The program committee would like to invite you and your company to the 2006 Annual Conference, this year held, 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 of our mission to be a non-profit technical organization, we are charged to bring the most timely and latest information in the industry.

We have 23 papers being presented in a concurrent format on Monday and Tuesday. Water Treatment will have one session and P&T and ES&M will have the other. This is our new approach. We hope you will find this beneficial, we are trying to add more to our programming and offering more information.

Here is a list of topics being given: Filtration for Multi-story Office Building HVAC; Environmental Impact of Evaporative Cooling Towers Using Sea Water; Experience and Modeling: Improving Localized Corrosion in a Complex Cooling Water System; Copper Removal from Cooling Tower Blowdown; Realizing the Full Potential of Your Cooling Tower Cold Lime/Soda Ash Blowdown Softener; Advance in Cooling System Treatment, Monitoring and Control; Cooling Tower Blowdown Limitations: Case Studies of New Wastewater Permit Limits and Their Solids; Optimizing Industrial Cooling Water System Performance with Proper Monitoring and Control; Evaporative Precoolers for Air Cooled Heat Exchangers; Guidelines for Successful Cooling Tower Installations; Seismic and Windload Rated Packaged Cooling Towers; Westar Energy Cooling Tower Rebuilds; Cooling Towers Work as a System; Roulette and Mechanical Vibration Switches: What are Your Odds?; Enhancement of Air Cooled Condenser Operation in Power Plants; High Performance Ceramic Fill; Cleaning of Cooling Tower Basins While Online: A Performance Comparison of Counterflow Reduced Fouling Fills; Responding to a Cooling Tower Emergency; Large Scale Mechanical Equipment Replacement - Simple Steps for Success; Development of an Online Multicomponent Water Treatment Analyzer; Guidelines for Selecting the Proper Fill; and A Review of Drift Eliminator Performance.

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.

“TECHNICAL COMMITTEE WORK”
(Tuesday 10:30a – 12:00p / Wednesday 1:30p – 5:00p)
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, please come sit in.

“ASK THE EXPERT” (Tuesday 2:00p – 4:30p)
This very popular session is back by demand. Come prepared with your questions for the panel of experts. We will have folks from all the standing committees ready to support your questions with good qualified answers. Jim Baker will moderate this session.

On behalf of the Board of Directors and the staff at CTI, we would like to thank all of those who attended the Committee Workshop in California. Many codes and standards were either approved or in the final stages of approval, hats off to the Technical Committee Chairs for a successful workshop. Let us never forget the hard work that Vicky and Donna put into the workshop. Many thanks to them.

We are fast approaching a changing of the guard for this President’s spot. I must admit that the two years has gone by rather quickly. I will be handing over the reins to Steve Chaloupka of Amarillo Gear, a very qualified individual who has a very good understanding of the CTI and our industry in general. As we originally stated, change will occur. I believe that many changes have occurred for the better of the organization over the past two years. I am sure that Steve will carry forward and make changes he feels are necessary to keep up with the times.

We are very excited about our upcoming Annual Conference at the Wyndham Greenspoint in Houston. Yes, we have been there numerous times over the years, but they treat us well and are affordable. The conference format will take on a different look, so be sure to examine the agenda closely to make your plans. Our Program Chair, Glenn Rees explains this in more detail in his article. The main message is that you will want to make plans to attend. We will look forward to seeing you.

One piece of business at the Annual Conference in which I will extremely proud to conduct is the presentation of a CTI Honorary Life Member Award. The Board of Directors voted to give this award to Mr. Ken Gruber, formally of Marley Cooling Towers. Ken worked some 50+ years in our industry. He worked diligently in CTI and served as the CTI President one term. He is one of my mentors and one of the most respected gentlemen every to be a part of this industry. This presentation will take place at the Monday luncheon in Houston.

In closing, I am always appreciative and feel blessed to be apart of this industry and to serve as your President. It has been a great two years I want to thank everyone who has worked with me to make it successful. I look forward to seeing everyone at the Annual Conference and talking with all of you. If anyone has any questions, concerns, complaints, or new ideas to share, always feel free to call. We hope to see you in Houston, and my family and I wish you a safe and happy upcoming Holiday season.

Jim Baker, CTI President 2004 and 2005
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Your Invitation…continued from page 1

“OWNER OPERATOR SEMINAR” w/Lunch (Tuesday 10:00a - 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.

“EDUCATION PROGRAM SESSION” (Wednesday 8:00a – 12:00p)

  Cooling Tower Design, Operation, and Maintenance
  • Cooling Tower Gearbox Maintenance and Operation - Presented by Craig Burris of Amarillo Gear – 1 hr
  • Cooling Tower Performance & Thermal Rating - Presented by Dennis Moran of CM Towers – 1 hr
  • Cooling Tower Design – Best Practices and Design Options - Presented by Jim Cuchens of Southern Company Services – 1 hr
  • Cooling Tower Operations: Effective Water Treatment - Presented by Mike Trulear of Chemtreat – 1 hr

If you don’t attend any other cooling tower related meeting or conference this year, you don’t want to miss this. The CTI program committee has put together a program that will offer the best opportunity to inform, educate and expand your knowledge about this industry. We hope you come prepared to take full advantage of everything we have to offer you. A great location, outstanding food, entertainment and a conference that will give back to the membership what you want - “Information”

I, Paul Nelissen, Bill Immell and Gary Geiger your program committee, invite and welcome you to the 2006 Annual Conference.

See you in Houston, Texas.

