New Orleans is one of the world’s most fascinating cites, steep in a history of influences from Europe, The Caribbean, Africa, and much more. It’s home to a truly unique melting pot of culture, food, and industry.

Along with a great location, we have a wonderful program lined up for you. We have a full offering of information, education, and an opportunity to participate in some of the ongoing work on our industry’s standards and codes. Our responsibility is to make sure the information delivered at our conference can be shared with others at your company.

This year we have 26 technical papers being presented in a concurrent format on Monday and Tuesday. Our Water Treating Group (WTG) will host one session, and the Performance and Technology Group (P&T) alongside our Engineering Standards and Maintenance Group (ES&M) will host another session. This concurrent format is set up so that we may present as much information as possible. We will continue to offer an extended amount of time for committee work, as we have done so at previous winter meetings. Please refer to the CTI news and our Guidebook App for scheduled committee meetings.

The Water Treating Panel Discussion on Monday, 2:00-3:45 PM, will be discussing Instrumentation and Control in Cooling Water Systems. Please make time to attend this important session.

Our program includes an Owner/Operator Seminar (Lunch INCLUDED) on Tuesday from 10:00 AM-2:00 PM. The topic to be discussed can be read about on page 6 of this newsletter. This session is open to all Owners and Operators. No vendors allowed please! Our ever popular Ask The Expert session will be held on Tuesday from 2:00 PM-4:30 PM. This is one of our highly attended sessions. Come prepared with your questions for the panel of industry experts.

The Table Top Exhibits on Tuesday from 4:00 PM-8:30 PM will consist of the industry’s top vendors and offers you a time to view the products and services they provide. Come enjoy a cold beverage, hor’d’oeuvres, and some great conversations!

On Wednesday from 8:00 AM-12:00 PM the Education Program Session will cover the subject of Fiberglass and Dry Cooling.

This CTI Program Committee has put together a program that will offer the best opportunity to inform, educate, and expand your knowledge about our industry. If you attend just one technical conference this year let it be this one! Please come prepared to take full advantage of everything we have to offer. A great location, outstanding food, entertainment, and a conference packed with industry information!

I, Phil Kiser, Helen Cerra, Pete Elliott, John Lichtie, and Ethan Chesnut, your program committee, invite and welcome you to the 2015 Annual Conference. I look forward to seeing you in New Orleans, Louisiana. Laissez les bon temps rouler!

Brandon Rees
2015 CTI Program Chairman
Swifter CTX Series

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Fiberglass Pultrusion Industry Updates

This education session discusses various updates of Pultrusion industry including: Revision of Visual Inspection Standard (ASTM D 4385), Study on effect of sealers on moisture absorption of Pultruded composites, latest developments on ASTM standards such as Freeze Thaw and 100°F Water Immersion test practices.

Thomas Wright is currently the sales manager at Bedford Reinforced Plastics, Inc. (BRP); his primary area of focus is the Cooling Tower Market. He is also very active in the areas of infrastructure, waste water treatment and military markets. At BRP, Thomas is responsible for sales, market development, design and development of new pultruded composite products to serve various markets and end users. Prior to BRP, Thomas worked for Creative Pultrusions Inc. He worked in several different capacities within CPI, learning the business from the shop floor up, gaining vast experience and increased responsibility. Thomas has over 38 years of experience in the manufacturing and sales of pultruded composites. He closely follows the new trends and developments in the composite industry.

Fiberglass Reinforced Plastic Piping

This educational session discusses the basic design of FRP piping and importance of proper supporting of FRP headers within a cooling tower structure.

Thomas Rhone is currently a Regional Sales Manager for Denali, Inc. that includes Ershigs, Inc., Belco Manufacturing Company and Fabricated Plastics, Ltd. These manufacturing companies provide composite products for the Pulp & Paper, Chemical, Metals, Semiconductor, Power and Municipal Industries. Thomas has over 33 years of experience in the manufacturing and sales of FRP composites equipment from project management to technical sales.

Owner Operator Session

Tuesday, February 10, 2015
12:00p - 2:00p - (lunch included)

Come and join Natasha Jones, Co-Chair for the Owner/Operator Council with the Cooling Technology Institute (CTI) at the 2015 CTI Annual Conference in New Orleans, Louisiana. The Council is comprised of owner/operators that are responsible for cooling towers, associated equipment as well as water treatment for the cooling systems at their facilities. This is an opportunity for owner/operators to hear informative presentations from recognized experts in the industry and talk with their peers about issues they are having and share lessons learned as well as best practices developed through experience. All those with an Owner/Operator ribbon at the Conference are welcome and encouraged to join.

This year’s Council will feature one technical presentation followed by an owner/operator only (no suppliers or manufacturers present) open forum discussion. The presentation will be about gamma scanning technology applied to film fill cooling towers, given by Paul Chila with Quantum Technical Services, LLC. The open discussion following the presentation is a great opportunity for owner/operators to cultivate relationships amongst each other and have a candid discussion about their ongoing operations, problems and solutions. Come prepared to share thoughts and experiences on topics ranging from performance monitoring, certifying cooling towers, water quality, plume abatement and vibration. Be sure to sign up and come enjoy the benefits of being an active participant in this Council.

Ask The Expert

Tuesday, February 10, 2015 - 2:00p - 4:30p
Grand Ballroom C
The purpose of a cooling water treatment program is to minimize corrosion, deposition, and microbiological growth in the cooling water contracted equipment, and in doing so, to avoid reductions in the thermal efficiency of the equipment and the equipment life and to eliminate health hazards to personnel working near these systems. The accurate control of cooling water treatment programs has become increasingly important and has led to the development of automatic chemical feed, monitoring and control systems, which better protect the cooling water equipment, extend the numbers of years between major turnarounds, and can reduce manpower requirements.
For nearly thirty years, the Cooling Technology Institute has provided a truly independent, third party, thermal performance testing service to the cooling tower industry. In 1995, the CTI also began providing an independent, third party, drift performance testing service as well. Both these services are administered through the CTI Multi-Agency Tower Performance Test Program and provide comparisons of the actual operating performance of a specific tower installation to the design performance.

By providing such information on a specific tower installation, the CTI Multi-Agency Testing Program stands in contrast to the CTI Cooling Tower Certification Program which certifies all models of a specific manufacturer’s line of cooling towers perform in accordance with their published thermal ratings. To be licensed as a CTI Cooling Tower Performance Test agency, the agency must pass a rigorous screening process and demonstrate a high level of technical expertise. Additionally, it must have a sufficient number of test instruments, all meeting rigid requirements for accuracy and calibration.

Once licensed, the Test Agencies for both thermal and drift testing must operate in full compliance with the provisions of the CTI License Agreements and Testing Manuals which were developed by a panel of testing experts specifically for this program. Included in these requirements are strict guidelines regarding conflict of interest to insure CTI Tests are conducted in a fair, unbiased manner.

Cooling tower owners and manufacturers are strongly encouraged to utilize the services of the licensed CTI Cooling Tower Performance Test Agencies. The currently licensed agencies are listed below.

**Licensed CTI Thermal Testing Agencies**

<table>
<thead>
<tr>
<th>License</th>
<th>Agency Name</th>
<th>Contact Person</th>
<th>Website / Email</th>
<th>Telephone/ Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B</td>
<td>Clean Air Engineering</td>
<td>Kenneth Hennon</td>
<td><a href="http://www.cleanair.com">www.cleanair.com</a></td>
<td>800.208.6162</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>865.588.5769</td>
</tr>
<tr>
<td>A, B</td>
<td>Cooling Tower Technologies Pty Ltd</td>
<td>Ronald Kayne</td>
<td><a href="mailto:cttai@bigpond.com">cttai@bigpond.com</a></td>
<td>61 2 9799 5000</td>
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<td>61 2 9799 5322</td>
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<td>425.357.8577</td>
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* Type A license is for the use of mercury in glass thermometers typically used for smaller towers.

