President

The summer meeting this past July in Albuquerque, New Mexico was a big success. The summer workshop was well attended, and consideration of progress was made on updating our codes and standards. Numerous business issues that are vital to the continued success of CTI were also addressed.

The organization and reporting of the Task Groups in each standing committee has improved tremendously since all groups are now using the standardized method of reporting. This method has greatly improved the efficiency of the task committees by clearly defining at what stage the task has progressed and responsibility of tasks to be completed. My sincere thanks are extended to Bill Howard and Chris Lazenery and all others for their efforts in promoting the benefits of the new reporting system and record keeping of tasks. This improved task group record keeping has made the interface with the CTI administrative management much more efficient in getting both new and revised standards to the Board of Directors for timely approval and publication.

The Thermal Certification Program has been a great success for CTI and continues to expand, especially internationally. In the past, CTI has contracted with Cooling Tower Test Associates (CTTA) to handle the testing, management and record keeping of the certified tower lines. This arrangement has been extremely successful and CTTA has done a superb job in managing and fostering the program. Now, due to size, widely spread international participation in the program, and the age of CTTA management, CTI will begin a process to bring the management of the Thermal Certification Program back “in-house” by assuming the responsibility to manage the program and its required contracts with tower manufacturers and testing agencies. These additional duties will require CTI to increase its staff on the technical and contracts administration side to handle all of the work that has been performed exclusively by CTTA in the past. The change is well timed, and CTTA has agreed to stay involved as long and to whatever extent that CTI requires to make a smooth and non-disruptive transition.

In addition, the CTI Board has indicated that CTI should not limit our certification to Thermal Certification only but should also explore certification of other products. CTI has received requests from manufacturers and suppliers to certify fill and drift eliminators manufactured from mechanical properties of FRP structural components, E – 84 flame spread ratings, and complete partition firewall ratings as required by NFPA – 214. Also, performance certifications of fans, fill materials, and gears have been suggested. Certification of products and materials could represent an excellent source of revenue to CTI and provide an excellent service to the industry (as an example, Eurovent, a similar association as CTI but located in Europe, certifies over 180 products in 18 different product categories), and the additional staff necessary to manage the thermal certification program should also be able to handle the product and material certification with no additional headcount.

Two separate committees were appointed this year to study the issues involved with CTI first assuming full responsibility of Thermal Certification and second expanding CTI’s role into Product and Material certification. Both committees have made excellent progress and the committees plan to present a draft business plan to the CTI BOD at the February board meeting for discussion. I compliment the excellent work that has been done to date by both these committees and their much appreciated volunteer efforts to improve and expand CTI’s standing in our industry.

As we have all read recently, the National Bureau of Economic Research (NBER) has stated that the economic recession ended in June 2009. Even though that date marks a milestone, the economy, as far as most of us can tell, is still very sluggish with very slow growth. I am happy to report that CTI has weathered the storm financially. Our financial position at the end of the year is strong and we expect to show improvement over our 2010 budget forecast. We have exceeded membership projections, and the CTI staff has done an excellent job in reducing both variable expenses as well as fixed costs. In addition, changes have been made in our financial reporting that will allow CTI to better forecast cash flow on a monthly basis against a monthly budget.

There is considerable activity occurring and it is all very positive. It is my pleasure to work with such a great group of dedicated CTI members and CTI Administrative Staff. Please accept my sincere thanks as President and from the members of the Board of Directors.

Jess Seawell, President 2010 - 2011
Come and join Jon Bickford, Chairperson for the Owner/Operator group with Cooling Technology Institute (CTI) at the CTI Annual Conference in San Antonio Texas. This group is made up of people that are responsible for cooling towers at their facilities. It is a chance to talk to others about issues they have with their cooling towers and gain important information on cooling towers. You will also have the opportunity to meet suppliers and manufactures of cooling towers, which will come in handy when you have problems with your cooling towers.

There are a couple of days of presentations given by experts on tower operation, environmental policies, water treatment and structural information. There are break out sessions where you can join in on group conversations for re-writing CTI standards and procedures. As a member of CTI you can also become a committee member on these groups and help in re-writing of the new procedures and standards.

This year at the Owner/Operator (O/O) session we are going to discuss issues that people are seeing with their towers. We have already started putting together questions that people want to have help with. We expect this list to grow as more O/O sign up for the conference. Some of the topics that we will be talking about are as follows:

- Safe access to cooling tower gearboxes.
- Switching from one speed fans to VFD driven fans.
- Options of doing away with gearboxes and shafts by going to direct drive fans.
- Rebuilding cooling towers and switching from a wood to a fiberglass tower.
- Do’s and don’ts on cooling tower rebuilds and the building of new towers.
- Lessons learned from tower project.
- Building or making repairs that are even better than the CTI standards. When money is no object.
- Different types of cooling tower products for fill, eliminators, and nozzles.
- Fire headers and lightning protection.
- Water treatment and sludge issues.

The best thing about this group is after we all leave the conference we will know people that we can call at any time for help and advice as tower problems occur. I hope to see a large turn out this year. With the change in the power industry for running plants as efficient as possible the cooling towers are becoming a very important part in plant efficiency.
Water Treating Panel Discussion

Monday, February 7, 2011
2:00p - 3:30p

The Cooling Technology Institute will present a panel discussion where industry experts will review and discuss the topical issues surrounding water reuse and conservation. Beyond representing an opportunistic example of current sustainability, water reuse possesses ramifications of technological and economic necessity in certain geographies. The panel will address these key points.

