Your Program Committee invites you to the 2008 CTI Annual Conference in Houston, Texas. February 3-7, 2008 at The Westin Galleria.

The program committee would like to invite you and your company to the 2008 annual winter conference and meeting, this year held in Houston, Texas, at The Westin Galleria, this is a big change for us, as we have not held our meeting in midtown in many years.

The city of Houston is full of heritage and culture with many interesting things to see and do. Along with the outstanding location we have a great program lined up 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 what we have to offer you can be shared with others at your company. Because of our mission as a nonprofit technical organization, we are charger to bring the most timely and latest information in the industry.

We have 24 papers being presented in a concurrent format on Monday. Water Treating will have one session and P & T and ES & M will have the other format will allow you another opportunity to take full advantage of the papers being offered. We hope you will find it beneficial, with our trying to add more to our programming.

Here is a list of topics being given:


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

Water Treating Panel Discussion - (Monday, February 4, 2:00p – 3:45p) - This will be a panel discussion on the proper control of cooling systems and its importance to the thermal and economic efficiency. Technological advances have improved the capability of control of cooling water systems. The panel will examine the use of control technology from an engineering, operator, instrumentation and supplier perspective. CTI has assembled a panel of experts to discuss and answer your questions.

Owner/Operator Seminar - (Tuesday, February 5, 10:00a – 1:45p) – This year’s committee has come up with another great program for the Annual Conference. The program will consist of three presentations with time included for questions after each presentation and talk about the Owner/Operators website. The three presentations presented will be: Preparing a Scope of Work for a Tower Rebuild; Wood to Fiberglass Conversion; How to make the Switch and Repairing and Inspections of Fan Stacks.

Ask the Expert - (Tuesday, February 5, 2:00p – 4:30p) – This very popular session is back by demand, come prepared with your questions for the panel of experts. We will have folks from all the standing committees ready to support your questions with good qualified answers.

Education Program Session – (Wednesday, February 6, 8:00a – 12:00p) - Your chairs, Bill Howard will host this years education program. The program will entitled Ancillary Equipment and Services Relating to Cooling Towers and will include 4 session on structural issues with cooling towers. The 4 - 1 hour sessions will be as follows:


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 and entertainment and a conference that will give back to the membership what you want “information”.

See you in Houston, Texas.

Glen West
Program Chair

Time once again has flown by as 2007 rapidly comes to an end. This has been a good year for the cooling industry in general, as well as the CTI. A lot of progress has been accomplished in respect to our codes, standards, specifications and recommended practices. I think we had an excellent workshop meeting last summer in San Antonio and appreciate all of the efforts given in propelling CTI forward with up-to-date technical documents. On behalf of the Board of Directors, we all say thank you to all who participated. I also want to thank Vicky Manser and her staff for arranging this workshop, which as always, went off flawlessly.

Speaking of meetings, we are quickly approaching the Annual Technical Conference being held in Houston on February 3-7, 2008. There will be technical papers which cover a wide array of topics and will be run in a dual format, split between Water Treating and Performance & Technology/Engineering Standards & Maintenance standing committees. Other great events you have to come expect include Ask-the Expert Seminar, the Educational Seminar, the Owner/Operator Seminar, Tabletop Displays and individual committee work. I fully expect this year’s conference will top all before it and offers a great venue to learn, share and socialize. Be sure to plan now to attend the cooling industry’s event of the year.

During my term as CTI President, I have had the opportunity to do a lot of interesting tasks, many of which I will cherish the rest of my life. Without a doubt, the highlight of these special duties is being able to present the most distinguished award in CTI, the Honorary Life Member Award. This prestigious award is being presented to a most deserving member, Mr. Jim Willa. Jim has recently retired after many years of service to the CTI and the cooling industry. As one of the founding fathers of the CTI57 years ago, Jim has provided invaluable contributions and expertise to our organization. It is an honor and privilege on behalf of the Board of Directors, and the membership of CTI, to present this award to Jim at the Annual Technical Conference during lunch on Monday, February 4, 2008. Please plan early to attend this once in a lifetime honor to CTI’s Past President.

Another happening at this year’s Annual Technical Conference is the retirement of your current President (me), and the installation of your new president, Denny Shea, serving years 2008 & 2009. I am sure Denny will continue to lead all efforts for the growth and well being of the CTI. He has many years of experience in our industry and has served several high level positions within the CTI. As for me, it is difficult to believe that two years have passed so quickly. I want to thank the Board of Directors, the CTI membership and the CTI staff for allowing me this opportunity to serve as your President. I have seen an increase in committee work over the last two years and an increase in Owner/Operator participation. Both of these are key items I wanted to see happen during my term. As you know by now reading my previous articles, I firmly believe that the future of CTI rests in the work being done today by many talented and gifted members. I want to thank everyone who has worked with me and again thank the membership for the opportunity serving as your CTI President!

Steven Chaloupka, CTI President, 2006 & 2007
Cooling Tower Fan Drives From Amarillo Gear Company

We could spend a lot of time using complicated specifications to try and convince you to buy our right angle fan drives. We would rather just give you straight and simple facts.

You get a better product...

Every design feature takes into account the extremely harsh conditions in which our fan drives operate. Consider the rigid one-piece gear housing, or the dual double-lipped seals on both the input and output shafts, the special epoxy paint system or any number of the other special design features. You can rest assured you are buying the best right angle fan drive available. And to back this up, we also can provide complete noise and vibration test data under full power and thrust loading. There’s no unnecessary guessing with Amarillo Gear fan drives, only verifiable and predictable quality.

You get a better price...

Amarillo Gear Company fan drives are more than competitively priced. Over the long haul, their durable and efficient operation means that dollar for dollar, you get a greater value.

You get better service...

For 60-plus years, Amarillo Gear Company has been dedicated to providing superior service. Contact one of our sales engineers. You will get expert advice quick dependable service and innovative responses on jobs that have special requirements.

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Table Top Exhibits and the Exhibitors
4th Level, Woodway II & III
Tuesday, February 5, 2008 • 4:00p - 8:30p

Here are a few of the companies that will be exhibiting:

- Aggreko Cooling Tower Services
- Amarillo Gear Company
- Baltimore Aircoil Company
- Bedford Reinforced Plastics
- Brentwood Industries
- ChemTreat, Inc
- Chemworks Filtration
- CleanAir Engineering, Inc
- Cofinco Srl
- Composite Cooling Solutions LP
- Cooling Tower Resources Inc
- Denso North America
- Dober Group
- Dynamic Fabricators LLC
- EMEC Americas
- Evaptech, Inc
- Fibergrate Composite Structures
- Hudson Products Corporation
- IMI Sensors
- Industrial Cooling Tower Services, Inc
- Midwest Towers, Inc
- The Mur-Tex Company
- Provibtech, Inc
- Rexnord Industries, LLC
- Rohm and Haas
- Ryan Transportation
- SanAir Technologies Lab, Inc
- C.E. Shepherd Co., LLC
- SPX Cooling Technologies, Inc
- Strongwell

Spaces still available - contact CTI at 281.583.4087 or vmanser@cti.org
CALL FOR PAPERS

2009 Annual Conference
February 8-12, 2009
The Westin, Riverwalk
San Antonio, Texas

The following schedule will begin
the process for papers presented
at the 2009 Annual Conference:

2008
May 4: Deadline for Abstracts
June 22: Authors Notified by Pro-
gram Chair
Aug 3: Six (6) copies of draft
must be sent to CTI office
for review
Nov 2: Final draft, based on re-
view comments and slides
due in the CTI office