**Licensed CTI Drift Testing Agencies**

<table>
<thead>
<tr>
<th>License</th>
<th>Agency Name</th>
<th>Contact Person</th>
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<td>866.208.6162</td>
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<td>865.938.7569</td>
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<td>425.557.8377</td>
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**CALL FOR PAPERS**

2016 Annual Conference
February 7-11, 2016
Hilton Houston North
Houston, Texas

The following schedule will begin the process for papers presented at the 2016 Annual Conference:

**2015**
May 8: Deadline for Abstracts
June 19: Authors Notified by Program Chair
Aug 7: Copy of the first draft must be sent to CTI office for review
Nov 6: 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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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

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

To a question go to www.cti.org

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- 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.

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February 9-11, 2015

Engineering Standards and Maintenance

James F. Blake - American Lightning Protection
Bill Howard - Cooling Tower Depot, Inc., Chair
Ken Mortensen - SPX Cooling Technologies

I. Call to Order/Announcements
II. Introduction of Attendees
III. Approval of 2014 Summer Workshop Meeting Minutes
IV. Professional Development Hours (PDH)
V. Documents Awaiting Ad-Hoc Approval
VI. Documents Awaiting Board Approval
VII. Documents Approved in 2012
VIII. Standing Lead Task Group Reports

IX. Standing Assignments
  • Technical Review Committee (5 year reviews) - Bill Howard
  • The ‘Ask The Expert’ designee
  • Task Group Meeting Schedule - Bill Howard
  • Attendance Recording - James Blake
  • Ad-Hoc Reviews

X. New Business/Old Business
XI. Adjourn

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Press Release

Contact: Chairman, CTI Multi-Agency Testing Committee

Houston, Texas 2-November-2014

Cooling Technology Institute, PO Box 681807, Houston, Texas 77268 - The Cooling Technology Institute announces its annual invitation for interested thermal testing agencies to apply for potential Licensing as CTI Thermal Testing Agencies. CTI provides an independent third party thermal testing program to service the industry. Interested agencies are required to declare their interest by March 1, 2015, at the CTI address listed.

Performance & Technology

Charles Kuhfeldt - Athlon Solutions
Jim Kanuth - ChemTreat, Inc. - Vice Chair
Phil Kiser - GE Power and Water, Chair

I. Call to Order
II. Acknowledgement of Attendees
III. Active Task Groups:

• ATC-105 (Thermal Test Code)
• STD-146 (Water flow Measurement Standard)
• STD-201 (Thermal Test Certification Program)
• STD 202 (Publication of Thermal Test Results)

IV. New Business

Press Release

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Water Treating Committee

Ken Martens - SPX Cooling Technologies, Vice Chair
Jared Medlan - McHale & Associates, Inc., Vice Chair
Jim Cuchens - Southern Company, Vice Chair
Toby Daley - Composite Cooling Systems LP, Chair

1. Call to Order / Announcements
2. Introduction of Attendees
3. Approval of Committee Minutes
4. Task Group Reports
   a. WTG-125 Instrumentation & Control
   b. WTG-126 Application of Non-Oxidizing Microbiocides
   c. WTG-130a Corrosion Monitoring
   d. WTG 130b Deposit Monitoring
   e. WTG 130c Microbiological Monitoring
   f. WTG-158 Physical Water Treatment
   g. WTG-161 (Old WTG-159) Best Practices Guidelines

5. Liaison Reports
   a. ASHRAE, AWT, EPRI, ASM, NACE, IWC

6. New Business/Old Business
Standing Committee Minutes from July 2014

I. Call to Order/Announcements/Introduction of Attendees - At 10:30 AM, Bill Howard began the meeting. A list of 15 attendees at the Closing meeting is available. Opening had 35 attendees, list available.

II. Lead Task Group Chair Reports
Wood, Metal, and Concrete Materials Task Group [Bill Howard]
• Wood, Joe LaBove and Bill Howard [Redwood and Treatment only] met Tuesday at 8AM. Approved AdHoc changes to STD – 103, 114, 119, and 134 and sent these documents to the Board of Directors for final approval. Designating as Historical: STD – 104 and 117. NDS effects on all of documents is now included.
• New Guideline, Cleaning of Cooling Towers, Philip Poll, Don Zelek – met Monday at 11AM. Reviewed a completed draft added sections on fill cleaning. Getting Water Treatment Committee involved on chemical treatment and disinfection. Goal is to go to Ad Hoc in August, 2015.
• Corrosion of Concrete, Narendra Gosaín, Tom Kline – did not meet, ESG-123
• Materials of Construction, Chapter 9, Ethan Chesnut – met Tuesday at 1:30PM. This group is preparing a 1st draft including substantial changes and references to other CTI documents. That draft will be re-distributed to the group.

Mechanical Equipment Task Group [Dave Suptic, Craig Burris]
• New Standard – Vibration, Craig Burris – met Monday and Tuesday at 9:30 AM. Reviewed and fine-tuned the Draft. This document is expected to go to Ad Hoc Review by the Winter 2015 meeting.
• Speed Reducers - Craig Burris – STD-111 forming a group to start work that met Wednesday. This standard will be broadened to include ACC Fan components as well.
• Chapter 11 – Electrical Components, Dave Suptic – met at 9:00AM Tuesday. This group is looking for a new chair and input from people with electrical controls and motor experience to add needed sections to the document. The group has had no consistent source of motor information and this input is needed to complete the document.

FRP and Plastics Task Group [Glenn Barefoot, Jamie Bland]
• New Guideline – Wood to FRP, John Ahern, Ken Mortensen, Glenn Barefoot – met Monday at 3PM. Document outlines the items to be covered and the content to be “no go to” pictures sought for the specific topic sections. With those items, a full draft is complete for review by the group.
• New Task Group Guideline on Thermoplastic Products, Kevin Hole, Chris Spencer – met Monday at 1:30PM. The purpose of this document is to provide a design guide, ala ESG-152 for FRP, for the thermoplastic components in the cooling tower. A refined outline covering selection criteria for these components was sub-divided into physical capabilities including flammability and water quality requirements/fouling requirements. A draft assembled by these categories will be completed next.

Construction Safety, Philip Poll - Met Tuesday at 10:30AM. Mentioned that the next Draft of Standard is due in Fall 2015 and not too many changes are anticipated.

Tower Operations Task Group [Jim Baker]
• STD-203 - Industrial Cooling Tower, Terry Ogburn, Tom Toth – met Monday at 4PM. Comments were addressed and alternate wording on several points was proposed. Expect to detail and send to Ad Hoc by October.
• Long-term Storage of Cooling Towers, Jim Baker, Steve Chaloupka – Met Monday at 2:30PM. Established scope, roster, and voting members.

Hazard & Environmental Protection Systems Task Group [James Blake]
• Chapter 8 (ES&M) Environmental Aspects of Cooling System Operation, James Blake – separated from Chapter 7 (Water). Plan to combine efforts with Water Treatment. Helen Cerra has been identified as the contact person.
• BUL-109 Nomenclature of Industrial Cooling Towers, James Blake – Met Tuesday at 2:30PM. Established scope, roster, and forwarded to Bill Howard.
• Lighting Protection, James Blake – Met Tuesday at 8AM. This document is a candidate to be re-affirmed.