Please attend to learn more about this important topic and have your concerns addressed by the panel.
Cooling Technology Institute

Code of Ethics

We the members of the Cooling Technology Institute (CTI), when acting on behalf of CTI, its members and the industry, will always abide by:

• Behaving with honesty, trustworthiness, and in good faith in representing and performing duties for the betterment of the CTI.
• Always striving to provide the best and most up to date technological information so CTI remains current with industry standards, specifications, guidelines and recommended practices for the benefit of both our members and our industry.
• Insuring that all official works, statements and/or actions on behalf of CTI are so noted as official property of the CTI. All non-official works, statements and/or actions will be clearly recognized as not of CTI and are of personal opinion.
• Avoiding damaging or critical actions with other CTI members that might be personally hurtful or degrading to their employer.
• Exposing existing or past conflicts and rectifying these conflicts in an expedient manner to the best possible solution for all parties involved.
• Holding fellow CTI members in the highest regard of respect and admiration.

August 29, 2006

Key Features of CTI ToolKit Version 3.1

• Air Properties Calculator. Fully ASHRAE compliant, psychrometrics. Interactive.
• Thermal Design Worksheet. in the “Demand Curve” Tab which can be saved to file and retrieved for later review. Now with printable and exportable graphs.
• Performance Evaluator. In the “Performance Curve” Tab to evaluate induced draft or forced draft, crossflow or counterflow cooling tower performance. Now calculates percent performance or leaving water temperature deviation. Data can be entered manually or with an input file. Automatic Cross-Plotting. Now with printable and exportable graphs.
• New and Improved Help Files. guide you through the software, explain performance evaluation techniques and offer tips for use.

Now works with Microsoft Windows Vista and all earlier Windows Operating Systems back to Windows 95
(16 MB ram recommended, and 3 MB free disk space required)

Dress code for the Annual Conference is Business Casual No Ties!

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CALL FOR PAPERS
2012 Annual Conference
February 5-9, 2012
Hilton Hotel
Houston, Texas

The following schedule will begin the process for papers presented at the 2012 Annual Conference:

2011
May 6: Deadline for Abstracts
June 17: Authors Notified by Program Chair
Aug 5: Six (6) copies of draft must be sent to CTI office for review
Nov 4: Final draft, based on review comments and slides due in the CTI office

Abstract Forms can be obtained by contacting the CTI office at 281.583.4087 or email: vmanser@cti.org
### Licensed CTI Thermal Testing Agencies

<table>
<thead>
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<th>License Type</th>
<th>Agency Name</th>
<th>Contact Person</th>
<th>Telephone/Fax</th>
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<tr>
<td>A</td>
<td>Clean Air Engineering</td>
<td>Kenneth Hennon</td>
<td>800.208.6162/865.918.7569</td>
</tr>
<tr>
<td>B</td>
<td>Cooling Tower Technologies Pty Ltd</td>
<td>Ronald Rayner</td>
<td>61 2 9789 5900/61 2 9789 9022</td>
</tr>
<tr>
<td>A</td>
<td>Cooling Tower Test Associates, Inc.</td>
<td>Thomas E. Watson</td>
<td>911.681.4027/911.681.0139</td>
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*Type A license is for the use of mercury in glass thermometers typically used for smaller towers.

Type B license is for the use of remote data acquisition devices which can accommodate multiple measurement locations required by larger towers.

### Licensed CTI Drift Testing Agencies

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<td>Kenneth Hennon</td>
<td>800.208.6162/865.918.7569</td>
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*Make your plans to attend Future Meetings for CTI*

#### July 17-20, 2011
Amelia Island Plantation
Amelia Island, FL

February 5-9, 2012
Hilton Hotel
Houston, TX

July 8-11, 2012
El Conquistador
Tucson, AZ

February 4-7, 2013
Omni Bayfront
Corpus Christi, TX

### Earn PDH Credits while meeting and working with others in the industry.

*Information when you register*
Concrete cooling towers in seismic zones that have been exposed to corrosion structural and forensics related work. Dr. Gosain has also served as an expert witness in several on serving as technical consultant for complex structural rehabilitation challenges as the Executive Director of the group until February 2009. Dr. Gosain’s focus is now at noise; specifically, how to balance the cost of the air-cooler metallurgy and design pressure with site noise requirements. In this paper, we will look at the effect of Air Flow on Size And Weight of Direct Drive Permanent Magnet Motors

This is a follow on to the Cost of Noise paper presented in 2008 (TP08-16). The

TP11-01
Effect Of Air Flow On Size And Weight Of Direct Drive Permanent Magnet Motors
Robbie McElvain and Bill Martin, Baldor Electric Company

Robbie McElvain 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 small pole permanent magnet motor development and application. Mr. McElvain is a member of IEEE and has authored several technical papers on both induction and permanent magnet motors and their use in industry.

The usage of direct drive fan motors is increasing. One concern about using direct drive solutions is the weight difference between this type of motor and the gearbox it replaces. The motors are located in the center of the fan hub where there is typically only a nominal amount of air movement. More air flow over the motor frame results in better heat dissipation and smaller, lighter motors.

