ISHRAE IEM STUDENT CHAPTER

STUDENT ACTIVITY

2020-21

ISHRAE IEM STUDENT CHAPTER

CORE WORKING COMMITTEE

SESSION (2020-2021)

1.V. Aditya (President)

2.Raubins Kumar

(Secretary)

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1.INTERNAL EVENTS

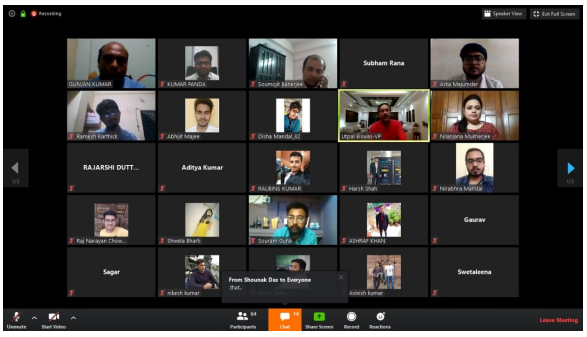
- **DIGITAL INSTALLATION CEREMONY OF CORE WORKING COMMITTEE**

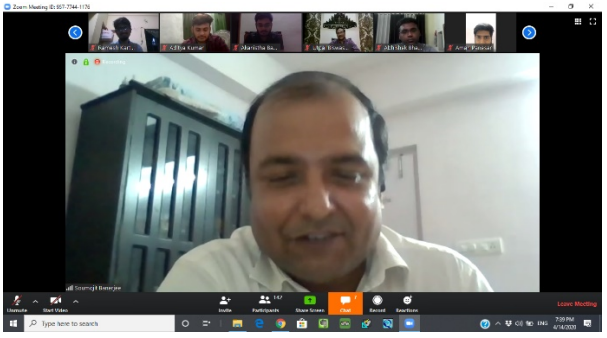
FOR SOCIETY YEAR 2020-2021

VENUE: Zoom App

TIMING: 14th APRIL, 2020 from 7:00pm to 9:00pm

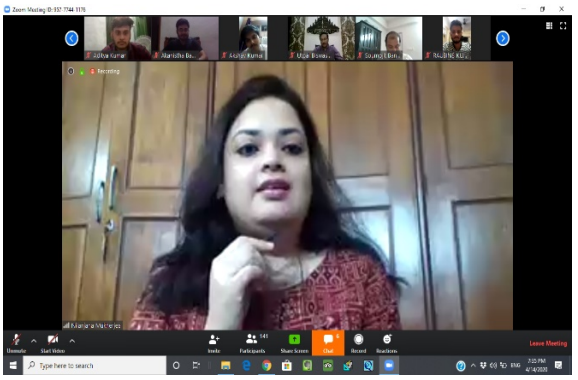
"***ISHRAE*** *is just like that magic wand which completely changes your life*", these were the parting words of Mr Ramesh Karthick before officially signing off as the President from ISHRAE IEM student chapter. Amid all the lockdown and work from home thing going in the world we must not forget our work and the responsibilities which comes along with it and ISHRAE is the one which will never disappoint you. This was seen when the society came forward with, for the first time a **digitally** held, **installation ceremony of the core working committee.**

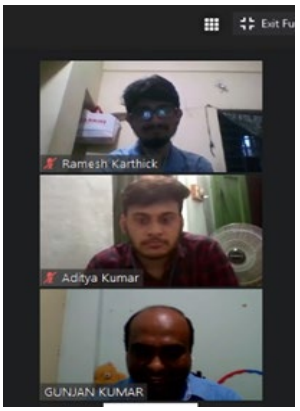




The student's chapter **Indian Society of Heating Refrigeration and Air Conditioning Engineers** (ISHRAE) of **INSTITUTE OF ENGINEERING AND MANAGEMENT**, Kolkata installed the core working committee for the session year 2020-2021 on 14th APRIL 2020 in the presence of **Mr. Somojit Banerjee**(ISHRAE Kolkata President), **Ms Nilanjana Mukherjee**(Secretary) , **Mr. Utpal**

Biswas (VP, Advocacy, ISHRAE Hq) along with **Mr. Arka Majumder, Mr. Shuvam Kangsabanik and Mr. Gaurav Jha** with all their efforts towards cohering this institute-industry gap. Alumni are the real gem of any society, they always donate their valuable time to offer support to the current members with their experience and expertise. IEM ISHRAE was overwhelmed by the presence of more than 20 such gems including **Mr. Akanistha Banerjee**, **Mr. Nirabhra Mandal, Mr. Rajarshi Dutta, Mr. Aman Pansear, Ms. Riddhi Lakhotia , Mr. Abhishek Bhattacharjee and Mr. Dyuman Das**. And of course, a tremendous participation from the IEM family, making the total members in the zoom meeting **above 150**.





The ceremony began with the address of our faculty, advisor and Zonal head of eastern region of ISHRAE, **Mr. Gunjan Kumar** who is the one holding this society together for years with utmost honesty and dedication.

R Karthick, the immediate past president addressed the gathering with a welcome speech followed by a brief overview of all the activities conducted by IEM ISHRAE chapter during the year 2019-2020. Students of IEM ISHRAE were witnessed to be taking part in all the events exuberantly and enthusiastically and grabbed numerous awards this year beginning from **1st position & 3rd position in AQUEST, winners & 2nd runners up in RACON 2019, 1ST position in NSDC and also in MAKAUT student innovation event** and the list goes on. It was a great year with lots of pleasant surprises and great accomplishments in towards the end.

The event moved further with a bunch of gratitude to all the people who acted as pillars to this society, the past **CWC members**. It was their consistent efforts and excellent leadership qualities that has brought this society here. Through their varied roles, they have contributed immensely to the success of this association. IEM ISHRAE whole heartedly thanks them for their passion, dedication and service to the society. But it can never be a good ending until it confirms a promising beginning. And with this the period of the earlier CWC members ended and the promising CWC committee was installed. The several notable posts for the society year 2020-2021 were allotted as follows **– Mr. V ADITYA-President, Mr. RAUBINS KUMAR-secretary, Ms MAHASWETA DAS-Treasurer. Mr. Somojit Banerjee**, ISHRAE Kolkata President administered the oath to all the newly elected student members.

Prof. Arun Kumar Bar(dean, IEM), Prof. Prabir Kumar Das(HOD, BSH department, IEM) , all the honourable dignitaries, alumni community along with **prof. Gunjan Kumar** gave their best wishes to everyone and with this the meeting was adjourned.

- **URJAMAAN 2020**

(POWER YOUR PASSION)

VENUE : ZOOM Online Platform

EVENT CONCLUSION DATE(As it was online so execution is done in April-May) : 8th May,2020

TIME: 7:00 pm- 9:00 pm

An Artist is someone who uses bravery, insight, creativity and boldness to challenge themselves everyday and take out something different every time.

And Art is that personal gift that changes the person. For them the medium doesn't matter, the intent does. It is their personal act of courage that creates change in the order.

Urjamaan 2020 was announced with a motive of finding those artists who possess extraordinary talent in themselves, and it very well succeeded in finding a lot of them. Some with amazing singing talents, some with fine dance skills, some with astonishing painting dexterity and many others with the capability to make a mark in the world with their sensational skills.

Urjamaan offered a lot of events through which others could catapult themselves into stardom. There was singing, dancing, poetry, sketching, 3 minutes Tech talk, photography and others and more than 380 participants enrolled themselves for this online event. 26 responses came within 12 hours after announcing this event which started this event as a success.

SINGING

A song can be more than words and music, when sung with soul a song carries you to another world, to a place where no matter how much pain you feel, you are never alone.

And all those who participated for singing did extremely well and it was tough to choose the best among them.

More than 52 responses came for singing and Disha Mandal (2nd Year EE) outperformed everyone and came at the top spot.

Vivekananda Goswami (2nd Year ME) came up second and Soumyajyoti Ghosh (1st Year EEE) came as the second runners up.

Rudra Banerjee was also awarded with Motivational Prize for singing.

DANCING

Dance allows you to express a wide variety of emotions. The way you dance can express happiness, excitement, and passion but also aggression and anger. What is so wonderful about dancing is that it helps you to relieve stress and to fully centre yourself in the present moment.

And the participants who sent their entries for dance performed enticingly marvellous. What so good about all the performances where the exuberancy and energy with which all of them showcased their dancing skills which made it even tougher for the judges to decide.

But Shourya Agarwal, a 1st Year ECE student outperformed everyone and came up as the winner.

Debasmita Deb (1st Year IT) & Ishita Nandi (1st Year EEE) combinedly took the second position and became 1st Runners Up.

Disha Chakraborty (1st Year CSE) & Dhrubajyoti Chowdhury (1st Year ME) came up third and became 2nd Runners Up.

Poetry

Poetry is the journal of the sea animal living on land, wanting to fly in the air. Poetry is a search for syllables to shoot at the barriers of the unknown and the unknowable. Poetry is a phantom script telling how rainbows are made and why they go away.

And this event let the poet come out of students. The amount of responses that was got for poetry was surprising even for the organisers. Participants allowed their poet to come out through their fine writing.

But the finest of all was by Prolay Sarkar (1st Year ECE) and Rohan Das (1st Year EEE) and they were selected as the winners.

Ankita Kumari (1st Year ECE) was no less and came second.

Ishita Nandi (1st Year EEE) after bagging the second prize for dance bagged the third Prize for Poetry and came as the second Runners Up.

Noyonika Mukherjee (2nd Year ME) was given with Motivational Prize.

Photography

It's not enough to just own a camera. Everyone owns a camera. To be a photographer, you must understand, appreciate, and harness the power you hold.

That frame of mind that you need to make fine pictures of a very wonderful subject, you cannot do it by not being lost yourself.

And that's the capability that photographers hold. They are naturally themselves everytime. And Urjamaan gave a platform to those to showcase this special ability.

Riya Kumari (1st Year EEE) came up as the best photographer and because her amazing picture she was awarded with the Winners Title.

Anmol Shree (1st Year EE) was not far behind and came as 1st Runners Up.

Anusha Chatterjee (1st Year ECE) became the 2nd Runners Up.

Amitabha Dey (2nd Year ME) was awarded with the Motivational Prize.

Sketching

It is only by drawing often, drawing everything, drawing incessantly, that one fine day you discover, to your surprise, that you have rendered something in its true character.

Drawing is the artist's most direct and spontaneous expression, a species of writing: it reveals, better than does painting, his true personality.

And drawing came as one of the most improved section of the event. Each drawing by each participant had a deep message in it which made it tougher for the judges to decide the winners.

And Akash Das (1st Year ECE) was selected as the winner for his extraordinary drawing.

Srishti Chakraborty (2nd Year IT) & Ashik Pal (1st Year ME) became 1st Runners UP.

Ayushman Sen (1st Year CSE) came as the 2nd Runners UP.

Pallab Biswas (2nd Year EE) was awarded with the motivational Prize.

Others

This category was introduced in Urjamaan 2020 for other skills like Instrument Playing, Stand Up comedy, Video Making, Video Editing, comedy etc.

Through the category of others, participants were allowed to showcase all the skills they posses.

Aritra Sen (1st Year CSE) came 1st in the category of others for Instrument Playing.

Sagnick Bhar (1st Year IT) came 2nd in the category for Instrument Playing.

Anjali Shaw (1st Year ECE) came 3rd for her amazing stand up comedy.

Sushant Shandilya (1st Year ME) was awarded with the Motivational Prize for Video Editing.

Prof. Dr. Arun Kumar Bar (Dean Engg. IEM), Prof. Prabir Kumar Das & Prof. Gunjan Kumar along with all the other respected dignitaries distributed the Prizes and bid their warm wishes to all the winners and Participants.

And with this Urjamaan 2020 ended on a good note!

- **TAAPMAAN 2020 (FEEL THE HEAT)**

STUDENTS ISHRAE
IEM STUDENT CHAPTER

IMSC
ISHRAE MODEL STUDENT CHAPTER

IEM
श्रद्धावान लभते ज्ञानम्
INSTITUTE OF ENGINEERING & MANAGEMENT
Good Education, Good Jobs

REPORT ON ISHRAE STUDENT DAY NAMED TAAPMAAN 2020- Feel the HEAT

Date:2nd-5th September,2020 Platform: Zoom

Continuing the legacy set by our seniors this year too with lots of energy, enthusiasm and technical connect we successfully organized our flagship event ISHRAE STUDENT DAY event at IEM Student's Chapter named "TAAPMAAN 2020 - Feel the heat" in a complete virtual platform.

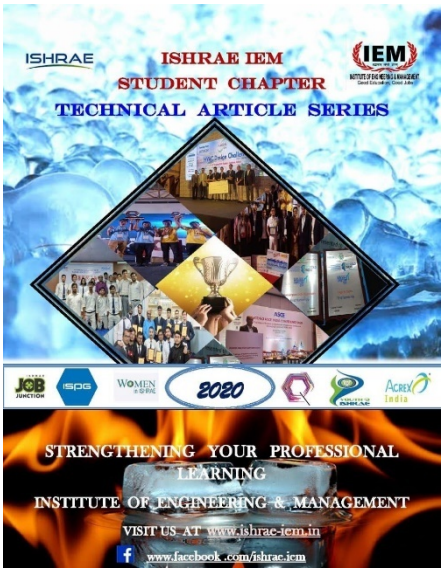
The event started on 2nd of September, 2020 and continued till 5th of September, 2020. It was a completely technical event enriched with several events like Technical Article Writing Competition, Facebook Quiz, Poster Presentation Challenge, Heat Load Challenge, Energy Conservation and Automation Challenge, BBG Memorial HVAC Quiz, Cad-o-trivia (newly launched this year specially for 2nd years) and Technical Talk. All the events showed up with huge number of

participation with a total of 394 registrations. All the events were graced with the presence of internal and external guests and Industrial delicates. The inauguration event included Vikram Sir's keynote, Model Student Chapter ppt presentation, a wonderful and mesmerizing song performance by one of the core members, and ISHRAE IEM ANNUAL MAGAZINE named Technical Article series release by Mr. Prabir Kumar Das. The event was inaugurated in the presence of :

Mr. Vikram Murthy- ISHRAE IMMEDIATE PRESIDENT, Univac Environment System Pvt Ltd, **Mr. Utpal Biswas**- Vice President- East ISHRAE, **Mr. Chandan Jagadeesh**, Manager- HVAC Industrial Automation, Larsen & Toubro Limited, **Mr. Irfan Ayas**, WBECBC Cell Member. Green Tree, **Prof. (Dr.) Amlan Kusum Nayak**, Principal, IEM Kolkata, **Prof. (Dr.) Arun Kumar Bar**, Dean - Engineering Professor & Head Mechanical and Electrical & Electronics Engineering Department, IEM Kolkata, **Prof. Tapas Kumar Datta,** HOD , Dept. Of Electrical Engineering, **Prof. Prabir Kumar Das,** HOD, BSH, , IEM Kolkata, **Mr. Shuvam kangsabanik**, CWC Member & Youth Chair, ISHRAE Kolkata, **Mr. Arka Majumder**, Student activity Chair, ISHRAE Kolkata and **Prof. Gunjan Kumar**, Faculty Advisor & 'Zonal Chair- Students' s Activities- ISHRAE .

Technical Article Writing Competition:

Students from second, third and fourth year wrote commendable articles on different topics related to HVAC and Cold chain. On the first day of TAAPMAAN ISHRAE-IEM launched the third edition of Technical Article compiling a few guest articles and selected internal articles.



V. Aditya
(4th YEAR EE)

SECOND

Aditya Swaroop
(4th YEAR ME)

THIRD

Sumit Nandi
(3rd YEAR EE)

THIRD

Shubhra Pal
(3rd YEAR ME)

