



The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is a global professional association seeking to advance heating, ventilation, air conditioning and refrigeration (HVAC&R) systems design and construction. Founded in 1894 it now has more than 50,000 members worldwide, composed of building services engineers, architects, mechanical contractors, building owners, equipment manufacturers, employees, and others concerned with the design and construction of HVAC&R systems in buildings. The society funds research projects, offers continuing education programs, and develops and publishes technical standards to improve building services engineering, energy efficiency, indoor air quality, and sustainable development.

The MKSSS's Cummins College of Engineering for Women, Pune - ASHRAE Student Branch was founded in January 2022. Currently, the chapter has thirty-two student members from the Mechanical Engineering Department. Prof. Rujuta Agavekar and Prof. Dr. Parag Chaware are the Student Branch Advisors.

List of Activities

Sr. No	Name of the company/event	Type	Date
1	Fresh Link Cold storage Pvt Ltd	Industrial Visit	October 27, 2023
2	Persistent Systems	Industrial Visit	November 4, 2023
3	Student Pune Air Conditioning and Refrigeration Conference (SPARC 2024)	Expert Sessions	January 13, 2024
4	Renuka Ice Factory	Industrial Visit	January 30, 2024
5	ASHRAE Student Branch Installation Ceremony in Cummins College of Engineering for Women, Pune	Installation ceremony	February 22, 2024
6	Expert lecture on: Session -1: Digitalization of the Mechanical, Electrical and Plumbing (MEP) sector leveraging building information modeling (BIM). Session-2: Careers in HVAC	Expert Session	February 22, 2024
7	Belimo	Industrial Visit	February 23, 2024
8	City Pride Theatre – Central Air Conditioning Unit	Industrial Visit	April 2, 2024



**MKSSS's Cummins College
of Engineering For Women**
Student Branch

Fresh Link Cold storage Pvt Ltd - Industrial Visit

Day and date - Friday, October 27, 2023

Type - Industrial Visit

Name of Company – Fresh link cold storage Pvt Ltd

Information –

An industrial visit was organized by ASHRAE student branch of Cummins college to Fresh Link Agro Cold Storage, Pune on Friday, 27th of Oct 2023. In total 23 students were present for the visit. There, students got a chance to see the actual working of Vapor Compression Cycle (VCC), which was utilized to maintain certain low temperatures depending upon the requirements of the perishable products.

Fresh Link Agro Cold Storage Pvt. Ltd. was incorporated in 2017 to cater farmers and corporates to preserve their perishable items for a longer duration. A quality controlled cold storage is a significant element of the supply chain. The perishable products such as fruits, pulses, dry fruits, vegetables, and spices need temperature-controlled storage that connects producers, processors, distributors, and retailers.

Fresh link is well equipped and capable of accommodating a range of goods which includes 5000 MT total capacity, 2000 MT & 3000 MT dedicated freezing chambers for frozen goods. Out of which there are 3 freezing chambers having capacity of 625 MT & 5 Positive Refrigeration chambers of 600 MT capacity respectively.

Location of Visit - Gate No. 319, Gaud Dara Road, KHED SHIVAPUR TOWN-412205

Duration - 2 hours

Number of Participants -

- 14 students of Third Year, Mechanical Department, (ASHRAE Members)
- Prof. Rujuta Agavekar, SBA
- Prof. Parag Chaware, SBA
- Prof. Mandar Vahadne

Learning Outcomes –

- Students gained practical knowledge of industrial refrigeration systems and observed the operational aspects and maintenance practices of cold storage
- The visit helped students to understand the practical application of theoretical concepts learned in the classroom. The students observed firsthand, the integration of refrigeration principles into real-world industrial processes.

Upon arrival at cold storage, we were provided an overview of the factory's operations. The visit included a detailed tour of the plant.

Key Features -

Component	Information/Specifications
Refrigerant	Ammonia (due to its high efficiency and low environmental impact)
Compressor	• 4 Kirloskar Pneumatics multistage compressors powered by Siemens motors (each of 100 HP) were used. • 2 stage adiabatic compression with intercooler
Capacity	• Preserve the perishable items for a longer duration. • 5,000 metric ton facility capacity

Condenser	Evaporative condenser - The condenser coils were placed inside the cooling tower to increase the effectiveness of the system
AHU	In total 4 AHUs were installed in the buildings (2 on either side of the building).

Temperature wise, cold stores can be classified as:

Medium temperature cold stores - generally designed for storing a variety of products at 0 to 8°C. Commodities include various types of fresh fruits and vegetables, dry fruits, spices, pulses, milk products etc. The cold stores may be designed for a single commodity such as potatoes, chilies, apples etc. or multipurpose type for storage of various commodities. The chambers in multi-commodity stores have to be designed for maintaining different temperatures and sometimes different relative humidity to suit various products. The bulk commodity stores have chambers of large sizes whereas the multi-purpose units have many chambers. These medium temperature cold stores are, generally, constructed as single floor structures for small capacities and multi-floor structures for larger capacities

Frozen food stores –

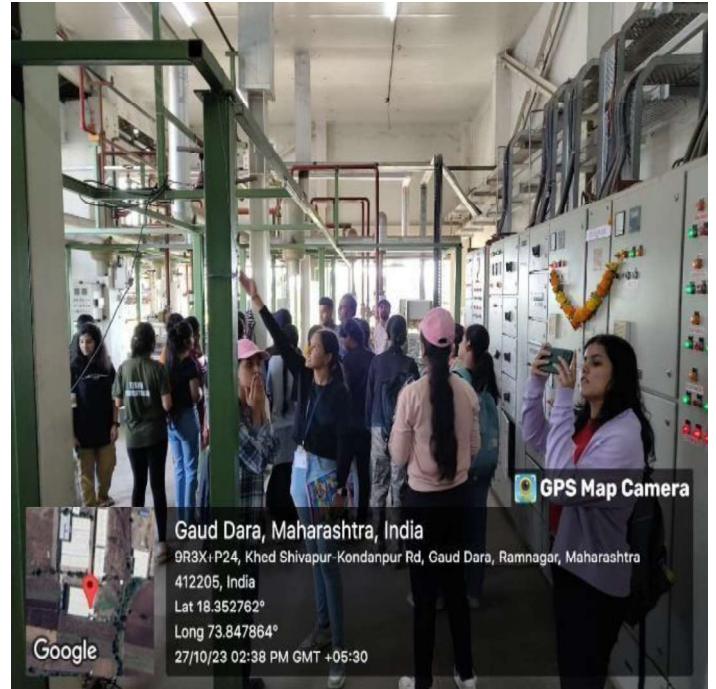
Designed for commodities which have to be processed and frozen for preservation over long periods of time. These include green peas, corn, okra, mixed vegetables, mango pulp and tomato puree. Other items are ice cream, butter, fish and meat products. Frozen food stores are designed for temperature of -18 to -22°C for most foods, but for items like ice cream, lower temperatures in the range of -25 to -30°C are specified. Frozen food stores are, normally, a part of food processing and freezing complex. However, they are also set up as a part of multi-purpose cold stores or as independent units to offer facilities for storage of

Blast freezer

Blast freezers are sometimes referred to as shock freezers. This type of freezer storage rapidly brings down the temperature of (usually) cooked or fresh produce, freezing it very quickly to lock in the taste and nutrition of the food for optimum quality for consumers.