Piping, Valves, and Mechanical Systems Task Group [Bill Howard]
• FRP Siding STD – 131, John Ahern – Met Mondays at 10:30AM. Standard was revised in 2009 and upon review seems to be quite current. Adding some information on FM and ASTM requirements was recommended. This document can be ready for Ad Hoc review at the next meeting.
• Filament Wound Pipe, Bill Daughrty - Met Tuesday at 11AM. This document is up to date and may be recommended as a “re-affirm”.
• STD-137 FRP Pultrusions, Glenn Barefoot – Met Monday at 3:30PM. This document is between reviews, but a change to remove edge seal left out of the last revision was requested and agreed by the previous voting members.

OP304 Document Procedure – Several Educational sessions were held on OP304 at this CTI meeting. These sessions will probably be a regular thing to support the document writing process at CTI.

New Business
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New Document Reviews - Safety - Philip Poll, Ken Mortensen – This is a good document, to be reviewed by company experts. It can be ready for Ad Hoc soon.

• Portland Cement, Narendra Gosaín, Tom Kline – Met Tuesday at 4PM, ESG-153 was reviewed and recommended for re-affirming to the Board of Directors. Editorial changes only.
• Materials of Construction, Chapter 9, Ethan Chesnut – met Tuesday at 1:30PM. The group is preparing a 1st draft including substantial changes and references to other CTI documents. That draft will be re-distributed to the group.

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1. Call to Order: - The P&T Committee Chairman, Toby Daley called the closing meeting of the Performance & Technology Committee to order at 11:00 am at the Sheraton Steamboat Resort in Steamboat Springs, Colorado.

2. Attendees

3. Active Task Group Opening Remarks
   a. ATC-105 (Thermal Test Code) L. Burdick, Chair. The committee met on three occasions (one each day). Progress is moving along.
   b. STD-146 (Water flow Measurement Standard) – D. Wheeler, Chair. No additional comments.
   c. STD-201 (Thermal Test Certification Program) – F. Michell, Chair. No additional comments.
   d. STD 202 (Publication of Thermal Test Results) – Paul Lindahl, Chair. This document has been revised based on input of the manufacturers a review will take place at this meeting. Looking for common ground between PM. Will provide more notice before changes are presented in the future.

4. New Business
   a. Discussed future of the CTI handbook, is it relevant (maybe some parts).
   b. Potential R&D project
      i. Total environmental impact of ACCs, Evaporative Coolers, Heat Exchangers. This could be sponsored by other committees as well.
      ii. Water Chemistry (Surfactants, Water Quality, and Water Treatment) effect on Drift.
      iii. Insertion mag. meter vs. pitot tube
   c. Work on meeting setup. (speakers, microphone, projector…)

5. The meeting was adjourned 11:00 am.
Managing Machinery Assets Using Predictive Maintenance

David Corelli, IMI Sensors / VibroAcoustics

David A. Corelli holds a Bachelor of Science degree in Systems Engineering from Wright State University and a Master of Science degree in Mechanical Engineering from The University of Alabama. He has over 38 years of experience in vibration analysis, instrumentation, and sensors. He has worked as a test engineer for the Air Force Avionics Laboratory; as a Field Engineer for Hewlett Packard, Entek Scientific, and IRD Mechnanalysis; and is currently the Director of Application Engineering for PCB Piezotronics. Dave Corelli is a Category IV Vibration Analyst in accordance with ISO 18436-2 and is the President of the Vibration Institute.

Predictive Maintenance (PdM) can be a key ingredient in successful implementation of an effective Asset Management program. Not only can it help manage machinery assets but also can result in significant saving in machine repair costs and lost production due to catastrophic failure and unplanned downtime. However, many companies are reluctant to invest money and personnel in PdM programs because they don’t understand how they work, how much they cost to start and maintain, and especially how to get started. This paper addresses these questions, provides cost justifications, and includes training recommendations and information on the validation of personnel skills through certification of persons per ISO Standards.

The CTI Office has worked hard to schedule a program that fits everyone’s needs. Incidental arise that may cause changes and/or omissions to parts of the program are out of our hands. Our apologies if this happens.

continued on page 11
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

Since 1999, Dr. Maulbetsch has been a private consultant to government and industry. Most of his work has been on water use and conservation in electric power production. He has published two major studies on alternative cooling systems for power plants for the California Energy Commission and the Electric Power Research Institute. Other studies have included the costs of retrofitting once-through cooled plants with closed-cycle cooling; the assessment of water conservation options for plants in arid regions; the effect of wind on air-cooled condenser performance; and the use of spray enhancement to augment the performance of air-cooled condensers on hot days. Prior to establishing his consulting practice, he was at the Electric Power Research Institute for 23 years. Before joining EPRI, Dr. Maulbetsch was the Director of the Energy Technology Center of Dynatech Corporation in Cambridge, Massachusetts and before that on the faculty of the Massachusetts Institute of Technology. Dr. Maulbetsch received his S.B., S.M. and Ph.D. degrees from M.I.T. in 1960, 1962 and 1965 respectively.

This study develops general guidelines for the arrangement of wind screens and estimates of their effectiveness through a combined process including field testing of a full-scale utility ACC coupled with physical (wind tunnel) and computational (CFD) modeling of the field conditions. Continuous field measurements of ACC and plant performance, ambient conditions, and air velocity and temperature around and under the ACC are being made for a one-year period. The wind tunnel and CFD results will be calibrated and validated with the field data. The models will then be used to explore other situations in an attempt to provide general guidelines for wind screen design and arrangement.

Cooling Tower Support Framing Systems: Distress and Repair

Narendra Gosain is a Senior Consultant in the Diagnostics Services Group of Walter P. Moore. In his 42 year career with Walter P. Moore, Dr. Gosain has been involved with several projects throughout the United States, including commercial, industrial, and medical structures. As an adjunct professor for 17 years in the Department of Civil Engineering at Rice University in Houston from 1981 through 1997, Dr. Gosain shared his expertise with later generations of engineering students. In spring of 2014, he introduced a new course on Forensic Structural Engineering in the Department of Civil and Environmental Engineering of the University of Houston. He has directed the structural design and restoration work of many of the firm’s prominent projects, including the restoration of the San Jacinto Monument and the historic, and award-winning expansion of The Astrodome in Houston. In 1999, Dr. Gosain started a new service line in Walter P Moore called the Diagnostics Services Group that is dedicated to structural restoration, rehabilitation, forensics and litigation support work. He served as the Executive Director of this group until February 2009. Dr. Gosain’s focus now is on serving as a technical consultant for complex structural rehabilitation challenges and forensics related work. Narendra Gosain got his Master of Engineering degree in 1965 from Indian Institute of Technology, Roorkee, India and his Ph.D. in Civil Engineering in 1975 from Rice University. He is a licensed professional engineer in Texas. Other than specifying the loads and support points for the cooling towers, the cooling tower manufacturer has very limited involvement in the design of support framing for commercial type cooling towers. Over a period of time, the cooling towers themselves generally undergo the required maintenance, but their support framing is often neglected. As such, extensive deterioration and distress has been observed in several cooling tower support structures. The paper describes some of the problems caused by such neglect and the methods used to restore the integrity of such framing. Some case histories are also discussed.

Empirical Methods for Inspecting, Analyzing and Converting Large Field Erected Wood Cooling Towers to Fiberglass Structure
Philip Poll, OBR Cooling Towers and Al Felzini, Linde Gas

Philip Poll is a Field Engineer with OBR Cooling Towers, Inc. Philip started his career in the cooling tower industry as a field repair technician in 2001. He attended Ohio University receiving a B.S. in Mechanical Engineering, where he participated in both the independent study and Co-op programs focusing on thermal systems. His experience includes project management, product design, equipment inspection and water treatment for both field erected and packaged cooling towers. Prior to joining OBR, Philip was employed as a District Representative for The Nalco Chemical Company, where he completed Nalco’s technical sales engineering training program.