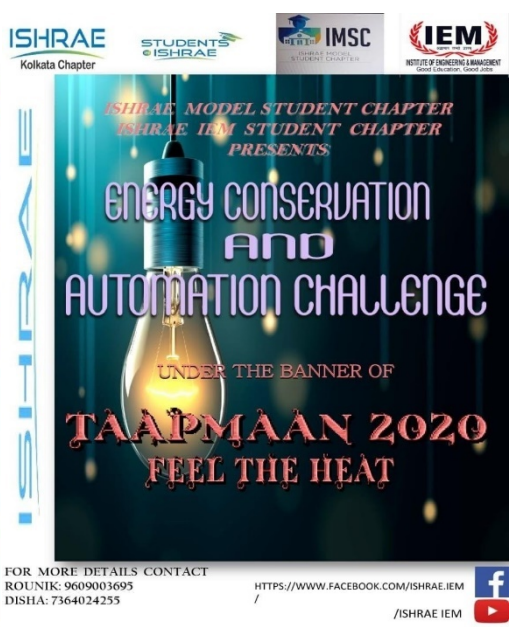
MOTIVATIONAL

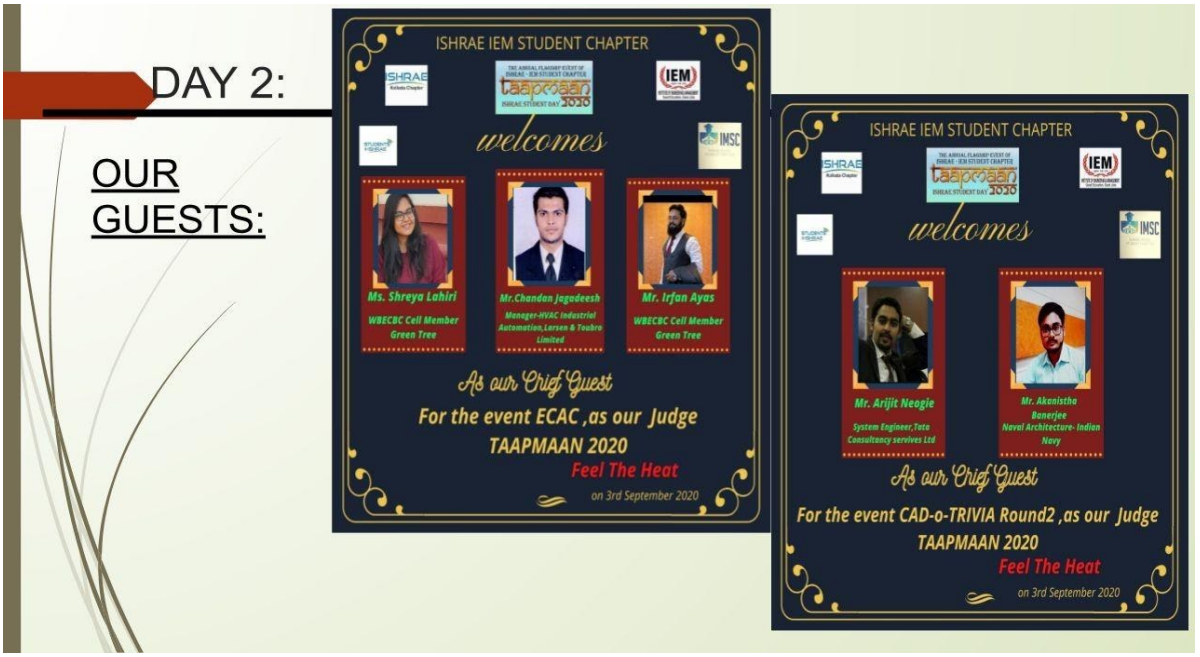
Nilangshuk
Chowdhary
3rd YEAR ME

MOTIVATIONAL

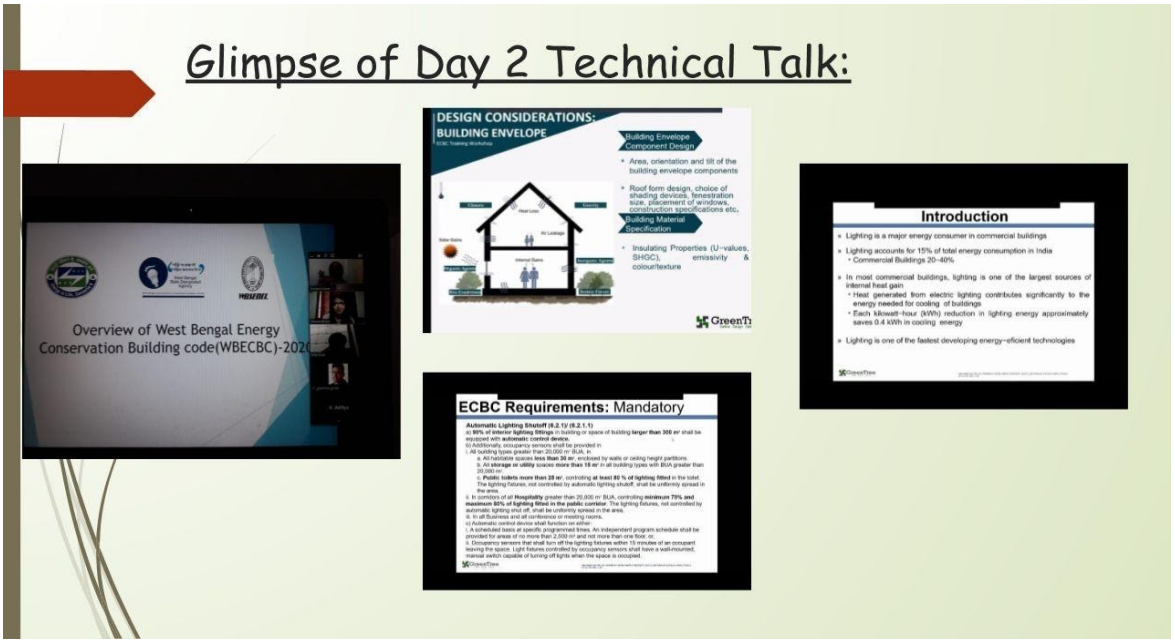
DAY-2

Some glimpse of the event:





Special Guest & Judges



CAD-O-TRIVIA:

The event was held on a web platform on 3rd September from 5pm to 6pm. After the success, full completion and execution of CAD-O-TRIVIA Round 1, on the basis of Round 1 result top 10 teams were selected for round 2. Round 2 was an extempore round in which Technical Understanding and Knowledge of basic Real life connect of engineering was judged.

For this event we had two industry persons Mr. Arijit Neogie and Mr. Akanistha Banerjee. One Alumni Mr. Nikunj Verma and Faculty member Prof. Susobhan Roy as panel of Judge.

With the arrival of the judge and the participants we started the CAD-O-TRIVIA round 2, the entire round was divided into two loops of questions. In the First loop the questions were asked from the Mechanical domain, and in the second loop the questions were asked from the electrical and electronics domain. The questions were mostly “Picture Analysis” type plus with the question- answer part.

ECAC- ENERGY CONSERVATION AND AUTOMATION CHALLENGE:

The Energy Conservation & Automation Challenge, one of the most demanding events of **TAAPMAAN 2020 – Feel The Heat** was held and the judges of the event were **Mr. Chandan Jagadeesh**, Manager – HVAC Industrial Automation, Larsen &

Tourbo Limited. **Mr. Irfan Ayas**, WBECBC Cell Member, Green Tree, **Mr. Arkadeep Dey**, WBECBC Cell Member, Green Tree, **Ms. Shreya Lahiri**, WBECBC Cell
Member, Green Tree. **Ms. Riya Bhattacharjee**, Alumni of IEM as an Internal Judge. The event was attended by Prof. Gunjan Kumar (Dept. of Mechanical Engineering), other alumni and above 70 students of **Institute of Engineering & Management,**
Kolkata.

The event had 10 final teams for presentations after shortlisting on the basis of Problem Statement that was given. Thus, all the team gave their presentations and showcased their innovative ideas about Energy Conservation & Automation for
making a building smart and sustainable.

WINNERS:

STUDENTS ISHRAE
IEM STUDENT CHAPTER

Winner:
Asmita Malla, Ashis Pal

Winner:

IEM STUO ENT CHAPTER

Srijani Das, Diptarab Dutta, Sayantan Chanda, Sagnik Chowdhury

1st Runner -Up:

Agnibha Ghosh, Amitabha Dey, Souvik Dutta

DAY 3


ISHRAE IEM MODEL STUDENTS' CHAPTER
Presents
HVAC COOL
PRESENTATION
Under the banner of
taapmaan
ISHRAE STUDENT DAY 2020
FEEL THE HEAT
CASH PRIZE OF ₹1000
• PPT also acceptable
• Team Size = 2-3
For more details contact :
SHWETA BHARTI : 7544006878
DISHA MANDAL : 7364024255
https://www.facebook.com/ishrae.iem/
/ISHRAE IEM
ISHRAE MODEL STUDENT CHAPTER
ISHRAE IEM STUDENT CHAPTER
PRESENTS
HEAT LOAD CHALLENGE
UNDER THE BANNER OF
TAAPMAAN 2020
FEEL THE HEAT
FOR MORE DETAILS, CONTACT WITH
SUBHAM :9064381431
ABHINAM : 7339716481
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NATION'S BEST MODEL STUDENT CHAPTER
ISHRAE IEM STUDENT CHAPTER
PRESENTS
CAD - O - TRIVIA
UNDER THE BANNER OF
TAAPMAAN 2020
FEEL THE HEAT
AutoCAD
DE - CODE
DESIGN AND CODE
POINT OF CONTACT :-
RIYA KUMARI - +91 70038 63268
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HTTPS://WWW.FACEBOOK.COM/ISHRAE.IEM/
/ ISHRAE IEM

MOTIVATIONAL TALK BY Ms. Nilanjana Mukherjee:

It was a great session where Ms Nilanjana Mukherjee gave a short talk on how after getting success, maintaining that success is important. And how these
things help us to grow further in life.

H VAC COOL PRESENTATION

DATE:3rd September 2020

HVAC Cool Presentation was an event under the banner of our annual flagship event TAAPMAAN 2020-FEEL THE HEAT, where participants were presenting posters and presentations on HVAC Domain. This event aims to prepare all the members for the National level Poster Presentation competition, REFCOLD.

This event is for both members and non-members of ISHRAE-IEM Students' Chapter.

Overall, in this event there was a participation of 35 students. There were 2 slots for the participants. All the PPTs submitted by the participants were reviewed by our Prof. Gunjan Kumar & Mr. Samarpan Deb Majumdar.

A Zoom link and a Google meet link has been provided to the participants at 5pm.

Each team has been given a time limit of 8mins and questioning session for 4mins by our Judges.

The event was moderated by Mr. Rahul Baidya along with Ms.Shweta Bharti.

1st Runner-Up:

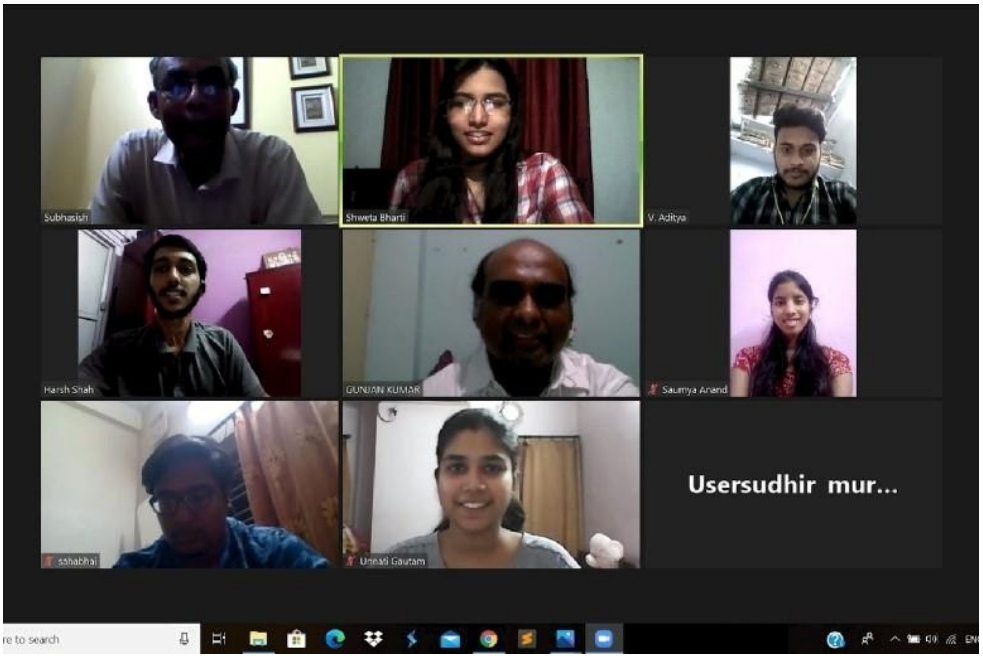



Pushpak Singh,Atul Kumar, Rehan Aziz, Shruti Chakrabarty

2nd runner-Up:

Vikram Yadav, Utpal Kashyap, Utsav Kumar Singh



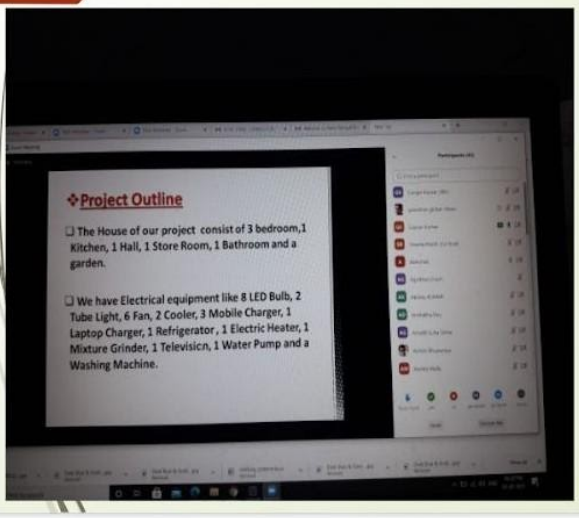


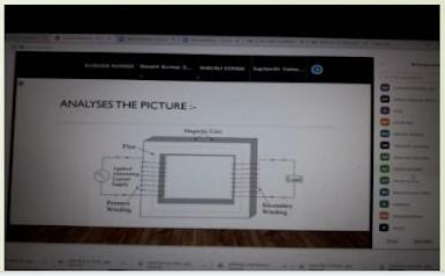
HEAT LOAD CHALLENGE:

Heat load challenge event has always been the highlight of the entire show Taapmaan. Knowing the importance of heat load calculation we keep an event solely dedicated to heat load calculation. This event overall opens the gateway for the students to higher level design competitions.

OUR JUDGES:

Glimpse of Heat Load Challenge:





WINNER:

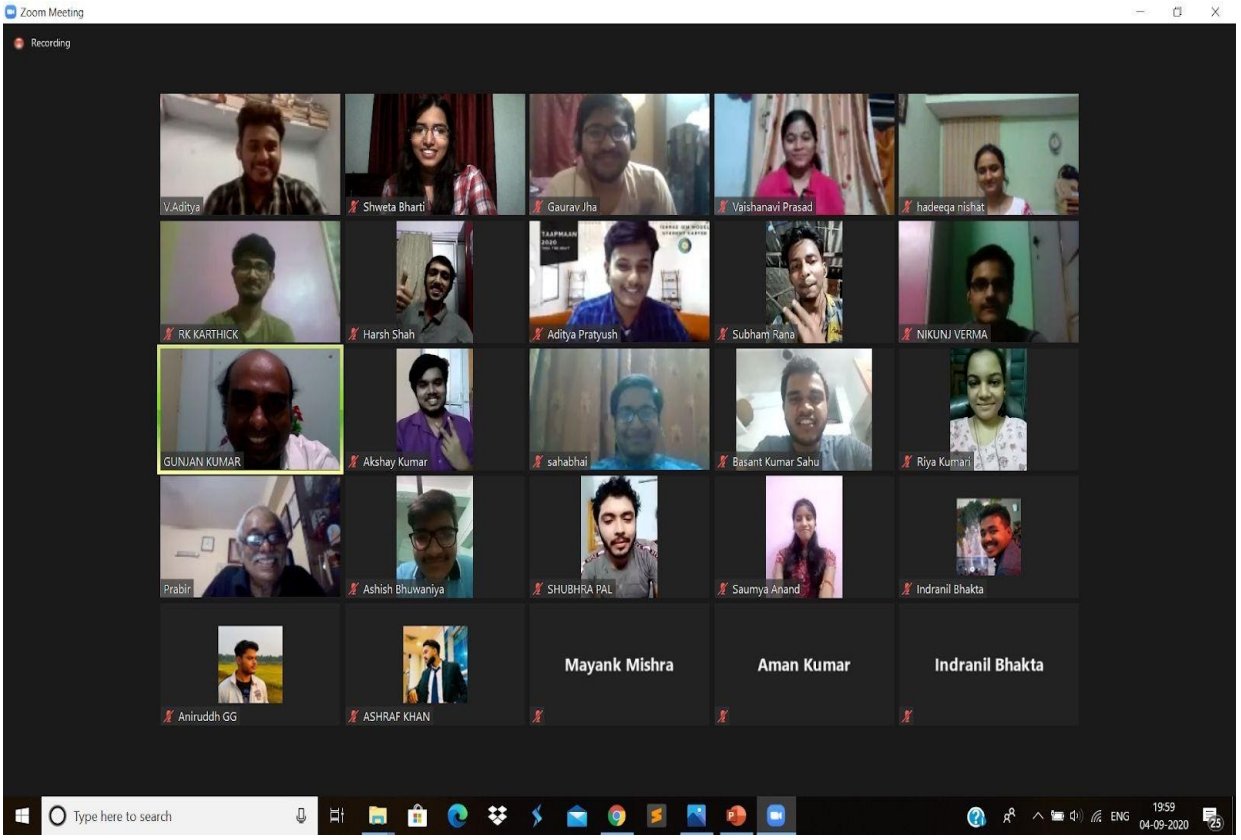
Shubra Pal, Ashish Bhuwaniya, Chirag Kamani, Santanu Jana

1st Runner-Up:

Rahul Dhanuka, Nilanghsuk Chaudhari, Rudraneel Bhattacharya, Tamoghna dey

2nd Runner-Up:

Aman Kumar, Vivek Kumar, Aditya Ranjan, Noyonika Mukherjee



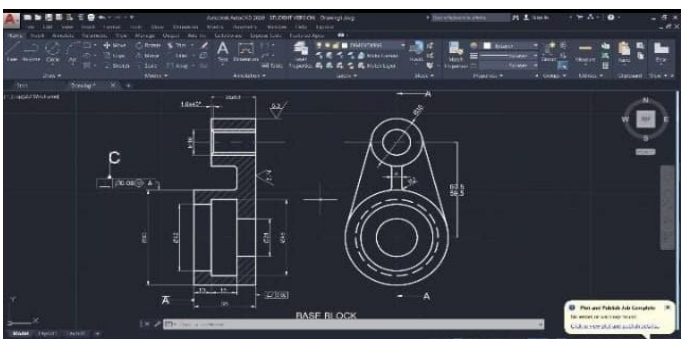
Glimpses of Heat Load Challenge:

CAD-O-TRIVIA FINALS:

AutoCad drawing round, The final round in the presence of Judge prof.Pinaki Mukherjee the CAD-O-TRIVIA round 3 began. In which the top 10 participants come up with their AutoCAD skill and prepared Technical drawing using AutoCAD software.

The participants present their screen of AutoCAD drawing for live assessment form the judge. It was full of enthusiastic participants .We are delighted with the overwhelming involvement of the sheer number of participants engaged with this event to make it a grand success. We appreciate everyone's effort. And for this along with the winner, 1st and 2nd runner up ISHRAE IEM student chapter added 3
motivational prize for the participants.