Blast freezers use blower fans that force cold air across the freezer's contents to chill it rapidly. Others can work in other ways depending on the design. They can be equipped with trays that move about to position foods and often include various compartments for freezing.

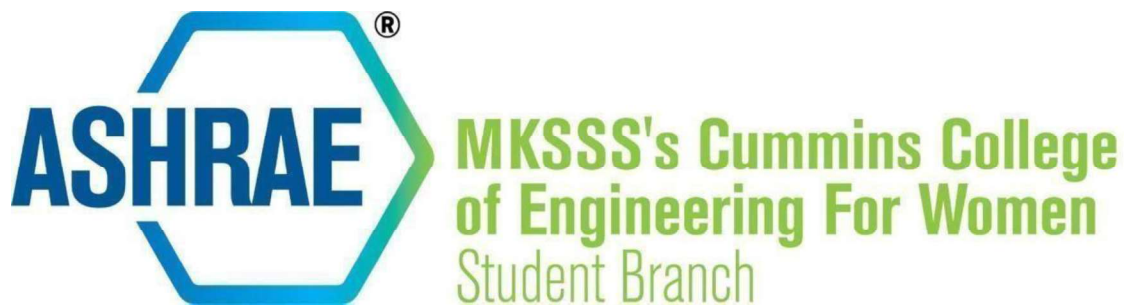
Photographs -



Conclusion –

The industrial visit to FRESH LINK AGRO Cold Storage was very beneficial. Through the entire cooperation, we were able to understand the working of the cold storage sector of the industry. In this visit, we got to see the working of AHU (Air Handling Unit) and VCC (Vapor Compression Cycle). We had already studied these theoretical concepts in the curriculum, but during the visit, we learned about the actual working of these units. We would like to express our sincere gratitude towards the whole team of FRESH LINK AGRO Cold Storage and ASHRAE Student chapter for organizing such a wonderful visit.

Compiled by: Vaishnavi Patil



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Persistent Systems

Industrial Visit- Report

Name of Company – Persistent Systems

Day – Saturday

Date – 4 Nov 2023

Type - Industrial Visit

Information –

Persistent Systems was founded in 1990 by Anand Deshpande and is headquartered in Pune, India. It operates globally with offices and development centers across North America, Europe, and Asia Pacific regions. The company offers a range of services including product engineering services, digital transformation, cloud computing, data and analytics, IoT (Internet of Things), and enterprise mobility solutions. Persistent Systems is an Indian multinational technology services company. It is a LEED certified trusted Digital Engineering and Enterprise Modernization Partner working with many industry-leading organizations across the world.

An industrial visit was organized by ASHRAE student branch of Cummins college to Bhageerath Persistent Systems on 4th November 2023. In all 23 students were there for the visit.

The Bhageerath Persistent System is revamped to facilitate hybrid workspace with various facilities. The office is spacious and well equipped with state-of-the-art technology and infrastructure with modern work cafes and gymnasium. Rooftop solar panels have been installed.

The building is equipped with a fire pumping station consisting of two pumps - Jockey Pump and Standard Fire Pump. The jockey pump is operated first. Once the required pressure is developed, it gets cut off and then the other pumps are operated. Jockey pump maintains the pressure and is required along with the main pump in case of emergency. In actual fire scenario power supply cut off; DG fire pump is also installed which helps in maintaining redundancy in all equipment.

The setup consisted of two units of Daikin chillers of 170TR each with R134a as the primary refrigerant and chilled water as the secondary refrigerant. The total load of the building was calculated to be 170TR due to which these chillers are used alternately.

Screw type compressors are used in the chiller. A water-cooled shell and tube condenser is used, here the shell consists of water and the tube consists of gas along with an electronic throttle valve. The gas is cooled by water in the condenser. The temperature of this water is lowered by the cooling tower present on the top of the building. The chiller line is insulated with aluminum cladding and nitrile rubber.

The compressor system is automated by use of VFD i.e. Variable frequency drive. As the no. of occupants keep varying the load on the system is variable. VFD facilitates the change in discharge depending on the load. The chilled water pump also consisted of a VFD and differential pressure sensor for which after achieving a certain setpoint temperature of water the valve is modulated to circulate required amount of water.

The system uses bore water which results in evaporative losses due to salt formation and reduces the rate of heat transfer. To prevent this a water softening plant is been installed which consists of sand filter to remove the impurities in water and a regeneration unit in which the salt is dissolved in water which reduces the TDS of water.

A dirt separator is also provided to remove the impurities from the water which is received from AHU to prevent scale formation. The dirt separator works on principle of venturi- effect where pressurized water vortex formed causes the particles to settle down and is released later. A vacuum degasser is present to remove the undesirable gasses not visible to the naked eyes . This vacuum degasser helps to improve the system performance.

Two air handling units are provided on each floor. These units consist of two stage filtrations of 0.3-micron filters. Fresh air dampers are provided to mix fresh air with the chilled air. In the winter season for ambient air of 10-12

degree C, these fresh air dampers are used at 100% which reduces load on the chiller. These fresh air dampers have CO₂ sensors to give necessary amounts of fresh air. UV tubes are installed near the cooling coils to kill bacteria colonies and maintain indoor air quality. For the cooling tower, special arrangement of electronic descaling for prevention of algae formation in the plant is done.

Duration - 3 -4 hours

Number of Participants –

- 19 students of Third & Last Year, Mechanical Department, (ASHRAE Members)
- Prof. Rujuta Agavekar, SBA
- Prof. Parag Chaware, SBA

Learning Outcomes

- Students learnt about the design and operation of modern HVAC (Heating, Ventilation, and Air Conditioning) systems, including control of temperature and relative humidity, ensuring air quality within a large corporate environment.
- Students learnt about the insights into the company's efforts towards energy efficiency and sustainability by observing features such as energy-efficient equipment, use of eco-friendly refrigerants, and implementation of smart controls to optimize energy usage.
- This visit provided valuable insights into the importance of regular maintenance and upkeep to ensure optimal performance and longevity of HVAC equipment.
- Students learnt about the importance of IAQ for occupants' health, productivity, and overall comfort. They also learnt about the filtration systems, ventilation strategies, and IAQ monitoring practices.
- Students learnt about the features that allow for customized temperature control in different areas of the facility, as well as how occupants can interact with the system to adjust settings for comfort and efficiency. How the air conditioning system integrates with other building systems such as lighting, security, and occupancy sensors to optimize energy usage and occupant comfort.
- Backup systems in place for the air conditioning system can provide insights into the company's preparedness for emergencies such as power outages, equipment failures, or extreme weather events.