This paper investigates the effect of air flow on size and weight of direct drive motors of various diameters. A simple method to direct more air flow over the motor is presented.

9:00a - 9:30a
TP11-04
An Improved Method For Calculating Calcium Carbonate Depostion on Heat Transfer Surfaces
Michael Coughlin, Diversey Inc.

Michael Coughlin graduated with a B.S. honoring in Microbiology from the agricultural college of McGill University in Montreal. He also holds an M.S. in biochemistry from Dalhousie University in Halifax, Nova Scotia and a Ph.D. in bioremediation from the University of Cincinnati. Michael has been an employee of Diversey for 20 years and has held several technical and research positions since joining the organization in 1980 and has authored papers on bioremediation, corrosion control and sanitation. Most recently, Michael has been responsible for developing a green product line for air scrubbers and cooling systems. By definition, when pH Actual = pH Saturation, the LSI is zero. However in special cases where these terms are greater than 6.5, an alternative index, the RSI, predicts CaCO3 dissolution. Conversely when the terms are equal but less than 6.5, the RSI predicts CaCO3 deposition. Furthermore, when there is virtually no calcium but ample alkalinity present, both conventional indices predict scaling when in fact none will occur. A new index is proposed that predicts not only scaling tendency but the amount of CaCO3 precipitation. The precipitation is always proportional to the water’s alkalinity, calcium, TDS and temperature.

9:00a - 9:30a
TP11-02
The 3 Rs of Sustainable Water Cooled Systems Operation
Allen Wilson, Fluid Treatment Solutions, Inc.

Wilson has dual degrees from Kansas State University in Business Administration and related fields of study. For the past 20 years he has served on the management staff of Fluid Treatment Solutions, Inc., a family of companies. In 1998, Wilson was appointed President of the company, during his tenure he has been instrumental in directing and managing the process for design changes for enhanced implementation of the company’s technology. To iterate the fact that cooling towers are inherently economically and environmentally ‘green’, this paper will utilize the main strategies of ‘green’, i.e. reduced energy, water conservation and recycling with a focus on water efficiency. A comparison of air cooled verses water cooled systems will be approached from several vantage points; energy consumption, water consumption and GHG emissions each of which will be delineated. A review of water treatment technology and its impact on water use, improved operational efficiency, environmental impact will be explored. Factors to be considered will be cycles of concentration and operational load. A conclusion can be reached that cooling towers are truly a sustainable and viable option in heat exchange systems for creature comfort.

9:00a - 9:30a
TP11-03
The Cost of Noise II
Robert Giammaruti, Hudson Products Corporation

Robert Giammaruti the Vice President of Fan Sales, Engineering and Service for Hudson Products Corporation/cofmcns USA. Employed since 1986, Bob oversees the engineering, sales and service of Til-Fan Fan, Fan Parts and Air-Cooler Fan Parts (Global) as well as Cofmcns Fan and Fan Parts (Western Hemisphere) used in Cooling towers and Air-Cooled Heat Exchangers. Previous work history includes various engineering and project management positions within Hudson as well as 5 years with the Babcock & Wilcox Company as a product development engineer. Bob graduated in 1989 and 1992 from Drexel University in Philadelphia with a Bachelor’s and Masters in Mechanical Engineering respectively.

This is a follow on to the Cost of Noise paper presented in 2008 (TP08-16). The 2008 paper was focused on how noise affected project cost as a function of reduced far-field noise, for a static heat exchanger design. However, there is a second component that an air-cooled heat exchanger designer must take into account when looking at noise; specifically, how to balance the cost of the air-cooler metallurgy and design pressure with site noise requirements. In this paper, we will look at the effect of reduced far-field noise as a function of air-cooler metallurgy and design pressure. The goal here will be to demonstrate how these additional parameters influence optimum air-cooler cost design.

9:30a - 10:00a
TP11-05
Structural Integrity Of Hyperbolic Cooling Towers In Seismic Zones During Concrete Veil Repair

Narendra Gosain, Ph.D., P.E. is Senior Principal in the Structural Diagnostics Services Group of Walter P. Moore. In his 38-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. Dr. Gosain has also served as an expert witness in several structurally related cases.

Concrete cooling towers in seismic zones that have been exposed to corrosion causing conditions are susceptible to deterioration over a period of time.

9:30a - 10:00a
TP11-06
Optimizing Treatment Cost Performance
Robert J Ferguson, French Creek Software

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 the cost performance of treatments in cooling systems requires the use of models that calculate the minimum effective dosage of scale and/or corrosion inhibitors and blends. This paper describes the theory, development, and applications of performance models to optimizing and comparing treatments in open recirculating cooling systems. The impact of blending inhibitors on dosage is described. Treatment and model limitations are also discussed.

9:30a - 10:00a
continued on page 11

THE 2011 CTI ANNUAL
© Again this year the Technical Sessions will run simultaneously between

Monday, February 6, 2011
Navarro B Ballroom (ES&M and P&T Sessions)
Navarro A Ballroom (ES&M and P&T Sessions)

Monday, February 7, 2011
Navarro B Ballroom (Water Treating)
Navarro B Ballroom (Water Treating)
Again this year the Technical Sessions will run simultaneously between two separate Ballrooms. Look closely to see which paper you want to attend.