Abstract Forms can be ob-
tained by contacting the CTI
office at 281.583.4087 or
e-mail: vmanser@cti.org

Cooling Technology Institute's
MISSION STATEMENT

To advocate and promote the use of environmentally responsible Evaporative Heat Transfer Systems (EHTS) for the benefit of the public by encouraging:

- Education
- Research
- Government Relations
- Technical Information Exchange
- Standards Development and Verification

Objectives

- Maintain and expand a broad base membership of individuals and organizations interested in Evaporative Heat Transfer Systems (EHTS).
- Identify and address emerging and evolving issues concerning EHTS.
- Encourage and support educational programs in various formats to enhance the capabilities and competence of the industry to realize the maximum benefit of EHTS.
- Encourage and support cooperative research to improve EHTS technology and efficiency for the long-term benefit of the environment.
- Assure acceptable minimum quality levels and performance of EHTS and their components by establishing standard specifications, guidelines, and certification programs.
- Establish standard testing and performance analysis systems and procedures for EHTS.
- Communicate with and influence governmental entities regarding the environmentally responsible technologies, benefits, and issues associated with EHTS.
- Encourage and support forums and methods for exchanging technical information on EHTS.

Mark Your Calendars!
February 3-7, 2008

Here is your check list for CTI’s 2008 Annual Conference. It’s time to begin making your plans.
- Pre-Register
- Register at the hotel - early!!!
- List papers to attend (Mon & Tues)
- Monday’s Panel Discussion
- Technical Meeting of my choice (Mon, Tues & Wed)
- Dinner and Theater Monday night
- Owner/Operator Seminar (Tuesday)
- Ask the Expert Seminar (Tuesday)
- Educational Seminar (Wednesday)

Register today - registration form on page 23 or www.cti.org!
Attend the Committee Meeting of Your Choice
February 4-6, 2008

Engineering Standards and Maintenance

Craig Burriss - Amarillo Gear Company, Vice-Chair
Chris Lazenby - Southern Company Services, Inc., Vice-Chair
Toby Daley - T Daley and Associates, Inc., Chair

Task Groups:
- STD-111, Gear Speed Reducers - Craig Burriss
- STD-112, Treatment Standard - Bill Howard/Terry Ogburn
- STD-136, PVC Materials Used for Fill, Splash Fill, Louvers – Mike Whittemore
- Chapter 1, Cooling Tower Applications – Jess Seawell
- Chapter 4, Cooling Tower Winter Operations – Jess Seawell
- Chapter 8, Environmental Aspects of Cooling System Operation – Denny Shea
- Chapter 10, Mechanical Components of Cooling Towers – Dave Sayker
- Chapter 12, Fire Protection – Mike Bickerstaff

Performance & Technology

Anthony DePalma - Tower Performance, Inc., Chair
David Wheeler - Clean Air Engineering, Vice Chair
Gene Culver - McKale & Associates, Inc., Vice Chair

Task Groups:
- Technology Document Review – Tony DePalma
- ATC-107 Air Cooled Steam Condenser Test Code – David Wheeler

New CTI Members for 2007

Advanced Heat Exchange, Inc
AmerTech Tower Services, LLC
Armec Cooling Tower Pvt Ltd
C&R Forest Products
Chevron Phillips Chemical Company
Cleon Corporation
Cooling Tower Services Inc.
Cooling Tower Sharon Ltd
Cooling Tower Testing and Inspection Services
De Weerd, Tania
Edospina S.A.
FANS A.s.
Grupo CEASA de C.V.
Hashem, Fadi
Himgril Cooling Towers
Hamon Indonesia, PT
Industro Systems, Inc.
JohnsonDiversey
Kinder Consulting
KS Watercooling
Maser Cooling Technologies Sdn Bhd
Mist Resonance Engg (P) Ltd
Mohawk Labs
Nalco UAE
Patel, Udayan
Polaced USA
Premium Energy Transmission Ltd
ProvtTech
Riverdale Mills Corporation
Ryan Transportation Services, Inc.
Schoeder, Nicholas
Smart Sogutma Suva Ve Armita
Tesileri Taah, Ltd.Sti
Sumber Capital Sdn Bhd
Super Tower Industries
Technogreen Co., Ltd
Technogreen USA, LLC
Tharp, Richard C.
Wincom, Inc.
 Earn PDH Credits while meeting and working with others in the industry. (Information when you register)
Cooling Technology Institute

Code of Ethics

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

• Behaving with honesty, trustworthiness, and in good faith in representing and performing duties for the betterment of the CTI.

• Always striving to provide the best and most up to date technological information so CTI remains current with industry standards, specifications, guidelines and recommended practices for the benefit of both our members and our industry.

• Insuring that all official works, statements and/or actions on behalf of CTI are so noted as official property of the CTI. All non-official works, statements and/or actions will be clearly recognized as not of CTI and are of personal opinion.

• Avoiding damaging or critical actions with other CTI members that might be personally hurtful or degrading to their employer.

• Exposing existing or past conflicts and rectifying these conflicts in an expedient manner to the best possible solution for all parties involved.

• Holding fellow CTI members in the highest regard of respect and admiration.

August 29, 2006

"CTI ToolKit Ver 3.0"

Cooling Tower Software Tools by the Cooling Technology Institute

CTI has created a powerful set of software tools indispensable for anyone responsible for cooling tower performance evaluation, prediction and monitoring.

Why you need the CTI ToolKit Version 3.0:

• Thermal Design Worksheet. An interactive, graphical worksheet designed to speed cooling tower thermal calculations. Now for 3.0: Now all work sheet data can be saved to file and retrieved for later review: New added print preview function.

• Performance Evaluator. Evaluates induced draft counterflow & crossflow cooling tower performance with field acquired data. Fully compliant with the latest CTI ATC-105 test code (performance curve method). New for 3.0: Now works for induced draft towers and forced draft towers and automatically calculates cold-water temperature deviation. Added print preview function. Easily copy graphs to work processor.


• Detailed Help Files. How-to-use help for typical applications is just a click away. New for 3.0 - revised & expanded.

for Microsoft * Windows ™

What does the CTI ToolKit do for me?

• Predicts off-design performance with the Demand Curve Tab application. Answers what-if questions like, how much will my leaving water temperature change if I increase my waterflow 10%? Decrease my range 15%?

• Evaluates cooling tower performance & acceptance tests.

• Performance Curve Tab application allows the automatic calculation of cooling tower performance using the performance test method of the CTI ATC-105. Automatically solves the iterative calculations for the exit air temperature and psychrometric properties to compute the test L/G as required by CTI ATC-105. Accurately interpolates between curves and generates all the necessary crossplots to determine the overall Tower Capability.

• Demand Curve Tab application speeds the evaluation of the characteristic curve method. This application allows the calculation of the overall Tower Capability when manufacturer’s performance curves are unavailable. High quality demand curve pages produced on any printer for your exact set of design conditions at any altitude.

• Produces your own performance curves from field test data. Using the Demand Curve Tab application and a single test point, create a set of performance curves along with any spreadsheet.

• All without picking up a pencil!

System Requirements:

Microsoft Windows ® 95/98, Windows NT 4.0 or higher/2000, minimum 8 MB Ram (16 MB recommended), 3 MB minimum of free disk space

Go to www.cti.org to order your copy of the CTI ToolKit (Ver 3.0) or call the CTI office at 281.583.4087.

Always looking for a better way ...

