This is your personal invitation to the 2010 Annual CTI Conference in Houston, Texas.

The program committee would like to invite you and your company to the 2010 Annual Conference and Meeting. This year, by popular demand in Houston, Texas. This is the home of CTI and its fine staff. Houston is a wonderful city 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 for you. We have 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 that what we have to offer you can be shared with others at your company. Because our mission as a non profit technical organization, we are charged to bring the most timely and latest information in the industry. We have 26 papers being presented in a concurrent format on Monday and Tuesday. Water Treating will have one session and P&T and ES&M will have the other. This has been our approach for the past several years. To make sure you find this beneficial, we are trying to add more to our programming and offer more information. You will find a list of the papers, the times they are being presented, their authors (including the authors companies), a brief bio of the author and a brief description of the paper starting on page 10 of this newsletter.

Technical Committees - We will offer an extended time for committee work to be done. At past annual meetings 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 CTI. Each of the standing committees will spend time working on current standards and codes. If you have an interest and would like to be a part of this work, feel welcomed to sit in. The CTI Program layout will alert you to each committee, the times meeting each day and the work to be done.

Owner Operator Seminar - Tuesday 12:00a – 2:00p - A time has been set aside for the owners to talk about current issues, cover future needs at their locations and talk candidly with each other. Lunch will be provided.

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 each standing committee ready to support your questions with good qualified answers. Jim Baker will moderate this session.

Education Program Session - Wednesday 8:00a – 12:00p – The year the Education Program will cover the following four topics:

1. Common Misconceptions about Building Codes as They Relate to Cooling Towers. (presented by Jane Heuser, with GEA Power Cooling, Inc.);
2. CTI ESG-152 Structural Design of FRP Components (presented by Thomas S. Wright, with Bedford Reinforced Plastics, Inc.);
3. Load and Resistance Factor Design (LRFD) or Pultruded Fiber Reinforced Polymer (FRP) (presented by Dustin L. Troutman, with Creative Pultrusions, Inc.); and
4. Acceptance Criteria for FRP Composites to be Used in Cooling Towers (presented by Thomas S. Wright, with Bedford Reinforced Plastics, Inc.).

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.
Swifter CTX Series

The next generation of industrial fans for cooling towers and heat exchangers.
Dramatic changes have occurred in building codes and how they relate to cooling towers. Those writing cooling tower specifications frequently are behind in updating or specifying to meet current building code requirements. The intent of this presentation is to present the latest building code requirements and reflect on how there is little to no relation to older specifications.

Presented by: Jane Heuser, GEA Power Cooling Inc.
Jane’s 30 year cooling tower career began in 1973 at Ecodyne Cooling Towers in Santa Rosa, California. She has both a BA (art, philosophy) and a BS (civil engineering) and is a registered Professional Engineer in California.
Jane currently works for GEA Power Cooling’s Aftermarket Services Group, out of their Santa Rosa, CA office as a project engineer. Due to Ecodyne’s acquisition by other entities, Jane has worked for Ceramic Cooling Towers, Balcke-Durr and SPX, serving over the years as a structural designer, project engineer, engineering manager, project manager and Qualifying Party for contractors licenses in several states.

CTI ESG-152 Structural Design of FRP Components

An in depth look at ESG-152 and how it is used. Service factors, temperature reduction factors, live and dead loads and how they are used in cooling tower design. When used properly ESG-152 can be an excellent source for writing specifications as it relates to an FRP cooling tower structure. This paper will explain and show examples of how ESG-152 is used.

Presented by: Thomas G. Toth, P.E., Midwest Towers, Inc.

Tom graduated 1977 with a BS in Architectural Technology from The New York Institute of Technology. He has also received a Masters of Administration Degree in Industrial Management in 1984 from Lynchburg College and is a Licensed Professional Engineer registered in Virginia, New Jersey, Colorado and Nebraska.
He has 18 years experience in Consulting Engineers offices, 4 years as an Engineer for a major Structural Steel Fabricator and 10 years as an Engineer for Cooling Tower companies. Currently the Senior Structural Engineer for Midwest Towers, Inc.

Load and Resistance Factor Design (LRFD) or Pultruded Fiber Reinforced Polymer (FRP)
LRFD incorporates state-of-the-art analysis and design methodologies with load and resistance factors based on theknown variability of applied loads and material properties. These load and resistance factors are calibrated from actual FRP statistics to ensure a uniform level of safety. Even though FRP composites are widely accepted in the cooling tower industry no nationally recognized building code lists them as accepted building materials. The purpose of LRFD is to create a nationally recognized code for FRP composites. This presentation will present the methodology for achieving this goal.

Presented by: Dustin L. Troutman, Creative Pultrusions, Inc.

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

Acceptance Criteria for FRP Composites to be Used in Cooling Towers FRP structural materials arrive at a job site and the owner may require inspection of the materials to confirm their quality. To an untrained individual many FRP sections might be rejected for visual blemishes or a perceived flaw. This presentation will present some of the more common problems with the visual and physical appearance of an FRP structural piece that does not affect the structural performance of the part. In addition methods for repairing visual and structural defects will be presented, including long term storage and maintenance of materials.

Presented by: Thomas S. Wright, Bedford Plastics, Inc.

Mr. Wright is currently a Business Development Manager at Bedford Reinforced Plastics, Inc. (BRP) and is the primary market manager for infrastructure, power and military markets. He is responsible for designing, developing and marketing composite shapes for BRP. Mr. Wright started his employment at BRP on January 7th 1991. Prior to working for BRP, Mr. Wright worked for Creative Pultrusions Inc. in various capacities within the company. He has over 30 years of experience in the manufacturing and sales of composites and is an active member of CTI, ACMA and SAMPE.