CONFERENCE PROGRAM

TTIP-01

Effect Of Relative Humidity On NTU Engineering Cooling Towers

Hossein Akhavi, Abtab

Hossein Akhavi was born in Tehran, Iran, 1960. He received his BSc degree from Elm a Sanat University of Technology, Tehran, Iran in 1986, in Mechanical Engineering. His work experience included designing and manufacturing air conditioning equipment such as chillers, cooling towers, air handling units, air washers etc. as well as industrial and scientific activities in the field of consulting, design, installing, and commissioning establishments systems for 25 years. Also, designed and installed the cooling system for M.R.I using chiller and cooling tower in University and the same cooling tower by the method of Free Cooling in winters. Registered an invention named as “cooling tower with no fan and no electromotor adopting the method of natural convection” and introduced a technical innovation by the name of “evaporative cooler with chilled water.” Engineering cooling tower is usually done by NTU (number of transfer unit) method. And in this method for two regions with equal atmospheric pressures, wet bulb temperatures, inlet and outlet water temperatures, ratio of water flow to air flow and air velocities with different relative humidity, the engineering result and capacity of cooling towers theoretically will be equal. Practically, this result may be correct. In this paper has given a solution which explains the difference of engineering and consequently difference of two cooling towers capacity for those two regions. This solution is just a compliment for NTU engineering method.

TTIP-02

Seismic Qualification - Fact And Fiction

Robert Simmons, Petra Seismic Design

Mr. Simmons has over 22 years experience in design, development, and application of vibration and shock isolation and seismic restraint of non-structural components such as mechanical, electrical, plumbing, and fire protection equipment and related systems. He has a BSME from Texas A&M University and is a registered P.E. in 29 states. He is a member and past Chairman for ASHRAE’s Technical Committee 2.7, Seismic Restraint and Wind Design. He is a member and past secretary for ASHRAE’s Technical Committee 2.6, Sound & Vibration Control. He is current chair for the Vibration Isolation Subcommittee of TC 2.6. Mr. Simmons served as Membership Chair and Past President of the Vibration Isolation and Seismic Control Manufacturer’s Association (VISCMA). He gives frequent lectures on vibration isolation and seismic restraint. Chapter 17 of the International Building Code (IBC) requires manufacturers of designated equipment to provide a certificate of compliance verifying that the equipment will meet pertinent earthquake load criteria. The evidence of compliance must be by actual test on a shake table, by an analytical method using dynamic characteristics, by the use of experience data, or by more rigorous analysis providing for equivalent safety. In the wake of this requirement, equipment manufacturers have grasped for a concrete method to obtain such a certification. This paper will explain the facts and fiction regarding when seismic compliance is required, how to go about obtaining a seismic certification, and what role jurisdictions such as OSHPD play.

TTIP-03

Efficacy of Non-chemical Devices In Controlling Legionella: Results From A Model Cooling System

Janet E. Stout, Ph.D., Scott M. Duda, M.S. and Radausk Vidic, Ph.D., Univ of Pittsburgh

Dr. Stout received her B.S. in Biology from Clarion State College, Clarion, Pennsylvania, and her Masters and Ph.D. degrees in Microbiology from the University of Pittsburgh. She is currently the Director of the Special Pathogens Laboratory in Pittsburgh. PA and an Associate Professor of Environmental Engineering and Environmental Engineering University of Pittsburgh. Dr. Stout elucidated the link between the presence of Legionella bacteria in hospital water systems and hospital-acquired Legionnaires’ disease. Dr. Stout has authored more than 80 peer review papers and book chapters on the environmental microbiology and epidemiology of Legionnaires’ disease. She has been instrumental in the development of methods and strategies for the prevention of infections due to Legionella and other waterborne pathogens. Dr. Stout is a member of the American Society for Microbiology, the Association for Professionals in Infection Control, and the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE).

The objective of this investigation was to assess the ability of several classes of non-chemical water treatment devices (NCD’s) to control the growth of Legionella in a model cooling system. In addition, water samples from cooling towers treated with NCD’s were also tested. NCD devices did not prevent Legionella growth in the model cooling towers or in field tests. Building owners and engineers should use only NCD’s for Legionella control, especially if they are only treated with non-chemical devices.

TTIP-04

NCDs and Biological Control In Cooling Water Systems

William E. (Bill) Pearson II, CWT, Southeastern Laboratories, Inc.