Although Brentwood has already produced over 100 million cubic feet of plastic sheet media for thousands of installations worldwide in our 30 years of service to the cooling tower industry, our primary focus continues to be on improving the quality of our products, manufacturing, distribution, and customer service.

New products ...

We are continually adding new products and product enhancements to meet the ever-increasing demands of the cooling towers of today and tomorrow. In the last 18 months alone we have introduced three new crossflow cooling tower products – Kelly Bar Splash Fill, XP75 Herringbone Crossflow Fill Kits, and the XFSIMAX Crossflow Cellar Drift Eliminator – and our new AccuShield™ anti-microbial products are coming soon.

New facilities ...

Lebanon, PA

Since the recent consolidation of all of our splash fill operations into this one efficient East Coast plant, we have been able to offer quality, pricing, and delivery of our splash products like never before.

Brentwood Asia

To cover the Asia Pacific market, the Brentwood Asia office was opened in Bangkok in 2000, followed by our brand new 4,000 square meter (43,000 square ft.) manufacturing facility in Rayong, Thailand.

Brentwood Europe

In September, the Brentwood Europe engineering & sales office opened in Prague, Czech Republic, centrally-located to serve our customers across Europe and Eurasia.

Go to www.cti.org for the Annual Conference is Business Casual No Ties!
DTEA II™ Chemistry

Organic Deposit, Biofilm & Corrosion Control
Chemistry for Cooling & Other Industrial Water Systems

Take Control of your industrial water treatment programs with DTEA II™ chemistry. DTEA II™ is the ideal treatment to enhance inhibitor programs, control organic deposits and fouling in cooling towers, closed loop systems, spray nozzles, filter cleaning, sand filters and other industrial applications. When you need results fast, turn to DTEA II™.

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Measure Biological Activity & Organic Fouling Rate in 30 Seconds

ATP is a tried and true method for testing surfaces and bulk water microbial activity and fouling rates. This hand-held unit is the ideal compliment to dipslides. Easy to use and simple to read, the AMSALite III™ produces results in just 30 seconds.

AMSALite III™ ATP Analyzer
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- Results in 30 Seconds
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All-In-One-Shot™ ATP Test Pens
- Improved Sensitivity for Anaerobes & SRBs
- Fits Directly into Analyzer
- Cost: Call for Competitive Pricing

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Full Conference Sponsorship

1. ACPT, Inc
2. Aggreko Cooling Tower Services
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5. Bedford Reinforced Plastics, Inc.
6. Brentwood Industries
7. ChemTreat, Inc.
8. Cofimeco USA, Inc
9. Composite Cooling Solutions, L.P.
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14. Evapco, Inc.
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26. Midwest Cooling Tower Services, Inc.
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10. MasterTech Services, Inc.
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13. Power Transmission Services, Inc.
14. Strongwell
15. Tower Engineering, Inc.
16. Tower Performance, Inc.
17. Gaennie Lumber Company
18. Water Cooling Equipment, Inc.

Everything you’d expect from a world leader in dry cooling.
You have our name on it.

Combining the expertise and resources of the most successful companies in the industry, SPX Cooling Technologies delivers dry cooling products and solutions for every size power plant.

Make your plans to attend Future Meetings for CTI

February 3-7, 2008
The Westin Galleria
Houston, TX

July 6-9, 2008
Hyatt Regency, Orange County
Garden Grove, CA

February 8-12, 2009
The Westin, Riverwalk
San Antonio, TX

July 12-15, 2009
Marriott Hotel
Colorado Springs, CO

February 8-11, 2010
The Westin Galleria
Houston, TX
The Water Treating Committee is busy working with several of the Cooling Technology Institute’s members to prepare a panel discussion on the proper control of cooling systems and its importance to thermal and economic efficiency. Technological advances have improved the capability of control of cooling water systems. The panel will examine the use of control technology from an engineering, operator, instrumentation and supplier perspective. CTI has assembled industry experts in this field to present and review control technologies and advances in managerial and operational tools, which have improved the operation of thermal heat transfer systems.

**CALL FOR PAPERS**

**2009 Annual Conference**
February 8-12, 2009
The Westin, Riverwalk
San Antonio, Texas

The following schedule will begin the process for papers presented:

- **2008**
  - May 4: Deadline for Abstracts
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  - Nov 2: Final draft, based on review comments and slides due in the CTI office

Abstract Forms can be obtained by contacting the CTI office at 210.583.4087 or email: vmanse@cti.org

In 1986, space age technology was introduced to the Cooling Tower Industry with the advent of the Addax® Composite Coupling. Being the first of its kind, the Addax® coupling was designed specifically for Cooling Tower applications. Since then, cooling tower coupling maintenance and corrosion problems have virtually been eliminated.

For more than 80 years, Rennord has been designing and manufacturing couplings for almost every industrial application imaginable. We understand your need for easy-to-maintain and reliable components and are pleased to offer the Rennord® Addax® Composite Coupling to fit the bill.

As the leader in the Cooling Tower Industry, Rennord is committed to providing the absolute best quality and service available—anywhere. Check around the world; Addax® couplings deliver the best value for your Cooling Tower application.

**REXNORD® ADDAX® COMPOSITE COUPLINGS**

**HELPING COOLING TOWERS AND MAINTENANCE PERSONNEL KEEP THEIR COOL FOR MORE THAN 20 YEARS**

- Addax® Composite Couplings offer:
  - Low Weight
  - Excellent Corrosion Resistance
  - High Misalignment Capacity
  - Single Span without intermediate support bearings
  - No Fretting Corrosion
  - Excellent Fatigue Life
  - Shipments in days, not weeks — some day shipment is always available

Now that’s cool!

Call 866-REXNORD or your Rennord Account Executive today to find out more about Rennord® Addax® Composite Couplings!
Monday's Technical Sessions running simultaneously between Galleria I Ballroom and Galleria II & III Ballrooms

Galleria I Ballroom (Water Treating Sessions)

8:30a - 9:00a  
**TP08-01 - Water Reuse in Cooling Towers – Current Experiences and Guidelines for Success in Refineries, Power Plants, and HVAC Systems**  
Paul Puckorius | Puckorius and Associates  
Water reuse in cooling tower systems is a growing trend and future requirements for fresh water conservation. Reuse of municipal waste water effluent has shown to provide numerous advantages in addition to water conservation. Case histories will provide data on water and chemical treatment requirements as well as water waste reduction and improved cooling system protection. Examples will be given of cooling tower systems in petroleum refineries utility power stations and air conditioning systems. Guideline lines for successful water reuse are based on recent documentation throughout the USA and will be included in the paper.

9:00a - 9:30a  
**TP08-02 - Evaluating Your Cooling Tower**  
Richard DesJardins | DesJardins Consulting  
Richard J. DesJardins is a Cooling Tower and Evaporative Cooling Consultant. He received his BSME from the University of Colorado and MBA from the University of Missouri at Kansas City. He formed his own company in 1984 after working 25 years with the Marley Co. He has represented several different cooling tower, heat exchanger and industrial equipment manufacturers, been Principal Engineer for an air pollution control company, designed and fabricated several different types of evaporative cooling equipment. He consults for many companies and cooling tower manufacturers. He is the author of cooling tower and psychrometric computer programs and CTI papers TP92-01 and TP06-01.

Low life cost may not be the best method for selecting a cooling tower. Power consumption for pumps and fans, the cost of the basin, piping and electrical equipment, and the choice of tower layout should often be deciding factors. Optimization of tower design conditions related to other equipment such as heat exchangers, condensers or other equipment is discussed.

