

DCI (Delhi Chapter of ISHRAE)
Indian Society of Heating Refrigerating & Air Conditioning Engineers



I-SHARE

by Delhi Chapter of ISHRAE

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VENTILATION FOR HEALTH AND LIFE SAFETY

PRESIDENTIAL ADDRESS

Dear Members of DCI

Greetings

We have been busy last **few months** in the society activities as we have undertaken many programs for our members and industry in line with ISHRAE's charter and mission. With an aim for the advancement of the HVAC industry, impart education, engage students and carry out scientific work related to HVAC & R, we have conducted more than 90 programs in this Society Year till **February 2018 with focus on Workshops** on all major topics like District Cooling Basic of Refrigeration, Hourly Analysis Program (HAP), GST, Design & Heat Load for Cold Room, Electronics & Automation in Cold Chain, Building Insulation, Ice Slurry as Secondary Refrigerant and its utility for energy saving, Cooling Towers, Smoke & Fire Safety, Ventilation for Healthcare etc.

Under initiative for trainings to ISHRAE members and industry people, we successfully completed ISHRAE Certified Professional (ICP) Program on **"ICP Clean Rooms", "ICP Design" & "ICP Service"**. The purpose of these certification courses is to upgrade knowledge of our industry colleagues / engineers, so that can have better hands on to design & service of HVAC & R systems / products.

We are pleased to share that DCI has now moved to a new premises at Saidulajab, (Adjacent to Saket Metro) New Delhi and all these workshops/trainings were held in-house giving delegates a more comfortable ambience with no fee at all. This further helped us to bring our education wing "ISHRAE Institute of Excellence" under same roof of DCI. Which further helped chapter to have more technical programs & workshops for students in addition to there on going courses. We have completed first batch in Dec2017 end & new batch has started in Jan2018.

As part of our annual program, we undertook a number of activities for Students and were able to enrol more than 350 student members in the last few months and provided 12 lectures to young prospective engineers by Industry experts. We have formed another new Student Chapter in this Society Year at Delhi Technological University (formerly known as Delhi College of Engineer). Under initiative of making students & industry come together DCI have conducted a Job Junction involving all Student Chapters at MRIU University, Faridabad with presence of 22 companies who shortlisted 78 students out of 129 students passed online test, for giving them opportunity to start their careers. Through the K-12 program for school children, we have conducted awareness sessions at number of schools under STEM. This highlight was arranging K-12 activities at National Blind School, R K

Puram, New Delhi under this initiative.

Under Advocacy drive, we have participated at various events held by societies like ASSOCHAM, CII, Cold Chain Federation, PHD Chamber of Commerce and signed MoUs with Defence Infrastructure Planning & Management Council (DIPM) & Indian Building Congress (IBC). Our understanding with these associate societies, we have further chartered more technical programs for all of you.

During our AGM in September 2017, wherein we have shared our audited Balance Sheet for the Society Year 2016-17 in presence of 200 ISHRAE members along with update on various national level initiatives. The event was well supported by industry.

Our annual conference on Ventilation – 7th Edition held on 5th January 2017 at India Habitat Centre under a theme "Health & Life Safety". Where we had discussed **Comprehensive Study on air pollution & greenhouse gases in Delhi, Natural Ventilation, Basement Ventilation, Hospital Ventilation among other relevant topics.**

DCI has known for its new initiatives for engaging members & HVAC industry. This year's initiative has been our **Corporate Charity Cricket league**. This event was spread over 7 weekends & engaged 9 different corporates to come together to play for the CUP. All surplus funds of this event has been forwarded to national blind school for their operations. We are further in plan to extend the league cricket with in associate societies to make the connections better for future growth of our industry together.

The most important event of the year ACREX India 2018 (South East Asia's largest HVAC&R exhibition) held on 22nd -24th February at BIEC, Bangalore with 600 Exhibitors showcasing their products to more than 50,000 Business Visitors. There was participation of major Global Players from more than 30 Countries with concurrent Activities like Workshops, Seminar, Interactive Panel Discussions, Students Quiz, Curtain Raiser, ACREX Awards of Excellence & ACREX Hall of Fame.

The Delhi Chapter of ISHRAE belongs to all of you & I encourage you to participate in the chapter activities as well as support the society in your own way.