Glimpses:

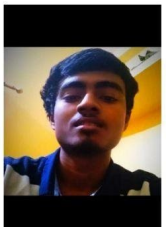


WINNER:

Mayank Shekhar, Suhail Halder

2nd RUNNER-UP

Arnaw Kumar, Akash Kumar



MOTIVATIONAL AWARD

Isha Kumari, Mayank Sharma

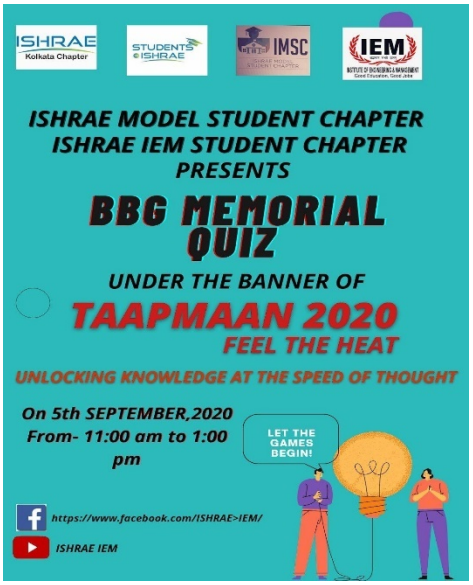
MOTIVATIONAL AWARD

Subhajoyoti Majhi, Shruti Chakroborty

MOTIVATIONAL AWARD:

Ashik Pal, Saptarshi Samanta

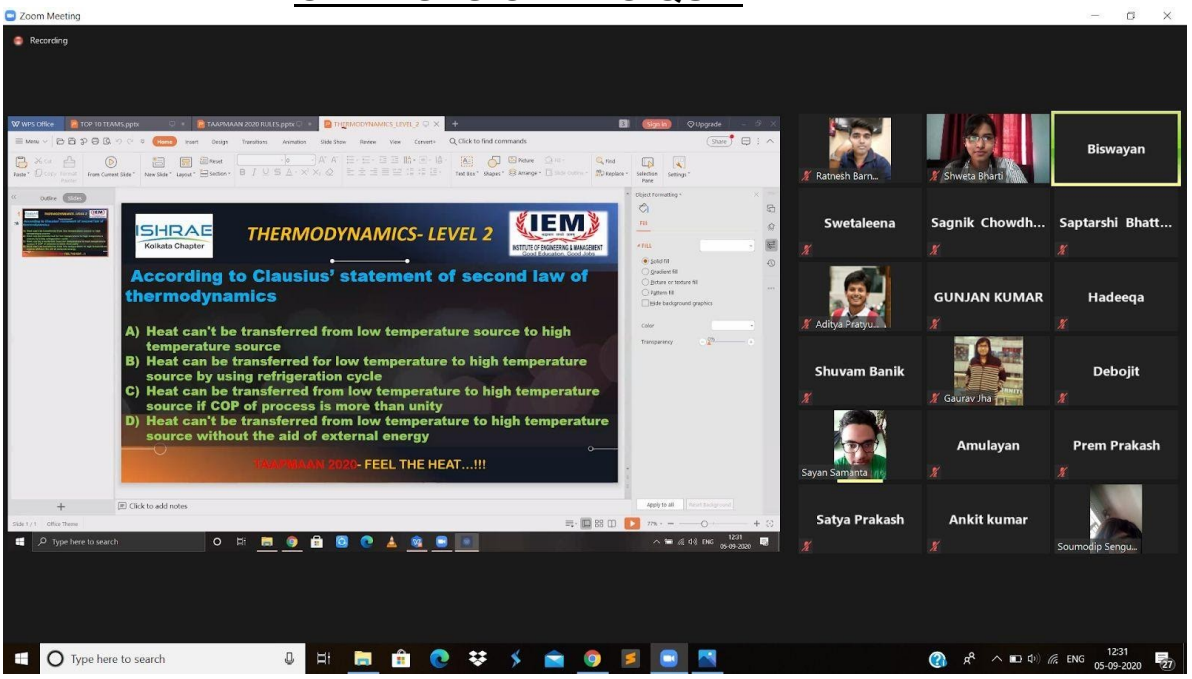
BBG Memorial Quiz:



After successful conduction of BBG Memorial quiz- Prelims, with a total of 52 teams (104 participants), top 6 teams got selected for BBG Memorial quiz- Finals.

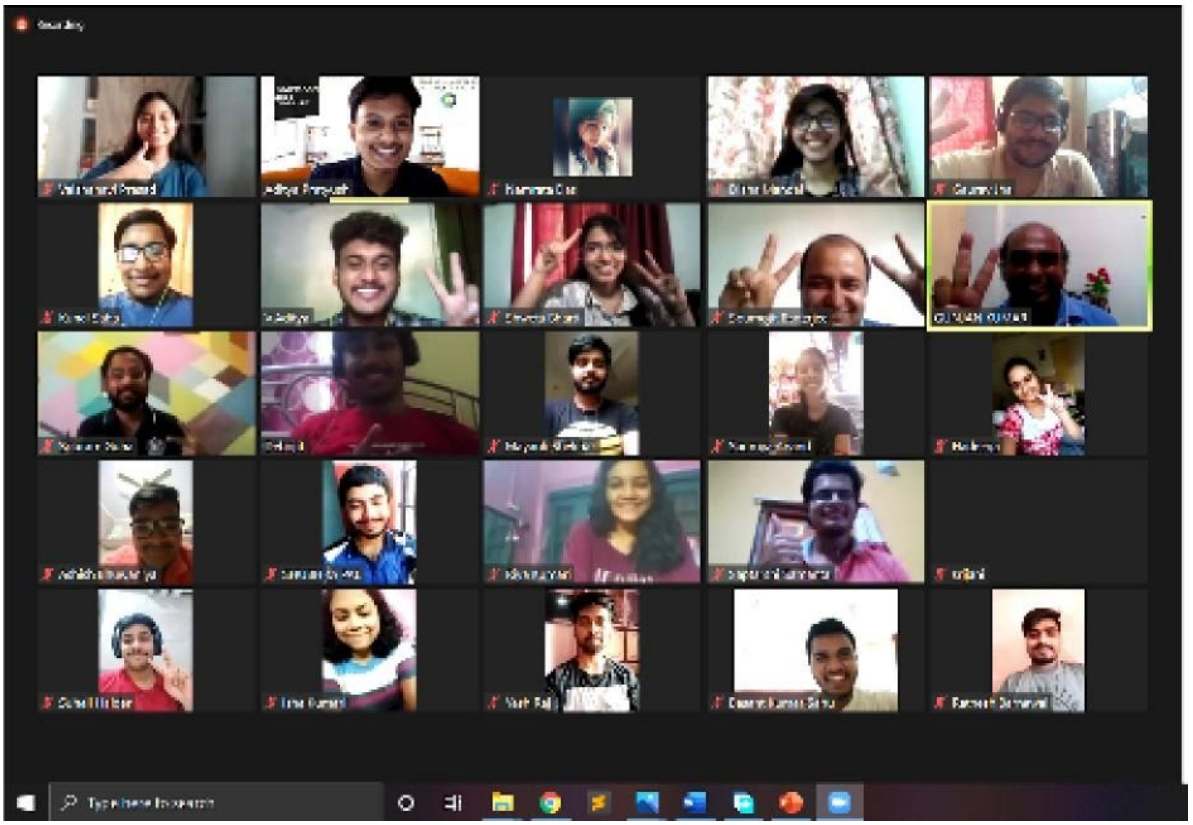
Team Quest Endeavour, consisting of Amulyan Bhargow and Aman Kumar, both from ME-4th year, secured 1st position. Mr. Soumojit Banerjee- President ISHRAE Kolkata and Mr. Shuvam kangsabanik CWC Member & Youth Chair, ISHRAE Kolkata were the chief guests of this event.

GLIMPSES OF BBG QUIZ



PRIZE DISTRIBUTION & CLOSING CEREMONY:

Later on, the Prize Distribution Ceremony was held followed by the Closing Ceremony. Mr. Amitabha Sur, National President Elect, ISHRAE, Mr. Soumojit Banerjee- President ISHRAE Kolkata and Mr. Gautam Mukherjee, Regional Director, East ISHRAE were the chief guests of the Prize Distribution Ceremony. Mr. Gaurav Kumar, Mr. Souram Guha, Mr. Arka Majumdar and Mr. Shuvam Kangsabanik was present as the chief guests in the Closing Ceremony along with around 20 alumni, professors and industrial experts.



The event was a huge success and benchmark creator as around 260 students participated and 68 students received awards. Certificate for participation was provided to every participant by ISHRAE Kolkata. Organizers received special organizing certificates.

We are delighted with the overwhelming involvement of the sheer number of participants engaged with this event to make it a grand success. We appreciate everyone's effort.

TAAPMAAN FEEL THE HEAT 2020!

2.*TECHNICAL TALK*

TECHNICAL SESSION ON- "Art and Science of Air Distributions with unique Fabric Ducting solutions"

VENUE: GoTo Webinar App.

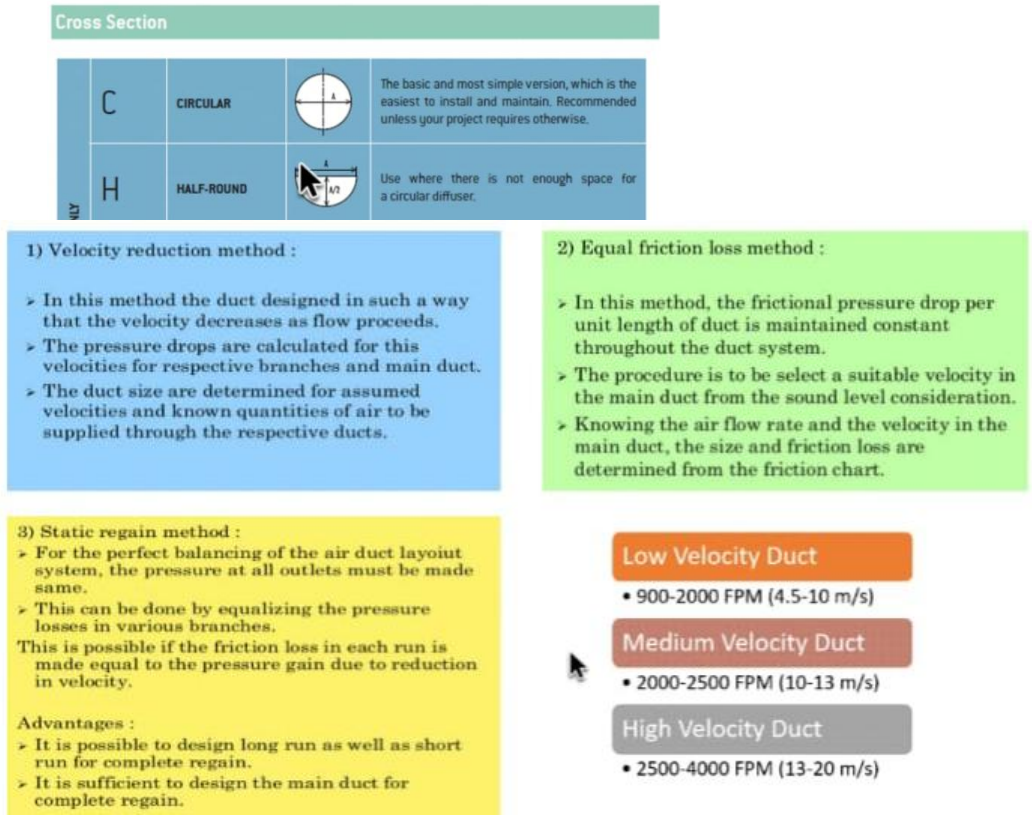
DATE: 24th of April, 2020

TIMING: 5:00 pm - 6:30 pm

Gathering: The Technical session was delivered by **Mr. Ulhas Vatpal** (Managing Director Prihoda India Pvt.Ltd). He is a Mechanical Engineering with MBA in Sales & Marketing having 14+ experience in HVAC & R segment. The Talk was attended by Prof. Gunjan Kumar, Dept. of Mechanical Engineering and above 50 students, **Institute of Engineering and Management, Kolkata.**

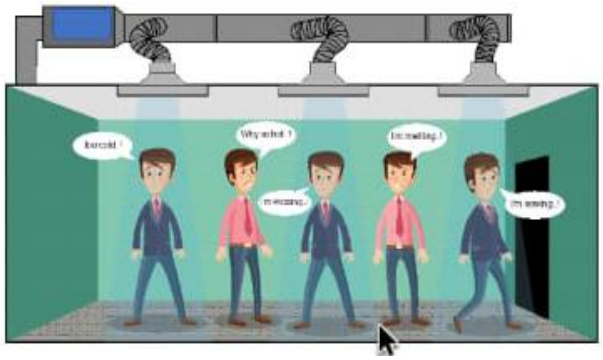
ISHRAE society never fails to provide great learning opportunities to the students even in the worse situations. And so various Technical sessions are being held amid this lockdown to enhance and enrich our knowledge. Having the same motive, we had a very technically rich session conducted successfully on 24th April,2020 on the topic **"Art and Science of Air distributions with Unique Fabric Ducting solutions".**

LEARNING FROM THE TALK: At first the session began with the discussion on what is duct and it's types. Basically Ducts are conduits and passages used in Heating ,Ventilation and Air conditioning. Later on the speaker started with the



three types of duct design methods. There are different shapes and designs of ducts based on the area of installation.

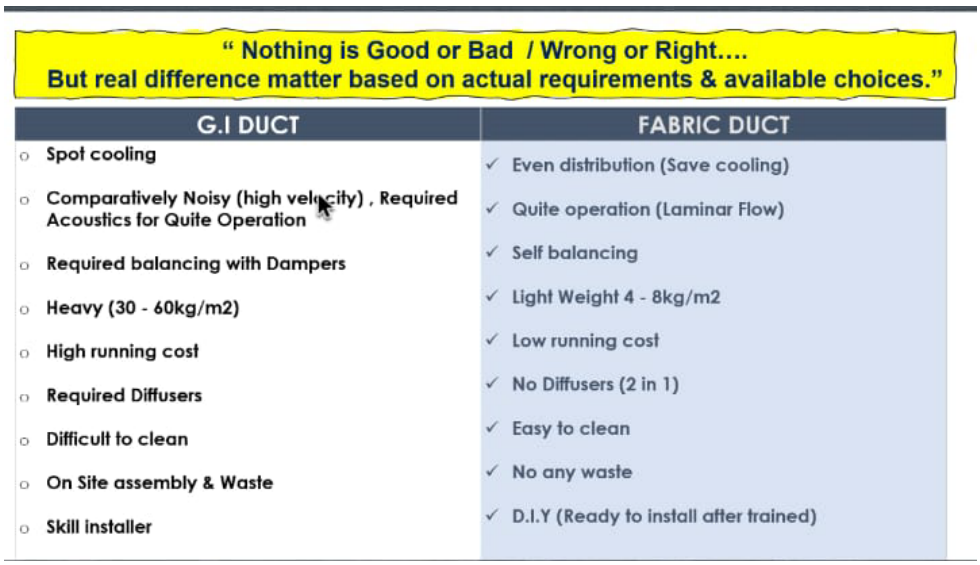
Uneven distribution of air through the nozzle emerges to be one of the great challenges in the duct design system. It is possible that despite having diffusers at different locations in a room, it may fail to cool the entire room uniformly. To overcome such problems **Fabric ducting** was introduced.



Un Even Air Distributions Spot Cooling – Discomfort Conditions

Further we learned about the different cross sectional shapes of the fabric duct i.e. which cross section would be more appropriate as per the location of installation like if it is to be installed at the edges or corners of the walls, shown in the below picture.

Comparison between **GI duct** and **fabric duct** was described.



Benefits of Fabric ducting was mentioned. The advantages of using Fabric duct for the users, contractors and the consultants were briefly described.

Proceeding with we learned about Fabric ducts are also included in the room decoration nowadays as it can enhance the look along with better cooling. It can also be used over large areas as it has no limitations of area.

At last the session was concluded with the discussion on maintenance of Fabric duct as its cloth may get contaminated soon. But the advantage is it's maintenance is easy as it can be easily washed in the factory's washing machine. The session lasted 1 hour and then it gave attendees the opportunity to ask questions at the end. They came up with various fascinating questions targeting VFD Automation , filters ,sensors and many more. It was an interactive session, students actively participated and interacted with the speaker.

3.WEBINAR

Topic - VRV basics and System Selection

Date: 11th April,2020

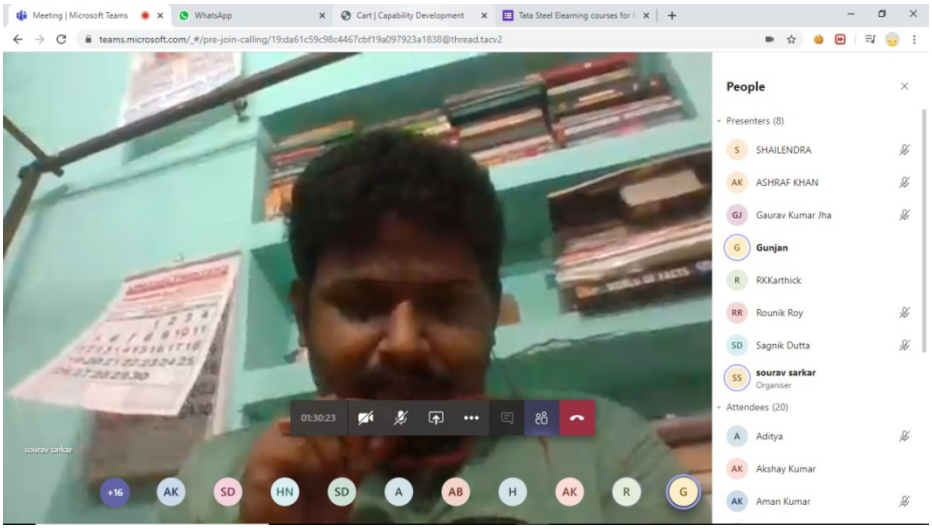
Timing :- 7pm-9pm

Speaker:- Alumni Mr. Sourav Sarkar(Batch 2014-2018, Mechanical Engineering Dept.), presently working in Daikin Air Conditioning India Pvt. Ltd.

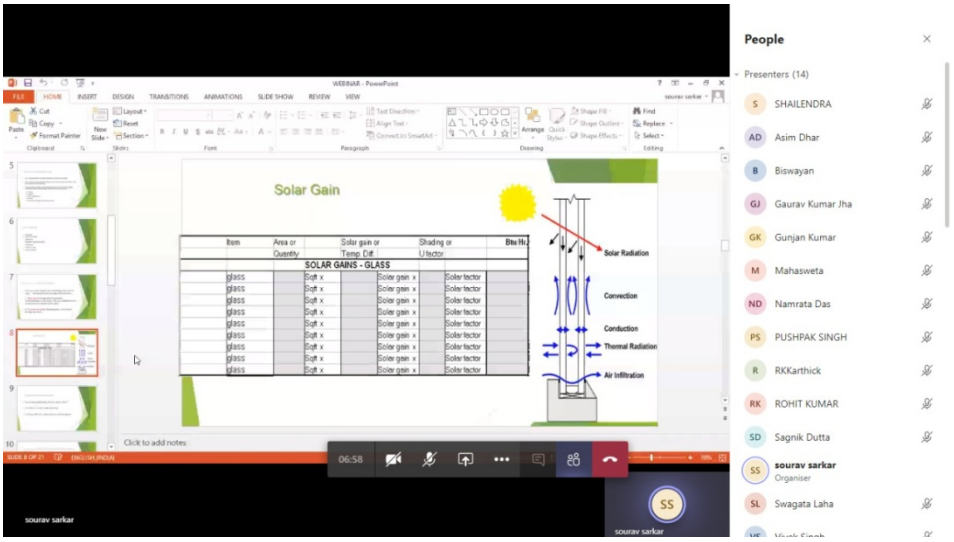
Gathering : Around 40 Mechanical, Electrical and Electrical & Electronics engineering students were present over there.