The paper evaluates options of present worth value, annual cost and capitalized costs of revenue streams, projected life span, return on investment, depreciation, taxes, general administrative expenses, and insurance requirements and provides comments on the proper choice of decision making formulae.

9:30a - 10:00a  
**TP08-03 - Crossflow Cooling Tower Performance Calculations**  
Robert Fulkerson | Fulkerson & Associates  
Robert Fulkerson has been associated with the cooling tower industry for 40 years starting as a cooling tower test engineer with Midwest Research Institute. He started his own cooling tower company in 1970 which was purchased by a British company in 1993. He has worked as a consultant for the past 11 years. He has served CTI as Chairman of the Performance and Technology Committee, Editor of the CTI Journal, Editor of the CTI news letter, Member of the Board of Directors, Vice President of CTI and President of CTI. He is a member of The American Society of Mechanical Engineers and served on the last two PTC-23 committees. He holds 5 patents.

This paper reviews and explains the Zivi Brand method of calculating crossflow cooling tower thermal performance. In addition it presents a mathematical method which can be used to predict the performance of a cooling tower which has a fill height and fill air travel, which is different from the test cell from which the rating data was obtained.

Galleria II & III Ballroom (ES&M and P&T Sessions)

8:30a - 9:00a  
**TP08-04 - The Application of Solid Water Treatment Chemistry for Cooling Towers**  
Fred Lattin and James Heinert | APTech Group, Inc.
Fred Lattin, Vice President: Field Technical Support & Training Fred comes to APTech Group with 30 years experience in the cooling equipment industry, having worked for Nalco Chemical Company in sales and sales management, and his own consulting practice. Fred graduated from Bradley University in 1966, with a degree in Industrial Management. His responsibilities while at Nalco included extensive training activities, both internal and external, with primary emphasis being in application technologies in industrial boiler, cooling and process water systems. In addition, Fred helped establish Customer Quality Action Teams, conducted on-site Safety and Hazardous Chemical Training, and assisted customers in identifying areas for maximum ROI opportunities. Fred is married, has 3 children and lives in the Cincinnati area.

Industry’s use of water treatment chemistry is well documented. Because of the physical nature of the liquid products being employed, these diluted liquids are shipped as corrosives and are hazardous to handle and apply. Solids chemistry has been developed that utilizes the current technology available but offers it in a form that is easier, safer, and more environmentally friendly to use. Solids are offered in a hard paste form that is reconstituted back into a liquid on site, by means of a unique dissolution system. Approximately 50 lbs of Solid is equivalent to 500 lbs of a conventional liquid.

**Celebrities in Concert**

Monday Night, February 4, 2008  
6:30p to 9:00p  
at the Westin Galleria Hotel

Cost is $70/per person includes Beer and Wine
**Monday's Technical Sessions running simultaneously between Galleria I Ballroom and Galleria II & III Ballrooms**

**Galleria I Ballroom (Water Treatment Sessions)**

8:30a - 8:45a
TP08-07 - New Solutions to Old Problems: Technical Innovation in Mature Markets
Daniel M. Cicero  |  Nalco Company

9:00a - 9:30a
TP08-08 - Improved Calcium Phosphate Control for Stressed Systems
Gary Geiger | GE Water and Process Technologies

9:30a - 10:00a
TP08-07 - Investigation on Fan Noise Generation and its Reduction
Claudio Cataldo | Colfimaco Srl

10:00a - 10:30a
TP08-08 - Wireless Vibration Monitoring for Condition Based Maintenance Cooling Towers
Gary Nadley | MachineTalker, Inc.

**Galleria II & III Ballroom (E&M and P&T Sessions)**

9:30a - 10:00a
TP08-06 - A Simplified Method to Evaluate Cooling Tower and Condenser Performance Using the CTI Toolkit
Luc De Backer and Natasha Peterson | Bechtel

10:00a - 10:30a
TP08-09 - A New Method to Measure Viable Legionella and Total Aerobic Heterotrophic Bacteria
William F. McCoy | Phigenics

10:30a - 11:00a
TP08-11 - Improved Intermittent Feeding of Aseptrol Tablet Redefines the Role of ClO2 in Small method within the context of hazard analysis and control to prevent legionellosis. methods, the new protocol has been shown to be more accurate, faster and more convenient. proven reliable for determining viable cell concentrations of Legionella pneumophila, bacteria was evaluated in hundreds of laboratory experiments and from analysis of over the University of Hawaii. He has two undergraduate degrees in Chemistry and Illinois (USA 1999), R&D 100 Award from Research and Development Magazine (USA 2001), Inventor of the Year Award from the International Water Association (USA 2001), Grand Prize Technical Innovation Trophy from the SUEZ Group (Brussels 2009), Governor's Pollution Prevention Award from the State of Illinois (USA 1999), R&D 100 Award from Research and Development Magazine (USA 1998). His Ph.D. in Microbiology is from the University of Calgary and the M.Sc. is from the University of Hawaii. He has two undergraduate degrees in Chemistry and Microbiology. A new method for enumerating viable Legionella and total heterotrophic aerobic bacteria was evaluated in hundreds of laboratory experiments and from analysis of over two thousand field samplers used in actual operating conditions. The method has been proven reliable for determining viable cell concentrations of Legionella pneumophila, Legionella species and total heterotrophic aerobic bacteria. In comparison to standard methods, the new protocol has been shown to be more accurate, faster and more convenient. Comparisons to other rapid methods are presented. Guidance is given for use of the new method within the context of hazard analysis and control to prevent legionellosis.

11:00a - 11:30a
TP08-12 - Architectural Enclosure Influences on the Performance of Field Erected Cooling Towers
Toby Daley | Composite Cooling Solutions, L.P.

11:30a - 12:00p
TP08-14 - Fan Stall Problems; Cause or Effect
Charles Foster | Diagnostic Cooling Solutions, Inc.

**Conference Program**

Ballrooms, Galleria I & II-III. Look closely to see which paper you want to attend.
Chlorine Dioxide is a powerful, broad-spectrum biocide with particular efficacy against algae and slime, and tolerance of high pH and water system contaminants. Until the introduction of BASF Aseptrol tablets, the use of ClO2 was limited to later systems by the capital cost and complexity of on-site generators.

2:30p - 3:00p
TP08-16 - The Cost of Noise
Robert Giammaruti | Hudson Products/Cofimco USA
Jess Seawell | Composite Cooling Solutions, L.P.

Today, owner/operators, OEM’s and suppliers are facing lower and lower near and far field noise limits with respect to their equipment. However, lost in this race to see who can out quiet who is the impact of cost. Specifically, the cost of noise with respect to not only fans, but the fan mechanical and structural components.

This paper will look at two specific applications, one a bank of induced draft-air-cooled heat exchanges and the other being a set of field erected cooling tower cells. In both case studies, the cost of lower and lower near and far field noise will be evaluated with respect to the fan mechanical and structural components.

3:00p - 3:30p
TP08-18 - A Novel Approach to Cooling Tower Packing Design
Dr. H. Goshayeshi | Azad University
Dr. John Missenden | South Bank University

The optimum heat and mass transfer area at which minimum cost exists throughout the technical life of forced draft counter cooling tower is studied in the present work. Original formula are developed and presented for the best thermoeconomical performance as a design point. Also, in this paper an investigation is made using measurements of the mass transfer rates and pressure drops for a comprehensive range of PVC plastic packings producing an economic comparison to find the best geometry and range. In order to do this, heat transfer and pressure drop for turbulent conditions in fills used in the modern cooling tower have been studied. A new method of comparison of existing cooling tower fills have been developed and the performance of the best packing has been expressed in relation to the ideal packing.