A series of empirical methods for inspecting, analyzing and converting large field erected wood cooling towers to fiberglass structure. Methods of inspecting and documenting the effectiveness of an Electrodynamic Pulse Field Water Treatment
Mario Bélassance, Blue Heron Cooling Tower Inc.

Mario Bélassance is a mechanical engineer that graduated from L’Ecole de technologie supérieure. Afterwards, he completed a Masters in Engineering from L’Université de Sherbrooke. He then began working in the cooling tower industry in 1995. He occupied responsible positions in the Design and Maintenance of 170 cooling Towers as well as in Cooling Towers’ Rebuilding and Upgrading. He also performed thermal testing and Cooling Towers’ marketing. He initiated a change to an article of the Canadian National Building Code concerning cooling towers. He’s the founder of Blue Heron Cooling Tower Inc. Now a consultant, he works to Upgrade Cooling Tower Maintenance Programs to protect public Health. He has delivered numerous seminars for various industries and professionals. His seminar held in Algeria in spring of 2013 echoed in national news bulletins.

In the summer of 2012, the city of Quebec experienced a large outbreak of legionnaire’s disease. Nearly 200 people were infected; 14 of them died. A public inquiry reported after “The measures introduced were not effective enough...” As a consequence, Quebec Government adopts new regulation for cooling towers manufacturer. This speaker will present major points from his two (2) years of experience in the upgrading of Cooling Towers Maintenance Program to prevent Legionella transmission.

A Progress Report of a Field Evaluation of a Cooling Tower System and the Effectiveness of an Electrodynamic Pulse Field Water Treatment
Paul R. Puckorius, Puckorius & Associates, Inc. and Richard Ruckstuhl, Jr., CWT Waterhouse Corporation

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 companies. Over 30 projects have been done throughout the USA, Europe, South America, Mexico, Canada, and middle and far east countries. Paul has over 50 years experience and knowledge 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 no-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. Mr. Puckorius is a member, past president and active on the water committee of the Cooling Technology Institute (formerly Cooling Tower Institute), member and on the executive committee of the International Water Technology Conference, member and past chairman of several committees including of the National Association of Corrosion Engineers, member of AWWA, and of the Waterese Association.

This is the continuation of the detailed independent evaluation of microbiological, corrosion and deposit control effectiveness in a HVAC cooling tower system over a period of two years only with a non-chemical water treatment system. These new results include the evaluation of the cooling tower water quality for both sessile and planktonic microbes and the impact of city water chlorination on bio-control and the effectiveness for scale and corrosion control.

Monday Night Dinner
February 9, 2015 from 6:00p - 9:00p
$75/per person
(more information on page 20)
existing conditions, evaluating and selecting new materials and performance of respective repairs will be explained. A large field erected cooling tower operating in a harsh environment with seawater bulk recirculation will be the subject of the study.

TP15-13
Outside/Inside Approach to Evaluating Concrete Elements in Mechanical Draft Cooling Towers

Thomas Kline, Structural Group, Inc.

With over 35 years of experience in concrete assessment and repair, Mr. Kline has accumulated a wealth of knowledge and experience as Engineering Services Division Manager, then Director of Investigate Design Build Services both nationally and internationally, for STRUCTURAL - USA's largest dedicated concrete repair company. Mr. Kline manages and directs a diverse group of technical experts in providing design-build capabilities, developing turnkey repair strategies and implementing sophisticated and verifiable repair programs for a wide range of concrete repair customers. Mr. Kline also serves as a Guest Lecturer for various seminars, symposiums and workshops. He has served/is serving as an ICRI Director and Committee Chair and as Chairman on several CTI Committees.

The paper will address an innovative technique for assessing the condition of reinforced concrete elements in Mechanical Draft Cooling Towers while on-line and off-line. These assessments assist Asset Owners with the preparation of Repair Budgets and in making enlightened decisions for these critical assets which are typically the last piece of equipment taken down before an outage and the first piece of equipment brought up after an outage. Case Examples will be presented as well as implemented repair programs focused on this approach.

TP15-14
Can Total Bacteria Measurement Be Used To Predict Legionella Presence?

Janet E. Stout, Ph.D and Scott Duda, Special Pathogens Laboratory

An advocate for prevention, she serves on the Legionella guideline committee for the Cooling Technology Institute and on ASHRAE committees: Legionella Guideline 12 and 13, and as team manager. She was directly involved in nuclear power plants new sites selection to define their cooling systems, in Europe (2006), South Africa (12/2007), Poland (2010) and recently in Saudi Arabia (04/2014). Since 2013, he is more particularly in charge of preparing the review of BREF (Best techniques References documents) about industrial cooling systems, as French member of EURELECTRIC (Association of the Electricity Industry in Europe).

The BREF (Best References documents) Industrial Cooling System (ICS) is an European Community document which gives the ‘Best Available Technique’ in the environment field. The previous document written in 2001 was a guideline for the design of ICS. It will be established a new version in 2015; the conclusions will become prescriptive, for all European countries. It will take into account the evolution of regulation in Europe, technological progress and new scientific knowledge. The EDF company works to establish a ‘wish-list’ for the next version of the BREF ICS on specific issues: Efficiency of ICS, use of biocides, emissions of chemical substances and heat into surface water, reduce water needs, entrainment of fish, and reduction of noise. The present paper shows the key points for French utilities.
attempt can be made to more thoroughly address deficiencies in engineering specifications for cooling towers' susceptibility to initiating and propagating a fire event. By this analysis the burning characteristics with respect to cooling towers in real world scenarios outside the laboratory, heighten awareness of fire risks and help to determine flame retardants work to minimize the burning characteristics, as well as the science behind the inherent burning characteristics of different polymers, including how they burn and how they react under various conditions.

Carlo Gallina received his university degree in aerospace engineering from the Politecnico di Milano in 2004. His studies were focused on structural analysis and turbo machines in general. Since 2005 he has been working in the technical department of Cofimco S.r.l., a leader in aluminium and fibreglass axial fans manufacturing. He is now in charge of the Engineering Division of Cofimco Italy and involved in the Research & Development of high performance axial fans.

Cofimco extensive research and laboratory tests pointed out in the development of an innovative shank to connect the blade airfoils to the hub of large axial fans used on Cooling Towers and Air Cooled Condensers: the new pultruded FRP shank reinforced with carbon rovings. The innovative shank material gives to the blade a suitable elasticity, midway between flexible and rigid links, resulting in a noticeable reduction of the vibration level introduced by the fan in the supporting structure; simultaneously, high strength of carbon rovings and innovative “damped” shaft design let fan blades to withstand the most severe duty points and limit blade deformation.

Carlo Gallina, Cofimco S.r.l.