About the webinar:

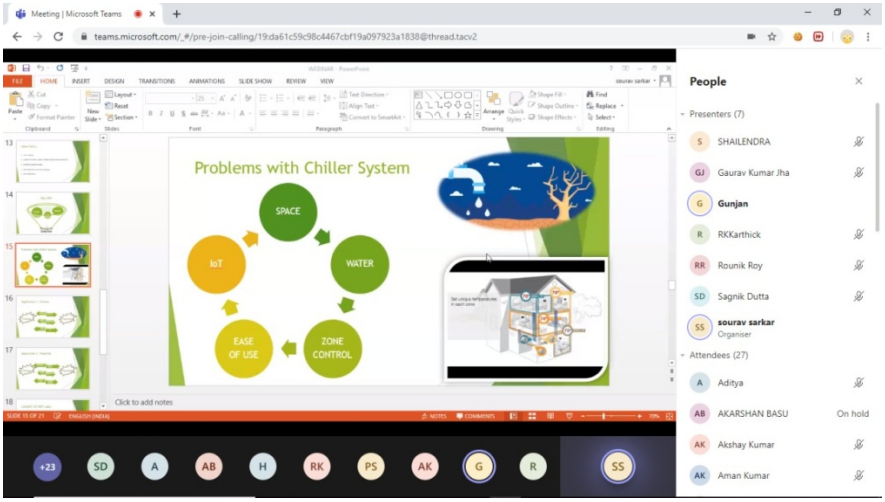
Variable Refrigerant Volume (VRV) is an HVAC technology patented by Daikin Air Conditioning India Pvt. Ltd. Our speaker, Mr. Sourav Sarkar, presently working with Daikin explained VRV basics and System selection in this webinar.



The speaker started off with the concept of sensible heat, latent heat, basics of heat load calculation and explained the factors affecting heat gain/loss in buildings. After that he elaborated about solar and transmission gain and the procedure of that gain calculation.



Then he took upon a practical example of how VRV actually works and why to choose VRV over any other conventional chiller-based system. Unlike conventional chiller-based system VRV systems allow for varying degrees of cooling in some certain areas reducing energy consumption. Then he focused on the concept of part load and its necessity.



The application of VRV is in different areas where cooling and heating demand is time dependent like hospitals and schools. Variable types of patients and timing of operations, variable number of students and timing of laboratory classes need variations in cooling and heating system. So Mr. Saurav Sarkar concluded the webinar by emphasizing on the application of VRV system in hospitals and schools along with the implementation of IOT for better future. The session was an interactive one which helped to learn many new things.

ISHRAE – IEM Student Chapter, Kolkata

WEBINAR ON THE TOPIC: A step to step towards Net Zero Energy Building

PLATFORM: GO TO WEBINAR

DATE: 21st August, 2020 (Friday)

Time: 7pm - 8pm

GATHERING - The webinar was delivered by Mr Ashish Rakheja who is the Managing Partner AEON Integrated Building Design Consultants LLP. He has over 25 years of work and experience, a seasoned consulting engineer who has designed over 2000 projects, including hotels, Airports, Hospitals, Retails , Residential, Commercial, High risks and Industrial projects, his achievements are way more which cannot be jot down in papers. The session was also attended by Prof Gunjan Kumar (department of Mechanical engineering IEM, Kolkata) with the student members ISHRAE. IEM STUDENT CHARTE of Institute of Engineering & Management, Kolkata.

ISHRAE once again came up with an excellent webinar on a step-to-step Approach towards Net Zero Energy Buildings. As always the webinar came up with great learning as provided a practical Industrial Insight.

LEARNING FROM THE TALK - The speaker Mr Ashish Rakheja started with a brief Introduction on what is actually Net zero- Energy means taking examples a building with no utility bills, A building standalone from grid, No cost for cooling or heating, limitless utilization of natural resources, A building with minimal carbon footprint, An Earth friendly Buildings i.e., a net zero energy building. Then he gave an insight on how early experiments took place in India with Net Zero energy.

After then the discussion was on Net zero buildings, which mainly focuses on 4 areas, 'Net Zero Energy, Net Zero Water, Net zero waste, Net Zero Carbon.

Then a minimum briefing of all the 4 major areas, but the main discussion carried forward on "Net-zero" energy building, how the amount of energy provided by renewable energy is being completely utilized by for building, how the net zero cost is being achieved and most important was how the carbon emissions generated are being balanced by the amount of on-site renewable

energy production. Then the cost of energy efficiency measures was discussed which should be taken care of during the construction, we need to understand

the climate of the place, its history, also its Vastu Panchabhutas. After then we got to know about the First Net Zero energy office building, which is in Greater Noida.

It is one of the greenest buildings in India scoring a total 63 LEED points out of possible 69. Then we were told about how the construction of the building took and the measures like Orientation, Roof Insulation, Wall Insulation, Windows Assembly, Interior lighting, day lighting Occupancy sensors, external lighting, efficient misc. equipment, demand Control Ventilation, Efficient Pumps, electricity Generation of the building was discussed in brief.

After then a Case study of the first Net Zero Energy Home (**SHUNYA**) was discussed, how it was constructed we got to know How the solar panels were used, It consisted of solar Photovoltaic Roof, Double Glazed Panels, Wooden deck, Solar shading insulated panels etc.

Then the discussion took place of on-site solar Shading Analysis, Annual solar Radiation Analysis, strategies for Pedestrian Walkways, Material selection for unshaded open areas & Pathways, Material selection for unshaded open Areas, about parking Strategies, Urban heat Island Reduction Strategies.

After then a brief discussion on AEON CORPORATE OFFICE was done which is the speaker's own office. Everything including its construction of cover floor, upper floor, about its water efficiency etc. was discussed.

After then a discussion of Available rating System of Net Zero energy buildings that is IGBC, LEED was discussed, about the projects Certified in India by

IGBC. Then finally a small overview on Plant -13 Godrej Boyce, Mumbai and Globicon Terminous, Navi Mumbai was given.

The webinar ended well and at the end fee speak cleared the doubts of everyone regarding the top and also incorporated a sense of vision in us regarding Net Zero Energy. It was an enriching session for students.

ISHRAE – IEM Student Chapter, Kolkata

Webinar on AC System Selection & Design Approach

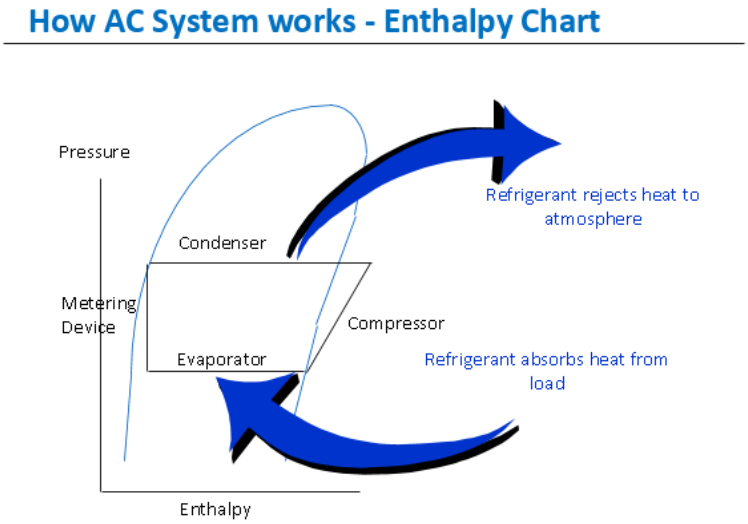
VENUE: zoom

DATE: 22nd August, 2020

TIMING: 5:00 pm - 7:00 pm

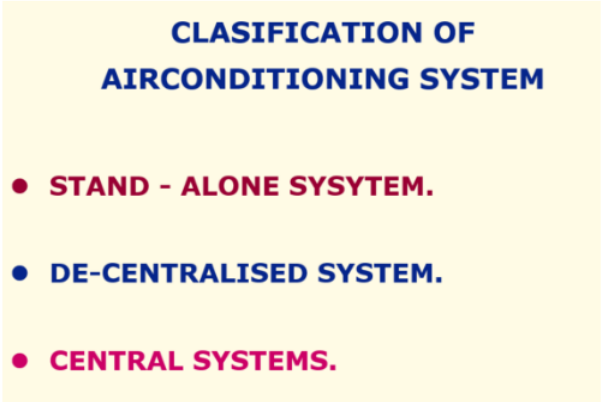
GATHERING: The Technical session was delivered by **Mr. Prateek Dutta Roy, Chief Engg. Manager, Larsen & Toubro Ltd**. The webinar was attended by Prof. Gunjan Kumar (Dept. of Mechanical Engineering), other alumni and the students of **Institute of Engineering & Management, Kolkata.**

LEARNING FROM THE WEBINAR: At first the session began with discussing the various agenda points and then following the same, the talk proceeded. We learned the necessity of Air Conditioning System, the working of commercial AC systems, the basics of an Air Conditioning System, part load efficiency any many more. The speaker gave a brief introduction of all the topics mentioned above. Then further proceeding the speaker described what enthalpy is and gave an overview of the enthalpy chart including various steps involved.



Then the speaker described the Chilled-Water System Components and also explained what indoor air loop is, how the same air is circulated in the

conditioned space with a fraction of fresh air. Then he elaborated about the internal parts of a centrifugal chilling machine and its working. Then he gave a brief talk about typically chilled and condenser water piping schematic in an AC system following the classification of Air Conditioning System.



Then the speaker stated about the human comfort conditions, why we need fresh air in a condensed space and the geographical conditions of the fresh air content in our country. The comparison of which can be seen in the picture below.

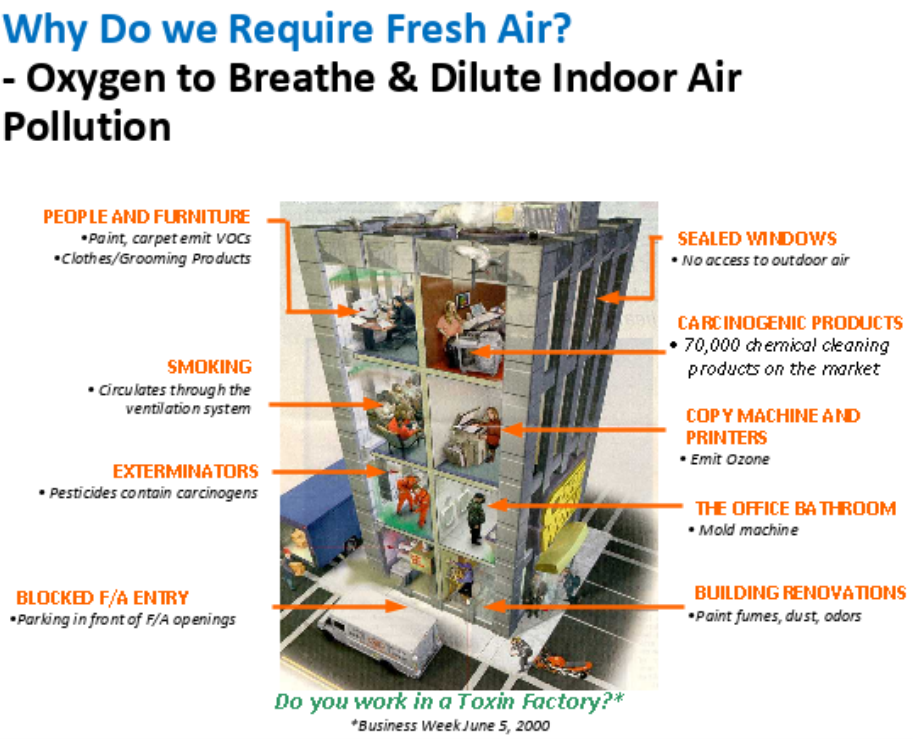
Fresh Air Load in Summer & Monsoon for major Indian Cities

	SUMMER CONDITION			MONSOON CONDITION		
CITY	Cooling Load (TR)	Fresh Air Load (TR)	% Fresh Air Load	Cooling Load (TR)	Fresh Air Load (TR)	% Fresh Air Load
Ahmedabad	31.52	7.25	23.0	37.19	14.04	37.75
Bangalore	25.28	1.85	7.3	29.39	6.48	22.05
Chennai	33.99	10.34	30.4	37.89	14.81	39.09
Hyderabad	29.03	5.09	17.5	32.5	9.56	29.43
Jaipur	29.65	5.40	18.2	35.25	12.19	34.57
Kolkata	32.81	9.26	28.2	38.59	15.58	40.38
Lucknow	31.38	7.40	23.6	37.26	14.19	38.09
Mumbai	29.15	5.71	19.6	35.82	13.04	36.39
New Delhi	30.83	6.48	21.0	36.74	13.73	37.37
Patna	30.56	6.48	21.2	37.94	14.81	39.03
Pune	26.72	2.78	10.4	31.11	8.33	26.78
Vizag	34.07	10.80	31.7	38.01	14.96	39.37

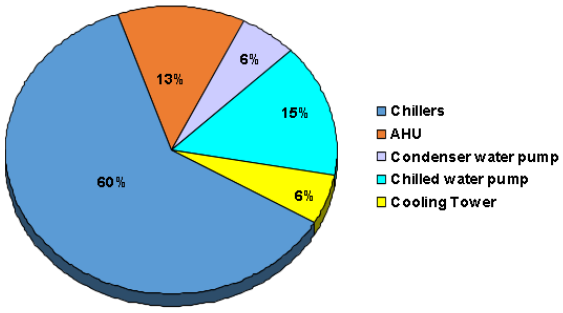
In a standard comfort application Fresh Air is only about 10-12% of the total air circulation

DATA CONSIDERED FOR HEAT LOAD CALCULATION:			
Area (Office)	10,000 ft²	Equipment Load	2.0 W/Sqft
Occupancy	50 ft2/Person	Fresh Air (as per Green Building norms)	30% more than ASHRAE 62.1 2007
Lighting Load	1.1 W/Sqft	Room Condition	75 deg.F, 55% RH

Source: Temperature Conditions from NBC-2005



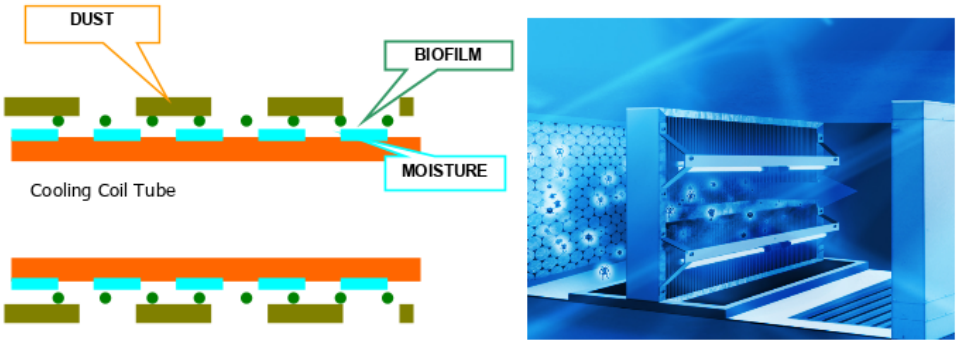
Then we learned how to improve overall energy performance and how to conserve energy for the Air Conditioning System as energy conservation is a hot topic nowadays. He then also gave a brief note on the overall chiller plant efficiency, then a brief note on the chilled beams and gave a brief description about typical underfloor air distribution layouts and advantages of underfloor Air Distribution.



Typical Under Floor Air Distribution Layouts

Then we moved on with the energy savings through VAV System and UVC Emitters at AHU coil outlet, here the speaker explained about its importance, how it is very useful in protecting the coils from dust and biofilm formation ensuring no microbial growth on the coil, keeping it clean.

UVC Emitters at AHU Coil Outlet



Installation of UVC Emitters does not allow Bio film formation on Coil Surface
Eradication of bio film ensures no microbial growth takes place and coil remains continuously clean
Drain Pans, Plenums and Ducts also remain clean

The session continued further covering the topics of IPLV, magnetic levitation, ECBC guidelines, de-couple refrigeration system, and many more. The speaker covered almost all the necessary topics in the system design that were required.

He started with the very basics and pulled up to very important concepts. It was a good interactive session; students actively participated and interacted with the speaker. The session lasted for more than 2 hours which were no doubt completely fruitful for the attendees.

ISHRAE IEM STUDENT CHAPTER

TOPIC OF THE WEBINAR: "AIR CONDITIONING SYSTEM FOR AN IT COMPANY (NSDC Problem statement discussion)"

VENUE: Go to webinar app

TIMING: 29TH AUGUST 2020(SATURADAY) FROM 7:30PM-8:30PM

"Engineering is the art of the science of making practical"

Keeping this in mind ISHRAE always brings opportunities for students to gain practical knowledge with industries expert. This time ISHRAE provides us a webinar on AIR CONDITIONING SYSTEM FOR AN IT COMPANY to enhance student's knowledge in this domain.

GATHERING: Mr. Prabir Kumar Sen, the most esteem and one of the wise Member of ISHRAE Kolkata was the speaker for the very webinar.He has done his graduation and Masters In Mechanical Engineering from Regional Engineering College (now National Institute of Technology), Durgapur, and has over 44 years of experience in the HVAC Industry. Currently, he is working as a Consulting Engineer and Advisor in the field of HVAC.

During his long career in the industry, Mr. Sen has worked as Associate Vice President with Sterling and Wilson Ltd, as Regional Business Development Manager with Voltas Ltd, as Chief Engineer with Development Consultants Ltd, Kolkata.

Mr. Sen has also worked with The kuljian Corporation, USA and Egypt and with Samsung Heavy Industries, South Korea.
Mr. Sen was a member of the Board of Governors of National Institute of Technology, Durgapur and a past President of the Association of Ventilation Engineers.

Mr. Sen is a life member of ISHRAE. He is regular speaker in ISHRAE, And is closely working on disseminating knowledge amongst young engineers and students. Mr. Sen has over a dozen of technical publications in Indian and International journals. He has also presented papers in many technical seminars.

LEARNING FROM THIS TALK: The webinar began with the problem statement that was Design an IT company with (500PAX), will consist of 15 ODC (off-shore developments centres), 20 PAX conference room-1no, 50 PAX training room-1no,12PAX meeting room - 4no, 2PAX room meeting room- 4no, general manager room-1no. Admin manager Room -1no, Server room -1no, 4 wash rooms for male , 4 wash room for Female , 2 Toilets for differently abled person , Breakout area-2no (15PAX Each) and first aid room-1no.
Thrust area: Energy efficiency and IAQ.
Problem understanding and designing basic Development.