Celebrities in Concert

Monday Night, February 4, 2008
6:30p to 9:00p
at the Westin Galleria Hotel

Come and enjoy an evening with the “Stars”, no not celestial but performers. Robin Williams will host an evening of musical tribute to Jerry Lee Lewis, Elvis Presley (you can’t believe everything you hear) and last but not least The Blues Brothers.

Cost is $70/per person includes Beer and Wine

Earn PDH Credits while meeting and working with others in the industry.
(Information when you register)
Tuesday, February 5, 2008

Tuesday’s Technical Sessions running simultaneously between Galleria I Ballroom and Galleria II & III Ballrooms

Galleria I Ballroom (Water Treating Sessions) continued from page 12

7:00a - 10:00a  New Member’s Breakfast (Westchester) Service
7:00a - 10:00a  Registration and Paper Sales, Galleria Foyer
7:00a - 10:00a  Speakers’ Breakfast, Photo Session & Prep Room (Sage)
7:30a - 8:00a

TP08-15 - Physical Water Treatment for Cooling Towers
David McLachlan | Fluid Treatment Solutions, Inc.
Dr. McLachlan earned his PhD at Iowa State University. During his career he has worked more than 30 years in industry including nuclear power, electronics, and heavy manufacturing. Dr. McLachlan has also taught at several universities and has worked as a consultant in related fields. Dr. McLachlan is currently the Vice President of Technical Development for Fluid Treatment Solutions Inc., in the field of Physical Water Treatment. This paper will review the fundamental operational principals found in the main physical water treatment systems; pressure, UV, magnetics, induced (pulsed), and static electric fields. Both scientific and empirical data will be presented. Field data will be obtained for small to large cooling towers. Data on COC, pH, conductivity, as well as scale, corrosion, and biological control will be covered.

8:00a - 9:30a

TP08-17 - The Conversion from Gas to Tablet Chlorination: A Case Study
Austin Loper | PPG Industries
Bill Smith | Chemtreat, Inc.
Austin Loper is a chemical engineer for PPG Industries, Inc. He received his M.S. degree from Texas A & M University, College Station in 1996. He has since worked within the chemical industry in various occupations: plant process engineer, operations manager, and regional sales. He currently works in Business Development for PPG’s calcium hypochlorite business unit.

Chlorine gas is used extensively in large cooling tower applications, but the environmental and safety risks have left operators searching for alternatives. This paper will review a conversion from chlorine gas to calcium hypochlorite tablet feed technology on a gulf coast chlor-alkali plant cooling tower. The paper will exhibit, in detail, the impact on cost, corrosion, tower performance, calcium buildup, and safety and handling.

8:30a - 9:00a

TP08-19 - Dolphin “Pulsed Power” Cooling Water Treatment
David Alley | Clearwater Systems
Paul Puckorius | Puckorius and Associates
David Alley is Director of Technology for Clearwater Systems Corp. of Essex Connecticut. In this position he is involved in all aspects research as well as product and application development. He holds degrees in Marine Science, Chemical Engineering, Metallurgy, and Materials Engineering. He is a career Coast Guard Officer with assignments in Marine Environmental Protection, Research and Development and as a Professor of Chemistry and Physics at the Coast Guard Academy. Following his Coast Guard career David conducted research and failure analysis involving high temperature and aqueous corrosion in the oil industry. This varied background serves him well in his present position where he must deal with issues including aqueous chemistry, microbiology, corrosion, and electromagnetic field theory.

A sequential study was conducted comparing water treatment performance of traditional chemical water treatment and Dolphin “pulsed power” water treatment. The study was conducted on the cooling tower for the University of Colorado (Boulder) ice rink. Feed water for the tower was Boulder city water. Parameters evaluated were scaling, total bacteria counts, corrosion coupons and cycles of concentration. Water, energy, manpower and safely issues are presented.

9:00a - 9:30a

TP08-21 - A Low-cost, Safe, Effective Halogen Disinfectant for Cooling Towers
Rodney Herrington and Susan B. Rivera | MIOX Corporation
Mr. Herrington is the Chief Technical Officer for MIOX Corporation. He has provided the primary technical direction for the company since its inception in 1994 and holds a number of key patents related to MIOX technology. Until assuming his role as CTO, he led development of the company product line and managed more than $10 million in MIOX research contracts with various government agencies including the Defense Advanced Research Project Agency (DARPA), the Army, the Marines, the Department of Homeland Security, and Sandia National Laboratories. Work at the CTO involves business development for new product lines and new alliances with manufacturing and marketing partners. He continues to provide technical direction to the MIOX team. He is a registered engineer in New Mexico and Colorado and is a graduate of Texas A&M University with a B.S. in Aerospace Engineering, an M.S. in Mechanical Engineering, and several post-graduate business courses.

9:30a - 10:00a

TP08-24 - Corrosion as a Process Variable
Jack Lehner | Pepperl & Fuchs, Inc.
Jack Lehner serves as the Business Development Manager for Pepperl+Fuchs, Inc. out of Twinsburg, Ohio. Mr. Lehner received his BS in Chemistry in 1967 from Ponte, Wmia State University and a MBA degree in 1974 from Loyola University, Chicago, Illinois. He has worked with Sherwin Williams Chemicals Company in various engineering, technical and production positions including Plant Manager of two Ref的安全. He also has worked as a consultant in related fields. Dr. McLachlan is a member of the American Society of Civil Engineers and active on several technical committees including the ASME B31.5 Refrigration Piping Section Committee and the Seismic Subcommittee of the ARCI Technical Committee on Sound. The International Building Code (IBC) establishes qualification requirements for equipment, such as evaporative cooling equipment, to resist seismic loads.

Many of the costs directly or indirectly related to corrosion could be mitigated or managed if it could be monitored. In this paper, we will discuss the cost of corrosion. We will also show how to identify the root cause of corrosion. We will show how to use this information to prevent future problems.

9:30a - 10:00a

Galleria II & III Ballroom (ES&M and P&T Sessions)

7:00a - 10:00a  New Member’s Breakfast (Westchester) Service
7:00a - 10:00a  Registration and Paper Sales, Galleria Foyer
7:00a - 10:00a  Speakers’ Breakfast, Photo Session & Prep Room (Sage)
8:30a - 9:00a

TP08-20 - Seismic Qualification of Evaporative Cooling Equipment by Shake-Table Testing
Panos P Papavizas | Baltimore Aircocil Company
Panos Papavizas is currently Manager Engineering Systems and Processes for Baltimore Aircoil Company. He has been with BAC over eighteen years and has held various positions. Prior to joining BAC, Panos worked as a consulting structural engineer for Greiner, Inc in Timonium, MD and Bechtel Power Corporation in Gaithersburg, MD. He has a BS degree in Civil Engineering from Virginia Tech and a MS degree in Civil Engineering from Lehigh University, both with an emphasis in structural engineering. Panos is a registered professional engineer in Maryland and Florida and a registered civil engineer in California. He is a member of the American Society of Civil Engineers and active on several technical committees including the ASME B31.5 Refrigeration Piping Section Committee and the Seismic Subcommittee of the ARCI Technical Committee on Sound. The International Building Code (IBC) establishes qualification requirements for equipment, such as evaporative cooling equipment, to resist seismic loads.

The Code-recognized standard AC156 provides a generic methodology for verifying post-earthquake functionality. This paper will focus on seismic qualification by shake-table testing per AC156’s, and make more recommendations specific to evaporative cooling equipment for verification of post-test functionality.