Innovative FRP-Carbon Pultruded Shaft for Axial Fan Blades

Carlo Gallina

Afternoon Schedule for Monday, February 9th

12:15p - 1:45p Group Luncheon, Armstrong Ballroom
2:00p - 3:30p Water Treatting Panel Discussion, Grand Ballroom A&B
3:00p - 4:00p Break
3:45p - 5:00p Technical Committee Meetings

Mr. Partha Nag, is presently working in NTPC Ltd., India as Additional General Manager (Center for Power Efficiency and Environmental Protection - CenPEEP). He has done his graduation in Mechanical engineering in 1987, MTech in Power Generation Technology from IIT Delhi in 2007. He had done his MTech Project on Cooling Tower Performance. Cofimco has been working in large capacity power Stations for over 18 years in operation, commissioning & Maintenance departments. For last 9 years he is with CenPEEP involved with implementation of Energy Efficiency Management System and associated with efficiency improvement & sustenance activities for power stations. He has been involved in performance assessment of around 110 odd operating cooling towers of NTPC Ltd. A program code developed for prediction of performance of NDCT based on manufacturer's performance curve. Development of a simulation code using CFD for detailed zone wise analysis of air flow and performance of cooling tower is carried out which is the limitation of program code. Development of drift measurement device which is very useful for measurement of drift as well as DBT and WBT of outlet air of cooling tower is carried out. Validation of the simulation using CFD is carried out with experimental result like cold water temperature at bottom, air temperature and air velocity and amount of drift in air at measured plane shows a good accuracy of the present simulation. Development of modified water flow distribution is done which shows improved performance. In this paper a performance analysis of cooling tower shows a detailed relationship of performance parameters with operating parameters. Comparison of CFD simulation with program code also shows a good match with design data. This study, along with the analysis of field data is expected to result in concrete recommendation to overcome the field level problem in performance evaluation and thus improved performance.

This ends the ES&M and P&T Papers for Monday’s program.

Tuesday’s Technical Sessions running simultaneously between Grand Ballrooms A&B and C

Grand Ballroom C (ES&M and P&T Sessions)

7:00a - 10:00a - New Members’ Breakfast, Salon 828
7:00a - 10:00a - Service, Grand Foyer
7:00a - 5:00p - Registration and Paper Sales, Grand Foyer
7:00a - 5:00p - Speakers’ Breakfast, Photo Session & Prep Room, Grand Chenier
8:00a - 8:30a

TP15-21 Study on the Combustion of Polymers within Cooling Towers Chris Bowman and Jia Shen, Brentwood Industries

Chris has been working in the cooling tower industry since 2008. He is a graduate of Villanova University and holds his Bachelor’s degree in Mechanical Engineering. Chris’ experience involves working as a New System Sales Engineer for Trane Company followed by working as a technical consultant and owner of Bowman Thermal Equipment LLC. Chris’ current position is with Brentwood Industries as the Business Development Manager for North America in their Cooling Tower Division. Polymers used in cooling towers are available in varying degrees of flammability risk, which, historical standards such as ASTM E84 may not accurately represent fully. This paper will discuss the science behind the inherent burning characteristics of different polymers, including how they burn and how flame retardants work to minimize the burning characteristics, as well as the ignition characteristics with respect to cooling towers in real world scenarios outside of a laboratory. There are many flammability standards used worldwide which will be reviewed as part of the scope of this paper. Cooling tower component manufacturers are using increasingly varied formulations of polymers in the manufacture of their products so it is prudent to analyze if current testing standards provide the complete picture of a cooling tower’s susceptibility to initiating and propagating a fire event. By this analysis the attempt can be made to more thoroughly address deficiences in engineering specifications that may not tell the whole story regarding the magnitude of risk associated with utilizing certain polymer formulations within cooling towers.

Raphael Ballroom A&B (Water Treating Sessions)

7:00a - 10:00a - New Members’ Breakfast, Salon 828
7:00a - 10:00a - Service, Grand Foyer
7:00a - 5:00p - Registration and Paper Sales, Grand Foyer
7:00a - 5:00p - Speakers’ Breakfast, Photo Session & Prep Room, Grand Chenier
8:00a - 8:30a

TP15-16 An Alternative Approach to Disinfection Using Chlorine Dioxide Ingmar Hermans and Vincent Van Camp, TwinOxide International B.V.

Ingmar has worked as Manager at Kodak’s Graphics- and Digital divisions for the Europe, Africa and Middle-East Region. He has over 15 years of business experience covering Sales & Service strategy, tactics & operations. Ingmar has held management positions for companies in capital equipment manufacturing, services & consumables sales throughout Europe. One of his current main focus areas is to streamline & optimize the Lead-To-Cash cycle time with positive cash inflow & improved Return On Marketing Investment (ROMI) as a result. Ingmar is focusing today within TwinOxide on developing the ‘two-powder component’ solid/chemi-clast product range to distribute TwinOxide together with qualified channel partners worldwide. Ingmar holds a degree in Law, has studied Economics and completed his MBA in Antwerp (Belgium). The use of oxidizing biocides is among the most cost effective means of disinfecting water. Chlorine dioxide has various benefits compared to other oxidizing biocides, but its stability, and require appropriate safety precautions to be incorporated in the design of generation and dosing equipment. The use of solid precursors can simplify the generation of chlorine dioxide, eliminate some of the potential hazards encountered with other generation methods, and produce stable chlorine dioxide solutions which can be used in many types of disinfection applications. Attributes of chlorine dioxide, its generation, and application are discussed in this paper.

continued on page 16
Hybrid Cooling Towers – Water Savings Calculations and Measurements

Marion Floret graduated with a master’s degree in engineering from the Ecole des Mines de Nantes, a French engineering school, with a major in energy systems. During her degree, she spent one year studying sustainable energy and environment at Cardiff School of Engineering in Wales. For her final year internship, she worked on the modeling of hybrid cooling towers for the main French electricity operator, Electricité de France (EDF) and was recruited right afterwards. Since 2011, she works as a performance tests engineer on cooling towers and other equipments on power plants. This includes the development of monitoring tools, the diagnosis of thermal losses and the estimation of the performance of the cooling towers.

Worldwide, the air moisture content entering a cooling tower may be measured either with a relative humidity sensor, a psychrometer, or a capacity hygrometer. Some European standards, dedicated to cooling tower thermal tests such as EN 14705, historically recommend hygrometers for cooling tower acceptance tests for more than 20 years now, while the CTI-ATC 105 (and also 140; 150) standard only recommends the use of mechanically-asciared psychrometers. The goal of this paper is to compare the measurement results of these two technologies with CTI-approved psychrometers and commonly used hygrometers for cooling tower tests.

New Cooling Tower Nozzle - Low Flow

Dr. Andreas Streng, CTS Cooling Tower Solutions GmbH

Dr. Streng serves as Head of CTS Cooling Tower Solutions GmbH, Dusseldorf/Germany, and has founded CTS Cooling Tower Solutions on November 2006. He has published two papers for CTI conferences and has several patents. He has been a consultant engineer in the cooling tower industry; helping with selection and design of cooling tower components and materials; solving great design problem like the design of existing cooling towers to improve overall performance and total performance tests before and after reconstruction. Dr. Streng did his studies at the Technical University of Dresden, subject process engineering; German graduation; “Diplom-Engineer” (equivalent to graduate engineer) and did his Doctoral thesis at the Technical University of Braunschweig, subject: thermodynamics of closed evaporative cooling towers.

Axial Impellers are integrated as driven impellers in multiple developer and holds a PhD in Business Administration. AMCA Standard 207 (Wire-to-air). In addition to working for Multi-Wing, he is also a frequent member in the committee developing draft SMCA Standard 207 (Wire-to-air). In addition to working for Multi-Wing, he has also worked as a project engineer for the development of mechanical nanofiber technology.

This paper is based on a previous one from 2010 where a new fully cone cooling tower nozzle of a much better distribution quality was described. An additional spray nozzle will be presented here to extend the working range of full cone nozzles. The main target of these R&D efforts is and is the improvement of the evenness of water distribution in cooling towers and consequently the overall cooling performance. The paper discusses the development and the results.