Here's,the attachment of basic design development picture of an Indore design of IT company where all the 500PAX available

1.offshore Development Centre: The offshore development center is an office dedicated to fulfilling the software requirements of a company. You can set up your offshore office anywhere around the globe. However, businesses prefer to pick a country where the cost of living is lower in comparison to their native country.

2.Confrence room: They offer private space for larger meetings, provide an area to discuss confidential topics, and accommodate formal gatherings. A home to meetings and collaborative sessions, **conference rooms** are a key component of your office. They are home to collaboration and a spot to make a **design** statement.

3.Training room: Training rooms are much more than spaces where employees come to sit and learn – they're dynamic environments where people meet, learn, share **ideas** and collaborate.

When **designing** a **space** to accommodate such a wide range of activities, it can be hard to decide which aspect of the **design** should take priority.

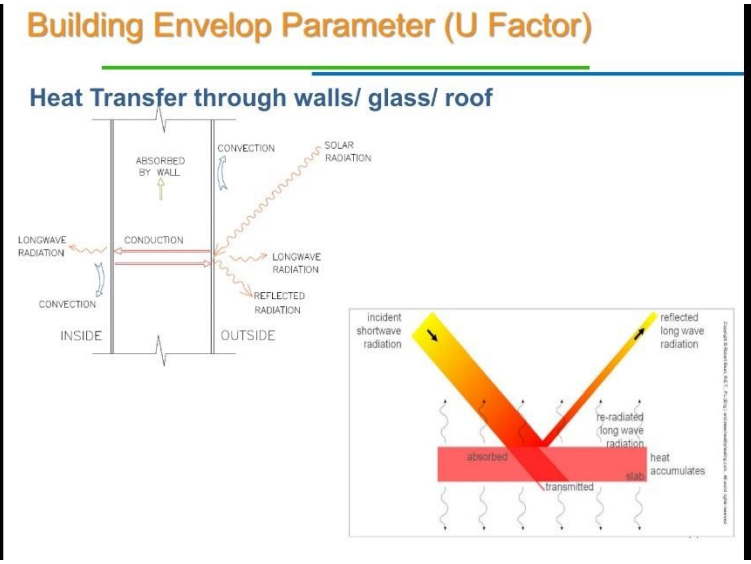
4. Breakout area: An office **breakout area design** is a method of embodying the culture of a company and creating time for team interaction away from a desk, but within the workplace. ...

Design basic report: In the IT companies the basic report is the DBR shell consist scope of work, outside design condition , inside design condition, building envelop parameters – U values for walls , roof, and the glasses, and sheading coefficient and SHGF, occupancy analysis, internal load- lighting and equipment, ventilation rates, diversity factor cooling load summary , purpose system, equipment selection- high side and low side with equipment schedule, purpose energy conservation measure, indoor air quality target, fresh air distribution strategy, fresh air ventilation strategy for toilets and pantry, electrical power supply and DG back up, interlocking with a fire protection system,

FOR THE OUTDOOR DESIGN CONDITION for an IT company we can refer to data provided in ASHRAE/ISHRAE/NCB 2016 WEATHER DATA

For Inside design condition we will refer to the data from ASHRAE 55 thermal comfort conditions , where we have to apply the graphic values and that will be taken from ashrae hand book during covid 19 we have to follow guidance documents for Air conditioning and ventilation suggests by which the room temperature between 24◦c and 30◦c maintain relative humidity between 40% and 70%.

U FACTOR the u factor is basically gives resistance of the walls/glass/roof through which heat transfer in the indoor condition.



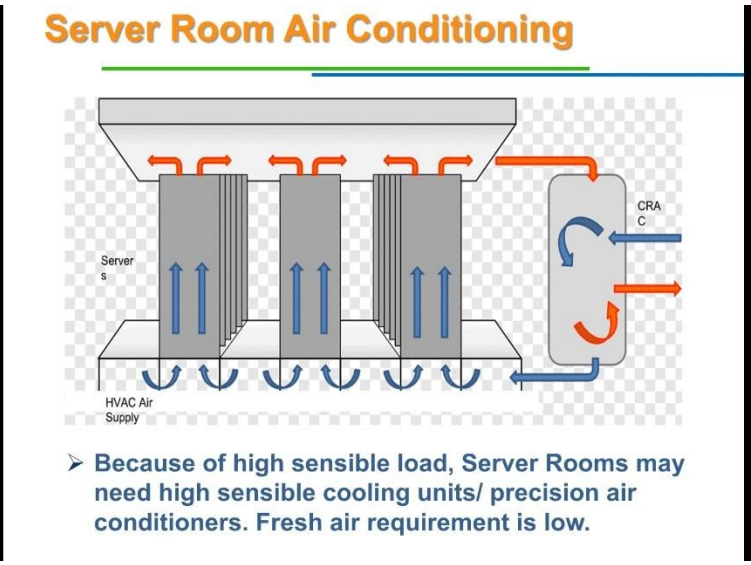
OCCUPANCY ANALYSIS it is basically decide the occupancy in the room and indicate in a tabular form

LIGHTING LOAD in the IT company the lighting load is also a factor which is deciding factor and for the many appliance it is used it is factor which effect the total load and the multiplying factor power by 1.12 obtain total heat dissipation

For the INDORE VENTALITION rate NCB 20167 suggests 5 cfm per person and 0.06 cfm/ft^2 but ISHRAE Covid 19 Guidance documents for air conditioning and ventilation suggests 5 cfm per person and 0.6 cfm per sq ft.

SERVER ROOM AIR CONDITIONING

Because of high sensible load, server room may need high sensible cooling units/ precision air conditioners. Fresh air requirements is low.



AIR FILTRATION STRATEGY & IAQ fresh air apply to the office may be centrally pretreated through dedicated outdoor air system(DOAS).

This will help in achieving the desire indoor air quality levels in the office and also maintain positive pressure that will prevent the pollunts from entering the space.

For the energy conservation will follow the same rule as per convenience.

ISHRAE IIEM STUDENT CHAPTER

WEBINAR ON THE TOPIC: Day lighting simulation software exposure and ECBC compliance for day lighting

VENUE: Zoom App

TIMING: 17th September, 2020 from 4:00pm to 6:00pm

Gathering:

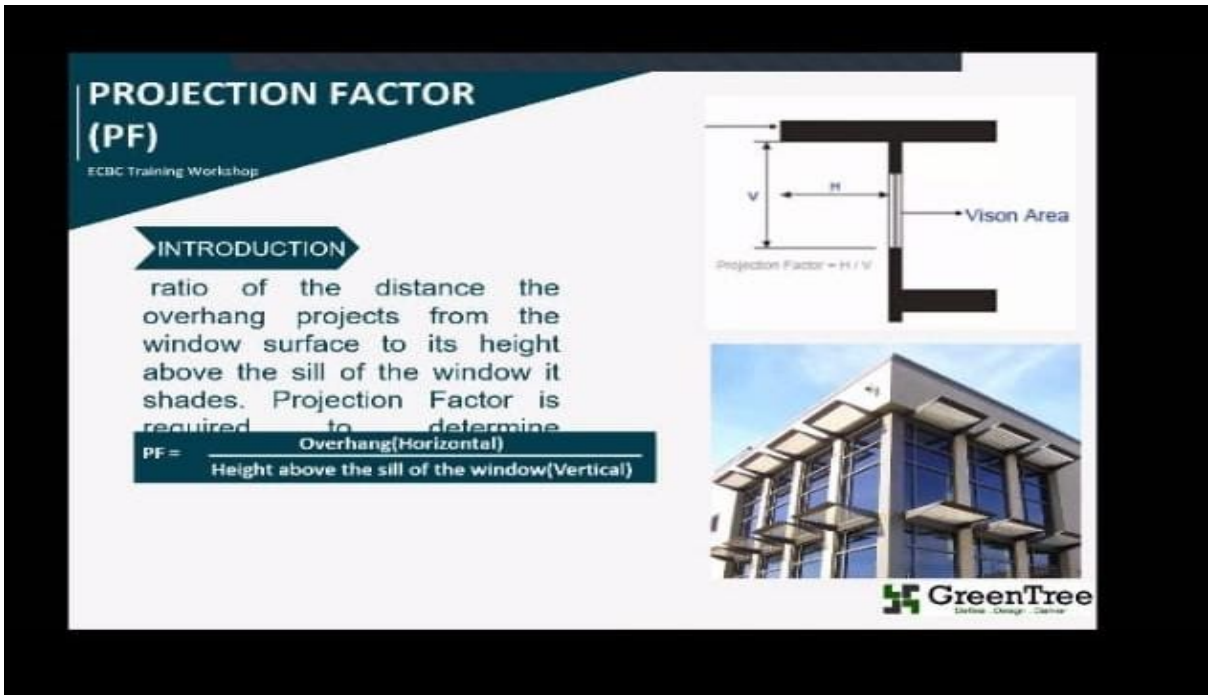
The technical session was delivered by eminent speaker **Mr. Irfan Ayas** (WBECBC Cell Member, Green Tree). He has a B. Tech in Mechanical Engineering and M. Tech in Energy Engineering Specialized in Energy Management & Audit. He has professional experience in Green Building, ECBC & Energy Efficiency field. He was accompanied by **Ms. Shreya Lahiri** (WBECBC Cell Member, Green Tree). She is an Architect, and she masters in sustainable architecture. She has more than 5 years of professional experience in the field of green building and currently working as an sustainability Architect. We also had **Mr. Arkadeep Dey** (WBECBC Cell Member, Green Tree). He has a B. Tech in Mechanical Engineering and a MBA in public system specialized in Energy Management, IGBC AP. Professional experience in Green Building, ECBC & Energy Efficiency field. The talk was attended by Prof. Gunjan Kumar (Asst Prof, Mechanical Engineering) and along with a participation of around 30 students.

Learning from the talk:

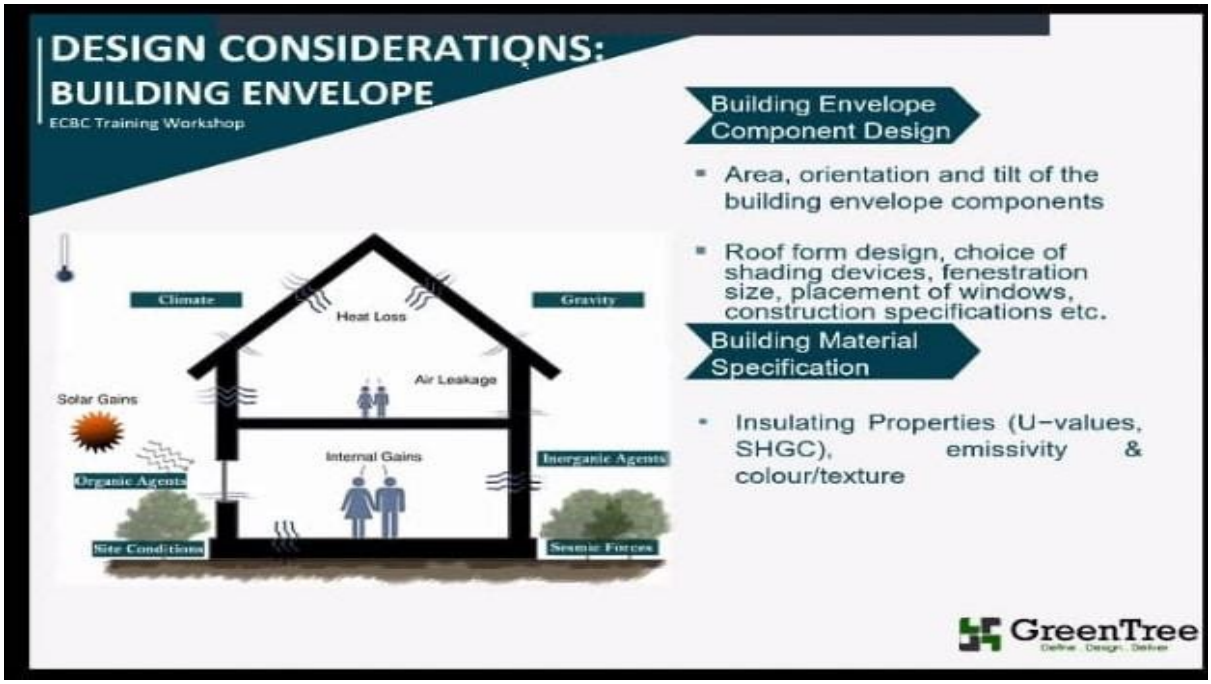
The session started with the basics of Lighting, how much part of our energy consumptions does it constitute? ECBC requirements were discussed which mainly comprised of following points:-

- Space Function Method
- Interior lighting power
- Day lighting control
- Exit signs
- Automatic lighting shutoff

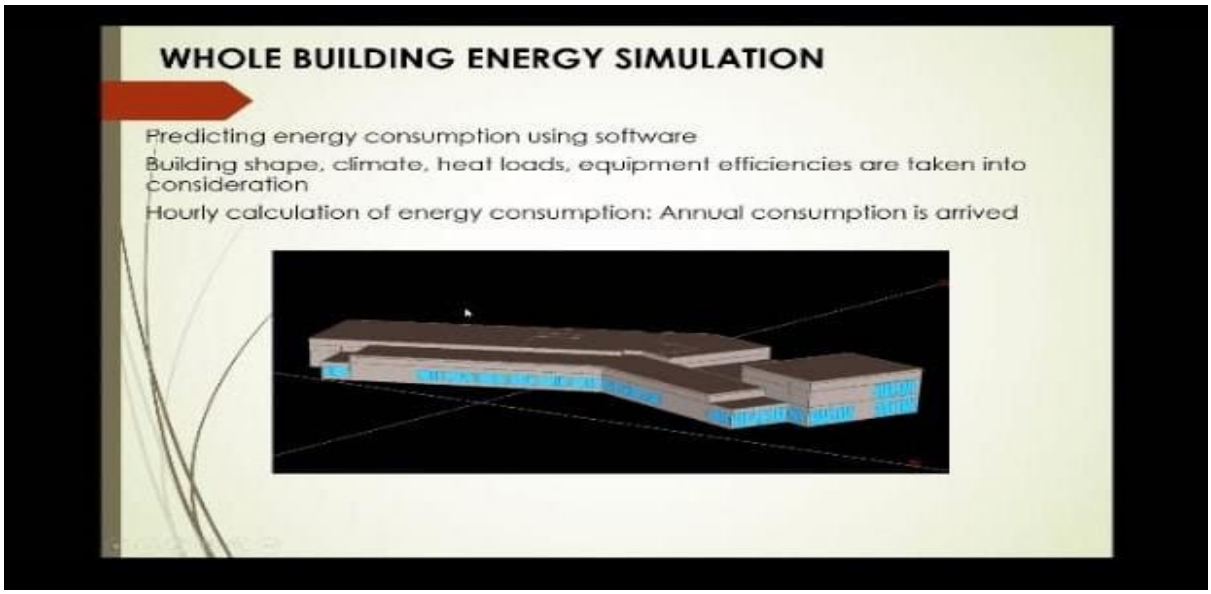
Places where lighting requirements can be applied were also discussed. It was further carried on by discussion of Projection Factor.



Design considerations were also discussed, in which building envelope component design and building material specification were discussed.



It was followed by discussion of energy simulation of whole building. Here concept of prediction of energy consumption using software was introduced.



The technical specification for this approach was discussed, which consists of:-

- Building envelope
- Comfort systems & controls

After this energy conservation measures were elaborated by the speaker. Energy conservation measures (ECM) is any type of project conducted, or technology implemented:-

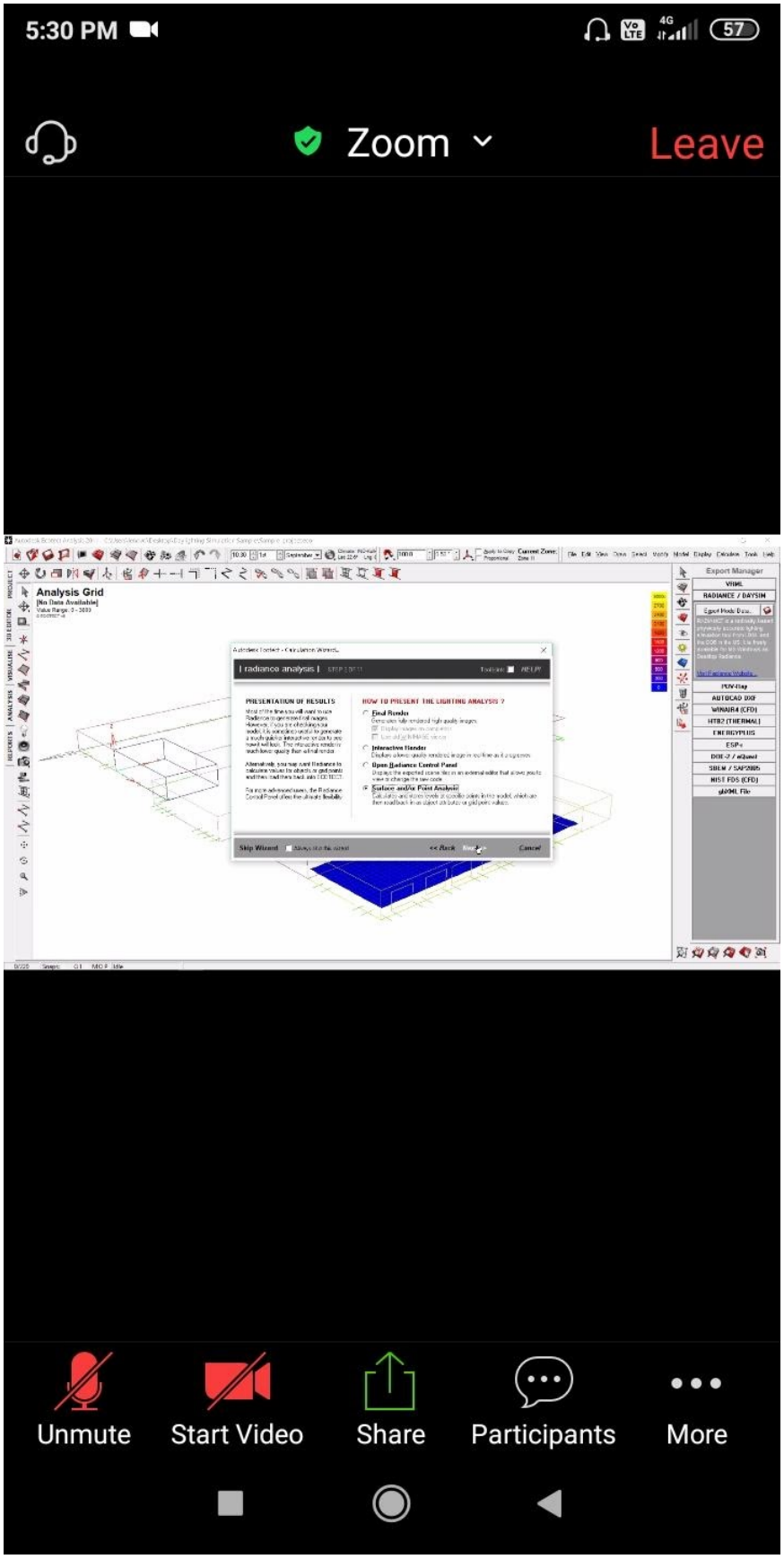
- To reduce the consumptions of energy
- To implement technology or facility
- To reduce utility costs
- To achieve a maximum savings

Moving towards the Daylight Simulation process and software, the speaker presents and demonstrated some important key points and steps.