Depending on your perspective, “It was the best of times. It was the worst of times” to quote Charles Dickens. The recession has brought both problems and opportunity. Most Self-Help groups indicate people who have experience that others should learn. It would be very easy for those who have had terrible tragedies in their personal and business lives. Their positive attitudes are an inspiration as they struggle to rebuild families, homes and businesses lost in Hurricane Ike. They just keep going mainly because it does no good to linger on problems that you do not have control over. It is better to focus on problems that you do not have control over. It is better to focus on problems that you do not have control over.

It has been an interesting year in CTI. The organization is healthy and strong. Many of our member companies have had their fair share of problems. Our supporting members who have had to pull back from direct attendance at meetings are returning via electronic media. The current situation may no longer allow you to attend all meetings in person; therefore, CTI is taking the initiative to find new electronic media streaming of the Winter Meeting as a means of reaching all our members, U.S. and international.

We are researching possibilities to use the computer meeting capability for task group meetings too. Until we get to this stage, I encourage participation anyway. Task group chairpersons are looking for help on every committee. You do not have to be present to participate, but you do need to express interest. CTI “ASK THE EXPERT” receives questions everyday on a variety of subjects. Many of the responses indicate people who have experience that others should learn. It would be very easy for a person who routinely uses the “Ask the Expert” system to join a task group. I have always found that I learn a great deal on a variety of subjects by participation. The other benefit is making day-to-day contacts. Hurricane Ike is an example of how contacts in CTI benefited owner/operators, manufacturers, suppliers working together to put plants back together and bring back on-line. This does not happen by accident. The most valuable asset most people contain is their industry contacts.

In these last few months of my term, I want to hear from each of you on ideas, questions, or criticism about CTI. The 2010 Winter Meeting in Houston, TX is just around the corner. The program, educational seminars and task group meetings are well into their planning stages. If you cannot attend in person, I invite you to view the task group meeting minutes on-line. The committee chairpersons will be sending meeting minutes of meetings, meeting schedules to you and as much information as we can bring to you. If you have an interest, contact someone or use “Ask the Expert”. The CTI Office is always available for questions and can recommend someone to speak with you. See you in February!
Owner Operator Session
Tuesday, February 9, 2010
12:00p - 2:00p
(lunch included)

Come and join Jon Bickford, Chairperson for the Owner/Operators group with Cooling Technology Institute (CTI) at the CTI Annual Conference in Houston 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 and a chance 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 days of presentation given by experts on tower operations, 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 the re-writing of the new procedures and standards.

This year we are going to have two presentations during the Owner/Operators Session. With the change over to fiberglass cooling towers and the repairs to cooling towers with the use of fiberglass it is important that you do it right. Dennis Moran an expert in this field will talk to you about the proper way of making connections between wood and fiberglass and how to make the connections. With environmental issues changing all the time you need to know how to monitor your water and how to treat it. We will have a company come in and show you the lasted technologies on water treatment and the instruments used to monitor your water quality.

Lunch will be provided and during our lunch time we will talk together about issues that you may be having with your cooling towers as well as sharing information about problems you have had in the past and what you have done to correct the problem. You will be able to talk freely with other Owner Operators like yourself during these 2 hours and discuss cooling tower projects and learn what type of material others prefer to use as well as whom to use to get the job done. You become part of a group that you can reach out to for help.

I hope to see you there and if you have an issue you would like to have discussed during the session that would involve pre-meeting research please e-mail me or call me and I will get the information ready for the meeting. (jonbickford@alliantenergy.com) 641-935-2915 or 641-777-0010.

Wood to Fiberglass Connection on Cooling Towers & Monitoring Equipment For Cooling Tower Water Quality
Water Treating Panel Discussion

Monday, February 8, 2010
2:00p - 3:30p

I HAVE A COOLING TOWER, NOW WHAT?

The panel discussion is directed toward the cooling water operators. The expert panelist will discuss the economics associated with water sources (inclusive of reuse) as it relates to pretreatment, tower fill, heat exchanger metallurgy and water quality variables to optimize the efficiency of operation, water conservation and equipment life.

Panelist:
- Unit Operations of Pretreatment and Economics:
  Presenter: Paul Gross, Liquid Process Technology
- Water Quality Evaluation and Limits:
  Presenter: Rob Ferguson, French Creek Software
- Water Quality and Fill Selection:
  Presenter: Jim Wallis, Brentwood.
- Water Quality: Effect of Water Quality on Metallurgy:
  Presenter: Jaspir Gill, Ph. D., Nalco Chemical Company

At HUDSON, we understand there is more to the design and production of fan blades than patented technology. We understand that there is more than establishing the highest standards in a manufacturing process, and we understand that there is more than providing the highest quality products and services to our clients - we understand that Hudson has a history.

A history developed over many years of producing the finest fan blades in the industry. We once again raise the standard with the introduction of the latest member of our famous Tuf-Life® lineage.

HUDSON Products Corporation

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DRESS CODE
for the Annual Conference is Business Casual
No Ties!
CALL FOR PAPERS
2011 Annual Conference
February 6-10, 2011
The Westin, Riverwalk
San Antonio, Texas

The following schedule will begin the process for papers presented at the 2011 Annual Conference:

2010
May 7: Deadline for Abstracts
June 18: Authors Notified by Program Chair
Aug 6: Six (6) copies of draft must be sent to CTI office for review
Nov 5: 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

To Ask the EXPERT a question go to www.cti.org
DYNAMIC FABRICATORS MERGES WITH AMTECH LLC

Dynamic Fabricators has merged with Amtech LLC, a leading custom-molded composite manufacturer that services the military, construction and transportation industries. Dynamic Fabricators Rathdrum, ID manufacturing processes are planned to eventually take place in Amtech’s ISO 9001:2008 certified facility in Yakima, WA.