Glenn Rees
CTI Chairman Program 2006
Attend the Committee Meeting of Your Choice
February 6-8, 2006

Engineering Standards and Maintenance
Toby Daley - T Daley and Associates, Inc., Chair
Jim Cuchens - Southern Company, Vice-Chair
David Theel - Universal Utility Services, LLC, Vice-Chair

Task Groups:
- Recommended Guidelines for Portland Cement Concrete – Tom Toth
- Industry Cooling Tower Standard – Dave Knight
- Chapter 9 - Materials of Construction – Jess Seawell
- FRP Pipe for Cooling Towers – Bill Daugherty
- Vibration Standard – Ian Fletcher
- Wood Standards - Douglas Fir – Bill Howard
- FRP Structures – Glenn Barefoot
- Safety Guideline – Julia Taylor
- Treatment Standard, STD-112

Performance & Technology
Rich Harrison - Baltimore Aircoil Co., Chair
Ken Hennon - Power Generation Technologies, Vice Chair
Paul Lindahl - SPX Cooling Technologies, Vice Chair

Task Groups:
- Air Cooled Steam Condenser Test Code– Dave Wheeler
- Evaporative Condenser Test Code – Bob Miller
- STD-146 Liquid Flow Measurement – Randy Bradley, Evapco
- ATC-140 Drift Test Code Revision – Ken Hennon
- ATC-150 Plume Abatement Test Code Revision – Paul Lindahl
- Technology Review – Tony DePalma
- Certification Committee – Tom Weast

Water Treating Committee
Doug Murray - Lonza, Inc., Chair
John Zibrida - ZIBEX, Inc., Vice Chair
Ken Mortensen - SPX Cooling Technologies, Sec.

I. Call to Order/Announcements
II. Introduction of Attendees
III. Approval of Annual Winter Meeting Minutes
IV. Water Reuse Document Status
V. Task Group Reports
  A. Environmental Issues – Don Erickson
  B. Water Re-Use Document – Phil Kiser
  C. Microbiological Monitoring – Walt Tyler
  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. Chapter 6 on Water Treatment Chemistry – Art Brunn
  H. CTI Document Review – Paul Puckorius
  I. Water Reuse Papers for Cooling Tower Users, WTP-147 – Art Brunn
  J. Deposit Control Monitoring – Mike Standish
VI. Liaison Reports
  •ASHRAE •ASM •AWT •EPRI •NACE
  •IWC •WATERTECH Microelectronics Water
VII. New Business
Need for new Task Groups?
Technical Paper Subjects for “targeted” symposium topics

Dress code for the Annual Conference is Business Casual
No Ties!
**New CTI Members for 2005**

Biosan Laboratories, Inc.
C.A. Technical Services
CCSC International
Changzhou Kwell Cooling Equipment Co., Ltd
Cooling Towers of Texas
COTOR Srl
CTP Manufacturing
Dober Group
DTE Energy
EFATAR Holdings Ltd
EnVibe, Inc.
FM Approval
Harker Enginuity
Holtec International
Industrial Cooling Solutions, Inc.
Koolqua Towers Pvt Ltd
Lee, Alan H.
McHale & Associates, Inc.
Metrix Instrument Company
MidAmerican Energy Company
Mosley, Jeff
Myron L Company
Patwardhan, Rashmi
Power Technology
Rexnord NV Addax
Shea, Dennis P.
Smart, Clifford L.
SPC Hi-Tech Industries Pte Ltd
TAFT Enterprise
Tay, Sin Hian
Tekni Engineering Pvt Ltd
Visionics Industries (SEA) Pte Ltd

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**Our Technical Committees**

**Engineering Standards and Maintenance**

(l-r) Committee Chair - Toby Daley
Committee Vice Chair - David Theel
Committee Vice Chair - Jim Cuchens (not pictured)

**Performance and Technology**

(l-r) Committee Chair - Rich Harrison
Committee Vice Chair - Ken Hennon
Committee Vice Chair - Paul Lindahl

**Water Treating**

(l-r) Committee Secretary - Ken Mortensen
Committee Vice Chair - John Zibrida
Committee Chair - Doug Murray
Steven L. Chaloupka
CTI Board of Directors President for 2006 and 2007

Steven L. Chaloupka is President of Amarillo Gear Company. Employed since 1993, Steven oversees Amarillo Gear’s worldwide operations of their specialized mechanical components for cooling towers and heat exchangers. Prior work history includes being raised on a family owned ranch near Dalhart, Texas, 1 year as a Field Engineer for Dresser Atlas Well Logging in Alice, Texas and 14 years in various technical positions with National-Oilwell in Houston, Texas. Steven graduated with honors in 1978 from Texas Tech University with a B.S. in Engineering.

Steven has been involved with the Cooling Technology Institute for the past twelve years. He has served as Treasurer on the Board of Directors, participated in several task groups within the Engineering, Standards and Maintenance standing committee, and most recently, as Vice-Chairman of the Membership Committee. Steven’s interest is in all areas within the CTI, but especially enjoys the people he meets within the cooling industry. He has made many life long friendships. Steven is excited to be President-Elect for the CTI and looks forward to the continued growth and technological advancements ahead for the organization.

Steven is married to Shelley Chaloupka and has two sons, Michael (15) and Carter (9). He has previously served as a Board Member of the Harrington Cancer Center Development Council, Amarillo College Continuing Education Council and is an Elder at First Presbyterian Church, all of Amarillo, Texas. Besides spending time with his family, Steven enjoys hiking, baseball and snow skiing.