Mr. Pearson lives in Raleigh, North Carolina and is Vice President and Director of Sales, Consulting & Technical Services for Southeastern Laboratories, Inc. He is a Certified Water Technologist (CWT) and has over 35 years experience in the water treatment industry, beginning his career with SEL in 1975. Bill is a Biochemistry graduate of East Carolina University and a member of the American Chemical Society (ACS) and the National Association of Corrosion Engineers (NACE International). Bill has been active in many water treatment technical trade associations and currently serves as Liaison for the Association of Water Technologists (AWT) to the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) and to the Cooling Technology Institute (CTI). He is a past-chair (2007-2009) of ASHRAE’s Water Treatment Technical Committee and is a voting member on the current ASHRAE & CTI committees writing Legionella standards. He has served on the AWTC Board of Directors, was President of AWT in 2003 and received the prestigious Ray Baum Memorial Water Technologist of the Year award in 2005. 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 paper also presents an inventory of current NCDs such as biocides, exchangeon 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. This paper will discuss the role of NCDs and biological control in the treatment of cooling water systems. This paper will also discuss the role of NCDs and biological control in the treatment of cooling water systems. This paper will also discuss the role of NCDs and biological control in the treatment of cooling water systems.
continued from page 11

TP11-11
Mistatteno-Cycle Enhanced Cooling Towers
Lee Gillian, Idalex; Paul Glanvill and Dr. Aleksandr Kozlov, Gas Technology Institute
Mr. Gillian's career has provided him with a wealth of experience beneficial to the ongoing research at Idalex Technologies. For nine years (1973 to 1980) he served as a Mechanical Engineer Fuel Engineers and Constructors. In this capacity he was responsible for design, manufacturing, installation and startup of heat transfer and associated equipment on major oil refineries and coal gasification plants in South Africa. As a Principal in Gillans Engineering (1984-2003) Mr. Gillian established himself as an industry expert in mechanical engineering, providing evaluations of commercial and multi-family residential building air-conditioning, heating, and ventilation throughout the Colorado, New Mexico and Oklahoma region. As an Expert Witness proved his expertise in the court room in litigation cases range from air conditioning, heating, ventilation, structural, roofing, drainage, and many other construction relation issues. His forensic engineering expertise and ability to focus on root causes has been invaluable in Idalex's research facility. This expertise also required him to develop a thorough understanding of current codes, plans, municipal standards and manufacturers' installation instructions that is invaluable as Idalex commercializes its first product, the Coolerado Cooler. Following its successful application in air-conditioning as marketed by the Coolerado Corporation, this document summarizes the potential of the novel thermodynamic cycle, the so-called Mistatteno-Cycle (“M-Cycle”), as applied to Cooling Tower Design. Through a review of existing methods and technologies, this document discusses how the M-Cycle Enhanced Open and Closed Circuit Cooling Tower designs have the potential in retrofit applications to (1) cool water down to the ambient air dew point temperature and (2) reduce system pressure drop and fan power consumption, with the potential to reduce both installed and operating costs. For readers seeking additional information, appendices discuss the M-Cycle and the corresponding psychrometrics in greater detail.

TP11-12
AeP’s experience With Polyester FRP Structure Cooling Towers
Vladislav Grebek, REKO PRAH, A.s.
(Vacation the first polyester fiberglass structure cooling towers were • Water Treating, Water Treating Panel Discussion (Navarro B Ballroom) 2:00p - 3:30p
2:00p - 3:30p            Break
3:00p - 4:00p            Water Treating, Water Treating Panel Discussion (Navarro B Ballroom)
3:30p - 5:00p
4:00p - 5:30p
5:00p - 12:00a
6:00p - 10:00p
7:00p - 9:30p
9:30p - 12:00a
12:30p - 2:00p
2:30p - 3:00p
3:00p - 4:00p
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8:00p - 9:00p
9:00p - 10:00p
10:00p - 11:00p
11:00p - 12:00a
12:00a - 1:00p
1:00p - 2:00p
2:00p - 3:00p
continued on page 13

TP11-19
AEP’s Experience With Polyester FRP Structure Cooling Towers
Bob Cashner, American Electric Power
Bob Cashner is a Senior Engineer with American Electric Power and works out of the corporate headquarters in Columbus, Ohio. He received a BS in mechanical engineering from the University of Missouri – Rolla. Bob has more than 25 years of experience with heat exchangers (cooling towers, foodwater heaters and condensers), pumps and balance of plant equipment. He also worked at an architectural & engineering company for over 5 years designing HVAC systems for telecom, schools, hospitals, historical sites, etc. Bob is a member of ASHRAE and ASME, and has presented several technical papers at EPRI and ASME conferences.

The first polyester fiberglass structure cooling towers were placed in operation on the AEP system during the period of 2008 to 2010. One of these towers is a counter-flow design while the other four towers are cross-flow designs. Surface blisters were found on 15% to 20% of the columns in two towers after 18 months of service. A majority of the fiberglass bearing pads have failed in 3 towers which caused the bottom of many of the pipe columns to vertically split and fail. Information will be presented on the above issues, field repairs and lessons learned.
For the purpose of our discussion, the document's content seems to be focused on the thermal performance of cooling towers and the methods to improve their efficiency. The text references the need for innovative strategies to address the challenges faced by cooling towers, particularly in terms of performance enhancement and maintenance. The document highlights the importance of improving the reliability and efficiency of cooling towers, which are crucial for various industrial applications.

For instance, one section mentions the thermal performance of cooling towers and the investigation of performance involves the development of a suite of integrated computer models. These models are used along with real plant data to assess the improvement achievable with the proposed air conditioning of the cooling tower fans. The investigation is to assess the viability of a new and novel approach to condition the entering air to the cooling tower in order to reduce the wet-bulb optimum temperature level. This approach is expected to bring about fewer number of gear failures and therefore higher reliability of the cooling tower fans.