Dynamic Fabricators, a division of Amtech, will continue to offer the same extensive line of SUPERIOR COOLING TOWER COMPONENT PRODUCTS at competitive prices as well as continuing our pledge to not compete directly against our customers.

Sales will continue through a satellite office in Rathdrum, Idaho. Amtech’s expertise in design, engineering, research and development, and strict quality procedures will strengthen, improve and expand Dynamic Fabricators cooling tower product line.

HOUSTON, TX LOCATION

Successfully serving the aftermarket cooling tower industry in Houston for six years now, we will continue at the same location with the same professional staff to serve you.

The Houston facility is conveniently located in NE Houston with a full line of lumber and PVC fabrication capabilities in addition to a large warehouse and secured yard space filled with cooling tower component items. We will continue to efficiently provide you with the products you need anywhere from an entire tower replacement to just a few emergency repair items.

For all orders please continue to contact the Rathdrum, Idaho sales office. The products you order for your project can be delivered directly to your job site or you can pick them up right from our warehouse at 18580 Van Road, Houston, TX 77049 where our team is ready to assist you.

PRODUCTS AVAILABLE

- Fan Stacks, Fan Rings & Repair Kits
- Header, Bypass, Riser & Lateral Distribution Systems
- Fiberglass Distribution Boxes and Downcomers
- Hudson Fans
- Treated Lumber
- PVC Pipe and Fittings
- Fiberglass or Wood Saddles
- Fiberglass Stiffener Rings
- Fiberglass Ladders & Handrail
- Stair Towers, Escape & Access Ladders
- Field Service
- Pultruded Fiberglass Components
- Casings & Closure Strips
- Gaskets & Caulking
- Mechanical Supports, Anchors, Straps
- Hardware (wide selection)
- Addax Drive Shafts

Providing excellent customer service is our number one priority and is what keeps our customers coming back.
CTI Thanks The Following Sponsors For Their Contributions To The Hospitality Suites For 2010

Full Conference(s) Sponsorship

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2. Amarillo Gear Company
3. Baltimore Aircoil Company
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6. ChemTreat, Inc.
7. Composite Cooling Solutions, LP
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9. Gaiennie Lumber Company
10. GEA Power Cooling, Inc.
11. Hudson Products Corporation
12. International Cooling Tower, Inc.
13. Kyung In Machinery Co., Ltd (KIMCO)
15. Moore Fans LLC
16. Rexnord Industries
17. SPX Cooling Technologies

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13. Precision Cooling Towers, Inc.
14. Strongwell
15. Tower Maintenance Service Company
16. Tower Performance, Inc.
17. Water Cooling Equipment, Inc.

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

Midwest Towers — The right choice for quality, service, and value.

Midwest Towers offers you a full checklist of cooling tower products and services for your project. We are a complete cooling tower supply company. Our skilled and experienced team can support you in every step — design, fabrication, installation.

- Crossflow & counterflow towers with wood or FRP structures.
- Custom lumber fabrication and treating.
- Fiberglass fan stacks and distribution systems.
- Non-skid fiberglass fan deck and hot water basins.
- Corrugated FRP casing and louvers.
- Fans, gears, drive shafts, motors, supports.
- Flow control valves, nozzles, grommets.
- Fill and drift eliminators.
- Hardware, brace connectors, base anchors.
- Replacement parts for all models and manufacturers.
- Budget optimization and thermal upgrade studies.
- Complete engineering services.
- Reconstruction and thermal performance upgrades.
- Maintenance and service contracts.
- Emergency response and repair.

Contact us today and see how much value we can bring to your project.
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 assure 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 Type*</th>
<th>Agency Name</th>
<th>Contact Person</th>
<th>Telephone/ Fax</th>
<th>Website / Email</th>
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<tbody>
<tr>
<td>A, B</td>
<td>Clean Air Engineering</td>
<td>Kenneth Hennon</td>
<td>800.208.6162</td>
<td><a href="http://www.cleanair.com">www.cleanair.com</a></td>
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<td></td>
<td></td>
<td></td>
<td>865.918.7569</td>
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<td></td>
<td>Cooling Tower Technologies Pty Ltd</td>
<td>Ronald Raynor</td>
<td>61 2 9789 5900</td>
<td><a href="mailto:coolingtowertech@bigpond.com">coolingtowertech@bigpond.com</a></td>
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<td></td>
<td>61 2 9789 5922</td>
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<tr>
<td></td>
<td>Cooling Tower Test Associates, Inc.</td>
<td>Thomas E. Wawer</td>
<td>913.881.0027</td>
<td><a href="http://www.cttai.com">www.cttai.com</a></td>
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<tr>
<td></td>
<td>McHale &amp; Associates, Inc</td>
<td>Thomas Wheelock</td>
<td>615.588.2654</td>
<td><a href="http://www.mchale.org">www.mchale.org</a></td>
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<td></td>
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<td>425.557.8777</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 measurement locations required by larger towers.

### Licensed CTI Drift Testing Agencies

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<tr>
<th>Agency Name</th>
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<tr>
<td>Clean Air Engineering</td>
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<td><a href="http://www.mchale.org">www.mchale.org</a></td>
</tr>
</tbody>
</table>

### Earn PDH Credits

While meeting and working with others in the industry. (Information when you register)
Monday's Technical Sessions running simultaneously between Galleria I, II & III

Galleria I (ES&M and P&T Sessions)
8:30a - 9:00a

TP10-01 Your Cooling Tower Project: On Time, On Budget
David Supsic, David M. Supsic, P.E., L.L.C.