Photographs



Conclusion

The industrial visit to central air conditioning facility of Persistent Systems was very beneficial. Students were able to understand the working of the HVAC unit of the industry. In this visit, we got to see the working of the fire pumping station, AHU (Air Handling Unit) and the cooling tower. Sustainable and efficient arrangements were observed during the visit.

We would like to express our sincere gratitude towards the whole team of Persistent Systems and ASHRAE Student chapter for organizing the visit.

Complied by: Mital Paratane & Sharvari Jadhav



**MKSSS's Cummins College
of Engineering For Women**
Student Branch

Student Pune Air Conditioning and Refrigeration Conference (SPARC 2024)

Report

Session 1

Day: Saturday

Date: 13th January, 2024

Type: Expert Session

Name of the Expert: Mr. Akshay Pahade (HVAC Consultant Pune)

Information: Benefits and opportunities in HVAC

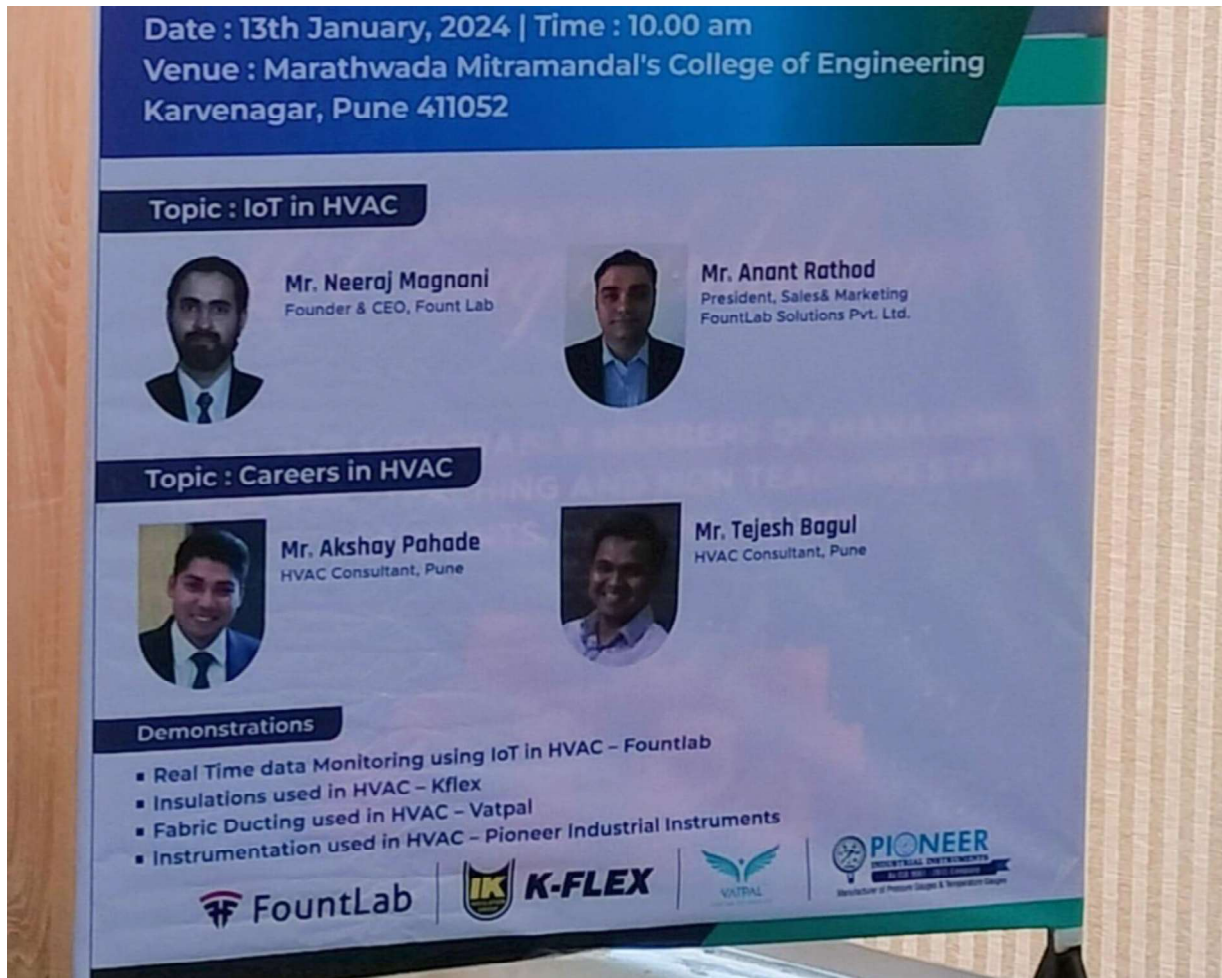
In the first session, Mr. Akshay Pahade, an HVAC Consultant from Pune, discussed the benefits and opportunities in the HVAC industry. He emphasized the impact of climate change and sustainability concerns on driving innovation in HVAC technologies. Mr. Pahade highlighted programs like the Smart Start program and ASHRAE YEA - HVAC Design Essentials, which are designed to enhance the skills of industry professionals. He also discussed energy consumption trends and the need for efficient HVAC solutions to address these challenges. Government initiatives such as the national cooling action plan, national cold chain plan, and ICAP were highlighted as key drivers shaping the industry. Mr. Pahade mentioned that the HVAC market is expected to reach \$5.9 billion by 2024, attributing this growth to the rise in high-rise buildings, hypermarkets, and expansion into tier II cities.

Location: Marathwada Mitra Mandal's College of Engineering, Karvenagar, Pune
411052

Learning outcomes:

- Students understood the importance of building connections and establishing an industry network for effective collaboration.
- Students also learned about various ASHRAE Youth Programs and the benefits of participating in such events, courses and competitions. Students appreciated the inflation of the HVAC market and its expansion over the years.