Newly Elected
Honorary Life Member
to be Honored at Luncheon
on Monday, February 6, 2006

Ken Gruber

One piece of business at the Annual Conference that will be conducted is the presentation of a CTI Honorary Life Member Award. The Board of Directors voted to give this award to Mr. Ken Gruber, formally of Marley Cooling Towers (now SPX Cooling Technologies). Ken worked some 50+ years in our industry. He worked diligently in CTI and served as the CTI President in 1984. He is one of the most respected gentlemen every to be a part of this industry. This presentation will take place at the Monday luncheon in Houston.
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7. Baltimore Aircoil Company
8. Brentwood Industries, Inc.
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10. Clearwater Systems Corporation
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23. Hudson Products Corporation
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31. Precision Cooling Towers, Inc.
32. C.E. Shepherd Co., Inc.
33. SPX Cooling Technologies
34. Strongwell
35. Swan Secure Products, Inc.
36. Tower Engineering, Inc.
37. Tower Performance, Inc.
38. Water Cooling Equipment Inc.
39. Willa, Inc.

Make your plans to attend Future Meetings for CTI

- **February 5-8, 2006**
  - Annual Conference
  - Wyndham Greenspoint
  - Houston, TX
- **July 9-13, 2006**
  - Committee Workshop
  - Sheraton Sand Key Resort
  - Clearwater, FL
- **February 4-8, 2007**
  - Omni Bayfront Hotel
  - Corpus Christi, TX
- **July 8-11, 2007**
  - The Westin La Cantera
  - San Antonio, TX

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- **Thermal Design Worksheet**. An interactive, graphical worksheet designed to speed cooling tower thermal calculations. New 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.

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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%?

"The Performance curve method is widely recognized as a more accurate method of determining tower capability from measured test data. The new CTI ToolKit Application provides a quick and easy method for anyone to evaluate a performance test using this more accurate method." - Rich Harrison, Jr.  ATC-105 Task Group Chairman

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Non-member | $450 | | |
CTI ToolKit Version 3.0 (Upgrade from V1.0) | $ 95 | | |
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Non-member | $120 | | |
PerfCurv 1.0 (Stand alone Performance Curve application) | | |
CTI Member | $195 | | |
Non-member | $240 | | |
Any of the above applications with original hard copy of the CTI Performance Curve (3-Ring Binder) | | |
CTI Member (add) | $100 | | |
Non-member (add) | $140 | | |
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Priority mail $6; 2nd Day Air $15; Overnight Domestic $25; US Priority International $20
Shipping for BlueBook 3-Ring Binder (from Texas): | | |
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Please allow 1-2 weeks for delivery
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System Requirements:
Microsoft Windows 95/98, Windows NT 4.0 or higher/2000/xp, minimum 8 MB Ram (16 MB recommended), 3 MB minimum of free disk space

"The Performance curve method is widely recognized as a more accurate method of determining tower capability from measured test data. The new CTI ToolKit Application provides a quick and easy method for anyone to evaluate a performance test using this more accurate method."

- Rich Harrison, Jr.  ATC-105 Task Group Chairman

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Seminar
Tuesday, February 7
2:00p - 4:30p
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- Different "Wood" FRP Pultruded for 4 x 4 lumbar
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Richard DesJardins, DesJardins Consulting

Richard J. DesJardins is a Cooling Tower and Evaporative Cooling consultant. He received his BSME from the University of Colorado in 1959 and MBA from the University of Missouri at Kansas City in 1965. Prior to formation of his own company in 1984 Mr. DesJardins worked for twenty-five years with the Marley Company and its subsidiaries. For the last 21 years he has represented several different cooling tower, heat exchanger and industrial equipment manufacturers, been Principal Engineer for an air pollution control company, and designed and fabricated several different types of evaporative cooling equipment. He has provided cooling tower and evaporative cooling consulting services to many major engineer-constructors, power companies, refineries, cooling tower manufacturers, and the air conditioning industry. He has authored cooling tower thermal performance and psychrometric computer programs and CTI paper TP92-01.

There are two principal concepts that often confuse people that are not familiar with cooling towers and how they operate: One, the cooling tower is a part of a bigger system: It does not set the heat load; the paper will explain how the tower interacts with the system. Two, the cooling tower and its components work as a system. The paper will explain how changes to one part of the tower can affect all the other parts of the tower: Such as selecting the economic size of the tower, affect of changing fill dimensions and type, heights, fan or stack size or type, inlet heights, location of louvers, nozzle type, choice of materials, temperature limits, definition of “tough” and “easy duties”, and many more. It will define normal limits for air velocities throughout the tower, water loadings, fan power, and other good practice limitations. It will explain how pressure drop changes power, and other good practice limitations. It will explain how pressure drop changes affect a fan’s performance. It will discuss aftermarket changes that make things worse, not better. Comments will be general, not specific to any one product or type.

9:30a - 10:00a

TP06-03 - Large Scale Mechanical Equipment Replacement – Simple Steps for Success

David M. Suptic, David M. Suptic PE LLC

David M. Suptic is a member of AMSE and ASHRAE and a consulting engineer specializing in cooling tower field operations. His experience includes over twenty years of service with a major cooling tower manufacturer in Engineering and Marketing management positions. Mister Suptic is a professional engineer with degrees in Mechanical Engineering and an MBA from the University of Kansas. Mister Suptic has served the Cooling Technology Institute as Co-Chair of the Engineering Standards and Maintenance Committee and as Chairperson of the Mechanical and Electrical Technology Committee and Program Committees.

Faced with multiple gear reducer failures on two large cooling towers, an international power generation facility replaced twenty-eight sets of gear reduction drives and supporting structure with new upgraded equipment. A description of the unique nature of this large scale equipment replacement project provides the reader with several key steps to insure success on construction projects of a similar nature.

10:00a - 10:30a

TP06-05 - Responding to a Cooling Tower Emergency

Billy Childers, Aggreko LLC

Billy Childers has been a part of the cooling tower industry for sixteen years and has experience therein including manufacturing, field construction, product development, sales, and management. He has written numerous technical papers and articles that have been published in trade magazines including the CTI Journal and is currently responsible for Aggreko’s rental cooling tower business.
This paper is intended to explore the “typical” path that businesses go down when an unexpected cooling tower failure occurs. Review the time and resources spent in planning and executing a recovery plan. Then review an alternative path that could be chosen to expedite the recovery and avoid any needless losses. The paper will also explore the need for, and the value of having, a good executable contingency plan in place.