TP10-02 Silica Scale Inhibition - A Kinetic Study
Heinz Plaumann, Keith Hirsch, and Joseph Lipari, BASF Corporation

TP10-03 The Importance of an ISO 9001 Component Supplier for the Cooling Tower Companies
Clint Smith, Strongwell

TP10-04 Antimicrobial Filtration
Jim Stephens, Sonitec, Inc. and Mark Miller, AquaShield™, Inc

Monday, February 8, 2010

Galleria II & III (Water Treatment)
8:30a - 9:00a

TP10-05 Complex Structural Analysis Simplifies Repair Phasing In Restoration Of Hyperbolic Cooling Towers

This paper reviews a case study applying an innovative technology designed to remove TSS and barometer pathogens using an environmentally neutral antimicrobial filter media. The filter media uses an EPA-registered antimicrobial agent that permanently bonds to the filter media. Treatment is instantaneous as an antimicrobial “sword” physically pierces the outer membrane of the microorganism on contact, providing for total pathogen destruction. Destroyed pathogens easily pass through the filter media with minimal reduction in flow rate. The media does not allow for mutation and provides for long term treatment. Independent 48-hour acute toxicity laboratory testing was performed following EPA guidelines to support that the antimicrobial agent does not leach, and the effluent (treated) water is non-toxic. Analysis of performance data obtained from independent laboratory tests and field pilots demonstrate that this same media technology can now be applied to water treatment technologies, including chemical treatment, filtration, ion exchange and membranes; in HVAC, potable, desalination, ultra pure, process, industrial and waste water markets. Jim graduated with a degree in Engineering Technology and has worked as Business Unit Manager for USFilter; Industrial Sales Director for USFilter/Stranco, Director of Sales for Koch Membranes Systems and presently is President of Midwest Design Solutions, LLC. Jim represents Sonitec, Inc. products including filtration and membrane technologies.

This paper reviews a case study applying an innovative technology designed to remove TSS and barometer pathogens using an environmentally neutral antimicrobial filter media. The filter media uses an EPA-registered antimicrobial agent that permanently bonds to the filter media. Treatment is instantaneous as an antimicrobial “sword” physically pierces the outer membrane of the microorganism on contact, providing for total pathogen destruction. Destroyed pathogens easily pass through the filter media with minimal reduction in flow rate. The media does not allow for mutation and provides for long term treatment. Independent 48-hour acute toxicity laboratory testing was performed following EPA guidelines to support that the antimicrobial agent does not leach, and the effluent (treated) water is non-toxic. Analysis of performance data obtained from independent laboratory tests and field pilots demonstrate that this same media technology can now be applied to water treatment technologies, including chemical treatment, filtration, ion exchange and membranes; in HVAC, potable, desalination, ultra pure, process, industrial and waste water markets. Jim graduated with a degree in Engineering Technology and has worked as Business Unit Manager for USFilter; Industrial Sales Director for USFilter/Stranco, Director of Sales for Koch Membranes Systems and presently is President of Midwest Design Solutions, LLC. Jim represents Sonitec, Inc. products including filtration and membrane technologies.

Clint Smith is the Manager, Corporate R&D Quality and Laboratory for Strongwell. Clint holds a M.S. in Physics from The Ohio State University and a B.S. in Engineering Physics from St. Joseph’s University. Clint is the current Chairman of ASTM D28.18 for Thermoset Plastics and also Chair’s ASTM D28.18.02 for Pultruded Products. Clint has papers and magazine articles for a number of organizations and has previously presented three papers at CTI. The ISO 9001 quality system originated in 1987 and has evolved since its inception becoming the standard quality system for the world. The ISO 9001 quality system presents an outline/philosophical approach for formalizing the quality system function within the manufacturing organization that does not interfere with the normal business operation. An important feature of this quality system approach is the independent verification. A formalized and verifiable quality system can translate into an improved product for the Cooling Tower customers regardless of the product purchased. The ISO 9001 quality system can be paraphrased as making what the customer wants and plan to improve.

9:00a - 9:30a

TP10-06 The Importance of an ISO 9001 Component Supplier for the Cooling Tower Companies
Clint Smith, Strongwell

Jim Stephen’s career spans more than 16 years applying water treatment technologies, including chemical treatment, filtration, ion exchange and membranes; in HVAC, potable, desalination, ultra pure, process, industrial and waste water markets. Jim graduated with a degree in Engineering Technology and has worked as Business Unit Manager for USFilter; Industrial Sales Director for USFilter/Stranco, Director of Sales for Koch Membranes Systems and presently is President of Midwest Design Solutions, LLC. Jim represents Sonitec, Inc. products including filtration and membrane technologies.


Narendra K. Gosain, Ph.D., P.E., is Senior Principal of the Structural Diagnostics Group for Walter P. Moore and Associates. For more than a decade, Dr. Gosain has directed Walter P.Moore’s forensics, assessment, restoration, and rehabilitation team. Prior to this, he was the Managing Director of the Houston Structural Engineering Design Group. He has a broad experience in the analysis of specialized structures and rehabilitation challenges. Concrete hyperbolic cooling towers built three to four decades back which have exposure to corrosion causing chlorides are susceptible to deterioration over a period of time. Such cooling towers are thin shell structures compared to their geometric proportions. As such, when a large areas of concrete gets removed from such structures during the repair work, their structural integrity may be compromised when subjected to lateral loads due to hurricanes and earthquakes. For the repair work to proceed in an efficient and safe manner, concrete removal and reinforcement work have to follow certain protocols determined using some complex structural analytical techniques.
CONFERENCE PROGRAM

Monday’s Technical Sessions running simultaneously between Galleria I, II & III

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

10:00a - 10:30a  
**TP10-07**
New Cooling Tower Nozzle: Features and Performance  
Andreas Streng, Ph.D., CTS Cooling Tower Solutions GmbH