Warm regards,

Gaurav Vasudev

PS: Feedback is always key to improvement, if you need to contact me with your feedback, pls feel free to contact me on 9871566133 or at president@dcishrae.org

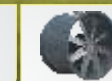




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STUDENT CHAPTER ACTIVITIES



6 Student Chapter(s) Re-installed

- DCRUST, HMR, HI-TECH, MRU, MRIU

Student Chapter Installation@Delhi Technological University (formerly known as Delhi College of Engineering)

14 Technical talks given to students covering:

- Pumps
- Cold Storage
- Energy Simulation Software
- Heat Load Estimation
- Insulation, Installation, Charging and Maintenance of Refrigeration and Air Conditioning Systems
- Energy Simulation Software
- Cooling Towers
- Basic of Air-conditioning & Refrigeration

Job Junction

- 120 Bright Students selected out of 250 after online test
- 22 Companies participated
- 78 Students Shortlisted after round of GDs and Personal Interviews

DISTINGUISHED LECTURER PROGRAM



Distinguished Lecturer program on 16th February'2018 on "Kitchen Ventilation" by Mr. Sushil K. Choudhury



Distinguished Lecturer program on "Evaporative Multi Stage Cooling System" on 17th February'2018 by Mr. Richie Mittal



ISHRAE CERTIFIED PROFESSIONAL COURSES

HVAC Design –

10 Day Course - 1st Module completed on 2-5th November 2017



Clean Room –

4 Day Course completed on 6-9th September 2017



ICP Service Program –

4 days Course completed on 16 – 19th January 2018





ADVOCACY

- MoU signed between DCI & Indian Building Congress (IBC) in September 2017
- Advocacy with Assochem at Hotel Shangri-La on 30th May'2017 (National Conference on Cold Chain and Awards 2017)

Advocacy on 27th July at PHD (National Conclave on Cold Chain Development)



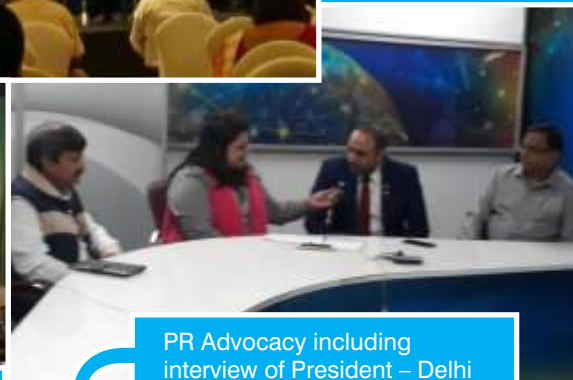
MoU signed between DCI & Defence Infrastructure Planning & Management Council – India (DIPM) in August 2017



Advocacy with CII on Strategies and Challenges - Next Generation Workplaces at Hotel Maurya Sheraton on 20th Sept'2017



Advocacy with DIPM "IC-TRAM 2017" at Manekshaw Centre on 6-7th October'2017



PR Advocacy including interview of President – Delhi Chapter at Radio 107.8 at Manav Rachna International University on 8th Nov'2017



K-12 ACTIVITIES

10 No. K-12 Activities held at various Government Schools/ Aanganwadi / NGOs under STEM :





WORKSHOPS

- Technical Workshop Building Energy Modeling on eQuest on 17th Nov.2017 by Mr. Suhaas Mathur-Submit 18.1117
- Technical workshop on AHU maintenance on 23rd November '2017 by Mr. Atul Rohatgi. -Submit-24.10
- Technical workshop on Building Insulation on 13th October'2017 by Mr. KK Mitra-Submit-24.10
- Technical workshop on Building Insulation on 25th November '2017 by Mr. KK Mitra
- Technical workshop on Cooling tower on 22nd July'2017 by Mr. Subir Das
- Technical workshop on Design & Heat Load for Cold Room on 16th June'2017 by Mr. Sanjay Hans
- Technical workshop on Electrical controls for Chillers and Freezers on 24th November '2017 by Mr. P K Goel
- Technical workshop on Electronic & Automation on 19th May'2017 by Mr. Srinivasan Nagobarao
- Technical Workshop on SOLAR Power in HVAC& R on 14th Oct.2017 by Mr. Siril-Submit-24.10
- Technical workshop on Testing and commission for VRV system, on 21st November '2017 by Mr. Ajay Raj
- Technical Workshop on Transport refrigeration on 14th November'2017 by Mr. Tarun Malhotra
- Technical Workshop on Various Compressor Technologies on 28th October'2017 by Mr. Sanjay Hans
- Technical Workshop on Ventilation in Healthcare on 28th Oct.2017 by Mr. Nitin Verma
- Workshop on Basic operation and maintenance of chilled water system on 20th November '2017 by Dr. Rajinder Sing
- Workshop on Determine size of air duct and water piping in chiller on 22nd November '2017 by Dr. A K Ahluwalia
- Workshop on Under Standing Cooling Tower 2nd September By Mr. Subir Das
- Worskshop on Ice slurry on 27th May,2017 by Dr. Rajinder Singh
- Workshop on fire and Safety on 19th Aug.17 at CBRE Office by Mr. Gaurav Vasudev
- Workshop on GST on 17th June'2017 by Agrawal
- Half day Technical Workshop by Mr. Rajendra Bhargav-30th Dec;2018
- Half day Technical Workshop by Mr.Yuvaraj-20.01.2018
- Half day Workshop on 9th Feb'18 by Dr. A.K Ahluwalia on Fundamental of Duct Design and air Distribution
- Technical Workshop on "District Cooling" on 29th April-2017(Fullday)
- Technical Full Day Workshop on Basic of refrigeration" on 8th May'2017
- Fullday Technical Workshop "HAP on 22nd July'2017 by Mr. S.K Batra