- **Software name- Autodesk Ecotect:** A complete tool for the analysis of sustainable design from concept to detail, providing a powerful visual and detailed environmental simulation of building performance.

Ecotect Analysis offers a wide range of simulation and analysis functionality energy building that can improve the performance of existing and new buildings.
Energy, water and CO2 are integrated with the instruments of visualization and simulation in the operation of a building within the context of their environment.

- Import CAD file in .DXF format
- Create windows and doors, if any skylight presents.
- Create zones accordingly to the plane
- Create shade if any
- Input the internal reflectance value for the envelope (floor, Wall, Celling)
- Input the VLT value for windows.
- Select the analysis plan & set the working ht.
- Analysis & determine the % of DA by using Radiance plugin.
- Go to result section to view the final report.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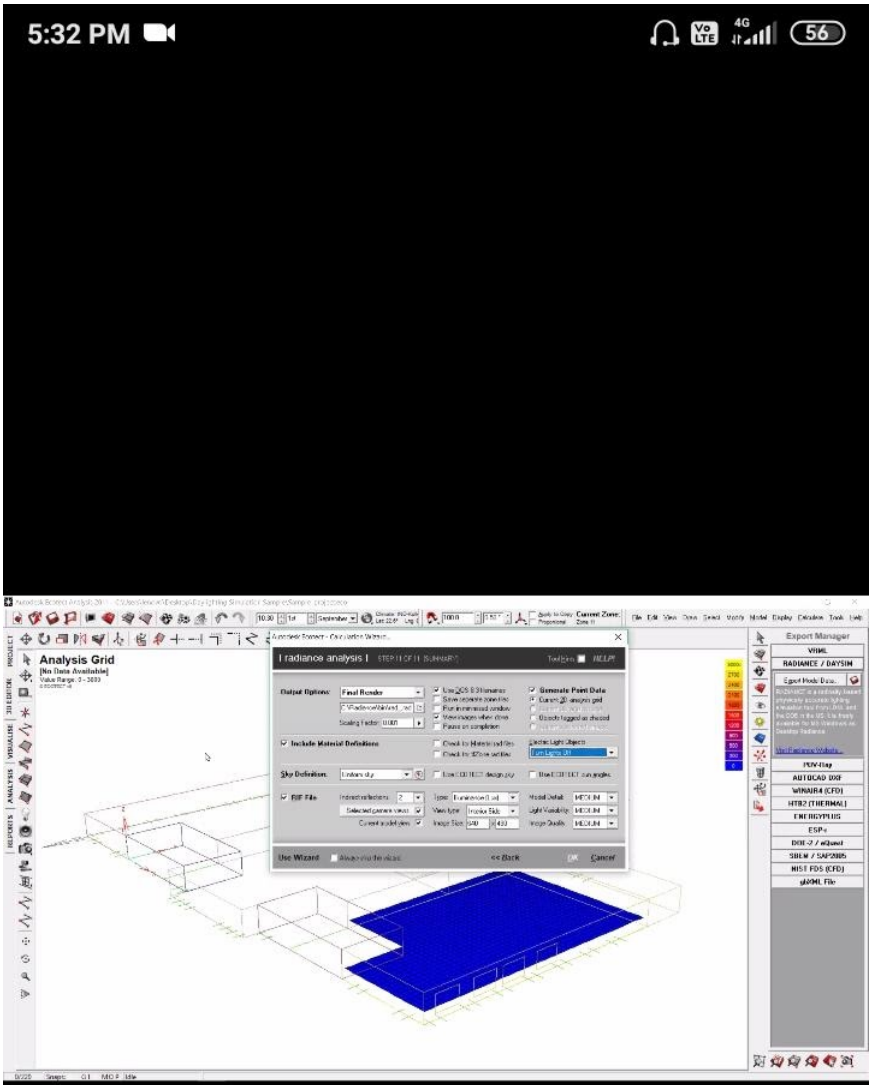
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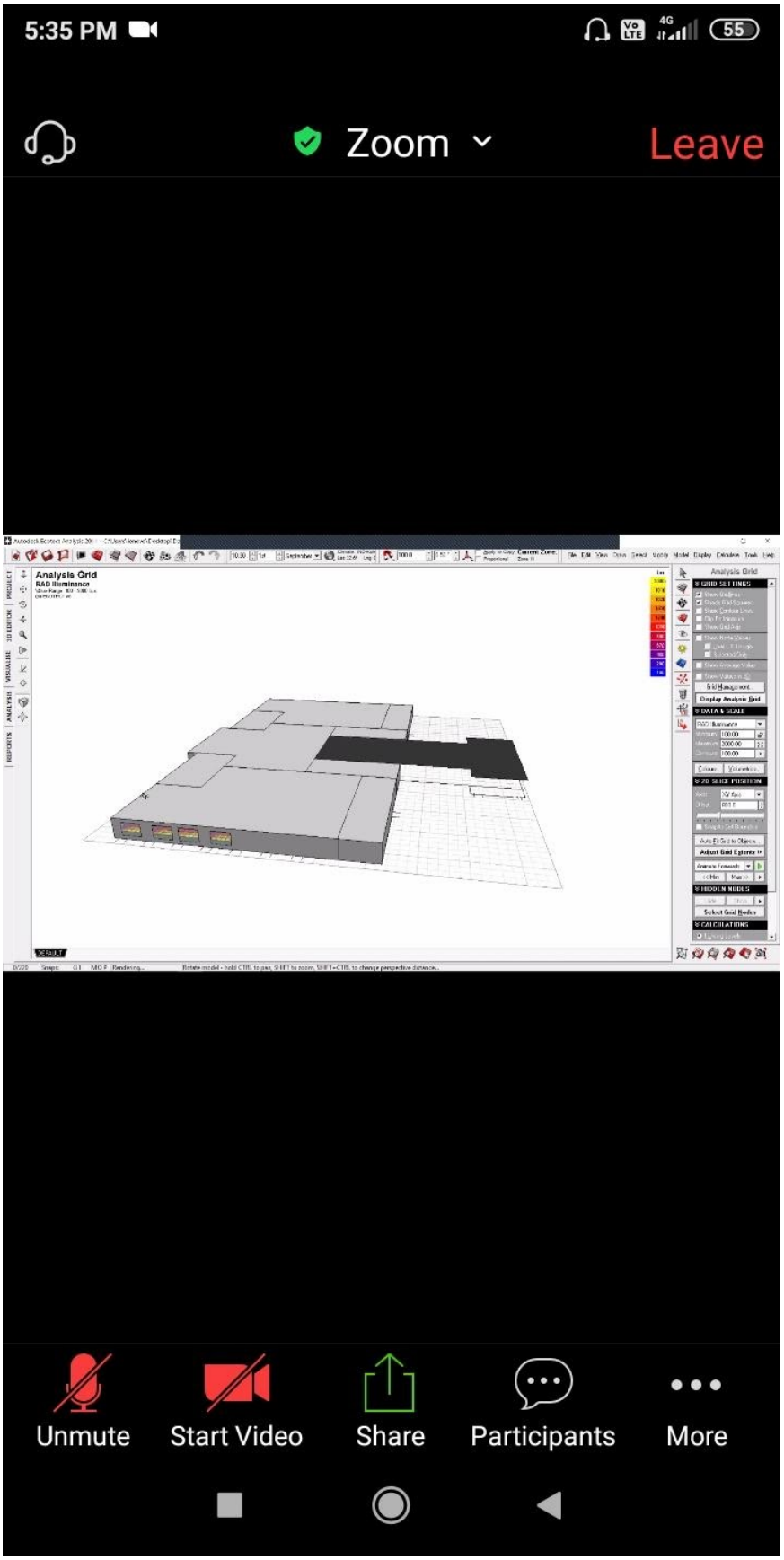
56
Analysis Grid
[No Data Available]
Radiance analysis
Export Manager
VRML
RADIANCE / DAYSIM
AUTOCAD DXF
WINAIRA (CFD)
HTB2 (THERMAL)
ENERGYPLUS
ESP-r
SBEM / SAP2005
NIST FDS (CFD)
gbXML File
GreenTree Global's screen



With this we came towards the end of the session. At last the session was concluded with question answer, doubt clearing and discussion. We the

students were very much benefited from this webinar as this webinar provide us with a lot of innovative ideas.

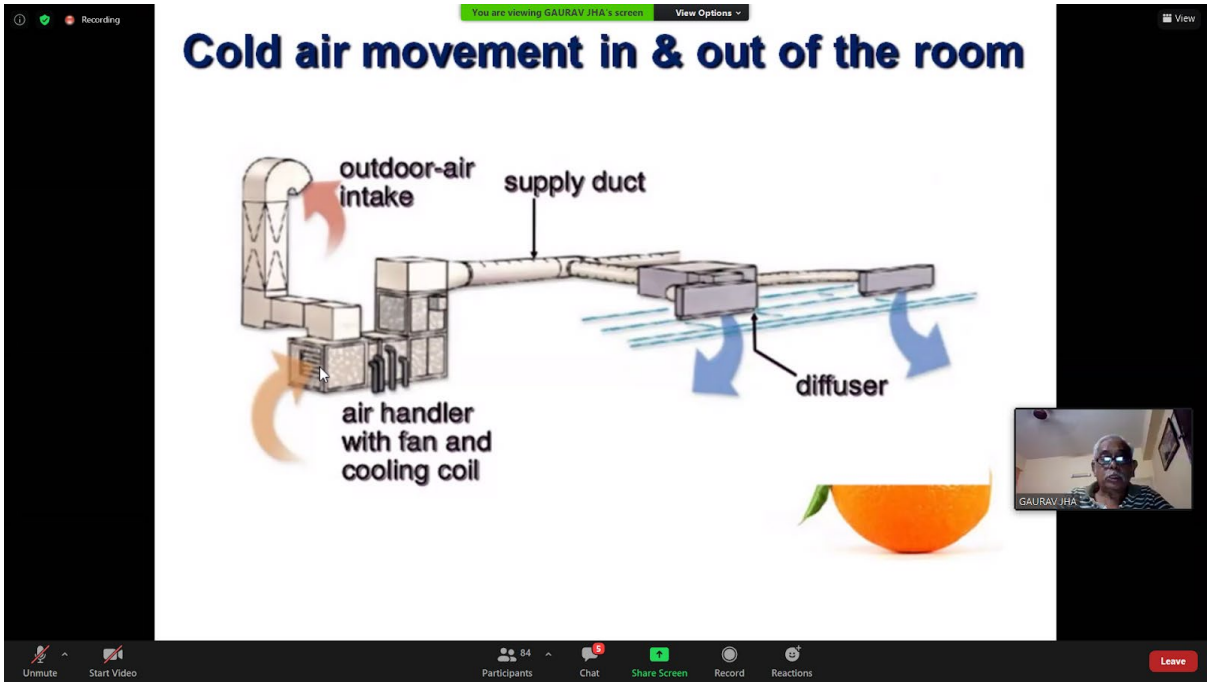
4.WORKSHOP

ISHRAE - IEM Student Chapter, Kolkata
WEBINAR ON THE TOPIC: Heat load Calculation Workshop

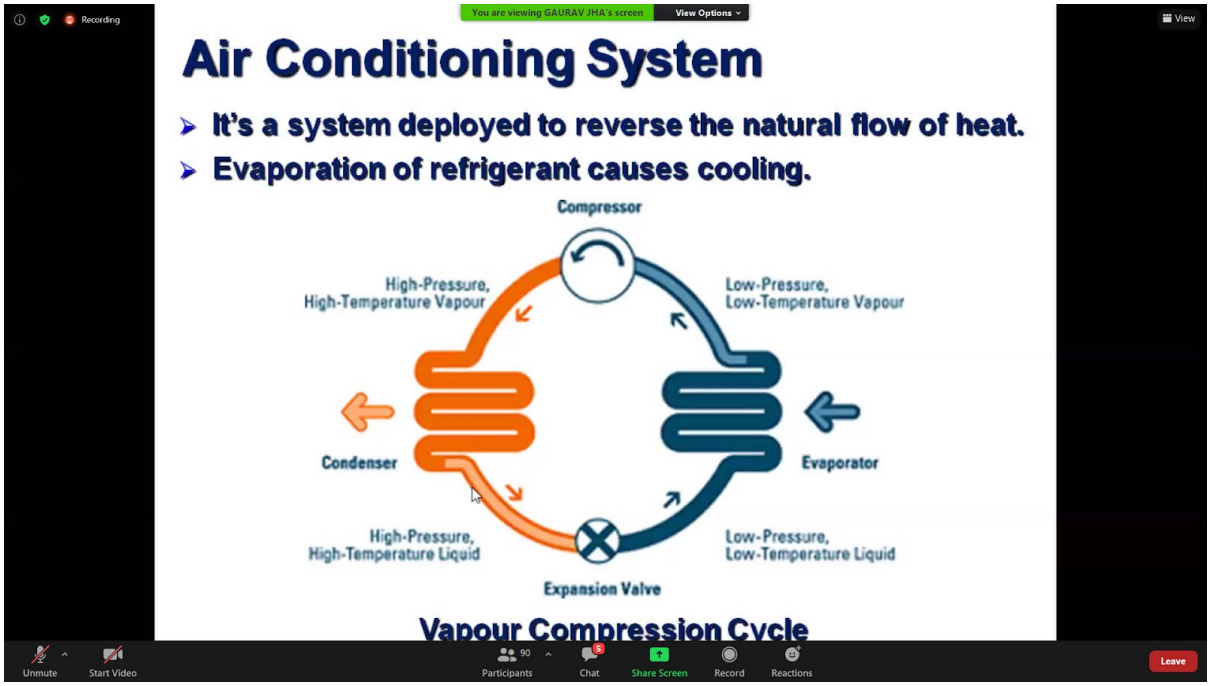
PLATFORM: ZOOM
DATE: 16th October, 2020 (Friday)
Time: 7:30pm – 9:30pm

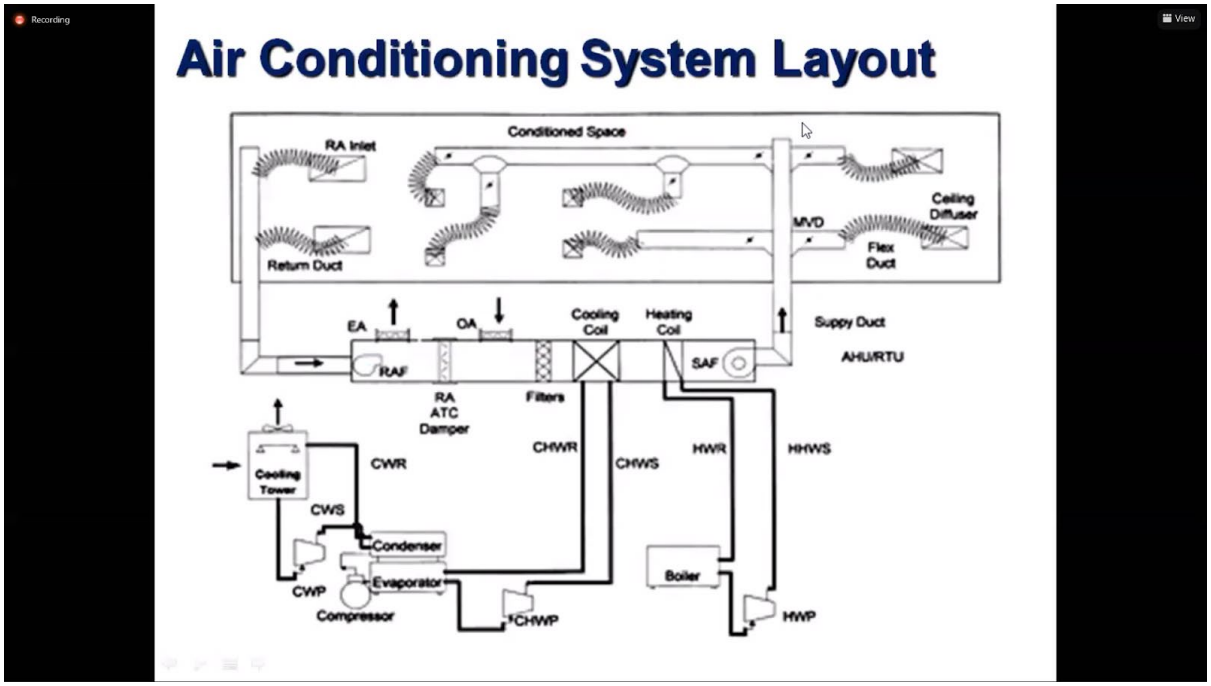
GATHERING - The webinar was delivered by Mr. Prabir Kumar Sen who is a life member and a "distinguished lecturer" of ISHRAE, and also a board member of ISHRAE Institute of Excellence and a member of the Technical Group for Healthcare facilities. He is closely working with ISHRAE student chapters in disseminating knowledge amongst engineering students. He has over

47 years of experience in the HVAC Industry. Currently, he is working as a Consulting Engineer and Advisor in the field of HVAC. The session was also attended by Prof Gunjan Kumar (department of Mechanical engineering IEM, Kolkata) with the student members ISHRAE. IEM STUDENT CHAPTER of Institute of Engineering & Management, Kolkata.
ISHRAE once again came up with an excellent workshop which also provided mentoring for East zone NSDC Participants. As always the workshop came up with great learning experience.
LEARNING FROM THE TALK - The speaker Mr Prabir Kumar Sen started with a brief Introduction on how heat flows in a room and what is Heat load/ AC cooling load/ Thermal load which is the amount of energy that must be removed continuously from a space to maintain desired space thermal condititon. The movement of cold air in & out of the room was also discussed.