9:00a - 9:30a

TP08-22 - Construction Productivity Guidelines for Field Erected Cooling Towers
Jim Baker | Composite Cooling Solutions
Presently with Composite Cooling Solutions, L.P. out of Fort Worth, Texas, Jim has also been employed by SX/P Marley Cooling Technologies and Marley Cooling Tower Company for 15 years, having worked for Phillips Petroleum for 15 years prior. Jim has been an active delegate for Cooling Technology since 1981 having served as Secretary on the Board of Directors and President in 2004 and 2005. He has served as Chairmen of several of the active committees and chaired numerous Task Groups. Currently Jim serves as the Chairman of the Past President’s Council.

Born and raised in Oklahoma Jim graduated from Northern Oklahoma College with an Associate of Science degree in Engineering. He then attended Tulsa University’s School of Engineering and Oklahoma Weslayan College graduating with a BS in Human Resource Management. Jim presently resides west of Kansas City with wife Linda of 25 years and son Travis.

Construction contracts on field erected cooling towers have two major types of cost: fixed and variable. Fixed costs are a contractor procure on a fixed price. Variable costs are items such as labor, supervision, equipment and job overhead. On many field erected cooling tower projects, the largest single area of cost overrun is in supervision and labor costs. This is not surprising, because supervision and labor are frequently the largest variable cost for a contractor. Within the past 20 years, there has been significant research in construction labor productivity which provides an increased body of empirical data as to the effects of various factors on construction labor productivity within our industry.

9:30a - 10:00a

Annual Conference Program continued on page 14
On-site, on-demand generation of MIOX (mixed oxidant disinfecting solution) provides several advantages for the cooling tower industry. These include excellent control of microbial populations even at the elevated pH typical of cooling tower waters, no negative impact on traditional scale and corrosion inhibitors, and environmentally friendly operating conditions. As an inherently safe technology, it only uses common sodium chloride salt as a feed stock. The solution can be fed directly to the cooling tower and controlled via ORP (Oxidation Reduction Potential). Operational sites have demonstrated significant reductions in operational costs when compared to conventional bromine or chlorine chemicals.

Vadim Malkov is currently employed with HACH Company out of Loveland, Colorado as a R&D Chemist. He has also worked with Genesis Laboratories, Inc av Scientist/Chemistry Supervisor in the states and with Kurgan State Agricultural Academy of Kurgan, Russia as a Professor and Kazan State University in Kazan, Russia as a Research Assistant. Vadim received his Ph.D. in Organic Chemistry from Kazan State University (Russia). He is affiliated with the American Society for Testing and Materials (ASTM International), American Water Works Association (AWWA), American Chemical Society (ACS) and Mendeleev Chemical Society. Vadim has also authored or co-authored a number of publications published both in Russia and the USA.

Molybdate-based chemicals have been used as corrosion inhibitors in cooling tower systems for several years. Although they provide superior performance, levels of molybdate have been reduced because of large price increases. It has become necessary to control molybdate levels to optimize performance versus cost in corrosion inhibition. A new online analyzer has been developed that can measure molybdate as molybdenum (MoO₄) with minimum maintenance. This analyzer can be used to monitor remotely when connected to data acquisition system with web based reporting. Two of these complete systems have been evaluated for several months at two sites in Texas. Comparisons have been conducted versus both bench tests. This paper will discuss results of current testing and features of the web-based monitoring system with graphs and charts illustrating its performance.

Molybdates, while not new, have been beneficial for cooling towers. Due to their high cost, as well as difficulty in control, molybdates are rarely used. This paper presents a study conducted by the presented authors and their colleagues to evaluate molybdates as a feed stock for a mixed oxidant disinfecting solution. The results are presented and the benefits of using these chemicals are discussed.

Moving beyond this initial finding, the authors have investigated the use of molybdates as a feed stock for a mixed oxidant disinfecting solution. The results are presented and the benefits of using these chemicals are discussed.

ON SITE, ON DEMAND GENERATION OF MIOX (MIXED OXIDANT DISINFECTING SOLUTION) PROVIDES SEVERAL ADVANTAGES FOR THE COOLING TOWER INDUSTRY. THESE INCLUDE EXCELLENT CONTROL OF MICROBIAL POPULATIONS EVEN AT THE ELEVATED pH TYPICAL OF COOLING TOWER WATERS, NO NEGATIVE IMPACT ON TRADITIONAL SCALE AND CORROSION INHIBITORS, AND ENVIRONMENTALLY FRIENDLY OPERATING CONDITIONS. AS AN INHERENTLY SAFE TECHNOLOGY, IT ONLY USES COMMON SODIUM CHLORIDE SALT AS A FEED STOCK. THE SOLUTION CAN BE FED DIRECTLY TO THE COOLING TOWER AND CONTROLLED VIA ORP (OXIDATION REDUCTION POTENTIAL). OPERATIONAL SITES HAVE DEMONSTRATED SIGNIFICANT REDUCTIONS IN OPERATIONAL COSTS WHEN COMPARED TO CONVENTIONAL BROMINE OR CHLORINE CHEMICALS.

Vadim Malkov is currently employed with HACH Company out of Loveland, Colorado as a R&D Chemist. He has also worked with Genesis Laboratories, Inc av Scientist/Chemistry Supervisor in the states and with Kurgan State Agricultural Academy of Kurgan, Russia as a Professor and Kazan State University in Kazan, Russia as a Research Assistant. Vadim received his Ph.D. in Organic Chemistry from Kazan State University (Russia). He is affiliated with the American Society for Testing and Materials (ASTM International), American Water Works Association (AWWA), American Chemical Society (ACS) and Mendeleev Chemical Society. Vadim has also authored or co-authored a number of publications published both in Russia and the USA.

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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.

Licensed CTI Cooling Tower Performance Test Agencies

<table>
<thead>
<tr>
<th>Agency</th>
<th>Contact Person</th>
<th>Telephone/</th>
<th>Fax</th>
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</thead>
<tbody>
<tr>
<td>Clean Air Engineering</td>
<td>Kenneth Hennon</td>
<td>800.208.6162</td>
<td>865.918.7660</td>
</tr>
<tr>
<td>Cooling Tower Test Associates, Inc.</td>
<td>Thomas Wheelock</td>
<td>865.588.2654</td>
<td>425.517.8177</td>
</tr>
</tbody>
</table>

Licensed CTI Drift Testing Agencies

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</table>

* Type A license is for the use of mercury in glass thermometers typically used for smaller towers. Type B license is for the use of remote data acquisition devices which can accommodate multiple measurement locations required by larger towers.
DYNAMIC FABRICATORS

DYNAMIC FABRICATORS
Offers a variety of SUPERIOR COOLING TOWER COMPONENT PRODUCTS at a competitive price. Our highly trained staff focuses on dynamic solutions employing innovative technologies to provide our customers the products they need for their specific project, serving both domestic and international markets.

Our headquarters and manufacturing facility located in Idaho has been one of the world’s premier original equipment manufacturers of cooling tower components for the last 20 years.

With our custom composite manufacturing capabilities, we can support product development from tooling through final production.

HOUSTON, TEXAS LOCATION
Conveniently located in Southeast Houston, our Texas warehouse is able to supply the cooling tower industry with one-stop shopping, quick delivery, and competitive pricing. Open for a little over two years now we are able to process your orders quickly at this facility, the same day if necessary on in-stock products, which we are constantly updating to best accommodate our customers.