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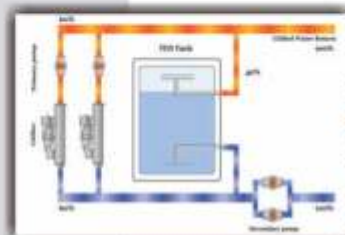


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KEEPING YOUR COOLING TOWERS HEALTHY

by Aneesh Kadyan

Cooling towers are a large consumer of energy in a HVAC system due to not only the fans but also the pumping systems associated with the unit. With the nearly continuous usage of the CT's, the energy use can be a large amount. While the design efficiency of the fans is in the range of 85 – 92%, the actual achievable efficiency is significantly lower due to factors such as fouling, tip clearance etc. Cooling towers also use large amounts of water and hence, contribute to the sustainability of the plant. Due to these two factors – high energy and water usage, the focus of the maintenance team should be higher than other systems but in reality, the importance that the plant operations and maintenance personnel pay to these is not as desired in most cases, especially in the building sector installations. The chiller is usually under an Annual Maintenance Contract with the OEM, but there is no such arrangement for the cooling tower, although the AMC will include the CT maintenance as well. Basic maintenance activities, such as monitoring of water hygiene and cleaning of the tanks is usually undertaken. Leaking CT wells, broken float valves, damaged fills etc. are a common sight on building terraces. Leaking water is a major ground pollutant as the chemicals added to the water to maintain hardness levels leak into the ground and mix with the underground water sources.

The Indian cooling tower industry is in a growth stage, in line with the developments in the HVAC sector and the building sector is again seeing larger number of installations due to the booming commercial and retail developments across the country. However, the upkeep of the installations is not at the desired levels leading to inefficient operations of the overall air conditioning systems.

Optimal cooling tower operation helps in efficient operation of the chiller. A one degree increase in the condenser water temperature results in 2.7% increase in chiller compressor kW. Thus, maintain the cooling water temperature close to design values has significant savings potential for plant operations. Key focus areas during operations, that lead to higher efficiencies and lower operating costs are shown in figure 2 and elaborated below.

- **Maintain Water hygiene:** This is one of the most basic maintenance requirements and the one that gets neglected most often. A robust water hygiene monitoring system requires checking of not only the hardness of the water but also the conductivity. The conductivity is an indication of the concentration of chemicals in the water. In case blow down controllers are not installed, the conductivity should be manually measured on alternate days. The concentration of

dissolved solids in the blow down water to that of in the makeup water is called the CoC and is used to measure CT performance. CoC can also be approximated as the ratio of volume of makeup water to blow down water. Thus, higher CoC results in lower blow down and consequently lower make up water requirement. Cooling towers have a typical CoC of 2 -4 but effective water management can increase the CoC to 6. By increasing CoC from 3 to 6, the makeup water requirement is reduced by 20%.

- **Optimize cooling tower operations:** In installations with multiple cooling towers, operation of the correct number of cooling towers as per the load requirement will result in lowering energy costs as well as increase asset life. Simple modifications to the cooling tower piping system can allow even distribution of load across cooling towers.
- **Install Flow meters** for make up as well as blow down water lines. This will allow the operators correlate the CoC measurements and identify system losses in case of differences in readings.
- **Regular maintenance of Fills and fan:** Damage to Fills due to foreign objects and dust is common. This reduces the heat transfer effectiveness and lowers CT capacity. Fan blades are also suspect to fouling and require regular cleaning. Fouling leads to improper flow patterns which in turn reduce fan flow rate. Thus, regular maintenance of the fills and fans is essential for optimum performance.
- **Covers for wells:** Sunlight enhances algae growth which causes biological fouling of the downstream systems such as condenser tubes. Covers over wells when not in use helps in blocking out the sunlight and prevents algae growth.
- **Retrofits:** When possibilities of retrofitting the CT exist, evaluate options to install VFD's and hollow FRP blades to lower energy costs. Installation of automation devices can also be evaluated.

Efficiently operating cooling towers have a positive impact on the whole air conditioning system of the building, in addition to keeping energy costs low. A well maintained cooling tower also reduces the plants impact on the environment by way of reducing the use of water and also minimizing dissolved chemicals from leaking into the ground water. Thus, the onus is on the Operations and maintenance teams to have a robust and detailed preventive maintenance plan for the cooling towers, which includes not only maintenance activities but also regular monitoring of system parameters and healthiness.

Author

Aneesh Kadyan, Director - Operations, for a leading real estate services firm directs the operations of a large team of professionals in the building and facility management arena. He is a post graduate in Mechanical Engineering and has over 19 years' experience in management of services in technology intensive environments. His areas of interest include Maintenance management, corporate governance, Strategic planning and technology interventions in Industry. Aneesh is a Professional Engineer (PE), a certified Energy Auditor and an IGBC Accredited Professional (AP).



Aneesh Kadyan

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