Photograph:



Session 2

Day - Saturday

Date - 13th January, 2024

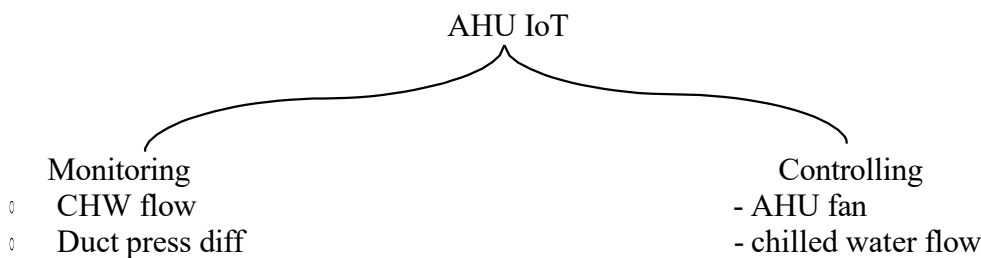
Type -: Expert Session

Name of the Experts - Mr. Anant Rathod

Topic - Introduction to IOT and its Applications in HVAC

Information -

In the second session, Mr. Anant Rathod delved into the role of Internet of Things (IoT) in HVAC systems. He explained how IoT is impacting HVAC system components and automation, focusing on sensor technologies such as temperature sensors (IP 65) and duct sensors (2-20m/s) for air velocity measurement. Mr. Rathod discussed IoT platforms used for indoor and outdoor air quality monitoring, weather stations, and IoT security considerations. He also highlighted future trends in IoT for HVAC and the importance of actuators for control valves, relays, switches, and drives. The session covered hardware and firmware components, including gateways and client servers, as well as wired/wireless technologies such as RS485, CAN, and LoRaWAN. Mr. Rathod explained how IoT-based maintenance strategies can optimize AHU, cooling towers, chillers, pumps, and VFDs, leading to reduced downtime and increased equipment lifespan. He also discussed AHU IoT for monitoring and controlling CHW flow and duct pressure difference.



Location: Marathwada Mitra Mandal's College of Engineering, Karvenagar, Pune 411052

Duration - 1.5 hours

Learning Outcomes - The session covered basics of IOT with its definition i.e. connecting and exchanging data over the internet with use of some technology. Various applications of IOT such as its use in accelerometers to use this data further for some other research and prerequisites to learn and use this technology were discussed.

IOT connectivity means different ways in which IOT devices such as sensors, trackers, etc. are connected. It also includes projects like smart parking and water management which are worth billions USD. There are various IOT services such as Descriptive Analytics which collects data then processes it and generates it in a report, Preventive, Predetermined, Preventive, Corrective, Condition-based, Predictive and Reactive Maintenance. The concept of life logging and thought controlled computing were also discussed.

Participants engaged in lively discussions, raising questions about sensor life and replacement criteria, fault finding based on historical data, and measures to prevent ozone layer depletion from HVAC equipment. The session also addressed types of maintenance, including predictive maintenance and parameter relativity, as well as IoT security best practices and compliance with regulations/laws.

Demonstrations

After the expert sessions, demonstrations by K-Flex company was arranged. They showcased their insulation products and explained specifications, further insights into their products and their contact information.

Company: K-Flex - High performance Insulation Systems

Part of L'ISOLANTE K-FLEX, a multinational company manufacturing elastomeric foam insulation with its headquarters in Milan, Italy. They demonstrated several products:

1. K-FLEX ST Sheets

2. K-FONIK Acoustic Systems

3. Technical Characteristics-

- closed cell products
- Thermal conductivity
- Resistant to water vapor diffusion
- Fire behavior

- Flexibility and ease of use
- Quality and safety
- Temperature range
- Environment friendly

In conclusion, SPARC 2024 provided valuable insights into the evolving landscape of HVAC technologies and opportunities. The event underscored the importance of sustainability, technological advancements, and industry growth drivers in shaping the future of HVAC. Based on the insights from SPARC 2024, further exploration of IoT applications in HVAC, energy-efficient designs, and compliance with environmental regulations could enhance the understanding and implementation of cutting-edge HVAC solutions. SPARC 2024 was a highly informative event focused on the Heating, Ventilation, and Air Conditioning (HVAC) industry.

Compiled by: Aditi Sant



**MKSSS's Cummins College
of Engineering For Women**
Student Branch

Renuka Ice Factory- Industrial Visit

Report

Day - Monday

Date - January 30, 2024

Type - Industrial Visit

Name of Company - Renuka Ice Factory

Information - Renuka Ice Factory is a facility for the production of ice. The factory's commitment to efficiency was evident throughout the visit which included detailed insights into the factory's processes, equipment, and maintenance practices, offering valuable learning opportunities for the participating students.

Location of Visit - Plot No E 75, MIDC, Baramati HO-413102

Number of Participants -

- 14 students of Third Year Engineering, Mechanical Department, (ASHRAE Members)
- Prof. Rujuta Agavekar, SBA
- Prof. Parag Chaware, SBA

Learning Outcomes - We gained practical knowledge into industrial refrigeration systems and observed the operational aspects and maintenance practices of industrial ice production.

The visit helped understand the practical application of theoretical concepts learned in the classroom. The students observed firsthand the integration of refrigeration principles into real-world industrial processes.

Upon arrival at Renuka Ice Factory, we were provided an overview of the factory's operations. The visit included a detailed tour of the production facilities, where the following key features were observed and explained:

Key Features -

Component	Information/Specifications
Refrigerant	- Primary: Ammonia (due to its high efficiency and low environmental impact) - Secondary: Brine (to remove heat from water during the ice-making process)
Compressor	- The factory employs the KCX2 compressor model. The KCX2 compressor is designed without a water jacket to prevent scaling issues. - Compressor RPM: The compressor operates at 750 revolutions per minute (rpm). - The compressor operates in two stages and is powered by a 50hp motor.
Capacity	The factory has a capacity to produce 18 tons of ice, which takes approximately 36 hours to complete. The daily production output is 10 tons of ice.
Bypass system	A bypass system is in place to manage any leakage issues that may arise during operation
Receiver	The receiver is maintained at 50% capacity to ensure optimal performance.

Agitator	An agitator is used to maintain a uniform temperature throughout the brine solution.
Pipe	MS Heavy pipes are used for their durability and resistance to corrosion. TATA C Class H
Ice Can	- The ice cans are coated with red oxide for protection against corrosion. - Each ice can can hold approximately 25 kg water.
Brine Solution	The brine solution temperature is maintained between -10°C to -12°C.