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- Header, Bypass, Riser & Lateral Distribution Systems
- Fiberglass Distribution Boxes & Downcomers
- Treated Lumber
- PVC Pipe and Fittings
- Fiberglass or Wood Saddles
- Fiberglass Stiffener Rings
- Fiberglass Ladders & Handrail
- Stair Towers, Escape & Access Ladders
- Pultruded Fiberglass Components
- Casings & Closure Strips
- Gaskets & Caulking
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- Hardware (wide selection)

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Texas Fax: (713) 847-3424 www.dynafab.net

1-877-604-6525 Dynamic Solutions, Innovative Technologies
This is just a sampling of the types of questions we get from those of every walks of life. Thanks to the 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:
At what intervals should you have a Thermal Performance Test performed on your cooling tower (i.e.: yearly, 3 yrs, 5 yrs)? Thank you in advance for your quick response to my question.

Answer 1:
The frequency of testing cooling towers varies widely from company to company. It is my recommendation that tower should be performance test every 5 years. My reasons are as follows:

A cooling tower should be tested to look for degradation of base components - Fans, Fill, Distributors etc. In order to properly test for actual performance capability, a company should prepare for a performance test by spending time doing inspections, general maintenance repairs and in general, bringing cooling tower operations (water flow balancing, water distribution, fan pitch etc.) up to specification. The performance test will then be able to measure the actual performance of the cooling tower system. The comparison over time will track when it is time for fill or mist eliminator replacement or upgrade.

I use the five (5) years mark because a generally well maintained cooling tower’s performance does not decay very rapidly unless a process induced event causes failures i.e. cooling water treatment degrades or pretreatment for removal of suspended solids change leading to fill fouling.

The five year interval is also based on economic since cooling tower tests are not cheap because of cost of Testing Company plus Maintenance/Operations Personnel required to assist and follow the test. A industrial site that has several cooling towers can save money by testing them all in one year or schedule testing company annually to do 1 or 2 cooling towers to keep annual budgets flat.

It has been my unhappy experience that testing of cooling towers is a very low priority for most owner/ operators because they do not see economic benefit.

The economics are generally hidden in cost to production units served. Money spent in testing and acting on the results will benefit the process units in ways that will never be able to be directly measured.

Normally, the only time a cooling tower gets to be an important item is when it is not performing.

Question 2:
Can you please give me a comprehensive explanation of the advantages of reinforcing fan stack rings, (the ones going on top of the stacks) over the spider cables currently used in many towers?

Answer 2:
Fan stack spiders are old technology. They work for a period of time but eventually either loosen or corrode and break causing severe mechanical equipment damage. Fan stacks should be designed with stiffening ribs as required to contain air load force from the passing fan blades. I have seen field applied fiberglass and steel rings to reduce vibration levels.

Question 3:
I am researching ways to reduce water consumption in cooling towers and would like to establish the credentials of alternative technologies such as ionisation, ozone and UV treatments. Are they reliable, and what level of benefit can be gained? And have they been satisfactorily tested?

I would really appreciate your assistance with this. Thank-you for your help.

Answer 3:
Cooling Tower Water can only be conserved by the reduction of amount of water that is lost from the system.
Since Cooling Towers cool by evaporation of water and is controlled by wet bulb temperature and operating parameters of process these water can not be reduced. The conservation of water in cooling is requires establishment of highest cycles of concentration possible based on make-up water quality. The means of controlling cycles of concentration is by reducing the amount of water that leaves the system. Water leaves a cooling tower via evaporation (discussed above), drift (water droplets that are entrained in the air leaving the cooling tower) and blow down. Blow down is water that leaves the system either as fugitive loss or purposely bleed from system via a control valve. Drift accounts for between 0.008% to .0002% of recirculation rate of cooling tower. Drift eliminators can be installed to reduce the water loss to lowest amount is possible plus environmentally can reduce amount solids that end up on ground, substations, cars, buildings, etc.

BLOW-DOWN SOURCES
Fugitive losses - These are water losses that occur when water leaks from cooling tower recirculation system. These losses limit the number of cycles of concentration that can be attained by cooling tower system. Controlled blow down is important in order to protect the overall process heat exchangers from becoming fouled with mineral deposits. The amount of blow down required is based on ability of recirculating cooling water to hold dissolved solids in the water and preventing it from depositing on heat exchanger surfaces.

ALTERNATIVE TREATMENT PROGRAMS
CTI has long been aware of the use of ozone, and non-chemical treatment methods. To date, CTI has many papers on use of ozone only, pulse technology, and ultrasonic technology for the control of microorganisms in cooling water. CTI does not have data on the use of these non-chemical alternative treatments for 100% effective overall cooling water treatment.

CURRENT COOLING TOWER WATER CONSERVATION TECHNIQUES
It has been my experience that the treatment of all cooling water treatments begins with the composition of the inlet make-up water. The inlet water composition determines the numbers of cycles of concentration that can be attained without further treatment. I have seen and used alternative treatments on cooling towers with HVAC and large industrial equipment where biological treatment only and exact control of the cycles of concentration is exercised. In the desert US, alternatives such as cooling tower blow down softening is has been used to remove calcium and other precipitating type minerals allowing very high performance repairs and in general, bringing cooling tower operations (water flow balancing, water distribution, fan pitch etc.) up to specification. The performance test will then be able to measure the actual performance of the cooling tower system. The comparison over time will track when it is time for fill or mist eliminator replacement or upgrade.

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Can you please give me a comprehensive explanation of the advantages of reinforcing fan stack rings, (the ones going on top of the stacks) over the spider cables currently used in many towers?

Answer 2:
Fan stack spiders are old technology. They work for a period of time but eventually either loosen or corrode and break causing severe mechanical equipment damage. Fan stacks should be designed with stiffening ribs as required to contain air load force from the passing fan blades. I have seen field applied fiberglass and steel rings to reduce vibration levels.

Question 3:
I am researching ways to reduce water consumption in cooling towers and would like to establish the credentials of alternative technologies such as ionisation, ozone and UV treatments. Are they reliable, and what level of benefit can be gained? And have they been satisfactorily tested?

I would really appreciate your assistance with this. Thank-you for your help.

Answer 3:
James L. Willa

James L. Willa has been a consultant for 20 years and is President of Willa, Inc. in St. Louis, Missouri. Willa, Inc. was engaged in cooling tower testing, inspecting, seminars, specification review, bid evaluations, and project engineering, but now does specification reviews, specification writing, and bid evaluations. Mr. Willa was Vice President and President of a major cooling tower manufacturing company (23 years). He has worked extensively with the Cooling Technology Institute as Field Engineer (4 years) and Manager (9 years). He performed all the testing and inspecting for 13 years with the CTI. He has been Chairman of the CTI Engineering Standards and Maintenance Committee and the Operating Seminar. He has conducted research for CTI bulletins on Wood Marine, Recirculation, Performance Testing, Lumber Standards, Treating Standards, Certification Program, and the Performance Curves “Blue Book”. He has twice served as President of CTI and several times as a board member. He has been a member of several technical organizations, has written and published numerous papers, has given many seminars, served on committees at CTI, ASME, AWPA, NACE (listed as Corrosion Specialist), and has over 50 years experience in the cooling tower industry.

Dennis P. Shea

Denny Shea is President of Shea Top Dog, Inc. He is under contract to Yoh Engineering as an inside Engineering Services Consultant at Solitua, Inc. Chocolate Bayou Plant in Alvin, Texas. He graduated from University of Missouri at Rolla with BS in Mechanical Engineering in 1970. He earned a MS in Engineering Management from University of Missouri at Rolla in 1973 with emphasis in area of Sanitary Engineering.