Air conditioning System was discussed which is a system developed to reverse the natural flow of heat. Vapour compression cycle was well explained which was accompanied by discussion of Air conditioning System Layout.





Then the speaker discussed Room/ Space Cooling Load which comprised of External loads and Internal loads. External Loads consists of:-

- Heat gain through exterior walls and roofs
- Direct solar radiation through fenestrations(windows)
- Conductive heat gain through fenestrations
- Heat gain through internal partitions & doors
- Infiltration of outdoor air

Internal Loads consists of :-

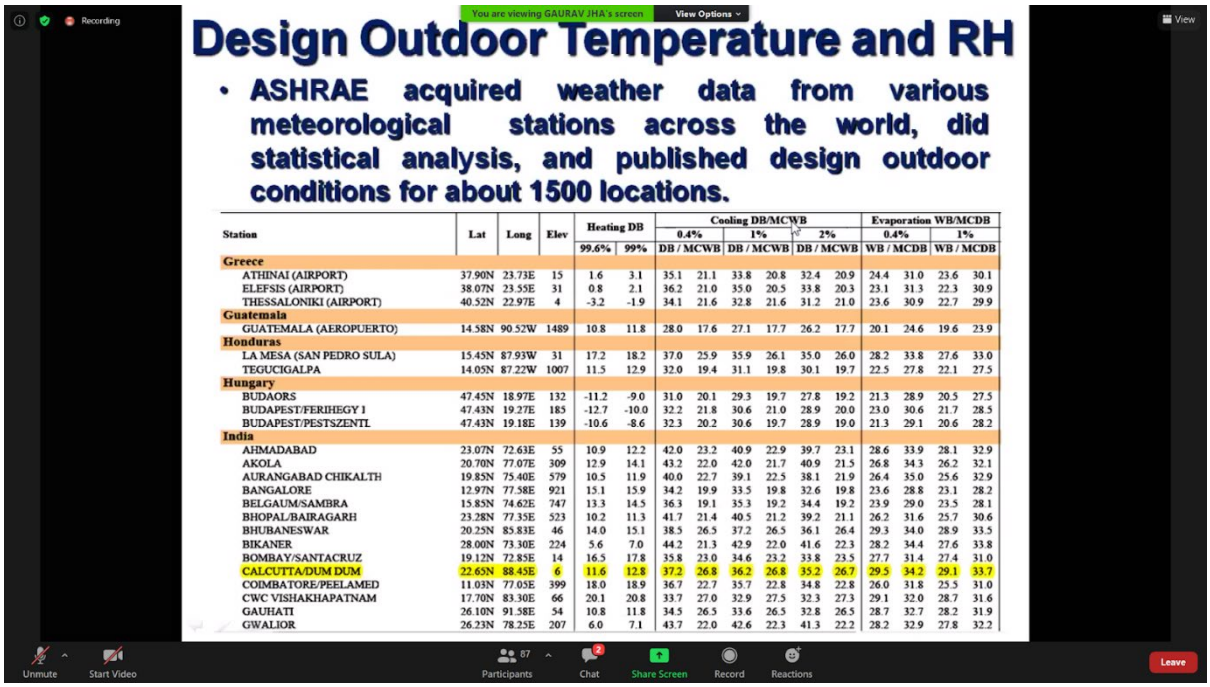
- People
- Electric lights
- Equipment and appliances
- All these, along with the supply air system heat gain (fan + air duct), forms the Effective Room Total Heat, a part of which is Effective Room Sensible heat, and the other part is Effective room latent heat.

The speaker then discussed Cooling coil Load and Bypass Factor. Some of the air (including fresh air), while passing over the coil, bypasses the cooling surface of the coil. The fresh air part of bypassed air adds to Room sensible &

latent heat, whereas bypassed RA is not cooled, and increases the coil leaving air temperature. It is the coil surface temperature required to accomplish both cooling/ dehumidification of air. In an ideal situation, when all the air comes in perfect contact with the cooling coil surface, the exit temperature of the coil due to :

- Boundary layer development as air flows over the cooling coil surface,
- Temperature variation along coil fins, and also

●Because of some air bypassing the coil, while flowing over it.
The speaker then discussed Design Outdoor Temperature and RH. ASHRAE acquired weather data from various meteorological stations across the world, did statistical analysis, and published design outdoor conditions for about 1500 locations.



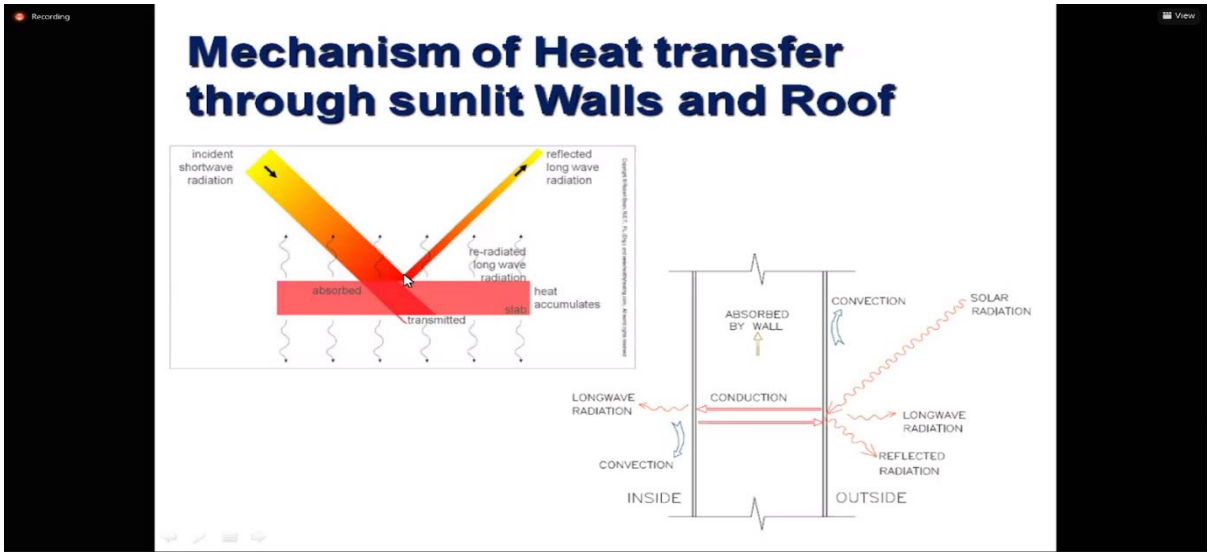
Station	Lat	Long	Elev	Heating DB		Cooling DB/MCWB						Evaporation WB/MCDB			
						0.4%		1%		2%		0.4%		1%	
				99.6%	99%	DB / MCWB		DB / MCWB		DB / MCWB		WB / MCDB		WB / MCDB	
Greece															
ATHINAI (AIRPORT)	37.90N	23.73E	15	1.6	3.1	35.1	21.1	33.8	20.8	32.4	20.9	24.4	31.0	23.6	30.1
ELEFSIS (AIRPORT)	38.07N	23.55E	31	0.8	2.1	36.2	21.0	35.0	20.5	33.8	20.3	23.1	31.3	22.3	30.9
THESSALONIKI (AIRPORT)	40.52N	22.97E	4	-3.2	-1.9	34.1	21.6	32.8	21.6	31.2	21.0	23.6	30.9	22.7	29.9
Guatemala															
GUATEMALA (AEROPUERTO)	14.58N	90.52W	1489	10.8	11.8	28.0	17.6	27.1	17.7	26.2	17.7	20.1	24.6	19.6	23.9
Honduras															
LA MESA (SAN PEDRO SULA)	15.45N	87.93W	31	17.2	18.2	37.0	25.9	35.9	26.1	35.0	26.0	28.2	33.8	27.6	33.0
TEGUCIGALPA	14.05N	87.22W	1007	11.5	12.9	32.0	19.4	31.1	19.8	30.1	19.7	22.5	27.8	22.1	27.5
Hungary															
BUDAORS	47.45N	18.97E	132	-11.2	-9.0	31.0	20.1	29.3	19.7	27.8	19.2	21.3	28.9	20.5	27.5
BUDAPEST/FERIHEGY I	47.43N	19.27E	185	-12.7	-10.0	32.2	21.8	30.6	21.0	28.9	20.0	23.0	30.6	21.7	28.5
BUDAPEST/PESTSZENTL	47.43N	19.18E	139	-10.6	-8.6	32.3	20.2	30.6	19.7	28.9	19.0	21.3	29.1	20.6	28.2
India															
AHMADABAD	23.07N	72.63E	55	10.9	12.2	42.0	23.2	40.9	22.9	39.7	23.1	28.6	33.9	28.1	32.9
AKOLA	20.70N	77.07E	309	12.9	14.1	43.2	22.0	42.0	21.7	40.9	21.5	26.8	34.3	26.2	32.1
AURANGABAD CHIKALTH	19.85N	75.40E	579	10.5	11.9	40.0	22.7	39.1	22.5	38.1	21.9	26.4	35.0	25.6	32.9
BANGALORE	12.97N	77.58E	921	15.1	15.9	34.2	19.9	33.5	19.8	32.6	19.8	23.6	28.8	23.1	28.2
BELGAUM/SAMBRA	15.85N	74.62E	747	13.3	14.5	36.3	19.1	35.3	19.2	34.4	19.2	23.9	29.0	23.5	28.1
BHOPAL/BAIRAGARH	23.28N	77.35E	523	10.2	11.3	41.7	21.4	40.5	21.2	39.2	21.1	26.2	31.6	25.7	30.6
BHUBANESWAR	20.25N	85.83E	46	14.0	15.1	38.5	26.5	37.2	26.5	36.1	26.4	29.3	34.0	28.9	33.5
BIKANER	28.00N	73.30E	224	5.6	7.0	44.2	21.3	42.9	22.0	41.6	22.3	28.2	34.4	27.6	33.8
BOMBAY/SANTACRUZ	19.12N	72.85E	14	16.5	17.8	35.8	23.0	34.6	23.2	33.8	23.5	27.7	31.4	27.4	31.0
CALCUTTA/DUM DUM	22.65N	88.45E	6	11.6	12.8	37.2	26.8	36.2	26.8	35.2	26.7	29.5	34.2	29.1	33.7
COIMBATORE/PEELAMED	11.03N	77.05E	399	18.0	18.9	36.7	22.7	35.7	22.8	34.8	22.8	26.0	31.8	25.5	31.0
CWC VISHAKHAPATNAM	17.70N	83.30E	66	20.1	20.8	33.7	27.0	32.9	27.5	32.3	27.3	29.1	32.0	28.7	31.6
GAUHATI	26.10N	91.58E	54	10.8	11.8	34.5	26.5	33.6	26.5	32.8	26.5	28.7	32.7	28.2	31.9
GWALIOR	26.23N	78.25E	207	6.0	7.1	43.7	22.0	42.6	22.3	41.3	22.2	28.2	32.9	27.8	32.2

The speaker then discussed Mechanism of Heat Transfer through sunlit walls and roof. A schematic diagram has been shown below. It was followed by the discussion of solar heat gain through glass which is equal to the product of area,

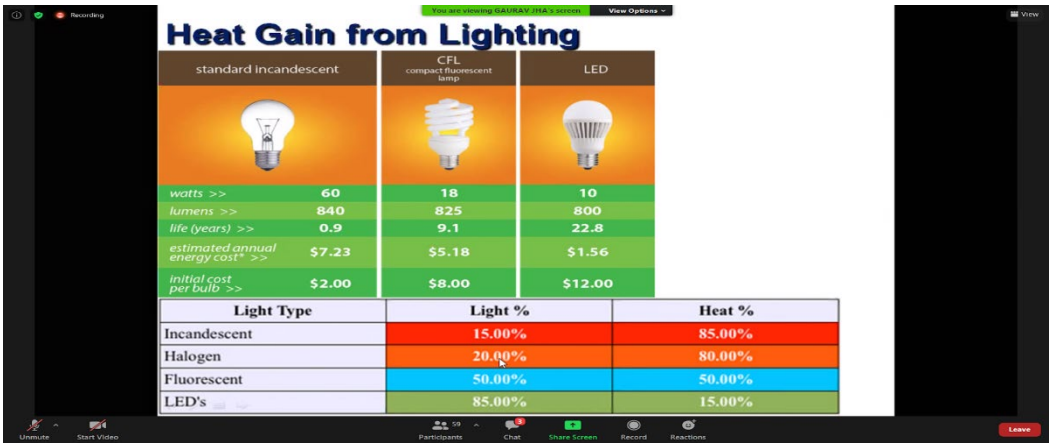
SHGF and shading factor, where SHGF is solar heat gain factor which is a measure of how much radiation passes through glass. It depends upon the type of glass, latitude of location, direction of window, month of the year and time

of the day. Shading coefficient depends on the type of window shading. It is 0.56 for light colour venetian blind, or roll up curtains from inside.
Additionally there is transmission of heat across glass because of temperature difference between indoor and outdoor. It depends upon type of glass and window.
This was followed by the discussion of transmission gain through glass which is

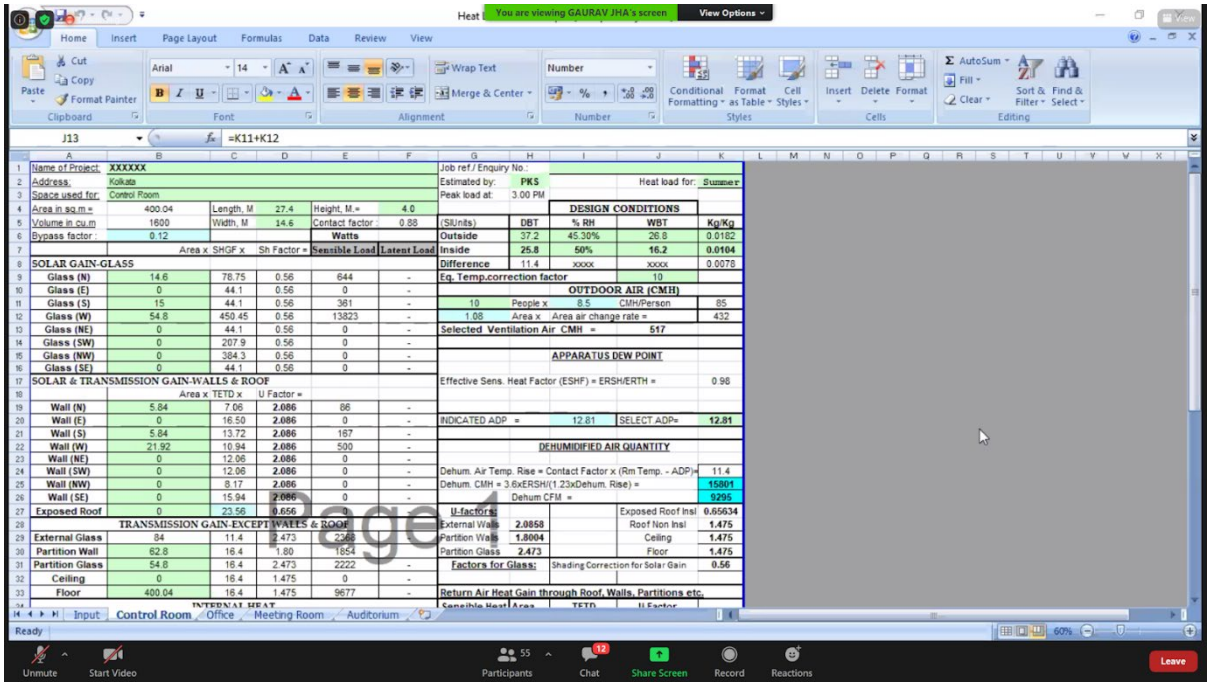
the product of area, change in temperature(outdoor design temp – indoor design temperature).