Photographs -

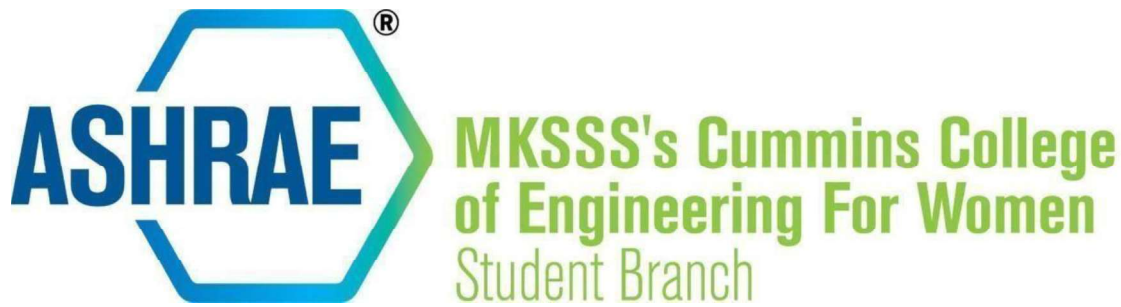




Conclusion :

The industrial visit to Renuka Ice Factory was a highly educational experience for the student members. The visit not only expanded students' knowledge but also provided them with practical exposure to industrial operations, enhancing their understanding of refrigeration concepts in a real-world context.

Compiled by: Aditi Sant



**ASHRAE Student Branch Installation Ceremony at Cummins
College of Engineering for Women, Pune.**

Report

Day- Thursday

Date - February 22, 2024

Type - Branch Installation

Information - ASHRAE Student Branch Installation Ceremony

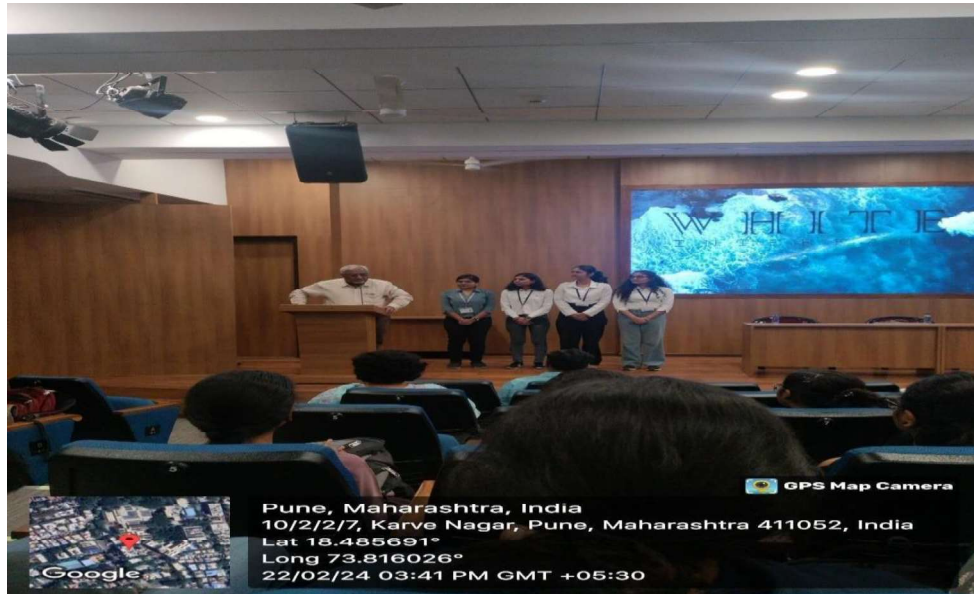
Time - 3:30 PM

On February 22, 2024, ASHRAE Student Branch Installation Ceremony was held to induct the new student members in ASHRAE Cummins Student Branch. The event took place in the K.B. Joshi Hall IT building, at 3:30 pm. Almost 80 students attended this ceremony. The ceremony started off with the welcoming of the ASHRAE officials, viz: President Mr. Yash Karkhanis and Secretary Mr. Tejesh Bagul of ASHRAE Pune chapter. Mr. Yash Karkhanis shared his experience of last year's ASHRAE student branch activities. Coming to the Main event, Mr. Yash Karkhanis President of ASHRAE Pune Chapter led the oath taking ceremony, wherein each member took a vow to uphold the integrity and dignity of their positions and also pledged to serve the ASHRAE Cummins student branch to the best of their abilities. Mr. Pune chapter president also addressed the importance of roles and responsibilities to new members.

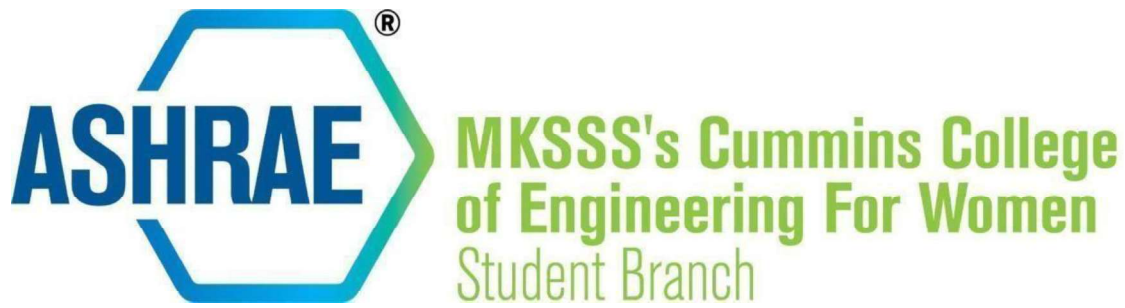
Then secretary of ASHRAE Pune chapter, Mr. Tejes Bagul gave a keynote session on Digitalization of the Mechanical, Electrical and Plumbing (MEP) sector leveraging building information modeling (BIM). Overall, the oath-taking ceremony was a grand success. The ceremony instilled a sense of pride and honor among the Cummins College ASHRAE student branch members, and it set the tone for an excellent year ahead.

Location: K.B. Joshi Hall IT Building, MKSSS's Cummins College of engineering for women, Karvenagar, Pune, Maharashtra.

Photographs:



Compiled by: Pratiksha Divate



Expert Lectures
Report

Session-1

Date – February 22, 2024

Type – Expert Lecture

Name - Mr. Tejes Bagul

Location - K.B. Joshi Hall IT building, MKSSS's Cummins College of Engineering for Women, Karve Nagar, Pune - 411052

Information- Digitalization of the Mechanical, Electrical and Plumbing (MEP) sector leveraging building information modeling (BIM).

Learning Outcomes -

Guest lecture on Digitalization of the Mechanical, Electrical and Plumbing (MEP) sector leveraging building information modeling (BIM) was delivered by Secretary and YEA Chair, Mr. Tejes Bagul. The lecture focused on how the industrialization changed from 1.0 to 4.0, HVAC and plumbing, what are the 6D's of BIM, MEP designs, and softwares used.

Mechanical, electrical and plumbing (MEP) refers to the installation of services which provide a functional and comfortable space for the building occupants. In residential and commercial buildings, these elements are often designed by specialized MEP engineers. MEP's design is important for planning, decision-making, accurate documentation, performance- and cost-estimation, construction, and operating/maintaining the resulting facilities.