Denny’s prior work history includes 4 years with Union Electric Company in St. Louis at Labadie Power Plant and Central Engineering. In 1974 he joined Monsanto Chemical Company’s Central Engineering Utilities Design Department in St. Louis. He transferred to Environmental Control and Utilities Department at Chocolate Bayou Plant in Alvin, Texas in 1978. He retired from Solitua, Inc. (Monsanto) as Engineering Fellow after 31 years as Corporate Water Treatment Specialist. He has experience in design, operation and maintenance of Boilers Systems, Cooling Towers, Compressed Air Systems, and Water Treatment Systems. His primary expertise is the design/operation of water treatment systems and cooling tower/pump basin design.

Denny has been involved in Cooling Technology Institute for 30 years. He has served on Board of Directors 3 times. He has been CTI Treasurer and CTI Secretary. He is currently Chairperson of Policies and Procedures and Response and Referral Committee’s. He is active in Water Treatment Committee, Engineering Standards and Maintenance and Owner/Operator Council. Denny is honored to be President and looks forward to growth and expansion of CTI.

Denny is married to Susan Shea has a married daughter Kelly (30), married son Patrick (28) and a granddaughter Isabel (2). Denny owns and operates a dog training school with his wife Sue. They enjoy competing in Obedience and Agility Trials. In addition, Denny is active in Al Garza Martial Arts and Filipino Martial Arts. He has earned black belts in both styles of Martial Arts.

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

Bring a Guest, bring a number of guests and you could get your registration free!

That’s right, CTI will give free registration to the person who has the most first time attendees at the Annual Conference due to an invitation by you! The registration form has a place for the attendee to enter the person’s name and company that invited them and a place to check that this is their first time to attend. Get that list ready and start inviting. What a great way to kick off 2008 for CTI.

Don’t forget that Guest

CTI recommends that:
1. Cooling Tower Systems be evaluated for fugitive losses and drift losses to allow operation at maximum cycles of concentration of cooling tower system.
2. Obtain services of qualified water treatment consultants who can evaluate the make-up water sources and potential for use of conventional chemical wastewater treatment and alternative treatments. It is important to remember that the selection of a water treatment program has nothing to do with a cooling tower itself. The process serviced by the cooling tower must be reviewed to select what the objective of a water treatment program is and select water treatment program that best fits the process.

Question 4:
We suspect that silt may be plugging portions of the drift eliminators in our cross-flow towers. By what means can silt be removed from drift eliminators? We are a nuclear plant with no plans to shut down until early 2008. Can it be done by isolating individual cells on-line?

Answer 4:
Isolation of tower cells on a crossflow tower for cleaning can possibly be accomplished depending on the type of piping and distribution valves in the hot water piping system. Cleaning of the DEs on-line however poses a logical problem due to safety and health concerns and may conflict with plant safety procedures (exposure to legionella, biocides, heat, fall protection, etc.).

Going inside the tower (on-line) to clean the DEs from inside the plenum area is the only method for manually cleaning the DEs. Depending on the tower size and design, this may require special equipment for accessing the entire face of the DEs. Cleaning of DEs from inside of fan stacks (with use of fire hoses) has typically caused more damage than good. We have done this type of cleaning during outages but have not done any on-line water-wash cleaning. The only method we would suggest is using pressure washing to remove some of the silt/sludge from the DEs. Depending on the age of the PVC (assuming the DEs are PVC), pressure washing may provide only minimal cleaning and may result in damaged DEs due to brittleness of aged components/materials. Damaging the DEs (roughness & geometry) could result in increased fouling rates. Such, cleaning could only provide a short term benefit and result in tower performance degradation beyond the point before the attempted cleaning.

In summary, we haven’t seen many cases in which cleaning of DEs provided a long term relief and DE replacement is the only viable option once the DEs become severely plugged to the point of impacting performance (air flow restriction) or emissions (increased drift).
What is a Cooling Tower?

A cooling tower is a heat rejection device, which extracts waste heat to the atmosphere though the cooling of a water stream to a lower temperature. Common applications for cooling towers are providing cooled water for air-conditioning, manufacturing and electric power generation. The generic term “cooling tower” is used to describe both direct (open circuit) and indirect (closed circuit) heat rejection equipment. A direct, or open-circuit cooling tower is an enclosed structure with internal means to distribute the warm water fed to it over a labyrinth-like packing or “fill.” The fill may consist of multiple, mainly vertical, wetted surfaces upon which a thin film of water spreads. An indirect, or closed circuit cooling tower involves no direct contact of the air and the fluid, usually water or a glycol mixture, being cooled. In a counter-flow cooling tower air travels upward through the fill or tube bundles, opposite to the downward motion of the water. In a cross-flow cooling tower air moves horizontally through the fill as the water moves downward. Cooling towers are also characterized by the means by which air is moved. Because evaporation consists of pure water, the concentration of dissolved minerals and other solids in circulating water will tend to increase unless some means of dissolved-solids control, such as blow-down, is provided. Some water is also lost by droplets being carried out with the exhaust air (drift).

For more information visit the Cooling Technology Institute at www.cti.org.
Cooling Technology Institute
Annual Conference, February 3-7, 2008

HOTEL INFORMATION

THE WESTIN GALLERIA
5060 WEST ALABAMA,
HOUSTON, TEXAS 77056
800.228.3000 OR 713.960.8100

Hotel Cut-Off Date
January 11, 2008

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

STANDARD ACCOMMODATIONS:
• [ ] Single - $143  • [ ] Double - $160
Registration Form for the
CTI 2008 Annual Conference
February 3-7, 2008

Complete and send this form to: Cooling Technology Institute • PO Box 73383 • Houston, TX 77273
281.583.4087 • Fax: 281.537.1721 • email: vmanser@cti.org

Early Bird Registration Ends: January 25, 2008

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) __________________________________________________________
   Last Name: ______________________________________ First Name: _________________________________________
   First-time Attendee: ______
   Company: ________________________________________________ Address: _____________________________________________________________
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   Phone (Country Code/Area/Number) ____________________________ Fax (Country Code/Area/Number) __________________________________________
   Email: ________________________________________________ (*E-mail addresses are used for communicating conference updates, session pre-work and to send any other pertinent information.)

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:
   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: 
   ______ CTI Member (includes technical sessions Monday, Tuesday & Wednesday) $695 $795
   ______ Non-Member (includes technical sessions Monday, Tuesday & Wednesday) $795 $895
   ______ One day  
   Mon Tues Wed (circle one)  
   $500 $500
   ______ Exhibit Hall Pass Only  
   $35 $35
   ______ Speaker (one for each paper only)  
   N/C N/C
   ______ Press (one attendee per company only)  
   N/C N/C
   ______ Honorary Life Member  
   N/C N/C

   Section 4a Subtotal US$: ______________________

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

   Check Appropriate Category:  
   Conference Rate:  
   ______ Additional luncheon ticket(s), Monday, Feb 4, 2008 (for spouse/guest) $30
   ______ Monday Night Dinner & Theater (February 4, 2008) $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 morning
   ______ I will attend the ‘Ask the Expert’ Seminar on Tuesday afternoon
   ______ I will attend the Educational Seminar on Wednesday morning

5. PAYMENT (Please check one)

   ______ Enclosed is Check# __________ in the amount of US$__________ (Please write the registrant’s name on the check)
   Credit Card: Please Charge US$_________________ to the following credit card. [ ] Visa [ ] MasterCard or [ ] AmEx
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