Moreover, the document discusses the importance of biocides and biocide options for biofouling control. It mentions that there are a large number of biocides available to the water treatment professional however, they are not always effective due to compatibility and efficacy issues. A new non-oxidizing biocide based on tributyl-tetradecyl phosphonium chloride has recently been introduced which overcomes many of the limitations of current non-oxidizing biocides. This new biocide out performs current biocides such as isothiazolone and glutaraldehyde versus algae and bacteria and is effective versus Legionella pneumophila. It is also synergistic with oxidizing biocides. The results are discussed and treatment recommendations are presented.

In summary, the document addresses the need for innovation in improving cooling tower performance and highlights the importance of using advanced technologies and strategies to enhance efficiency and reliability.
bottom supported system gives owners a superior alternative to old hanging fill methods. The new fill was rigidly supported from beneath. Our contractor introduced a "proprietary" hanging system that was part of the tower's original design. The new fill was falling out of the tower. Our Cooling Tower contractor throughout the project. The original fill was severely fouled. It had numerous gaps by the tower remained online with water continuously circulating over half the tower. Companies, Miller Steam Plant in Alabama. At least one of the two units supplied PTC Committees associated with cooling towers and condensers (steam surface & ACC). The paper gives the guidelines of the fill design in relation with the fouling and the scaling resistance. It describes several fill type; film, mesh, splash and explain the technology is proposed to abate the plume under more severe operating conditions. The new technology will be introduced which has the capability of saving water while inherently reducing the plume. Based on this new technology, an additional technology is proposed to abate the plume under more severe operating conditions. Cooling towers are the largest water using utility in buildings. Deteriorating water quality and decreasing sources of potable water are driving new initiatives in water conservation. Water treatment strategies that reduce potable water use and preserve resources have been successfully implemented in the past decade. The strategies presented will cover basic operational methods, treatment strategies and approaches for potable water reduction. An overview of key strategies and design criteria for engineers will assist in the implementation of efficient potable water use in condenser water systems. Water Treating, Carranza • Engineering Standards & Maintenance, Hidalgo Ballroom • Performance & Technology, Zapata
• Water Treating, Carranza • Owner Operator Seminar (w/box lunch) - info on page 4 - Camino Real Lunch on your own • Ask-The-Expert Seminar - Hidalgo Ballroom • Table Top Exhibits and Hospitality Suite (Bar Closes @ 9:30p), Navarro Ballrooms A & B and foyer...continued from the left hand column.

Navarro B Ballroom (Water Treatment Sessions)
9:00a - 9:30a
Assessment of Physico-Chemical and Microbiological Quality of Drinking Water from Disinfected water Sources Points to House Hold Water Containers in Selected Communities of Akaki-Abitti Sub City
Mengenatluh Birhams, Ambra National Regional State of Health Bureau and Seyoum Leta, Addis Ababa University
Uncontrolled physico-chemical parameters such as temperature, turbidity, pH and inefficient chemical chlorine dosing, which led to low chlorine residuals at distribution and household water containers were the major factors that contributed to the occurrence of high bacterial numbers. Moreover, the water pipe lines and sewerage lines arrangement was also another factor that contributed to bacterial growth in the distribution system, there by compromising the quality of water at the point of use. Bacteriological load was greater at the household samples due to poor hygienic practice. Therefore, the management of water treatment and potable water reduction strategies is important to make the water quality acceptable in the study area.

Navarro A Ballroom (ES&amp;M and PT&amp;T Sessions)
8:30a - 9:00a
Cooling Tower Plume
Jean-Pierre Libert, EvapTech, Inc.
Jean-Pierre R. Libert is Technical Director for EvapTech Inc. He plans, directs and controls the technical matters involving thermal evaluations, ratings and optimizations of all mechanical draft, natural draft and plume-attuated towers, mechanical equipment selections, low sound applications, water chemistry, thermodynamic R&amp;D and related product development activities. Jean-Pierre holds a M.S. Degree in Mechanical Engineering from Faculte Polytechnic of Mont, Belgium, and has been an active member of the Cooling Technology Institute since 1985. He is member in good standing of the American Society of Mechanical Engineers. Prior to joining EvapTech, Jean-Pierre had extensive cooling tower industry experience acquired since 1979 in a variety of assignments in Belgium, Mexico and the U.S. Evaporative cooling systems emit a visible plume a significant portion of the time. Even though a cooling tower plume contains mostly pure water and hardly any pollutants, it is often seen as a nuisance. This paper describes the psychrometry of the plume under typical operating conditions and reviews how to specify no visible plume. Several technologies exist to reduce or abate the visible plume and these techniques will be shown. A new technology will be introduced which has the capability of saving water while inherently reducing the plume. Based on this new technology, an additional technology is proposed to abate the plume under more severe operating conditions. The new technology will be introduced which has the capability of saving water while inherently reducing the plume. Based on this new technology, an additional technology is proposed to abate the plume under more severe operating conditions.
A Night at the Casino
Monday, February 7, 2011

Dinner in the Olivares Room (River Level)
from 6:00p to 7:15p
Games will be held in the Canino Real room (Lobby Level)
from 7:30p to 10:30p
A fabulous dinner ($75/pp) awaits you and then a fun time at
the tables. Bring Lady Luck because your money
won't work here.
Door Prizes to be given away!