Plumbing

Competent design of plumbing systems is necessary to prevent conflicts with other trades, and to avoid expensive rework or surplus supplies. The scope of standard residential plumbing usually covers mains pressure potable water, heated water (in conjunction with mechanical and/or

electrical engineers), sewerage, stormwater, natural gas, and sometimes rainwater collection and storage. In commercial environments, these distribution systems expand to accommodate many more users, as well as the addition of other plumbing services such as hydroponics, irrigation, fuels, oxygen, vacuum/compressed air, solids transfer, and more.

In Building Information Modeling (BIM), mechanical, electrical, and plumbing (MEP) design involves creating detailed 3D models of HVAC systems, electrical wiring, and plumbing networks within a building. These models integrate data about materials, dimensions, performance specifications, and spatial relationships. MEP engineers use BIM software to collaborate with architects, structural engineers, and other stakeholders, ensuring that MEP systems are efficiently designed, clash-free, and compliant with building codes and standards. BIM facilitates better coordination, visualization, and analysis of MEP designs, leading to cost savings, improved efficiency, and reduced risks during construction and operation.

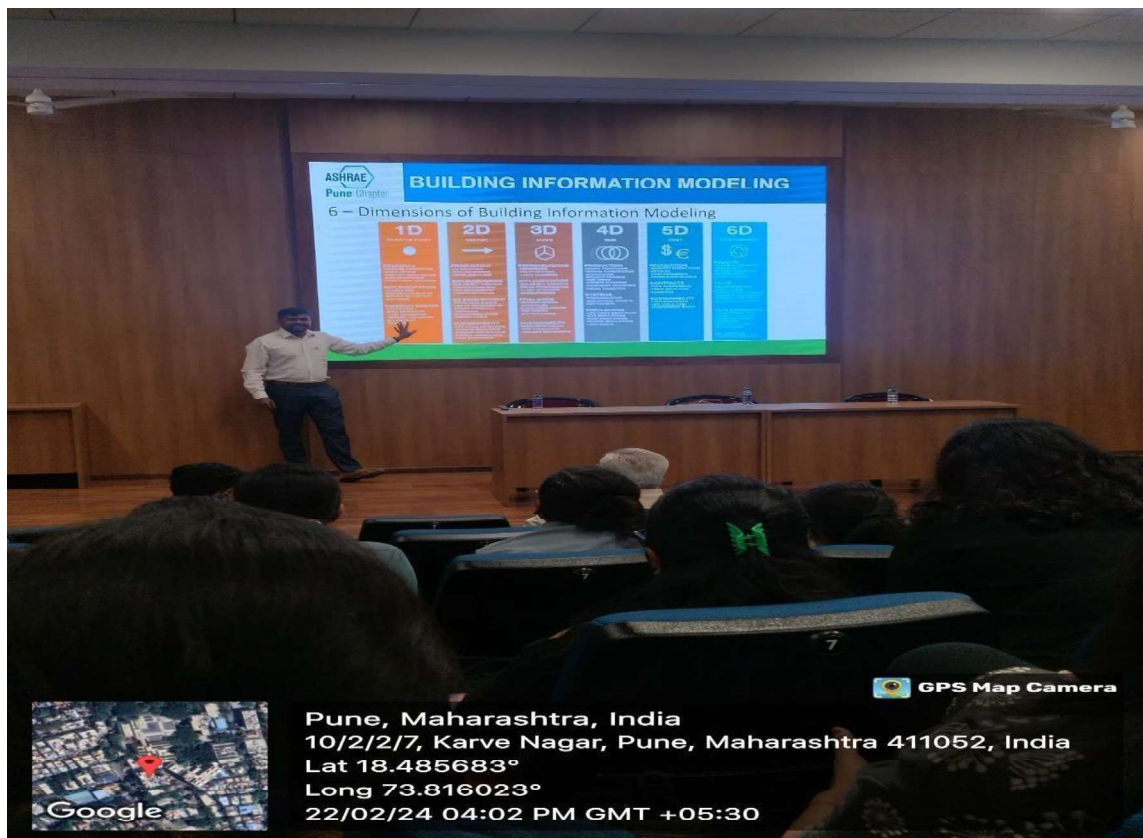
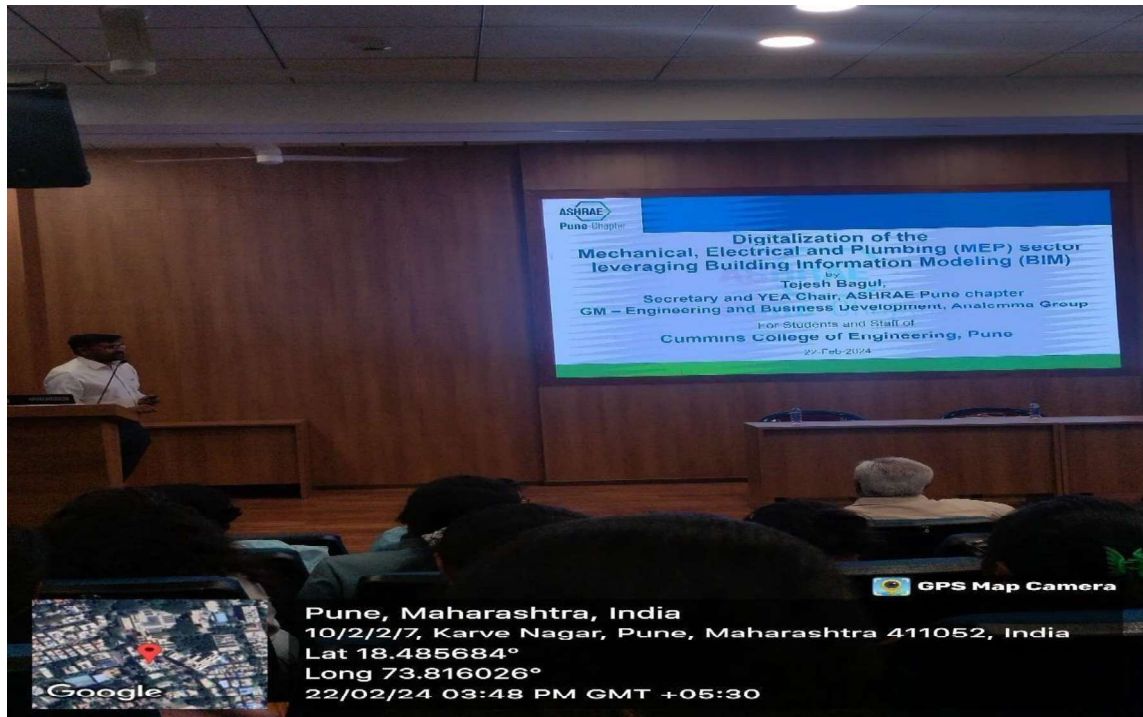
There are different types of software used in the MEP

- AutoCAD MEP
- Revit MEP
- HEC-RAS
- Auto Pipe

Conclusion: -

Any building project benefits greatly from the work of MEP consulting engineers. They actively manage the designing, organizing, and installation of the mechanical, electrical, and plumbing networks throughout the construction project. MEP students need some skills that are planning, designing, and managing the MEP system and the building. The MEP is responsible for taking care of a building's mechanical, electrical, and plumbing systems. The safety of a building and the use and occupancy of it by people are both impacted by the design, development, and implementation of the MEP system. In MEP there are different job roles, which provides quick career progression.