Leveling the Playing Field for Axial Impeller Comparisons and Regulatory Compliance

Sham Morten Gabr, Multi-Wing

Hesham Morten Gabr (Sham) is Multi-Wing Group’s Chief Strategy Officer responsible for market intelligence, strategy and planning. Sham leads Multi-Wing’s activities with fan efficiency worldwide and is the Danish delegate and expert on fan in ISO/TC 117 & CEN/TC 156. He also included in the committee developing draft SMCA Standard 207 (Wire-to-air). In addition to working for Multi-Wing, Sham has worked as a strategy consultant, business policy analyst and holds a PhD in Business Administration.

Axial Impellers are integrated as driven impellers in multiple non-fan products, including cooling towers. However, there is no common rating standard for axial impellers. That means that a level playing field for axial impeller performance comparisons is absent. No commonly accepted standard for comparing axial impeller data on an apple-to-apple basis exists.

Controlled Hydrodynamic Caviation for Cooling Tower Water Treatment

David Burge, EcoWater CHC

David has a B.S. in Chemical Engineering from the University of Massachusetts, Amherst. After graduating, he worked for Sandia National Laboratory and was a Fellow at a NASA Research Institute at the University of Hawaii before joining MIOX Corporation in 2006. At MIOX, Dr. Burge applies his R&D background to the development of innovative disinfection and water treatment technologies based on MIOX’s core expertise in electrolytic production of disinfectants.

This ends Tuesday’s Water Treating Technical Papers. Continued activities for Tuesday are on page 17.
10:00a - Noon
Technical Committee Work
• Engineering Standards & Maintenance Grand Ballroom D
• Performance & Technology Grand Ballroom C
• Water Treating Grand Ballroom A&B

Noon - 2:00p
Owner Operator Seminar (w/box lunch)
Grand Ballroom D

Noon - 2:00p
Lunch on your own

2:00p - 3:00p
Services

2:00p - 4:30p
Grand Ballroom C

4:00p - 8:30p
Table Top Exhibits
list of Exhibitors [to date] on page 18
& Hospitality Suite (Bar Closes @ 9:30p)
Armstrong Ballroom

4:00p - 8:30p
Table Top Exhibits
list of Exhibitors [to date] on page 18
& Hospitality Suite (Bar Closes @ 9:30p)
Armstrong Ballroom

Wednesday, February 11, 2015

7:00a - 10:00a
Services

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

7:00a - 8:00a -
Speakers’ Breakfast, Grand Chenier

8:00a - 12:00p -
Educational Seminar, Grand Ballroom C - information on page 3

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

1:30p - 5:00p -
Technical Committee Meetings - (same rooms as Tuesday)

2:00p - 3:00p -
Services

5:00p - 8:00p -
Hospitality Suite (Bar closes @ 8:00p) - Armstrong Ballroom

Thursday, February 12, 2015

Thursday’s activities involve the Board of Directors and Committee Chairs only

7:30a - 8:15a
Board of Directors’ (includes Committee Chairs) Breakfast, Grand Chenier

8:30a - 2:00p
Board of Directors’ Meeting, Grand Couteau

Monday Night Dinner
February 9, 2015 / 6:00p - 9:00p

Come down to 241 Bourbon Street and you’ll find the best of the Wild, Wild West right here in The Big Easy. The Bourbon Cowboy is a true Honky-Tonk Saloon where the DJ’s spin the best mix of Country and Rock music from the driver’s seat of a classic fire-engine-red 1950’s era Chevrolet Pickup Truck. The One-n-only Bourbon Cowboy is the place to go for the best Bull Ridin’, Bead Tossin’ and Boot Scootin’ on Bourbon Street or in the whole wide world. So kick up your heels and set a spell, dance to your favorite song or take a spin on our famous Mechanical Bull ride. Rise above the crowd for a Bird’s-eye view of Bourbon Street. Bourbon Cowboy’s huge wrap around balcony overlooks Bourbon and Bienville Streets. Spend your big night high above New Orlean’s world famous Bourbon Street, partying with your friends, throwing beads to the crowd below.

Hors D’oeuvres,
Fruit and Cheese Display, Dip Bar
Chicken & Andouille Jambalaya
Couchon du Lait Po-boy’s
and Desserts
(includes an Open Bar)
Right now while you’re at the CTI conference, Bedford has thousands of corrosion-resistant FRP profiles in stock, available immediately. You could place an order today, have it fabricated to your specs, and get it shipped faster than ever before. We’ve built up our inventory to deliver the industry’s shortest lead times — so you can deliver faster for your customers.

Call 800-377-3280 or visit bedfordreinforced.com/inventory.
• WTG-130A Corrosion Monitoring – Matt Wangerin - There is a document, WTG-149, that was reviewed (deemed not reviewed) and was rolled over to the Board for the approval process. There is a Document in progress, WTG-130-A, a subset of the original WTG 130, that is also in review, and this document, WTG-130A, will be addressed by the group to determine if rewriting or editing is needed. The members of the group discussed where the draft document is at this time, and will try to produce a new draft document.

• WTG-130B Deposit Monitoring – Dwight Emerich (reported) - Matt Wangerin and Pete Elliot have parts of the document which has been idle for a year or more due to the task group leadership vacancy. The group will re-start the process. The document pieces have been located and will be reviewed. The group has defined the tasks facing them to move the document forward. They will summarize these tasks and forward them to Bob Cunningham.

• WTG-130C Microbiological Monitoring – Pete Elliot - The group had two meetings. They have the draft document and will continue to work on it via conference calls.

• WTG-158 Physical Water Treatment Practices – Paul Puckorius (reported) - The group has held some conference calls since the winter meeting and has a scope and initial statement. These will be reviewed and then they will start on a “primer” of physical water treatment. Progress was made at this session. The group will continue via conference calls. They are targeting being ready for ad hoc review prior to the Annual meeting.

• WTG-161 (old number was 159) Best Practices Guidelines for Cooling Water Systems – Jack Bland (reported) - Bill Pearson is the new vice-chairman. The group had two meetings. After the first meeting a committee comprised of Kim Kanuth, Ian Horne, and Jon Cohen produced a draft of the projected best practices guidelines. This is being reviewed by the CTI R&D committee. The document will be reviewed by Phil Kiser and will be reviewed by the Board for the approval process. There is a draft document.

• NACE: Christine McGinnis reporting. Based on attending the last several meetings the interest at NACE has shifted away from water treatment and AWT in pursuit of projects that we suggested above in the schedule of meetings.

• AWT: Bill Pearson reporting. The AWT meets twice per year and conducts training sessions.

• ASHRAE: Bill Pearson reporting. The ASHRAE meeting took place in Seattle two weeks ago. The committee TC3.6 is actively looking for research topics.

• NACE: Christine McGinnis reporting. Based on attending the last several meetings the interest at NACE has shifted away from water treatment.

• Chapter 6 of the manual, “Water Chemistry and Treatment” was last reviewed in 2005. Matt Wangerin, outgoing Water Treatment Committee Chairman, explained the status of this chapter, as follows, in summary. Since most of the documents that are currently being worked on by the committee either revise or extend significant portions of Chapter 6, and given the limited resources of the committee to undertake another entire chapter review while producing several new documents, the review of Chapter 6 was placed in the queue of work group assignments falling in place after the future completion of several of the existing task group papers. The new paper can be included in the revised Chapter 6 by reference or quotation.

• The Legionella Standard Task Group has voted down the creation of a standard as reported by Jack Bland. A revision of document No. 159, the existing guideline, will be pursued.