10:30a - 11:00a
TP06-07 - Evaporative Pre-coolers for Air Cooled Heat Exchangers
Matt Smith, L.S. Enterprises and Rich Ault, Brentwood Industries

Math Smith graduated from the University of Florida in 1976 with a BS in Chemical Engineering. He is the owner and founder of L.S. Enterprises, the primary focus of which is the design of direct contact heat and mass transfer devices such as water cooling towers, evaporative coolers, air pollution control scrubbers and other similar equipment.

Evaporative pre-cooling of air cooled heat exchangers provides the thermodynamic advantages of water cooling towers plus the reduced maintenance of air cooled heat exchangers. In areas where water conservation, cooling tower plume abatement, or water discharge permits are a problem, evaporative pre-cooling of the air going to the heat exchanger can be the answer. This paper discusses the advantages of pre-coolers and presents some basic design considerations.

11:00a - 11:30a
TP06-09 - Enhancement of Air Cooled Condenser Operation in Power Plants
Ram Chandran, Holtec International

Ram Chandran received his Bachelor’s degree in Chemical Engineering from Madras University, India and his Doctorate from Salford University, England. He has been in the Air Cooling Systems industry for thirty years. Ram has worked for ABB Lummus Heat Transfer, Hamon Cooling Towers and Baulcke Durr in various capacities as Design Engineer, Product and Project Manager, Director of Sales & Marketing and Manager of Operations, and is currently with Holter International as Program Manager, Air Cooled Condensers.

This paper discusses the impact of velocity in the design of ACCs. The velocity at design point and change at other operating points affect the duct and tube bundle design. Combined with the varying ambient temperature, it affects and/or limits the range or turbine operation. This can affect the plant electric output. This has also an effect on condensate temperature. This requires energy which is redirected from generating capacity which is often ignored. The paper will illustrate the effect of velocity on 1) duct design, 2) tube bundle design, 3) performance limitation, 4) control system capability, 5) range of condensate sub cooling, 6 cost impact.

11:30a - 12:00p
TP06-11 - A Review of Drift Eliminator Performance
William C. Miller, Brentwood Industries, Inc.

Bill Miller is a Sales Engineer with Brentwood Industries, Inc., based in Reading, Pennsylvania, and has been in the Cooling Tower industry since 1998. In 1993 he graduated with a Bachelor of Science in Aerospace Engineering from the Pennsylvania State University. His duties at Brentwood include daily quoting and order processing activities as well as application engineering of Brentwood’s vast array of cooling tower products to its customers’ requirements. He is a member of Tau Beta Pi, the National Engineering Honor Society. Bill and his wife of over ten years Christy reside in Lancaster County, Pennsylvania.

Drift eliminators and the technology behind them continue to evolve to adapt drift specifications grow more stringent and tower operators strive for the best performing products available to the marketplace. As such, the choice of best product for the application becomes more critical. One important aspect of drift performance is the pressure loss characteristic of a drift eliminator and the difference between dry and wet measurements. The differences between various eliminator configurations highlight the benefits of the new technology and theory applied to drift eliminators to achieve the best performance and lower pressure drop. This yields continued improvements for the tower operator.

There is a cost effective method of cleaning sludge from a cooling tower basin while it is in operation, no need for shutdown. Removal of heavy debris and thorough inspection of the basin’s floor, walls, screens and valves is presented.

Group Luncheon
12:15p - 1:45a
Ballroom C

continued from page 10

continued from page 12
Monday's Technical Sessions running congruently between Ballrooms A & B

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

2:00p - 2:30p
TP06-13 - Cleaning of Cooling Tower Basins while On-line
David Landin, MB Western Industrial Contracting
There is a cost effective method of cleaning sludge from a cooling tower basin while it is in operation, no need for shutdown. Removal of heavy debris and thorough inspection of the basin’s floor, walls, screens and valves is presented.

2:30p - 3:00p
TP06-15 - Guidelines for Successful Cooling Tower Installations for Campus District Energy Systems
Frank T. Morrison, Baltimore Aircoil Company
Frank Morrison is currently manager, Product Marketing – Commercial and Industrial Systems for Baltimore Aircoil Company. At BAC, Frank has worked in both Product Engineering and Research and Development. He has a BS in Mechanical Engineering, an MBA from Loyola College, and is a member of ASHRAE 90.1 Energy Committee, TC8.6 Cooling Tower Technical Committee, and TC5.6 Water Treatment Technical Committee.

Water cooled systems provide many advantages for campus district energy systems, including low first cost, low energy cost, and reduced space requirements. A well-designed evaporative cooling tower installation is critical to achieving the maximum benefit from the system investment. This paper provides insight into key considerations for these large cooling tower installations, including proper selection, layout, sound, plume, water use, control strategies, and maintenance.

3:00p - 4:00p - Break

3:00p - 3:30p
TP06-17 - Westar Energy Cooling Tower Rebuilds
David Spacek, Westar Energy, Inc.
David Spacek has a Bachelor of Science in Mechanical Engineering from Kansas State University. He has thirteen years experience as a staff engineer at the Jeffrey Engineer Center as well as twenty-six years service with Westar Energy, Inc.

The Westar Jeffrey Energy is to rebuild the rings of fill sections and accompanying structural support for two rounds series 600 Marley Cooling Towers during the fall maintenance outage of Unit 3. This job is scheduled to be completed in five and a half weeks. This represents double the amount of work attempted in previous rebuilds.