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

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

10:30a - 11:00a

**TP10-09**
Plume Abatement - The Next Generation  
Paul Lindahl and Ken Mortensen, SPX Cooling Technologies

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

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

11:00a - 11:30a  
**TP10-11**
A New Control Scheme Provides the Most Cooling for Your Money  
Robbie McElveen, Baldor Electric Company

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

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

11:30a - 12:00p  
**TP10-13**
Modeling Of The Performance Of Induced And Forced Cooling Tower  
Dr. Hamid Reza Goshayshi, Azad University

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

This paper presents a mathematical model for the numerical prediction of the performance of induced and forced draft cooling tower. The mathematical model is based on the heat and mass transfer equations. The leading parameters are the tower characteristic, mass transfer coefficient and Lewis number. This model is used to predict the thermal behavior of cooling tower which experimental data.
It has been found that the accuracy of 10% obtained by using the chosen model can be then taken into account whenever this model is used to predict other characteristics related to the cooling tower.

Jarrell holds a Bachelor’s degree from Queen’s University and a Master’s degree from Colorado State University, both in Mechanical Engineering. He is a registered professional engineer in four states. In his 25 years in the building HVAC industry, Jarrell has worked in research, in consulting and as an expert witness on mechanical system and building performance issues from energy efficiency to indoor air quality. Jarrell currently utilizes peer review and commissioning to achieve high performance in new buildings, and system troubleshooting and retro-commissioning to improve energy efficiency and overall performance of existing facilities. Jarrell has served on national ASHRAE committees and has published a number of papers. This paper describes a novel, patent pending, two-stage evaporative cooling tower dry ambient air conditions. A heat recovery system is utilized between cooling tower discharge and intake to pre-cool warm and dry entering air to reduce its wet bulb temperature, dropping the theoretical cold water temperature limit to ambient dew point. For given ambient conditions, performance can be engineered through a combination of cooling tower component sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional cooling tower output for a given application, fan power savings from 10% to more than 50% can be achieved along with water consumption savings from 10% to more than 30%. If the enhanced cooling tower is operated as an evaporative chiller that can completely displace water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional cooling tower component sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb. When operated to duplicate conventional sizing and heat recovery effectiveness. Initial performance modeling predicts potential cooling water temperatures well below ambient wet bulb.
Condition Assessment Of Reinforced Concrete Cooling Tower Structures
Kevin Michols and Leandro Echeverry, Wiss, Janney, Elstner
Kiten J. Michols is a Principal at Wiss, Janney, Elstner Associates, Inc., an interdisciplinary/firm of architects, structural engineers, and materials scientists that specializes in the investigation, analysis, testing, and design of repairs for historic and contemporary structures. He has 28 years experience in evaluation of existing structures, rehabilitation and retrofit design, and troubleshooting construction related problems. Area of significant experience include existing condition assessment, structural integrity evaluation, durability enhancement, nondestructive testing, and repair design. Project experience includes buildings, bridges, stadiums, tunnels, piers, cooling towers, tanks, dams, utility structures, and industrial facilities. He holds professional registrations in 16 states and is an active member of the International Concrete Repair Institute, American Concrete Institute, American Society of Civil Engineers, and Structural Engineers Association of Illinois.

As reinforced concrete cooling towers age, their harsh operating environments can lead to deterioration and structural distress. Both mechanical and natural-draft cooling towers present unique conditions inherent to their type of construction and exposure conditions. With time, process and environmental exposure conditions render the towers susceptible to corrosion of embedded steel reinforcing, concrete cracking and spalling, and in cold climates freeze-thaw deterioration. Operational cycling and construction defects can accelerate deterioration. Condition assessment of cooling tower structures is essential to identify safety and structural concerns, determine the root cause of distress, and plan maintenance needs. Condition assessments typically involve visual inspections and various nondestructive testing techniques. Depending on observed conditions, concrete core sampling and laboratory testing are used to characterize materials quality and durability. Structural analysis may be required to evaluate structural capacity. Condition assessments are typically conducted during short-duration outages. Depending on the elements to be surveyed, manlifts, suspended swing stages, or fixed scaffolding are used to provide up close access. Condition assessment of cooling towers is a key component of an overall facility maintenance program. Case studies will be presented to illustrate condition assessment methods and results. Information from the assessments provide the knowledge necessary to monitor structural conditions, plan maintenance, and when necessary prioritize repairs to maximize the service life of cooling towers.

Water/Energy Nexus, Comparing The Relative Value Of Water Versus Energy Resources
Jennifer Hamilton, Tom Bugler, and John Lane, Evapco, Inc.

Jennifer Hamilton holds a Bachelor of Science in Chemical Engineering and a Minor in Environmental Engineering from Penn State University. She spent several years working as a consultant at the Environmental Protection Agency (EPA) where she developed the effluent guidelines for the metals processing industry, assessed the environmental impact of new chemicals prior to market release, and wrote compliance assistance documents for the construction industry. Jennifer has been with Evapco for four years and is the Product Manager of the Closed Circuit Cooler Division. Both water and energy are critical natural resources that are interrelated in both their production and delivery. In addition, water and energy are used in HVAC and industrial cooling processes. In many cases, energy can be conserved through the use of water, and water can be conserved if energy usage is allowed to increase. This paper proposes a simple way to compare the use of both resources through an index of the ratio of power saved divided by the water invested. This index could be utilized to set relative values on water and energy usage for codes or for guidance in “green” applications. The index could be determined for regional or even local climate conditions.