Photograph:



Compiled by: Pratiksha Divate

Session 2

Date - February 22, 2024

Type - Guest Lecture

Name: Yash Karkhanis

Topic - Careers in HVAC

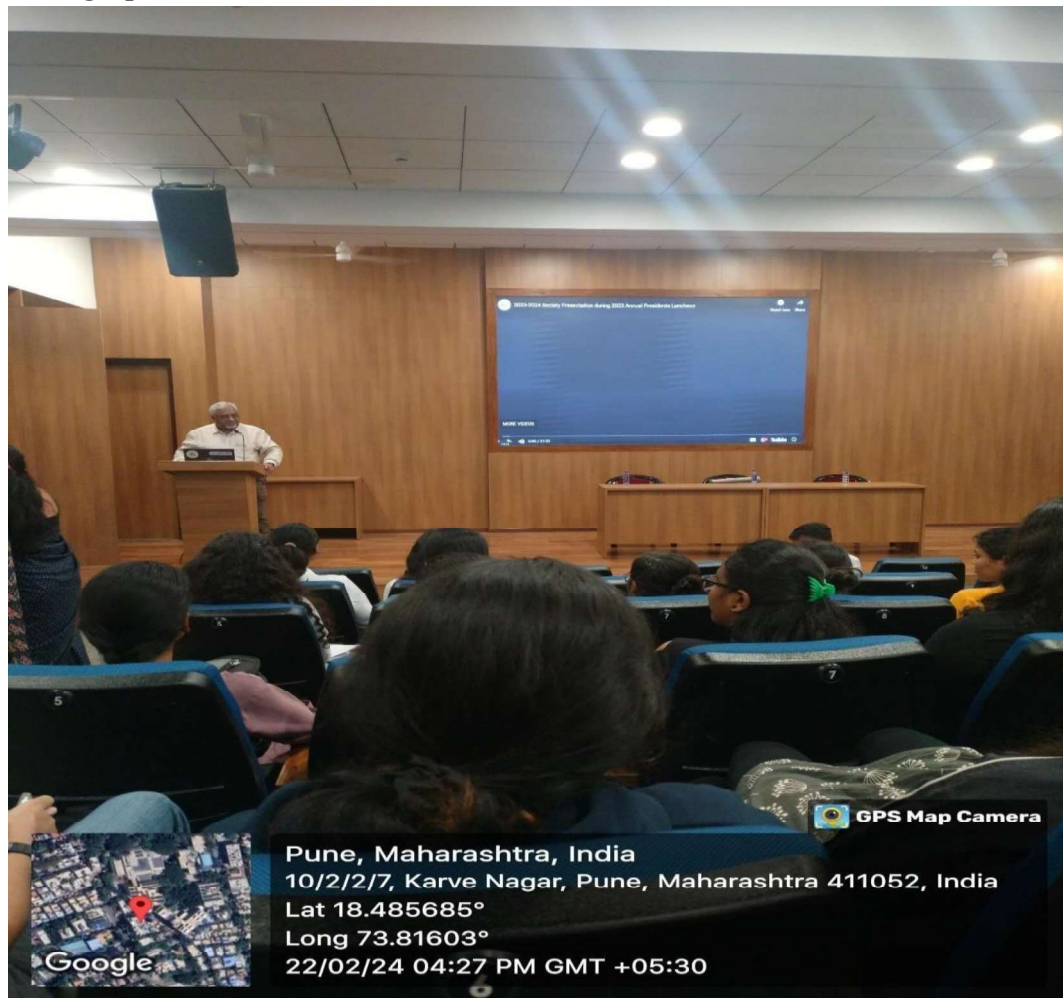
Location - K.B. Joshi Hall IT building, MKSSS's Cummins College of Engineering for Women, Karve Nagar, Pune - 411052

Information - Mr. Yash Karkhanis, president, ASHRAE Pune chapter is an experienced HVACR professional with over 25 years of experience in designing and executing HVAC systems for critical process applications in the Pharma, Food, and Chemical industries. His expertise lies in the design and execution of sub-sea oil and gas pipelines, as well as HVAC systems for critical process applications.

Learning outcomes- Careers in heating, ventilation, and air conditioning (HVAC) encompass various roles, including:

- HVAC Technician: Responsible for installing, maintaining, and repairing HVAC systems in residential, commercial, and industrial settings.
- HVAC Engineer: Designs HVAC systems for buildings, considering factors like energy efficiency, environmental impact, and occupant comfort.
- HVAC Installer: Installs HVAC equipment, ductwork, and piping according to specifications and building codes.
- HVAC Sales Representative: Sells HVAC equipment and services to residential or commercial clients, providing recommendations based on their needs.
- HVAC Project Manager: Oversees HVAC projects from start to finish, coordinating with clients, technicians, and suppliers to ensure timely completion and quality work.
- HVAC Service Manager: Manages a team of HVAC technicians, assigning tasks, scheduling service calls, and ensuring customer satisfaction.
- HVAC Controls Technician: Installs, programs, and maintains HVAC control systems, including thermostats, sensors, and building automation systems.

Photograph:



Compiled by: Pratiksha Divate



**MKSSS's Cummins College
of Engineering For Women**
Student Branch

**BELIMO INDUSTRY VISIT
Report**

Day - Friday

Date - February 23, 2024

Type - Industrial Visit

Name of Company - Belimo

Information - Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation and air-conditioning systems. The focus of the company's core business is on damper actuators, control valves, sensors and meters. Founded in 1975, the company employs over 2,300 people and has been listed on the Swiss Exchange (SIX) since 1995.

Location: Belimo CESIM House, Plot No R-12, Rabale, TTC Industrial area, Navi Mumbai – 400701, India

Number of Participants :

- 22 students of Third Year and 1 student of second Year, Mechanical Department, (ASHRAE Members)
- Prof. Rujuta Agavekar, SBA
- Prof. Amit Rajurkar, Assistant Professor, Mechanical Engineering Department

Presenter: Tushar P Shinde (National HVAC Specialist in Belimo, Mumbai)

Purpose of Visit:

The purpose of the visit to Belimo was to gain insight into the company's operations, particularly focusing on their products and their commitment to sustainability. The visit aimed to understand their range of damper actuators, control valves, hydraulic circuits, and sensors, along with their applications in air and water products.