• Helen Cerra noted that the CTI R&D committee is reviewing new projects and asked that any idea be submitted to Phil Kiser. There is also the potential to collaborate with ASHRAE and AWT in pursuit of projects that we suggest. The discussion following this comment led to the recommendation of the group meeting noted above in the schedule of meetings.

• Discussion concerning the use of the Legionella group’s work and the information gathered in that effort to enhance CTI’s definition of biofilms occurred. The question was whether this could be utilized by the group working on WTG 130 B. The chairman answered that the scope of the WTG 130 B group was how biofilm is monitored and that it would not change to include developing a new or enhanced definition at this time.

Helen Cerra proposed that the group consider trying to answer the question or document previous data concerning how water treatment chemistry affects cooling tower drift rates. In discussion it was noted that Rich Aul has some information on this topic. Also the probable effects of biofilm on drift rates were discussed. No action was taken on this discussion at this time.

• Phil Kiser introduced the discussion of whether the water treatment committee and its task groups should adopt the practice of having voting and non-voting members. This distinction is made in other CTI groups. The topic was discussed in some detail but no action was proposed or taken other than to introduce the topic to the group for further consideration.

Matt Wangerin noted that the Water Treatment Committee sponsors a panel discussion at the fall CTI meeting which occurs on Monday afternoon and is 1.5 hours long. Topic suggestions were solicited and the following were offered:

• Suggestions on how to write a proper bid specification
• Instrumentation and Control of Cooling Water Systems
• Reuse of water in Cooling Water Systems
• Phil Kiser, incoming committee chairman, thanked Matt Wangerin for his service as chairman for the previous four years.

Adjournment - The motion to adjourn was made and seconded and the meeting adjourned at 10:30 AM on the final day.
Owner/Operator Seminar  
*box lunch included*  
**Tuesday**  
February 10, 2015  
Noon - 2:00p  
Grand Ballroom D  
lead by:  
Frank Michell w/AEP & Natasha Jones w/Bechtel

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

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A Complete Power Transmission Package to Keep You Cool.

Cooling towers are one of the harshest environments for power transmission equipment. Moisture, chemicals, and minerals attack the equipment driving cooling tower fans, making durability, corrosion resistance and superior customer service a priority.

That’s why customers choose Addax® Composite Couplings and Falk® Renew® Prager® repair and asset management services.

- Lower total cost of ownership — properly maintained, the cost-effective Addax Composite Coupling can last the life of the cooling tower, while its lower weight results in less wear on other system components.
- Professional on-site inspection, evaluation, service and repair or replacement of gear drives, couplings and bearings.
- Same-day, emergency delivery of gear drives and couplings for many applications are available to maximize your uptime.

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Make your plans to attend  
Future Meetings for CTI  
Committee Workshop  
July 12-15, 2015  
Tradewinds Island Resort  
St. Pete Beach, FL  
Annual Conference  
February 7-11, 2016  
Hilton Houston North  
Houston, TX  
Annual Conference  
February 5-9, 2017  
Sheraton New Orleans  
New Orleans, LA  
Annual Conference  
February 4-8, 2018  
Hilton Houston North  
Houston, TX

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- Lower total cost of ownership — properly maintained, the cost-effective Addax Composite Coupling can last the life of the cooling tower, while its lower weight results in less wear on other system components.
- Professional on-site inspection, evaluation, service and repair or replacement of gear drives, couplings and bearings.
- Same-day, emergency delivery of gear drives and couplings for many applications are available to maximize your uptime.
Earn PDH Credits while meeting and working with others in the industry.

(Information when you register)
The following companies have reserved their tables for exhibiting:

1. EvapTech, Inc.
2. ChemTreat, Inc.
3. Design Controls, LLC
5. Cooling Towers of Texas
6. C.E. Shepherd Co.
7. FasTec International
8. Structural Group
9. Resolite
10. Moore Fans LLC
11. Waterline Controls
12. Enduro Composites, Inc.
13. EcoWater CHC
14. GEA 2H Water Technologies
15. Polser Fiberglass Levhalari
16. Composite Cooling Solutions
17. French Creek Software
18. EPI Engineering, Inc
19. Rexnord Corporation
20. Baltimore Aircoil Company
21. IMI Sensors
22. Sonitec-Vortisand
23. Midwest Cooling Towers, Inc.
24. McHale & Associates
25. Proco Products, Inc
26. SPX Coolinnamic Fabricators
27. Dynamic Fabricators
28. Glocon, Inc
29. Aggreko Cooling Tower Services
30. Amarillo Gear Company
31. Bedford Reinforced Plastics
32. Hudson Products Corporation
33. Cofimco USA, Inc.
34. Rain for Rent
35. G&G Marine
36. AMSA, Inc.
37. Denso North America
38. CleanAir Engineering
39. Tower Tech Inc.
40. Cool Water Technologies
41. Brentwood Industries
42. Gaiennie Lumber Co.
43. Prominent Fluid Controls
44. Strongwell
45. For information on reserving your table
   contact Virginia Manser
   at 281.583.4087
   or vmanser@cti.org
CTI Thanks The Following Sponsors For Their Contributions To The Hospitality Suites For 2015 Full Conference(s) Sponsorship

1. Advance Cooling Towers, Inc.
2. Aggreko Cooling Tower Services
3. AirFlo Cooling Technologies
4. Amarillo Gear Company
5. AMSA, Inc.
6. Bailsco Blades & Castings, Inc
7. Baltimore Aircoil Company, Inc
8. Bedford Reinforced Plastics
9. Brentwood Industries
10. C.M. Towers, Inc.
11. Cenk Endustri A.S.
12. ChemTreat, Inc.
13. Cooling Tower Depot, Inc
14. Evapco, Inc.
15. EvapTech, Inc.
17. GEA Heat Exchangers, Inc.
18. Hudson Products Corporation
21. Kyung In Machinery Co., Ltd (KIMCO)
22. Liang Chi Industry Co., Ltd
23. MasterTech Services Inc.
24. Midwest Cooling Tower Services LLC
25. Midwest Cooling Towers, Inc.
26. Moore Fans LLC
27. Precision Cooling Towers, Inc
28. Rexnord Corporation
29. C.E. Shepherd Co., LP
30. SITS Cooling Systems Pvt Ltd
31. Solenis
32. Strongwell
33. Thornton, Musso & Bellernin
34. Tower Engineering, Inc.
35. Tower Performance, Inc.

Press Release

Contact: Chairman, CTI Multi-Agency Testing Committee
Houston, Texas 2-November-2014

Cooling Technology Institute, PO Box 681807, Houston, Texas 77268 - The Cooling Technology Institute announces its annual invitation for interested thermal testing agencies to apply for potential Licensing as CTI Thermal Testing Agencies. CTI provides an independent third party thermal testing program to service the industry. Interested agencies are required to declare their interest by March 1, 2015, at the CTI address listed.

www.hudsonproducts.com
The following is just a sample of the types of questions we get from those in every walk of life at the CTI office via our Website. Thanks to the Ask the Expert Committee the CTI is able to reach out in another way to help those in the industry and those who have interest in the industry.

**Question 1**
We are going to be expanding an existing wooden cooling tower that has the potential for seeing high pH material (up to 10) for weeks at a time. We would like to build the new portion of the tower from fiberglass.

We are considering using vinyl ester resin for the wetted parts and polyester resin for the non-wetted parts. Do you see any issue with the material selection we plan? Will we encounter any problems with the mixing of materials?