Oil-In-Water UV Fluorescence Sensor In Cooling Tower And Other Industrial Applications
Vadim B. Malkov, Hach

Dr. Vadim Malkov has worked for Hach Company as an R&D chemist and then in Product Management for 7 years, specializing in the area of process analysis and instrumentation. Prior to Hach, Vadim worked as a chemist, manager, and was also teaching chemistry at a higher education institution in Russia. Dr. Malkov graduated from Kazan State University in Russia where he received his master’s degree and earned then his PhD in organic chemistry. He is affiliated with American Chemical Society, American Water Works Association, ASTM, and a number of professional societies. He has published more than 15 papers in both Russian and American scientific and professional journals as well as co-authored one US patent.

Oil-In-Water sensor technology is being used in a wide variety of applications to monitor water quality. The ability to sense oil in water of varying concentrations and process flow conditions is very useful for the water treatment, paper, and power generation industries. This sensor can detect oil-in-water concentrations down to 5 ppm and also can work in strong effluents with high turbidity. This paper will introduce the technology, feature set, limitations, and performance data. The sensor will be demonstrated on-site using an example water treatment plant as a case study. The application is not limited to water treatment plants; results will also be presented from use in the pulp and paper, beverage, and oil and gas industries.

A Novel Deposit Monitoring Technique For Industrial Cooling Water And Process Systems
Daniel M. Cicero, Nalco Company

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

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

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THE 2010 CTI ANNUAL CONFERENCE PROGRAM

Tuesday, February 9, 2010

Tuesday’s Technical Sessions running simultaneously between Galleria I, II & III

1:00p - 2:00p - Water/Energy Nexus, Comparing The Relative Value Of Water Versus Energy Resources
Jennifer Hamilton, Tom Bugler, and John Lane, Evapco, Inc.

2:00p - 3:00p - Condition Assessment Of Reinforced Concrete Cooling Tower Structures
Kevin Michols and Leandro Echeverry, Wiss, Janney, Elstner

3:00p - 4:00p - Oil-In-Water UV Fluorescence Sensor In Cooling Tower And Other Industrial Applications
Vadim B. Malkov, Hach

4:00p - 5:00p - A Novel Deposit Monitoring Technique For Industrial Cooling Water And Process Systems
Daniel M. Cicero, Nalco Company

continued on page 14
Lunch on your own

Thermal Design

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Ask-The-Expert Seminar - Services

Performance Evaluator

of the technology (i.e., Natural Draft vs. Mechanical Draft). Once assessed, Means & Methods have been developed to repair, stabilize and subseal voids to provide significant water-tightness to existing Cooling Tower Basins, regardless of the technology (i.e., Natural Draft vs. Mechanical Draft. While designers allow for cooling water evaporation into the atmosphere, excessive amounts of cooling water loss requiring “make-up water” has become a larger issue, almost from the beginning, the term “make-up water” has been part of the cooling equation. For afternoon activities - follow the schedule in the left hand column.

For Wednesday and Thursday’s activities - follow the schedule in the left hand column.

Cooling Tower Basin Leakage Assessment & Mitigation

Thomas R. Kline, Structural Group, Inc.

Cooling Tower Basin Leakage Assessment & Mitigation

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

Cooling Tower Software Tools by the Cooling Technology Institute

CTI ToolKit Version 3.1

...now Windows Vista compatible

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)
The following are samples of the types of questions we get from those of every walk of life. 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 our Industry.

**Question 1:**
We are currently using a chemical free setup on our cooling towers (a UV electronic system). Our tubes are still fouling and scale buildup in basins. Do you have any information on this?

**Answer 1:**
I have been working with cooling tower systems for over 30 years. The following is my opinion and I can only caution you that the physical laws of chemistry are fixed. If a cooling tower is not blown down, the water will become oversaturated with dissolved solids and precipitate usually in the heat exchangers. I witnessed a similar experiment with a magnetic zero blow down system some years ago at a plant I was internal water treatment consultant for. The system appeared to work fine with a fine precipitant on deck of cooling towers in the hot water basin during winter months. As heat load increased in the spring the heat exchangers or chillers began to foul rapidly. The tower was returned to a regiment of proper blow down and water chemistry control. No more fouling occurred.

I have worked with an ozone installation using proper criteria for blow down. The system is working fine only using ozone for biological control and low cycles of concentration. Fouling has been controlled but corrosion has increased from <2 mils per year to >4 mils per year. The plant accepted the increased corrosion in favor of reduced chemical usage. It is my opinion that you must control biological activity and water chemistry to control fouling and corrosion. I have talked to many providers of mechanical devices and users of mechanical devices. I have heard people boast of successes and failures. I believe successes come because attention was paid to water chemistry and biological control. Failures seem to occur because either biological or water chemistry were ignored.

I have used UV systems for biological control of clean water systems in process applications for microbiological control of process water in a process that had to meet FDA regulations. The major drawback to UV is that they have suspended solids in the microbiological matter is shielded from UV radiation. The UV system may work fine for biological control but water chemistry must also be maintained.

I suggest you consult with an independent water treatment consultant to recommend future course of water treatment.

**Question 2:**
We have been informed by our CT vendor that the fill needs to be ‘aged’. The project design engineers have never heard of this requirement in their 30+ years in industrial design. What is fill aging? Does CTI have any technical reports on this topic? If so, how may we obtain a copy?
Exhibiting Companies:

1. C.C. Jensen
2. Cooling Tower Resources, Inc.
4. Clean Air Engineering
7. Aggreko Cooling Tower Services
8. SPX Cooling Technologies
10. Dynamic Fabricators
11. Amarillo Gear Company
12. Composite Cooling Solutions
13. Rexnord Industries, Inc.
18. SPIG U.S.A.
20. Bullet Hotshot Inc.
21. Brentwood Industries
22. Jonda Enterprise
23. WaterLine Controls
24. Glocom Inc.
27. Sonitec, Inc.
28. GEA Polacel Cooling Towers, LLC
29. GEA 2H Water Technologies
30. Ryan Transportation
33. Midwest Towers, Inc.
34. Gd&G Marine
35. AirFlo
36. C.E. Shepherd
37. Baltimore Aircoil Company
38. Hudson Products
39. Cofimco
40. Structural Preservation
44. Strongwell
45. The Mur-Tex Company
48. IMI Sensors

There is still time and room for your company to sign up for a table. For more information you can call the CTI office at 281.583.4087 or email Virginia Manser at vmanser@cti.org.
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If your plant requires new cooling towers for process fluid with solids in suspension, you will find a good support in Zincobre. We can help you.