3:30p - 5:00p
Technical Committee Meetings
• Engineering Standards & Maintenance
  Main Meeting
  Task Groups
• Performance & Technology
  Main Meeting
  Task Groups
• Water Treatment
  Main Meeting
  Task Groups

5:00p - 12:00a
Hospitality Suite (Bar Closes @ 9:30p)
6:00p - 9:30p
Dinner and Casino Night

Ballroom B (Water Treating Sessions)

12:15p - 1:45p - Group Luncheon - Ballroom C
2:00p - 2:30p
TP06-14 - Copper Removal from Cooling Tower Blowdowns
Christopher Howell – Crown Solutions, Inc.

Chris Howell is the Equipment Sales Manager, New Business Development for CROWN Solutions, Inc. He was previously a Senior Project Engineer and Project Manager, and started the Design/Build Division, of CROWN. Chris joined CROWN Solutions in 1993, and prior to that, he was a senior station chemist at the Davis Besse Nuclear Power station and was in the Naval Nuclear Power Program. Mr. Howell holds a University Degree in Nuclear Engineering Technology.

Cooling tower Blowdown discharge limits for inorganic metals are being lowered more and more. This paper will document a case of a large cooling tower application in the Gulf Coast that had a 17 parts per billion (ppb) discharge limit placed on it and how ultra filtration membrane technology was used successfully to lower the cooling tower Blowdown copper concentration from 400 ppb to less than 17 ppb.

2:30p - 3:00p
TP06-16 - Optimizing Industrial Cooling Water System Performance with Proper Monitoring and Control
Jean M. Gucciardi, Gucciardi Consulting, Inc. & Loraine Huchler, P.E., CMC, MarTech Systems, Inc.
Jeannette M. Gucciardi is president of Gucciardi Consulting, Inc., a water treatment consulting firm, providing technical monitoring and product development services to specialty chemical companies. Her firm also provides water treatment technical services for manufacturing and industrial facilities. Jean’s previous work included an eighteen year tenure at a major water treatment company with technical marketing and engineering assignments in the US and Europe. She holds a Bachelor degree in Science and a Master of Science degree in Environmental Engineering from the University of Wisconsin, Milwaukee. She has presented technical papers at the American Power Conference and the Intertech Conference on Corroplants and Flocculants. Jean has also published articles in a number of technical journals including Chemical Engineering and Chemical Processing and authored the June 2003 “Ask the Experts Column” in Chemical Engineering Process. She belongs to several technical societies including CTI and AWT.

Proper monitoring and control are the keys to cooling water system optimization. Technological developments in monitoring equipment and data acquisition systems have increased the options and reduced the cost of modernization to maximize cooling water system reliability in industrial systems.

3:00p - 4:00p - Break

3:00p - 3:30p
TP06-18 - Development of an Online Multicomponent Water Treatment Analyzer
Richard Tribble holds a Bachelor of Science in Chemistry from Virginia Commonwealth University and is an expert from ChemTreat, Inc. Research and Development in cooling and boiler water treatment online analysis and product feed and control.

A new online analysis platform for water treatment systems is discussed. This new platform has the ability to measure multiple system analytes including water treatment active components such as anionic polymers. The impact of measuring key actives in cooling water treatment is demonstrated through improved system performance and control. Several laboratory studies and case histories are presented which demonstrate the capabilities of this new analysis platform.

3:30p - 5:00p
See schedule in left hand column
5:00p - 12:00a
Hospitality Suite (Bar Closes @ 9:30p)
6:00p - 9:30p
Dinner and Casino Night

Dress code for the Annual Conference is Business Casual
No Ties!
Tuesday’s Technical Sessions running congruently between Ballrooms A & B

continued from page 12

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

Tuesday, February 7, 2006

7:00a - 8:00a - New Member’s Breakfast
7:00a - 9:30a - Services
7:00a - 5:00p - Speakers’ Breakfast, Photo Session & Prep Room
7:00a - 5:00p - Registration and Paper Sales
8:00a - 8:30a

TP06-19 - Guidelines for Selecting the Proper Fill
Donald Zelak – Brentwood Industries

Don has been in the cooling tower industry for 17 years. He has worked for Brentwood Industries since 1988 as their service manager. He has a BS degree in Electrical Engineering from Wilkes University and an MBA from Kutztown University. For many years PVC film fills have been the most popular choice of heat transfer media for use in cooling towers. Throughout this history, design features of these fills have continued to evolve from the first cross corrugated products through vertical flow fills to today’s popular combination designs. Some of these features are not obvious to the casual observer and if not chosen correctly can adversely affect tower performance, product cost, lifespan, or ease of installation. This paper traces the history of these fill designs while providing guidelines as to the proper fill selection.

8:30a - 9:00a

TP06-21 - A Performance Comparison of Counterflow Reduced Fouling Fills

Toby Daley, President of T. Daley & Associates, Inc., holds a Bachelors of Science in Chemical Engineering from the University of Texas at Arlington and is a registered professional Structural Engineer. He is a CHI EPSI LON Civil Engineering Honor Society and Tau Beta Pi National Engineering Honor Society member. Toby has served as an Adjunct Professor and developed a graduate level course in Composite Structures at the University of Texas at Arlington and as Vice Chair of the Civil Engineering Faculty Advisory Council at the University of Texas at Arlington Civil Engineering Department. He has thirty-two years experience in the cooling tower industry, thirty years with Ceramic Cooling Tower Company where he was Vice President of Engineering and Research and Development and subsequently Chief Operating Officer, has served as Past President, Treasurer, Performance and Technology Committee Chair, and on the Board of Directors of CTI. Mister Daley is currently the Engineering Standards and Maintenance Committee Chair.

This paper will present recent testing results of counterflow film and splash type reduced fouling fill configurations. It will present a comparison of the relative performance of the fills. This recent testing program provides a today’s performance perspective of the most commonly used fills of this type.