Thursday, February 10, 2011
Thursday’s activities involve the Board of Directors and Committee Chairs only
7:30a - 8:15a  Board of Directors’ (includes Committee Chairs) Breakfast, Sabino
8:30a - 2:00p  Board of Directors’ Meeting, Encino

CALL FOR PAPERS
2012 Annual Conference
February 5-9, 2012
Hilton Hotel
Houston, Texas

The following schedule will begin the process for papers presented at the 2012 Annual Conference:

2011
May 6: Deadline for Abstracts
June 17: Authors Notified by Program Chair
Aug 5: Six (6) copies of draft must be sent to CTI office for review
Nov 4: Final draft, based on review comments and slides due in the CTI office

Abstract Forms can be obtained by contacting the CTI office at 281.583.4087 or email: vmanser@cti.org

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The accumulation of solids in the basin of a cooling tower has following adverse effects:

Answer:

1) It reduces the volume of basin thus increasing the velocity of flow into pump basin. This normally results in additional suspended solids being carried into the process heat exchangers and other low flow areas causing deposition. I had a very large tower accumulate 3 feet of sludge in a 5 foot basin that resulted in process heat exchanger fouling and failures. The accumulation had gone on so long that divers through the bottom of the tower was actually the top of compacted sludge.

2) The reduced volume of basin does not allow time for entrained air to be released from water prior to entering pump basin and pumps. I know of a company that once accumulated enough sludge in basin to cause pumps to cavitate due to entrained air. It was found in a 5 foot basin only 1 foot remained before flowing into pump basin.

3) Higher levels of suspended solids circulating can cause fouling of film fill and in some cases splash bar fill if suspended solids are high enough. Sludge needs to be removed every two to four years at minimum to prevent process problems. The deeper the sludge the more problems that process units are going to have. If you have systems that can not be shutdown due to multiple users then divers and dewatering systems need to be used to clean the basin.

Question 3:
What needs to be taken into consideration when sending rain water to a cooling tower as a supplementary make-up water source? We are seeing more applications like this with no change in chemical treatment programs. Shouldn’t the chemical program be adjusted since rain water has a different water quality than most city water sources (i.e., pH of 5, low conductivity, high microbial count)?

Answer:
Yes, the use of rain water for make-up water must be looked at as re-use water. CTI has a white paper which details steps to be taken when re-use water is considered for cooling tower make-up. Obviously, using rain water that is properly filtered to remove suspended solids can be of much better quality than available make-up water or gray water from local waste water treatment plant. It is imperative that quality and % of make-up be known so that treatment programs can be properly adjusted for using a different source of make-up water. It is especially important to understand the potential for organic contamination that can lead to microbiological fouling due to increase availability of organic materials.
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February 9-11, 2010

Engineering Standards and Maintenance

Craig Burriss - Amarillo Gear Company, Vice-Chair
Chris Lazenby - Southern Company Services, Inc., Vice-Chair
James L. Baker - Composite Cooling Solutions, LP, Chair

I. Call to Order/Announcements
II. Introduction of Attendees
III. Approval of 2010 Summer Workshop Meeting Minutes
IV. Professional Development Hours (PDH)
V. Documents Approved in 2010
VI. Documents waiting Board Approval
VII. Standing Lead Task Group Reports
   • Wood, Metal, and Concrete Materials Task Group – Chair - Bill Howard, Vice Chairs - Terry Ogburn & Tom Toth
   • FRP and Plastics Task Group – Chair - Glenn Barefoot, Vice Chairs - Jamie Bland & Jim Cuchens
   • Mechanical Equipment Task Group – Chair - Craig Burriss, Vice Chairs – Denny Moran, STD-151, Chapter 10, Chapter 11, Tower Vibration Guideline
   • Tower Operations Task Group – Chair - Jess Seawell, Vice Chairs - Chris Lazenby & Jon Bickford, Chapters 1 & 4
   • Hazard Protection and Environmental Task Group – Chair - James Blake, Vice Chairs Denny Shea & Mike Bickerstaff, Fire Protection and Safety
VIII. 5 Year Document Review Status – Bill Howard
Standing Assignments
   • Technical Review Committee (5 year reviews) - Bill Howard
   • The ‘Ask The Expert’ designee - Denny Shea
   • Task Group Meeting Schedule - Bill Howard
   • Attendance Recording - James Blake
   • Ad-Hoc Reviews - Jon Bickford
IX. New Business
X. Adjourn

Water Treating Committee

Matt Wangvin - Ashland Hercules Water Technologies, Chair
Jim Kanuth - ChemTreat, Inc. - Vice Chair
Petie Elliott - GE Water & Process Technologies - Secretary (not pictured)
Jon Cohen - H-O-H Water Technology - Coordinator (not pictured)

I. Call to Order/Announcements
II. Introduction of Attendees
III. Approval of Committee Workshop Minutes
IV. Task Group Reports
   A. Environmental Issues – Don Erickson
   B. Water Re-Use Document – Phil Kiser
   C. Cooling Water Performance: Microbiological Monitoring - Tom Cabezut
   D. Filtration of Cooling Water Systems – Tom Cabezut
   E. Oxidizing Biocide, WTP-141 - Dwight Emerich
   F. Ozone Reading Lists, WTP-139 & 139.1 – Ken Mortensen
   G. Cooling Water Performance: Deposit Control Monitoring - Jean Guchiardi
   H. CTI Document Review - Paul Puckorius
VI. Liaison Reports
   • ASHRAE • ASM • AWT • EPRI • NACE • IWC • WATERTECH
VII. New Business
Need for new Task Groups? Technical Paper Subjects for “targeted” symposium topics