If you already have electrolyte cooling towers, but you wish to increase their efficiency, we can help as well.

Our solutions are carefully studied to make the most of your existing installation and minimize your investment to provide the lowest cost solution while increasing performance. Zincobre focuses on providing the best overall project value.

www.zincobre.com
Amarillo Gear Company Announces Expansion and Gear Drive Renewal Program

Amarillo Gear Recently Completed their plant realignment and expansion of their Aftermarket Division. According to John Lichtie, Manager of Aftermarket, “We have the capability now to renew your existing Amarillo Gear drive to new factory specifications and include a new warranty at no extra charge”. Lichtie also noted that often a customer can send in his Amarillo Gear drive and “have it renewed faster and at a better price than buying a new gear drive”. Jana Warren, coordinator of gear drive renewals, stated that, “We now have dedicated equipment, space, and inventories to do these renewals on a timely basis. It is really fun to delight our customers with this new service”.

Amarillo Gear often can renew a single reduction gear drive in 1 - 2 weeks and expediting is generally now available. The larger double reduction gear drives can be renewed in as little as 3 to 4 weeks and depending on the ratio; can be offered with Expediting Service as well. Lichtie stated that rarely is a customer’s gear drive beyond renewal. Amarillo Gear can also provide you with a “not to exceed” renewal quote. All you have to do is provide Amarillo Gear with the serial number from the gear drive and the quote can generally be done over the phone. Other services available through the Aftermarket division include replacement parts, ratio changes to existing gear drives, and additions of special features such as non-reverse to your gear drive. Lichtie stated, “We are here to meet our customer’s needs and we now have the tools to do so. If you are only having partial repairs done to your gear drives and then getting minimal life from them, maybe it is time to investigate having it renewed to new factory specifications by Amarillo Gear”.

For more information on this service or other Amarillo Gear products, please contact them at 806-622-1273 or visit them on the web at www.amarillogear.com.

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American Cooling Tower, Inc.

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- Fan Balancing
- Gear Box Maintenance
- Drive Shaft Alignments
- Maintenance Programs

PARTS
- Fill Media
- Grille Emitter
- Spray Nozzles
- Distribution Systems
- Mechanical Components
- Coatings
- Structural
- Hardware
- Steel fabrication
- FRP Wood, Steel
Standards
New and Revised

New:
ESG-120 - Lightning Protection System Guidelines - This guide line sets forth recommended design criteria, components, and the specifications for traditional lightning protection systems installed on water-cooling towers. March 2009 - $10.00

ESG-121 - Construction Safety & Health Guidelines - The purpose of this document is to serve as a safety and health guideline for various cooling tower procedures that are routinely performed on job sites. The information provided is based on OSHA federal requirements. October 2009 - $10.00

Revised:
STD-131 - Fiberglass-Reinforced Plastic Panels - This covers the classification materials of construction, workmanship and methods of testing glass-fiber reinforced plastic panels in various profiles intended for use as casing, louvers and similar applications on cooling towers. July 2009 - $10.00

STD-137 - Fiberglass Pultruded Structural Products for Use in Cooling Towers - This specification offers recommendations for classification, materials of construction, tolerances, defects, workmanship, inspection, physical, mechanical and design properties of glass fiber-reinforced pultruded structural shapes intended for use as construction items in cooling tower applications. October 2009 - $12.00

ESG-138 - Recommended Procedures Long Term Storage - Procedures recommended for the long-term storage of industrial scale cooling towers. In general, long-term storage is for an extended period of more than one year, but these recommendations can also be modified for seasonal storage. The techniques are divided between Mechanical Equipment and Wood Structure. These two group of components require the most attention because they will deteriorate rapidly if preventive measures are not taken. October 2009 - $10.00

Chapter 9 - Materials of Construction for Cooling Towers - The materials of construction for a cooling tower are of primary importance and should be given the most detailed attention. The average process cooling tower is operated to some degree on a year round basis and is, therefore, alternately exposed to hot, warm, or cold air and water. The air is sometimes dirty, polluted with fumes, and most probably contains microbiological organisms. Also, there is always an abundance of oxygen to support life and to accelerate corrosion. Moisture conditions may range from saturation to dryness. Temperatures may range from extremely hot to extremely cold. This chapter describes various materials of construction and the limitations of such materials. The choice of the materials of construction should be made based on their suitability to a particular cooling tower process. October 2009 - $12.00

Ask-The-Expert...continued from page 15

Answer 2:
Aging, or conditioning as it is alternatively called, is the process of allowing the surface of plastic film fills to develop an effective water film. We recommend to our customers that prior to testing, the fill be ‘aged’ for a minimum of 30 days. Aging is accomplished naturally by allowing the tower to operate normally.