9:00a - 9:30a

TP06-23 - Roulette and Mechanical Vibration Switches: What are your Odds?
Gene Ort

Gene Ort holds a Bachelor of Science in Mechanical Engineering and two patents. His relevant experience includes working for a major gas turbine and AC motor manufacturer and major manufacturers of instrumentation for vibration monitoring of rotating equipment including cooling towers. Gene has had the training for vibration analyst and successfully led a project that outfitted an entire grassroots refinery in Thailand with all of the installed vibration monitoring instrumentation as well as the portable vibration data loggers and analysis software. He is currently a consultant on internet marketing of industrial instrumentation.

You have a better chance winning at roulette than protecting your cooling towers with mechanical vibration switches. What are the odds at roulette? You put your money on the table enough times and the casino takes 5.76% of it. The switches are not even close.

Cooling towers are no longer “balance of plant” (BoP) equipment, and have increasing significance in facility operations. With any reasonable definition of “protection”, mechanical vibration switches, called earthquake switches by those who know, may offer no protection from the most likely causes of cooling tower problems. Better alternatives (non-commercial) are presented for consideration.

9:30a - 9:45a - Break

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

10:00a - 2:00p - Owner Operator Seminar (w/lunch) - information on page 4

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

2:00p - 3:00p - Services

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

4:30p - 9:30p - Table Top Exhibits and Hospitality Suite - Salon C

Ballroom B (Water Treating Sessions)

Tuesday, February 7, 2006

7:00a - 8:00a - New Member’s Breakfast
7:00a - 9:30a - Services
7:00a - 5:00p - Speakers’ Breakfast, Photo Session & Prep Room
7:00a - 5:00p - Registration and Paper Sales
8:00a - 8:30a

TP06-20 - High Performance Ceramic Fill
Peter Fay – Consultant and Ann Engh – Sandkuhl Clay Works, Inc.

Peter Fay is a Mechanical Engineering graduate of Purdue University. He worked for Douglas Aircraft for number of years in the development of both commercial aircraft and ballistic missiles. He then became involved in the development of nuclear power plants with Aerojet-General Nucleonics and later with General Atomic. In 1976 Peter joined GEA Power Cooling in San Diego and was responsible for Product Applications and later Product Development of the entire product line. He continues to work in this field as an independent consultant and holds a number of patents related to this sphere of activity. In the recent past he has worked with Sandkuhl Clay, a supplier of ceramic cooling tower fills, on the development of the fill that is the topic of today’s paper. Peter is an avid photographer, tennis player, and world traveler.

The cooling tower industry has long sought without success to find the ideal fill. Such a fill would have high performance, low fouling tendency, durability, non-flammability, elevated temperature capability, non-hazardous environmental characteristics, freeze-thaw capability and good economics.

Traditional cellular ceramic fill blocks provide many of the above attributes with the high performance criterion being the one glaring exception. A vertical flow ceramic film type fill that meets all the attributes set out above is now available to the industry and is discussed in the paper.

8:30a - 9:00a

TP06-22 - Seismic and Windload Rated Packaged Cooling Towers
Daniel S. Kelly – EVAPOCO

Daniel Kelly has five years experience with Evapco, Inc. where he is currently a Global Product Manager. He worked previously in the Mechanical Equipment Group at the Technical Headquarters of Praxair, Inc. where he was a specifying engineer for mechanical equipment such as cooling towers, pumps, vessels, and compressors.

Changes to national building codes and state building codes in California and Florida have given rise to special requirements for cooling towers to be able to withstand windload and seismic forces.

This paper will review the state and national codes as they apply to cooling towers with emphasis on what must be communicated to specifying engineers, owners and building inspectors with the goal of getting unit acceptance at the jobsite and also design of units that meet the code.

9:30a - 9:45a - Break

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

10:00a - 2:00p - Owner Operator Seminar (w/lunch) - information on page 4

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

2:00p - 3:00p - Services

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

4:30p - 9:30p - Table Top Exhibits and Hospitality Suite - Salon C
THE
2006 CTI ANNUAL CONFERENCE
PROGRAM continued

Wednesday, February 8, 2006

7:00a - 10:00a
Service

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

7:00a - 8:00a
Speakers’ Breakfast

8:00a - 12:00p
Educational Seminar

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

1:30p - 5:00p
Technical Committee Meetings
  • Engineering Standards & Maintenance
    Main Meeting
    Task Group
  • Performance & Technology
    Main Meeting
    Task Group
  • Water Treating
    Main Meeting
    Task Group

2:00p - 3:00p
Services

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

Thursday, February 9, 2006

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

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

Education Seminar

“Cooling Tower Design, Operations, & Maintenance”
Wednesday, February 8, 2006
8:00a - 12:00p

The 2006 CTI education program will include 4 sessions on cooling tower design, operation, and maintenance. The sessions will particularly focus on gearbox operation and maintenance, tower thermal performance, and design considerations including structural, thermal performance, environmental, and reliability.

The program will include 4 - 1 Hrs Session as follows:

1. Cooling Tower Gearbox Maintenance & Operation - presented by Craig Burris, Amarillo Gear Company
4. Effective Water Treatment - presented by Mike Trulear, ChemTreat, Inc.

The above order does not necessarily reflect order of presentations.

Jim Cuchens of Southern Company, CTI Education Chairman and moderator for the program.