With a pH that high I would confirm with the Pultrusion supplier that the Vinyl-ester resin will survive for extended periods or indefinitely at a pH of 10. There are some inexpensive Vinylester resins that can approach the cost of polyester but they aren’t all that great. I don’t think I would mix the wetted and non-wetted sections with different FRP. I would recommend all Vinylester throughout the structure. There is some risk that the higher pH could cause blistering of the surface veil on the Polyester parts. For the difference in cost I would not risk it. In addition, I would suggest that when you are talking with cooling tower suppliers, you get them to let you talk directly to their pultrusion suppliers (no CTI manufacturers that I am aware of make their own pultrusions) to be sure they understand the nature of your application, and that you are serious about requiring all vinylester parts throughout. Otherwise, there is the possibility that some polyester or “cheap” vinylester parts might be supplied. If this is an application that has been ongoing at your plant for some time, then you are no doubt familiar with the potential complications of a pH as high as 10, especially in your wood cooling tower.

**Question 2**
In my company we have twin towers with capacity of 48,000 gpm and the area where we settled in the water is very expensive. Is there technology to recover water evaporated from our towers?

The short answer is this: There is no technology out there, to recover the water that is evaporated from cooling towers, but there are several options to recover cooling tower blow down which involve UF/RO pretreatment and channeling the R.O. permeate back to the cooling tower’s Makeup water stream. Cooling tower blow down can also be sent to on site evaporators which will essentially boil the blow down water and recover the pure vapor for reuse as cooling tower makeup. The final option, and one that is seeing more play currently, is the use of municipal waste water by tapping into the city’s piping system, and pretreating this water by means of multi-media filtration, or precipitation, then maybe a UF/RO stage, dependent on the cooling tower makeup water quality desired or mandated.

**Question 3**
The induced draft counter flow cooling tower is placed perpendicular to the summer wind conditions, in low wind conditions the downwind wet bulb temperature...
Cooling Technology Institute
Annual Conference, February 9-12, 2015

HOTEL INFORMATION
SHERATON NEW ORLEANS, NEW ORLEANS, LA

504.525.2500

Hotel Cut-off Date - January 19, 2015

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

Standard Accommodations (Subject to Availability):
Single - $189++ / Double - $189++

Earn PDH Credits while meeting and working with others in the industry. (Information when you register)

Make your plans to attend Future Meetings for CTI

Committee Workshop
July 12-15, 2015
Tradewinds Island Resort
St. Pete Beach, FL

Annual Conference
February 7-11, 2016
Hilton Houston North
Houston, TX

Annual Conference
February 5-9, 2017
Sheraton New Orleans
New Orleans, LA

Annual Conference
February 4-8, 2018
Hilton Houston North
Houston, TX
continues from page 24

rises and the difference between upwind and downwind wet bulb temperature goes as high as 3 degrees C. Massive recirculation takes place and I have tested it by letting go of a balloon from the top of the fan stack. It gets sucked inside quickly.

1. Can I block the down wind of air inlet and force all air to inter from one side only?
2. Will its velocity pressure drop increase prohibitively at 1800 ft per minute (if one side is totally blocked)?
3. What is the maximum allowable inlet air velocity or is there no standard for this?
4. What is the maximum L/G recommended for such a tower?

To answer your questions:

1. It might be better to start by blocking half of the vertical height of the downwind air inlet from the top of the air inlet down. There is an advantage in better air distribution across the fill if you leave part of the downwind air inlet height open. Closest to the ground, there will also be a certain amount of fresh air coming around the end of the tower. Note also that closing the downwind air inlet reduces the total air flow, which reduces the air exit velocity, which increases the recirculation tendency.

2. Common practice is to limit to 1200 fpm and also to consider keeping the ratio of entering velocity pressure below 1/5 of the tower pressure drop to avoid having air bypass the upwind perimeter of the fill.

3. It is believed to be more determined by the pressure ratio mentioned above than a velocity limit.

4. This is not generally a limit, being governed more by fluid mechanical limitation on air distribution and recirculation interference.

**Question 4**

We have a cooling tower with gas chlorine dosage point (one and only dosage point) to the main return water line, is this a “normal” point to gas chlorine dosage? We think the usual is to dosage the C12 to the basin… the cooling tower is under construction now and we want to know if this point of dosage is correct.

There are three places that gaseous chlorine is generally introduced into a cooling tower system. The most commonly used application point is after the chiller/heat exchanger, which is your current design. While you will lose some chlorine due to off-gassing over the tower, you will keep the tower fill cleanest by feeding at that point and you will get good dispersion in the system. The issue with feeding into the basin or ahead of the chiller is corrosion. Dispersion in the basin is difficult and can be the root cause of aggressive corrosion. Likewise, overfeeding ahead of the heat exchange device can be corrosive. So, you can feed in any of those points, but generally, gaseous chlorine is normally fed at the point you are currently planning to use.
Registration Form for the
CTI 2015 Annual Conference
February 9-12, 2015

Complete and send this form to: Cooling Technology Institute • PO Box 681807 • Houston, TX 77268
281.583.4087 • Fax: 281.537.1721 • email: vmanser@cti.org

Early Bird Registration Ends: January 30, 2015

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)

<table>
<thead>
<tr>
<th>Aware of the conference after seeing (please check one):</th>
<th>Annual Conference News</th>
<th>First-time Attendee:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company:</td>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>City/State/Province:</td>
<td>Zip or Postal Code/Country:</td>
<td></td>
</tr>
<tr>
<td>Phone (Country Code/Area/Number):</td>
<td>Fax (Country Code/Area/Number):</td>
<td></td>
</tr>
</tbody>
</table>

Email: 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: 
Physical: Please check here if you require special accommodations to participate and email a description of your needs by January 30, 2015 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: Conference Rate after:

<table>
<thead>
<tr>
<th>Category</th>
<th>Early Bird Rate by:</th>
<th>Conference Rate after:</th>
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</thead>
<tbody>
<tr>
<td>CTI Member</td>
<td>$695</td>
<td>$795</td>
</tr>
<tr>
<td>Non-Member</td>
<td>$795</td>
<td>$895</td>
</tr>
<tr>
<td>One day</td>
<td>$500</td>
<td>$500</td>
</tr>
<tr>
<td>Exhibit Hall Pass Only</td>
<td>$75</td>
<td>$75</td>
</tr>
<tr>
<td>Speaker (one for each paper only)</td>
<td>N/C</td>
<td>N/C</td>
</tr>
<tr>
<td>Press (one attendee per company only / ID Required)</td>
<td>N/C</td>
<td>N/C</td>
</tr>
<tr>
<td>Honorary Life Member</td>
<td>N/C</td>
<td>N/C</td>
</tr>
</tbody>
</table>

Section 4a Subtotal US$: __________

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

<table>
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<tr>
<th>Event</th>
<th>Conference Rate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional luncheon ticket(s), Monday, Feb 9, 2015 (for spouse/guest)</td>
<td>$30</td>
</tr>
<tr>
<td>Monday Night Dinner - Bourbon Cowboy (February 9, 2015)</td>
<td>$70</td>
</tr>
<tr>
<td>Set of Papers - Hard Copies</td>
<td>$150</td>
</tr>
<tr>
<td>Set of Papers - CD (w/PDF file of each paper) Available after conference</td>
<td>$150</td>
</tr>
<tr>
<td>Mailing for papers and/or CD sent to Mexico and/or Canada</td>
<td>$10*</td>
</tr>
<tr>
<td>Mailing for papers and/or CD sent to all other countries</td>
<td>$15*</td>
</tr>
</tbody>
</table>

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
Card#: Exp. Date CVC Code: __________

Cardholder’s Name: __________
Cardholder’s Signature: __________

There will be a 15% charge on any credit card refund made - no exceptions!
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