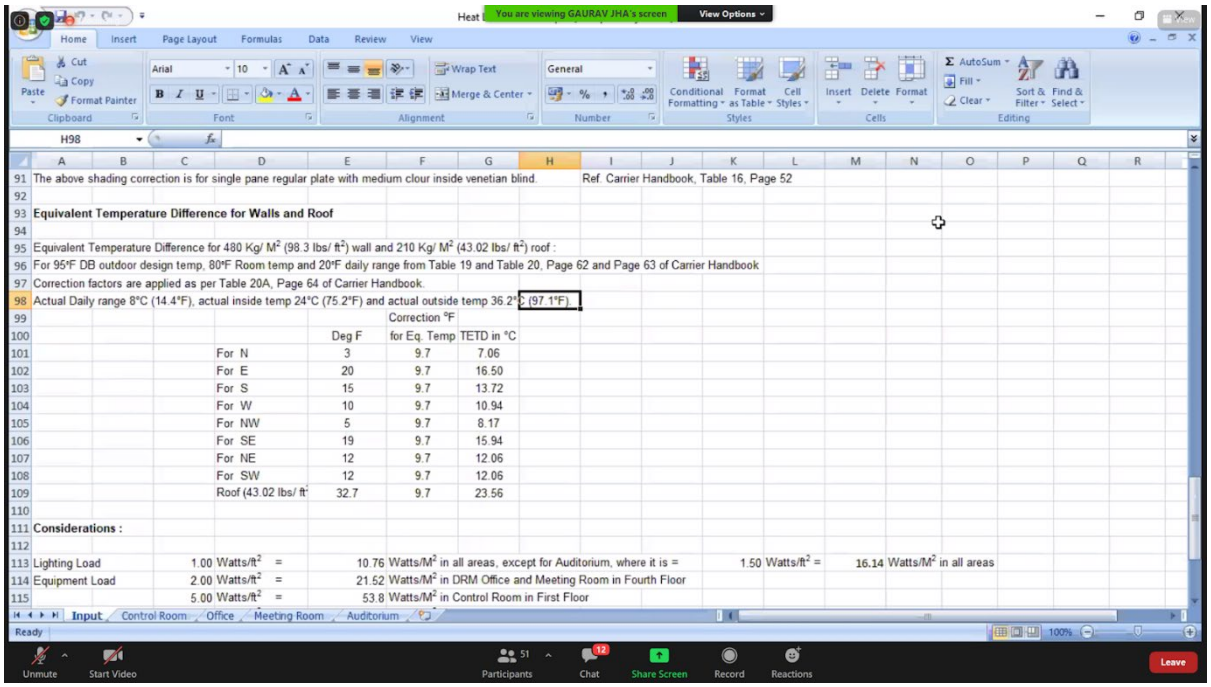


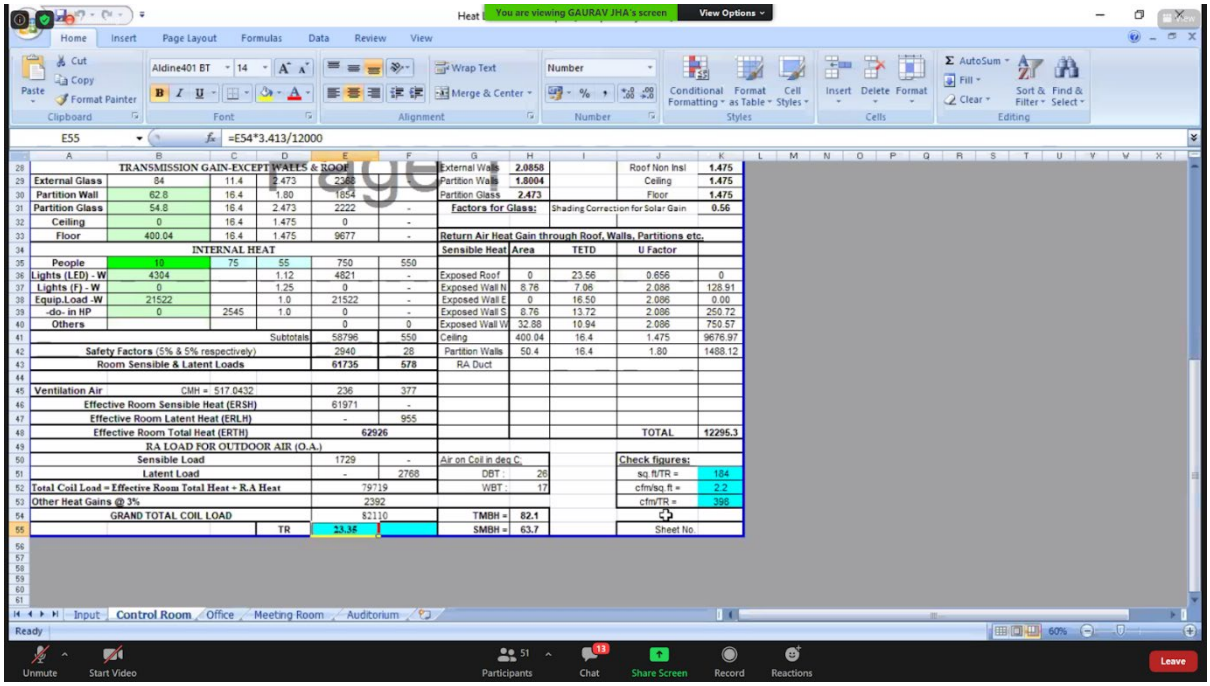
The speaker then discussed heat gain from other sources, like heat gain from people, which is maximum when an individual is working out, slightly less when he is walking, lesser when he is sitting and least when he is sleeping. Speaker also gave an account of heat releases of a normal person engaged in office work. Sensible heat is 75 Watts and latent heat was 55 watts. Heat gain from lighting was also discussed.



The speaker also shared an excel sheet containing a well discussed Heat load calcualation.


You are viewing GAURAV JHA's screen
View Options
=K11+K12
Name of Project: XXXXXX
Address: Kolkata
Space used for: Control Room
Area in sq.m = 400.04 Length, M 27.4 Height, M.= 4.0
Volume in cu.m 1600 Width, M 14.6 Contact factor : 0.88
Bypass factor : 0.12
Job ref./ Enquiry No.:
Estimated by: PKS
Peak load at: 3.00 PM
Heat load for: Summer
DESIGN CONDITIONS
Outside 37.2 45.30% 26.8 0.0182
Inside 25.8 50% 16.2 0.0104
Difference 11.4 xxxx xxxx 0.0078
Eq. Temp.correction factor 10
OUTDOOR AIR (CMH)
10 People x 8.5 CMH/Person 85
1.08 Area x Area air change rate = 432
Selected Ventilation Air CMH = 517
APPARATUS DEW POINT
Effective Sens. Heat Factor (ESHF) = ERSH/ERTH = 0.98
INDICATED ADP = 12.81 SELECT ADP= 12.81
DEHUMIDIFIED AIR QUANTITY
Dehum. Air Temp. Rise = Contact Factor x (Rm Temp. - ADP)= 11.4
Dehum. CMH = 3.6xERSH/(1.23xDehum. Rise) = 15801
Dehum CFM = 9295
SOLAR GAIN-GLASS
Glass (N) 14.6 78.75 0.56 644
Glass (E) 0 44.1 0.56 0
Glass (S) 15 44.1 0.56 381
Glass (W) 54.8 450.45 0.56 13823
Glass (NE) 0 44.1 0.56 0
Glass (SW) 0 207.9 0.56 0
Glass (NW) 0 384.3 0.56 0
Glass (SE) 0 44.1 0.56 0
SOLAR & TRANSMISSION GAIN-WALLS & ROOF
Wall (N) 5.84 7.06 2.086 86
Wall (E) 0 16.50 2.086 0
Wall (S) 5.84 13.72 2.086 167
Wall (W) 21.92 10.94 2.086 500
Wall (NE) 0 12.06 2.086 0
Wall (SW) 0 12.06 2.086 0
Wall (NW) 0 8.17 2.086 0
Wall (SE) 0 15.94 2.086 0
Exposed Roof 0 23.56 0.656 0
U-factors:
External Walls 2.0858
Partition Walls 1.8004
Partition Glass 2.473
Exposed Roof Insl 0.65634
Roof Non Insl 1.475
Ceiling 1.475
Floor 1.475
Factors for Glass:
Shading Correction for Solar Gain 0.56
TRANSMISSION GAIN-EXCEPT WALLS & ROOF
External Glass 84 11.4 2.473 2368
Partition Wall 82.8 16.4 1.80 1654
Partition Glass 54.8 16.4 2.473 2222
Ceiling 0 16.4 1.475 0
Floor 400.04 16.4 1.475 9677
Return Air Heat Gain through Roof, Walls, Partitions etc.
Input Control Room Office Meeting Room Auditorium
Ready
60%
Unmute Start Video Participants 55 Chat 12 Share Screen Record Reactions Leave


You are viewing GAURAV JHA's screen
View Options
H98
The above shading correction is for single pane regular plate with medium clour inside venetian blind. Ref. Carrier Handbook, Table 16, Page 52
Equivalent Temperature Difference for Walls and Roof
Equivalent Temperature Difference for 480 Kg/ M² (98.3 lbs/ ft²) wall and 210 Kg/ M² (43.02 lbs/ ft²) roof :
For 95°F DB outdoor design temp, 80°F Room temp and 20°F daily range from Table 19 and Table 20, Page 62 and Page 63 of Carrier Handbook
Correction factors are applied as per Table 20A, Page 64 of Carrier Handbook.
Actual Daily range 8°C (14.4°F), actual inside temp 24°C (75.2°F) and actual outside temp 36.2°C (97.1°F).
Correction °F
Deg F for Eq. Temp TETD in °C
For N 3 9.7 7.06
For E 20 9.7 16.50
For S 15 9.7 13.72
For W 10 9.7 10.94
For NW 5 9.7 8.17
For SE 19 9.7 15.94
For NE 12 9.7 12.06
For SW 12 9.7 12.06
Roof (43.02 lbs/ ft² 32.7 9.7 23.56
Considerations :
Lighting Load 1.00 Watts/ft² = 10.76 Watts/M² in all areas, except for Auditorium, where it is = 1.50 Watts/ft² = 16.14 Watts/M² in all areas
Equipment Load 2.00 Watts/ft² = 21.52 Watts/M² in DRM Office and Meeting Room in Fourth Floor
5.00 Watts/ft² = 53.8 Watts/M² in Control Room in First Floor
Input Control Room Office Meeting Room Auditorium
Ready
100%
Unmute Start Video Participants 51 Chat 12 Share Screen Record Reactions Leave



The workshop ended well and at the end fee speak cleared the doubts of everyone regarding the top and also incorporated a sense of vision in us regarding Heat load calculation. It was an enriching session for students.

5. FACTORY VISIT

WEBINAR ON THE TOPIC: HITACHI Virtual Factory visit.

VENUE- Teams.microsoft

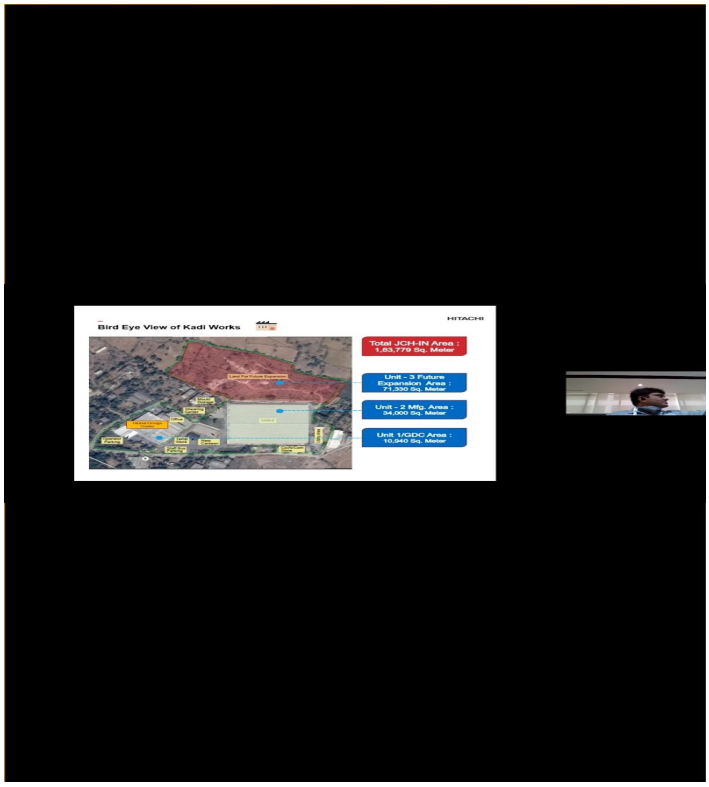
DATE AND TIME – 29th August, 2020 (Saturday)

TIME – 11:00 AM – 1:00 PM

GATHERING- The webinar was delivered by Mr. Apurva Shah and his team. Apurva Shah, Asst. Vice President, Dept. Head – Manufacturing at Jonson Controls Hitachi Air Conditioning India Ltd. He took us in kadi works situated in Gujrat, India.

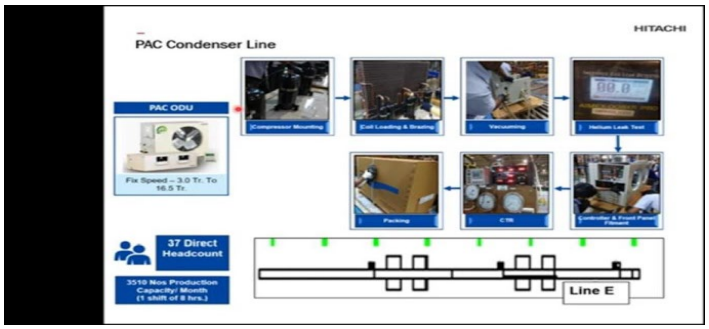
***ISHRAE** once again come up with a brilliant webinar on the topic **HITACHI VIRTUAL FACTORY VISIT**. Like always it was very enriching, practical and technically rich webinar which significantly contributed to the enhancement of our knowledge in this domain.*

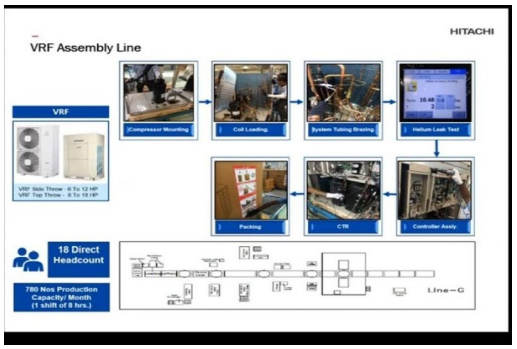
LEARING FROM THE TALK: The speaker starts the session by showing the **Bird Eye View of Kadi Works, Gujrat**. He tell us about the factory total area, which is 1,83,779 Sq. meter. Then how the factory is divided into several units, with the help of picture. Then with the help of pictures he showed us the types of product range that they manufactured in the plant. He explained the Outdoor Unit Components and Indoor Unit Main Component with the help of pictures again.



Next the speaker moves to the new topic i.e., Heat exchanger shop. He explained about Condenser and Evaporator Coils , then the line structures. Then he explained different types of assembly line.

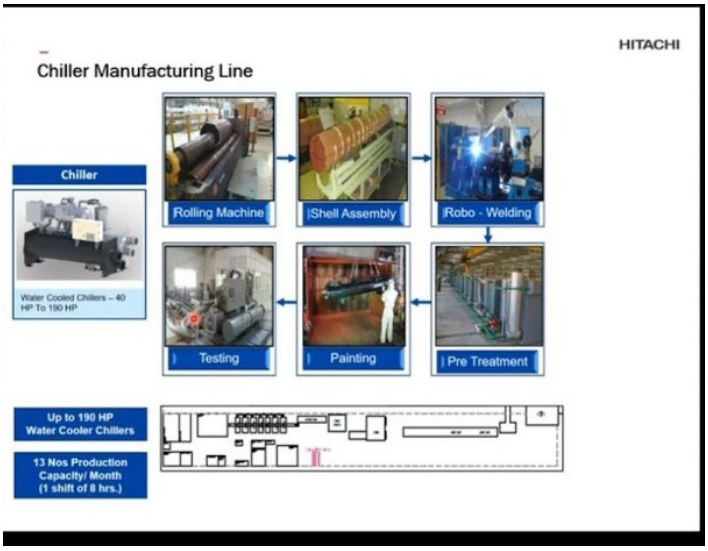
- WAC+ SAC ODU Assembly Line
- SAC IDU Assembly Line
- VRF Assembly Line
- PAC Condenser Line
- Chiller Manufacturing Line


HITACHI
PAC Condenser Line
PAC ODU
Fix Speed – 3.0 Tr. To 16.5 Tr.
Compressor Mounting
Coil Loading & Brazing
Vacuuming
Helium Leak Test
Packing
CTR
Controller & Front Panel Fitment
37 Direct Headcount
3510 Nos Production Capacity/ Month (1 shift of 8 hrs.)
Line E

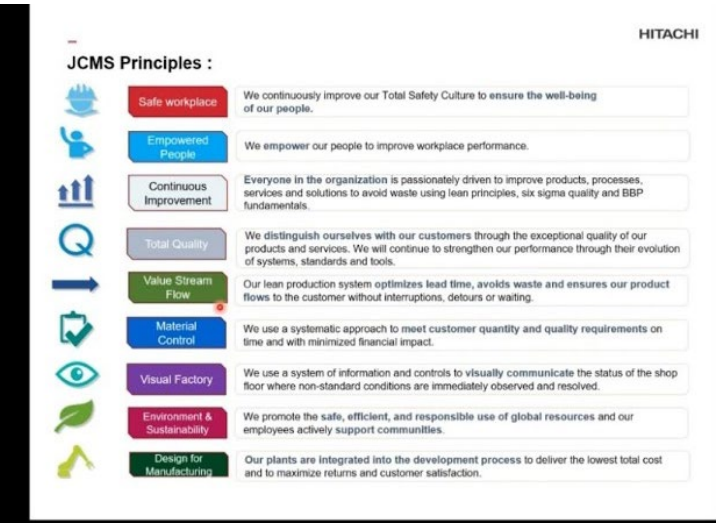

HITACHI
VRF Assembly Line
VRF
VRF Side Throw - 6 To 12 HP
VRF Top Throw - 8 To 18 HP
Compressor Mounting
Coil Loading
System Tubing Brazing
Helium Leak Test
Packing
CTR
Controller Assly.
18 Direct Headcount
780 Nos Production Capacity/ Month (1 shift of 8 hrs.)
Line – G

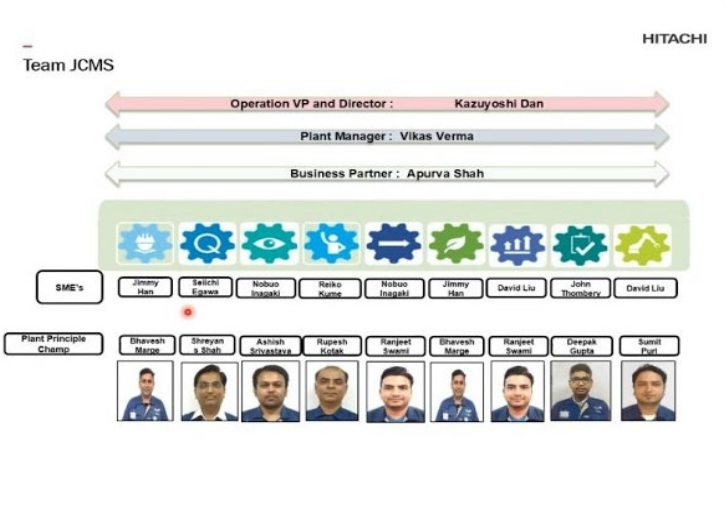

AM
36.1KB/s
92
Virtual Factory visit
HITACHI
SAC IDU Assembly Line
SAC IDU
Cabinet Assly.
T Flow Fan Assly.
Coil Assly.
Drain Pan Assly.
Packing
Front Cover Assly.
CTR
Motor Assly.
82 Direct Headcount
27.3K Nos Production Capacity/ Month (1 shift of 8 hrs.)
Line K1/K2/K3


HITACHI
WAC + SAC ODU Assembly Line
WAC
Fix Speed/Inverter – 1 Tr. To 2 Tr.
SAC ODU
Fix Speed/Inverter – 1 Tr. To 2.5 Tr.
62 Direct Headcount
27.3K Nos Production Capacity/ Month (1 shift of 8 hrs.)
Compressor Mounting
Parts Assembly
Heat Exchanger
Motor Mounting
Fan Mounting
Micro Leak Test
Vacuum Test
CTR
Packing 1
Packing 2
Line A / B / C



Next the speaker introduce us with JCMS Principles and Team JCMS





At last the session was concluded with question-answer/ doubt clearing session where the queries of the students regarding the topic was cleared. We students were very much benefited from this webinar.