Question 3:
At my customer’s plant we use bleach and sulfuric acid for all the cooling towers. For the bleach and sulfuric acid systems, the tanks are all outside and have independent dikes, and the pumps are inside the dikes. For some new cooling towers I recommended the same type of setup. However, the contract engineering firm recommended the bleach and sulfuric acid pumps to be inside a building along with the other chemicals. I expressed my safety concerns with this and they went along with me, except they moved the pumps to just outside the dikes for easy egress. But now they are second guessing this issue and are again looking at putting these pumps inside the building. I would like to know your expert opinion on the safe handling of sulfuric acid and bleach independent of one another as well as together. I will be passing your response on to my customer.

Answer 3:
The CTI safe handling guidelines do not cover specific design considerations for pumps inside or outside dike walls. I have spent 38 years in design, continued on page 21
Attend the Committee Meeting of Your Choice
February 9-11, 2010

Engineering Standards and Maintenance

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

I. Call to Order/Announcements
II. Introduction of Attendees
III. Approval of 2009 Summer Workshop Meeting Minutes
IV. Professional Development Hours (PDH)
V. Documents Approved in 2009
VI. Documents waiting Board Approval
VII. Standing Lead Task Group Reports
   - Wood, Metal, and Concrete Materials Task Group – Chair - Bill Howard, Vice Chairs - Shane Schmidt, 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

Performance & Technology

Kenneth (Ken) Hennon - Clean Air Engineering, Chair
Rich Aull - Brentwood Industries, Inc., Vice Chair (Not Pictured)
Jean-Pierre Libert - EvapTech, Vice Chair (Not Pictured)

Task Groups:
- ATC-140 Drift
- ATC-150 Plume Abatement
- STD-202 Publication
- STD-201 Certification
- ATC-105 Thermal Test
- Technology Review

Committee Meeting... continued on page 21

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

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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 –
   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 Gucciardi
   H. CTI Document Review - Paul Puckorius
V. Liaison Reports
   • ASHRAE • ASM • AWT • EPRI • NACE
   • IWC • WATER TECH Microelectronics Water
VII. New Business
Need for new Task Groups?
Technical Paper Subjects for “targeted” symposium topics

Committee Work Results
The hard work of our standing committees (Engineering Standards and Maintenance, Performance and Technology, and Water Treating) are shown in the 2 new standards that were developed this year and the revisions of 3 standards and 1 chapter that are part of the Cooling Technology Institute’s publications. CTI continues to keep the industry up-to-date by constantly reviewing their publications on a five year basis. For more detailed information please see page 19.

Standards
New and Revised
New:
ESG-120 - Lightning Protection System Guidelines - March 2009 - $10.00
ESG-121 - Construction Safety & Health Guidelines - October 2009 - $10.00
Revised:
STD-131 - Fiberglass-Reinforced Plastic Panels - July 2009 - $10.00
STD-137 - Fiberglass Pultruded Structural Products for Use in Cooling Towers - October 2009 - $12.00
ESG-138 - Recommended Procedures Long Term Storage - October 2009 - $10.00
Chapter 9 - Materials of Construction for Cooling Towers - October 2009 - $12.00

operation and maintenance of cooling tower systems. The evolution of safety concerns due to chemical spills and injuries have shown that best practices must be followed. I offer the following recommendations which are probably similar to your recommendations.

There are two primary considerations in handling of sulfuric acid and sodium hypochlorite.
1) The mixture of these two chemicals in any amounts produces a violent reaction and production of chlorine gas. The location of tanks and pumps should never be located in close proximity or where the potential exists for chemicals mixing.
2) It is not considered safe to place the bleach pumps or sulfuric acid pumps outside of the dike due to potential for leakage on suction or discharge connections.

Bleach Handling:
The handling of bleach is very difficult. Bleach is corrosive to any metal except most exotic such as titanium. Common piping materials used are Teflon lined steel pipe, PVC pipe or black PVC tubing. Insulated fiberglass tanks are recommended for storage of bleach to prevent degradation during summer and UV breakdown of tank material. I would never recommend placing bleach tanks, pumps in a building. The one thing certain is that bleach will leak from connections, piping or suction/discharge tubing. It would be ill advised to place pumps outside of a diked area.

Sulfuric Acid Handling Guidelines:
The handling of sulfuric acid are documented in the chemical industry “Sulfuric Acid Guidelines.” The guidelines are specific about containment tank dike vol-
continued on page 22
Earn PDH Credits while meeting and working with others in the industry. (Information when you register)

Ask-The-Expert...continued from page 21

umes, pump locations and storage precautions inside buildings. 98% sulfuric acid can be handled in carbon steel. I have used sulfuric acid for cooling towers, demineralizer systems, and other process uses for most of my career. I have found that carbon steel tanks are economical for bulk storage. I recommend the use of 316L stainless steel for day tanks, piping and pumps since it lasts longest in the field. I have found that most safety problems around pumps are due to corrosion at suction and discharge of meter pumps. It is recommended that all tanks and pumps be placed inside a dike area to prevent potential for leaks at suction and discharge of pumps.

I have discussed handling of these chemicals over the years with experts and we all agree that safety is the first and most important consideration.

If you have a question about your system, or just one of concern you can go to the Cooling Technology Institute website (www.cti.org) and enter your question at the Ask-The-Expert site. Our Experts looking forward to serving you by answering your questions.
Registration Form for the
CTI 2010 Annual Conference
February 7-11, 2010

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:
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Email: _______________________________________ (*E-mail addresses are used for communicating conference updates, session pre-work and to send any other pertinent information.)

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

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, 2007 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:
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4a. REGISTRATION FEES: (Full-conference or one-day registrants)
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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 8, 2010 (for spouse/guest) $30
Monday Night Dinner & Karaoke (February 8, 2010) $70
Set of Papers - Hard Copies $125
Mailing for papers sent to Mexico and/or Canada $10*
Mailing for papers sent to all other countries $15*
Set of Papers - CD (w/PDF file of each paper) Available after conference $125

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