Owner/Operator Seminar

Tuesday, February 7, 10:00a – 2:00p
(lunch will be included)

Meet Jennifer Cunningham of Air Liquide, Chairperson for the Owner/Operator Council. Jennifer has lined up a terrific program for the Owner/Operators on Tuesday, February 7th from 10:00a - 2:00p (lunch is included). Be sure to check on the registration form that you will be attending so we will have enough seating and enough lunches for everyone. This year’s seminar will cover:

How-to Inspect Your Mechanical Equipment:
  • Hands-on inspection from fan motor, to drive shaft, to gearbox and fan assembly
  • Two companies will represent each product for further discussion:
    Fans - Hudson/Howden
    Drive shaft - Addax/Amarillo
    Gear box - Amarillo/SPX
  • Trouble Shooting Failures
  • Vibration Analysis

How-to Inspect Structural Members:
  • Case study of a cooling tower collapse

How-to Inspect Your Piping:
  • Case study on a piping failure

Be sure to check on the registration form that you will be attending this seminar.

Dinner and Casino Games

Monday Night, February 6, 2006, 6:00p - 9:30p
at the Wyndham Hotel

Come and enjoy a wonderful Mexican dinner and a night at the tables! After eating a wonderful Mexican dinner you will be able to try your hand at Texas Poker, Black Jack, Roulette or Craps! Prizes will be given (sorry no money!)

Dinner will be:
  Roasted Napoleon Green Salad with Margarita Vinaigrette
  Black Bean Salad Tossed with Squash, Zucchini, Jicama, Green Onion and Red Chili Vinaigrette
  Spicy Hurricane Baby Shrimp Ceviche
  ~~~~~~~
  Chili Roasted Chicken Quesadillas
  Chicken and Beef Fajitas served with Pico De Gallo, Guacamole, Jack Cheese, and Flour Tortillas
  Cheese Enchiladas
  Borracho Black Beans Topped with Monterey Jack Cheese
  Mexican Rice
  ~~~~~~~
  Coconut Caramel Flan
  Chocolate Tres Leches
  Maple Pralines

Cost is $70/per person (includes 2 drink tickets and poker chips).
For nearly thirty years, the Cooling Technology Institute has provided a truly independent, third party, thermal performance testing service to the cooling tower industry. In 1995, the CTI also began providing an independent, third party, drift performance testing service as well. Both these services are administered through the CTI Multi-Agency Tower Performance Test Program and provide comparisons of the actual operating performance of a specific tower installation to the design performance. By providing such information on a specific tower installation, the CTI Multi-Agency Testing Program stands in contrast to the CTI Cooling Tower Certification Program which certifies all models of a specific manufacturer’s line of cooling towers perform in accordance with their published thermal ratings.

To be licensed as a CTI Cooling Tower Performance Test Agency, the agency must pass a rigorous screening process and demonstrate a high level of technical expertise. Additionally, it must have a sufficient number of test instruments, all meeting rigid requirements for accuracy and calibration.

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

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

### Licensed CTI Thermal Testing Agencies

<table>
<thead>
<tr>
<th>License Type*</th>
<th>Agency Name</th>
<th>Contact Person</th>
<th>Telephone/Fax</th>
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</thead>
<tbody>
<tr>
<td>A, B</td>
<td>Cooling Tower Technologies Pty Ltd</td>
<td>Ron Rayner</td>
<td>61 2 9789 5900</td>
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<td></td>
<td></td>
<td></td>
<td>61 2 9789 5922</td>
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<td></td>
<td>Bexley North, NSW 2207</td>
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<tr>
<td>A, B</td>
<td>Cooling Tower Test Associates, inc.</td>
<td>Thomas E. Weast</td>
<td>913.681.0027</td>
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<td></td>
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<td></td>
<td>913.681.0039</td>
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<tr>
<td></td>
<td>Stanley, KS 6621</td>
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<td></td>
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<tr>
<td>A, B</td>
<td>Power Generation Technologies</td>
<td>Ken Hennon</td>
<td>865.688.7900</td>
</tr>
<tr>
<td></td>
<td>div. Environmental Systems Corp.</td>
<td></td>
<td>865.687.8977</td>
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<tr>
<td></td>
<td>200 Tech Center Drive</td>
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* Type A license is for the use of mercury in glass thermometers typically used for smaller towers.
Type B license is for the use of remote data acquisition devices which can accommodate multiple measurement locations required by larger towers.

### Licensed CTI Drift Testing Agencies

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Contact Person</th>
<th>Telephone/Fax</th>
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<tbody>
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<td></td>
<td>Power Generation Technologies</td>
<td>Ken Hennon</td>
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<tr>
<td></td>
<td>div. Environmental Systems Corp.</td>
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<td>200 Tech Center Drive</td>
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### Table Top Exhibits and the Exhibitors

**Tuesday, February 7, 2005 • 4:30p - 9:30p**

1. Dynamic Fabricators
2. Rexnord/Addax
3. Cooling Tower Resources
4. Brentwood Industries, Inc
5. Amarillo Chittom AirFlo
6. ERICO, Inc.
7. Amarillo Gear Company
8. Midwest Towers
9. Industrial Cooling Tower
10. C.E. Shepherd
11. Aggreko Cooling Tower Services
12. Biosan Laboratories, Inc.
13. Rohm and Haas
14. The Mur-Tex Company
15. Strongwell
16. ChemTreat, Inc.
17. Baltimore Aircoil Company
18. Hudson Products Corp.
20. Dober Group
21. SPX Cooling Technologies
22. Ashland Specialty Chemical

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**Table Top Exhibits**

<table>
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<tr>
<th>Wednesday, February 8, 2005 • 9:00a - 6:00p</th>
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</thead>
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**Thursday, February 9, 2005 • 9:00a - 6:00p**

1. A.C. Patterson
2. A.T. Hanna
3. C.E. Shepherd
4. Chiltom AirFlo
5. Cooling Tower Resources
6. Cooling Tower Technologies
7. Dober Group
8. E.R. Baier
9. Enviro Systems
10. F.A. Raymond
11. Industrial Cooling Tower Services
12. Johnson Controls
13. Marketing Information Services
14. MEIKO
15. R & A Cooling Tower Sales
16. RHEON INC.
17. Rohm & Haas
18. SPX Cooling Technologies
19. Strongwell
20. T.B. Industries
21. The Mur-Tex Company
22. Voss/Thompson