Performance & Technology

Mark Shaw - Black & Veatch Corporation, Vice Chair
Kenneth (Kos) Hennon - Clean Air Engineering, Chair
David Wheeler - Clean Air Engineering, Vice Chair

Task Groups:
   • ATC-140 Drift
   • ATC-150 Plume Abatement
   • STD-202 Publication
   • STD-201 Certification
   • ATC-105 Thermal Test
   • Technology Review
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Cooling Technology Institute
Annual Conference, February 6-10, 2011

HOTEL INFORMATION
THE WESTIN RIVERWALK
420 W MARKET ST, SAN ANTONIO, TEXAS 78205
210.224.6500 or CTI WEBSITE

Hotel Cut-Off Date - January 14, 2011

• CHECK-IN TIME IS 3:00PM • CHECK-OUT TIME IS 12:00PM

Standard Accommodations: Single and Double - $185

Make your plans to attend Future Meetings for CTI

July 17-20, 2011
Amelia Island Plantation
Amelia Island, FL

February 5-9, 2012
Hilton Hotel
Houston, TX

July 8-11, 2012
El Conquistador
Tucson, AZ

February 4-7, 2013
Omni Bayfront
Corpus Christi, TX

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Registration Form for the
CTI 2011 Annual Conference
February 6-10, 2011

Please type or print clearly all information. A separate form must be completed for each registrant. Photocopies of this form may be used.

1. REGISTRATION INFORMATION:
   I was invited to the conference by: (If applicable give name of the person and their company responsible for your attendance)
   
   Aware of the conference after seeing (please check one):
   __________ Annual Conference News   __________ Website

   Last Name: ______________________________________   First Name: ______________________________________
   Company: ________________________________________________   address: ______________________________________________________________
   Email: ___________________________________________________

   Badge Information - First Name or Nickname (as you wish it to appear on your badge)

   Spouse’s Name Only if they accompany you to the Conference:

   PDH CREDITS AVAILABLE - PLEASE ASK AT THE REGISTRATION TABLE!

2. SPECIAL NEEDS:
   Dietary: __________ Vegetarian
   Physical: __________ Please check here if you require special accommodations to participate and email a description of your needs by January 31, 2011 to vmanser@cti.org. We cannot guarantee we can accommodate your request but will do our best.

3. IN CASE OF AN EMERGENCY DURING CONFERENCE, PLEASE CONTACT:
   Name (Please print clearly): ________________________________________
   Daytime Phone: __________________________________________________
   Evening Phone: ________________________________________________

4a. REGISTRATION FEES: (Full-conference or one-day registrants)

   Check Appropriate Category: __________________________

   Early Bird Rate by: January 28, 2011
   Conference Rate after: January 28, 2011

   __________ CTI Member (Includes technical sessions Monday, Tuesday & Wednesday) $695 $795
   __________ Non-Member (Includes technical sessions Monday, Tuesday & Wednesday) $795 $895
   __________ One day (one attendee per company only) $500 $500
   __________ Exhibit Hall Pass Only $35 $35
   __________ Auxiliary Staff for Table Top Exhibits (one person per exhibit) N/C N/C
   __________ Speaker (one for each paper only) N/C N/C
   __________ Press (one attendee per company only) N/C N/C
   __________ Honorary Life Member N/C N/C

   Section 4a Subtotal US$ __________ __________

4b. CONFERENCE EVENTS / OTHER FEES: (Full-conference or one-day registrants)

   Check Appropriate Category: __________________________

   Conference Rate: __________________________

   __________ Additional luncheon ticket(s), Monday, Feb 7, 2011 (for spouse/guest) $30
   __________ Monday Night Dinner & Casino (February 7, 2011) $75
   __________ Set of Papers - Hard Copies $125
   __________ Set of Papers - CD (w/PDF file of each paper) Available after conference $125
   __________ Mailing for papers and/or CD sent to Mexico and/or Canada $10*
   __________ Mailing for papers and/or CD sent to all other countries $15*

   *This cost is for those attendees who purchase a set of the Technical Papers presented and wish to have them mailed.

   For those attending in the US there is no additional mailing charge.

   Section 4b Subtotal US$ __________
   Total Amount Due US$ __________

4c. CONFERENCE EVENTS (Full-conference or one-day registrants)

   I will attend the Water Treating Panel Discussion on Monday afternoon
   I will attend the New Member Breakfast on Tuesday morning
   I will attend the Owner/Operators’ Seminar on Tuesday noon
   I will attend the ‘Ask the Expert’ Seminar on Tuesday afternoon
   I will attend the Educational Seminar on Wednesday morning

5. PAYMENT (Please check one)

   __________ Enclosed is Check# __________ in the amount of US$ __________ (Please write the registrant’s name on the check)

   __________ Credit Card: Please Charge US$ __________ to the following credit card. [ ] Visa [ ] MasterCard or [ ] AmEx

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