Introduction to Belimo & Sustainability: -Upon arrival at Belimo, we were greeted by representatives who provided a comprehensive overview of the company's history, mission, and commitment to sustainability. Belimo's dedication to sustainability was evident throughout the facility, from their energy-efficient production processes to their environmentally friendly product designs.

Belimo's sustainability initiatives include:

1. **Energy Efficiency:** Belimo has invested heavily in energy-efficient manufacturing processes to reduce their carbon footprint. This includes optimizing energy usage in production facilities and investing in renewable energy sources wherever possible.
2. **Product Design:** Belimo designs its products with sustainability in mind, focusing on energy efficiency, durability, and recyclability. Their products are engineered to minimize environmental impact while providing optimal performance.
3. **Green Practices:** Belimo implements green practices throughout its operations, such as waste reduction, recycling programs, and eco-friendly packaging solutions. They actively seek ways to minimize waste and pollution at every stage of the product lifecycle.

- **Introduction to Damper Actuators - Air Products:**

During the visit, we were given a detailed presentation on Belimo's damper actuators for air products. These actuators play a crucial role in HVAC systems, controlling airflow to maintain optimal indoor air quality and temperature. Belimo's damper actuators are known for their precision, reliability, and energy efficiency. We learned about the different types of actuators offered by Belimo, their applications, and their benefits in improving HVAC system performance while reducing energy consumption.

- **Introduction to Control Valves - Water Products:**

Belimo also specializes in control valves for water products, which are essential components in heating, cooling, and water management systems. We were briefed on the various types of control valves manufactured by Belimo, including globe valves, butterfly valves, and ball valves. These valves are designed for precise control of water, flow, temperature, and pressure, contributing to energy savings and system efficiency. Students learned about their features, applications, and how they integrate with building automation systems for optimal performance.

- **Hydraulic Circuits and Introduction to Sensors:**

Additionally, our visit included an introduction to hydraulic circuits and sensors used in Belimo's products. Hydraulic circuits are vital in controlling fluid flow and pressure in various applications, including HVAC and water management systems. We learned about the principles of hydraulic circuits, different configurations, and their importance in ensuring system reliability and performance.

Photographs: -





Conclusion: -

In conclusion, the visit to Belimo provided valuable insights into the company's commitment to sustainability and their range of products for air and water management systems. Belimo's focus on energy efficiency, product innovation, and green practices underscores their dedication to environmental stewardship. The introduction to damper actuators, control valves, hydraulic circuits, and sensors highlighted the company's expertise in providing reliable, efficient solutions for building automation and HVAC applications.

Compiled by: - Tisha Bais



**MKSSS's Cummins College
of Engineering For Women**
Student Branch

City Pride Theatre Air Conditioning Unit's Visit

Report

Day - Tuesday

Date - April 2, 2024

Type - Industrial Visit

Location - City Pride

Location of Visit - Central air conditioning facility at City pride theater, Kothrud, Pune - 411038

Number of Participants -

- 70 students of Third Year, Mechanical Engineering Department
- Prof. Rujuta Agavekar, SBA

Purpose of Visit:

The purpose of visiting the Central Air Conditioning facility at City Pride Theatre is to gain comprehensive insights into its state-of-the-art system. This visit aims to delve into the technology and infrastructure that supports comfortable viewing experiences for patrons. Additionally, it provides an opportunity to understand the energy efficiency measures and environmental considerations inherent in large-scale air conditioning operations. Assessing the maintenance protocols and operational strategies employed ensures a deeper understanding of how uninterrupted service is maintained.

Introduction:

The visit to the central air conditioning facility at City Pride Theatre in Pune provided valuable insights into the cooling infrastructure supporting the comfort of patrons. The facility utilizes three cooling units with capacities of 110 TR, 2 units of 55 TR, and 95 TR respectively

Overview of Cooling Units:

There are 3 vapor compression refrigeration systems as follows.

1. 110 TR Unit: This unit serves as the primary cooling source, boasting a substantial capacity to efficiently regulate the temperature within the theater complex. Its robust design and high capacity make it well-suited for maintaining comfortable conditions even during peak occupancy periods.
2. 55 TR 2 Unit: Complementing the larger cooling unit, the 55 TR unit provides supplementary cooling support, ensuring uniform temperature distribution across the theater space. Its moderate capacity is optimized to address fluctuations in demand while maximizing energy efficiency.
3. 95 TR Unit: Acting as another essential component of the cooling system, the 95 TR unit contributes to maintaining optimal environmental conditions within the theater premises. Its intermediate capacity bridges the gap between the larger and smaller units, enhancing overall system flexibility and resilience.

Shell Tube Type Condenser:

The utilization of shell tube type condensers underscores the commitment to efficiency and reliability within the cooling system. This condenser design facilitates efficient heat exchange. Water flows through tubes and refrigerant vapor undergoes condensation on the shell side. Its robust construction enhances durability, minimizing maintenance requirements and downtime.

Compressor: - Screw type compressor is used in the vapor compression system.

Evaporator: Shell and tube type evaporator is used where water is on the shell side and refrigerant is on the tube side. Water at 13 °C comes from AHU after picking up the heat from the air of the cinema hall and its temperature is lowered to 6 °C. This chilled water acts as secondary refrigerant. This chilled water goes back to AHU. Primary refrigerant picks up heat from water and undergoes phase change. Refrigerant vapor goes to the suction of the compressor.

Cooling Tower:

The presence of a cooling tower enhances the cooling efficiency of the system by facilitating the dissipation of heat generated during the air conditioning process. This crucial component plays a vital role in maintaining the optimal operating conditions of the cooling units, contributing to overall energy savings and system performance. Cooling towers are located on the rooftop.

Throttle Valve: Thermostatic expansion valve is used for throttling in the system.

Air Handling Units for Theatre Rooms:

The integration of air handling units within the theatre rooms ensures the delivery of conditioned air to maintain comfortable indoor environments. These units regulate air distribution, filtration, and ventilation, enhancing air quality while effectively controlling temperature and humidity levels. By customizing airflow patterns, the air handling units optimize comfort for patrons, enhancing their overall viewing experience.

Conclusion:

The visit to the central air conditioning facility at City Pride Theatre provided valuable insights into the design, operation, and components of the cooling system. The utilization of multiple cooling units, shell tube type condensers, cooling towers, and air handling units underscores the commitment to efficiency, reliability, and patron comfort. The integration of these components reflects best practices in large-scale air conditioning systems, serving as a benchmark for similar facilities seeking to enhance their cooling infrastructure.

Acknowledgment:

Special thanks to the management and staff of City Pride Theatre for their hospitality and willingness to share insights into their central air conditioning facility.

Photograph:



Compiled by: - Kashmira Lohar