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**Friday, February 10, 2005 • 9:00a - 6:00p**

1. A.C. Patterson
2. A.T. Hanna
3. Bally Thermal Systems
4. C.E. Shepherd
5. Chiltom AirFlo
6. Cooling Tower Resources
7. Cooling Tower Technologies
8. Dober Group
9. E.R. Baier
10. Enviro Systems
11. F.A. Raymond
12. Marketing Information Services
13. MEIKO
14. R & A Cooling Tower Sales
15. RHEON INC.
16. Rohm & Haas
17. SPX Cooling Technologies
18. Strongwell
19. T.B. Industries
20. The Mur-Tex Company
21. Voss/Thompson
To a question go to www.cti.org

The following questions were sent through our website to the “Ask The Expert” Committee. 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**
How does one come across reducing the amount of water lost through evaporation on natural draught cooling towers?

**Reply to Question 1**
The basic principle of heat removal using an Evaporative Cooling Tower (Natural Draft or Mechanical) is through the evaporation of water. The evaporation rate of a cooling tower is determined by ambient conditions of the area. The only way to reduce the evaporation rate is to reduce the heat load on the cooling tower. There are several ways to reduce make-up to a cooling tower:

- Increase cycles of concentration - optimum usage of chemicals is 7 cycles of concentration. Higher cycles of concentration needs to be carefully evaluated due to potential for fouling of condenser,
- reduction in losses in the unit. (Many designs waste water through oil coolers, open coolers etc. Finding the sources of fugitive losses allows better control cycles of concentration thus allowing water savings), or
- reduce the amount of drift loss from cooling tower (if the cooling tower has high drift loss, more efficient drift eliminators can be installed to reduce drift again allowing better control of blowdown and cycles of concentration.)

**Question 2**
We want to add a dry pipe system to a fire retardant FRP cooling tower. This option does not state that it would meet NFPA 214 requirements - it is just some extra water flow over the fire retardant tower for added insurance in case of a fire. The question - does 214 now apply by default? We are told that many towers just place sprays over the motor and gear box, and that concept doesn’t meet 214 - so it is my opinion that 214 does NOT automatically have to be the basis of the design unless we state that it does. Any comments?

**Reply to Question 2**
NFPA 214 describes the correct way to install a sprinkler system if a sprinkler system is deemed necessary. Chapter 4 describes the fire risk analysis that can be performed to determine the extent and method of fire protection systems that may be required. Is the FRP tower proposed fire retardant (flame spread less than 25) and also self extinguishing? If the FRP is not self extinguishing then a fire could spread. Is the tower a cross flow or counterflow design? Does the FRP tower have fire walls (partitions) between cells and (continued on page 17)
Dress code for the Annual Conference is Business Casual
No Ties!

A dry pipe system is acceptable per NFPA 214. The extent of coverage is determined by the potential fire risk. If you state the sprinkler system is to be installed per NFPA 214, then you will get a fully designed system that would be acceptable on a wood tower. The owner can certainly specify a modified sprinkler system with reduced spray heads in only certain areas of the tower if that modification satisfies their risk analysis and their Insurance Company agrees with the proposal and they are not violating any local fire codes. Hopefully these comments will be useful to the inquirer.
**CALL FOR PAPERS**

2007 Annual Conference  
February 4-8, 2007 • Omni Bayfront Hotel • Corpus Christi, Texas

The following schedule will begin the process for papers presented at the 2007 Annual Conference:

- **2006**
  - May 3: Deadline for Abstracts
  - June 24: Authors Notified by Program Chair
  - Aug 2: Six (6) copies of draft must be sent to CTI office for review
  - Nov 1: 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

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**What’s New in Publications?**

CTI’s committees are working on a 5-year revision program for each of our Standards and Chapters by looking at each every five years and revising and reprinting those that need to be updated with new and better information and reprinting those that are correct as stand. As you may realize with the number of Standards and Chapters that CTI has, this will take some time to have each completed and viewed on a 5-year rotation but our standing committees are well underway. Soon you will be seeing information printed in each Standard and Chapter located on the second page left hand corner that shows when it was revised and the year it will be reviewed again.

Our latest reviewed and revised Standard and Chapter are:

- **ATC-128 revised 7/2005:** Code for Measurement of Sound From Water Cooling Towers - This code applies to mechanical and natural draft towers. Test and measurement procedures, operating conditions and instrumentation are specified. $15.00

- **Chapter 13 revised 7/2005:** Inspection of Cooling Towers $15.00

Our newest Standard is:

- **STD-203 as of 10/2005:** Industrial Cooling Tower Standard - this standard covers the design, fabrication and inspection of crossflow and counterflow mechanical cooling towers. $10.00

Each standard and chapter is available through the CTI office. You can order them via the telephone or the internet and they are available to you electronically.
Shepherd Cooling Tower Components are the key to unlocking success. Engineered for universal application, our products are perfect for new construction or retrofitting. Items available from stock include:

- PVC Coated Hanger Grids
- Stainless Steel Hanger Grids
- Gull Wing Splash Fill Slats
- V-Bar Splash Fill Slats
- Drift Reduction Units
- Film Pack
- Nozzles & Accessories

Inquire about a custom manufacturing process. From concept to completion, we specialize in manufacturing product solutions for unique applications.

C. E. Shepherd Company, L. P.
2221 Canada Dry Street
Houston TX 77023
Telephone: 713.924.4300
Fax: 713.928.2324
Website: www.ceshepherd.com